

Market Monitor Report

MC Webinar
January 27, 2014

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Monitoring Analytics

PJM real-time, load-weighted, average LMP (Dollars per MWh): 1998 through 2013

Year	Real-Time, Load-Weighted, Average LMP			Year-to-Year Change		
	Average	Median	Standard Deviation	Average	Median	Standard Deviation
1998	\$24.16	\$17.60	\$39.29	NA	NA	NA
1999	\$34.07	\$19.02	\$91.49	41.0%	8.1%	132.8%
2000	\$30.72	\$20.51	\$28.38	(9.8%)	7.9%	(69.0%)
2001	\$36.65	\$25.08	\$57.26	19.3%	22.3%	101.8%
2002	\$31.60	\$23.40	\$26.75	(13.8%)	(6.7%)	(53.3%)
2003	\$41.23	\$34.96	\$25.40	30.5%	49.4%	(5.0%)
2004	\$44.34	\$40.16	\$21.25	7.5%	14.9%	(16.3%)
2005	\$63.46	\$52.93	\$38.10	43.1%	31.8%	79.3%
2006	\$53.35	\$44.40	\$37.81	(15.9%)	(16.1%)	(0.7%)
2007	\$61.66	\$54.66	\$36.94	15.6%	23.1%	(2.3%)
2008	\$71.13	\$59.54	\$40.97	15.4%	8.9%	10.9%
2009	\$39.05	\$34.23	\$18.21	(45.1%)	(42.5%)	(55.6%)
2010	\$48.35	\$39.13	\$28.90	23.8%	14.3%	58.7%
2011	\$45.94	\$36.54	\$33.47	(5.0%)	(6.6%)	15.8%
2012	\$35.23	\$30.43	\$23.66	(23.3%)	(16.7%)	(29.3%)
2013	\$38.66	\$33.25	\$23.78	9.7%	9.3%	0.5%

Offer-capping statistics – energy only: 2009 to 2013

	Real Time		Day Ahead	
	Unit Hours	MW	Unit Hours	MW
	Capped	Capped	Capped	Capped
2009	0.4%	0.1%	0.1%	0.0%
2010	1.2%	0.4%	0.2%	0.1%
2011	0.7%	0.2%	0.0%	0.0%
2012	0.9%	0.5%	0.1%	0.1%
2013	0.4%	0.2%	0.1%	0.1%

Offer-capping statistics for energy and reactive support: 2009 to 2013

	Real Time		Day Ahead	
	Unit Hours Capped	MW Capped	Unit Hours Capped	MW Capped
2009	0.4%	0.1%	0.1%	0.0%
2010	1.2%	0.4%	0.2%	0.1%
2011	0.9%	0.3%	0.0%	0.0%
2012	1.5%	1.0%	0.5%	0.4%
2013	1.8%	1.8%	1.9%	1.6%

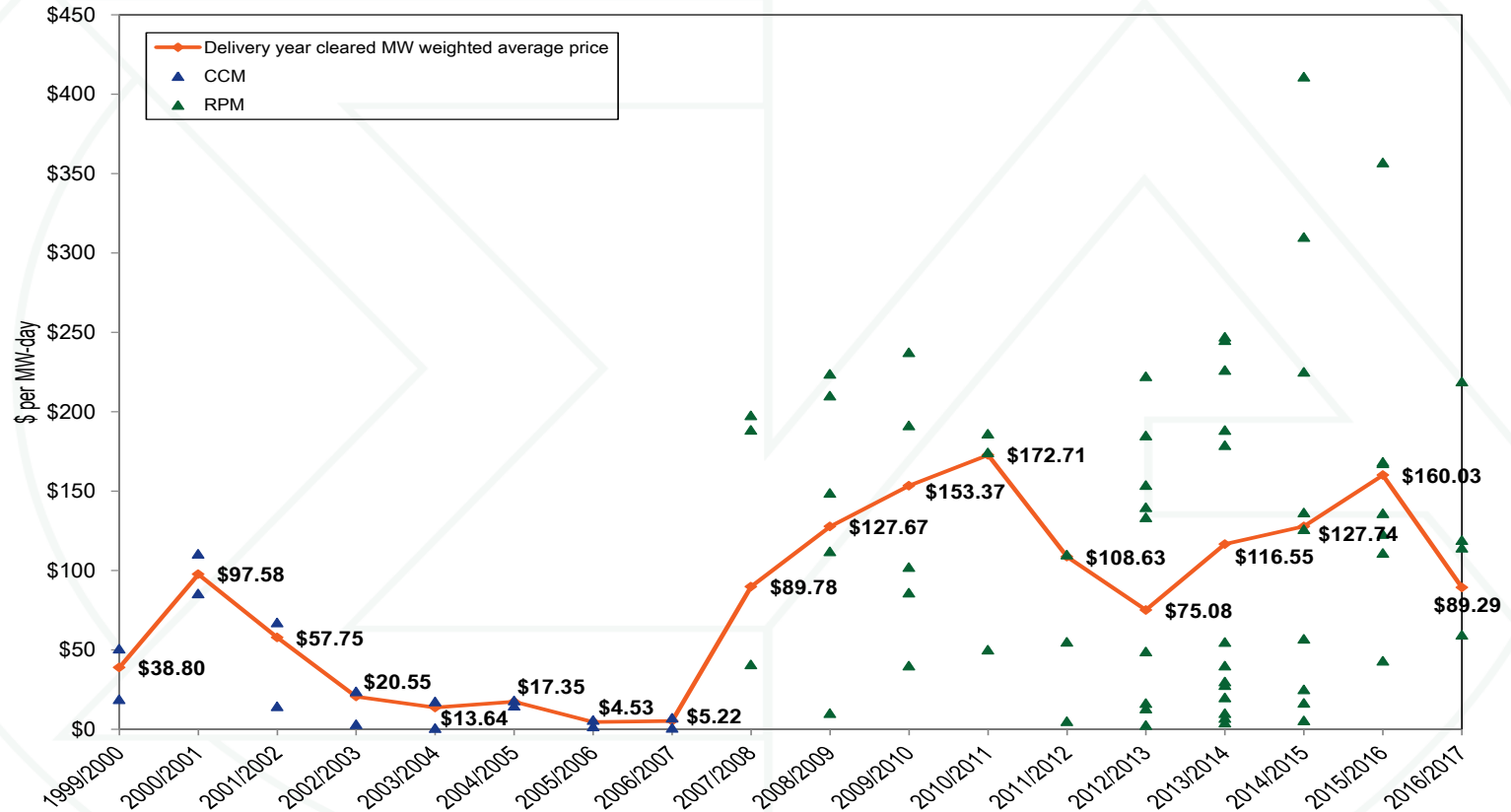
Components of PJM real-time (Adjusted), annual, load-weighted, average LMP: 2013 and 2012

Element	2012		2013	
	Contribution to LMP	Percent	Contribution to LMP	Percent
Coal	\$19.06	54.1%	\$18.20	47.1%
Gas	\$8.39	23.8%	\$10.57	27.3%
VOM	\$2.53	7.2%	\$2.25	5.8%
Ten Percent Adder	\$1.50	4.3%	\$1.86	4.8%
NA	\$1.16	3.3%	\$1.79	4.6%
FMU Adder	\$0.10	0.3%	\$1.31	3.4%
Oil	\$1.69	4.8%	\$1.30	3.4%
Markup	\$0.44	1.2%	\$0.76	2.0%
LPA Rounding Difference	\$0.35	1.0%	\$0.50	1.3%
Emergency Demand Response Ad	\$0.00	0.0%	\$0.17	0.4%
CO2 Cost	\$0.09	0.3%	\$0.13	0.3%
NOx Cost	\$0.10	0.3%	\$0.10	0.2%
Increase Generation Adder	\$0.12	0.3%	\$0.04	0.1%
SO2 Cost	\$0.02	0.1%	\$0.01	0.0%
Uranium	\$0.00	0.0%	\$0.00	0.0%
Wind	(\$0.04)	(0.1%)	\$0.00	0.0%
Other	\$0.01	0.0%	\$0.00	0.0%
Constraint Violation Adder	\$0.02	0.1%	\$0.00	0.0%
Market-to-Market Adder	\$0.02	0.1%	(\$0.00)	(0.0%)
Decrease Generation Adder	(\$0.22)	(0.6%)	(\$0.13)	(0.3%)
LPA-SCED Differential	(\$0.10)	(0.3%)	(\$0.21)	(0.5%)
Total	\$35.23	100.0%	\$38.66	100.0%

Total PJM congestion (Dollars (Millions)): 2008 to 2013

Congestion Costs (Millions)				
	Congestion Cost	Percent Change	Total PJM Billing	Percent of PJM Billing
2008	\$2,051.8	NA	\$34,306	6.0%
2009	\$719.0	(65.0%)	\$26,550	2.7%
2010	\$1,423.3	98.0%	\$34,771	4.1%
2011	\$999.0	(29.8%)	\$35,887	2.8%
2012	\$529.0	(47.0%)	\$29,181	1.8%
2013	\$676.6	27.9%	\$33,862	2.0%

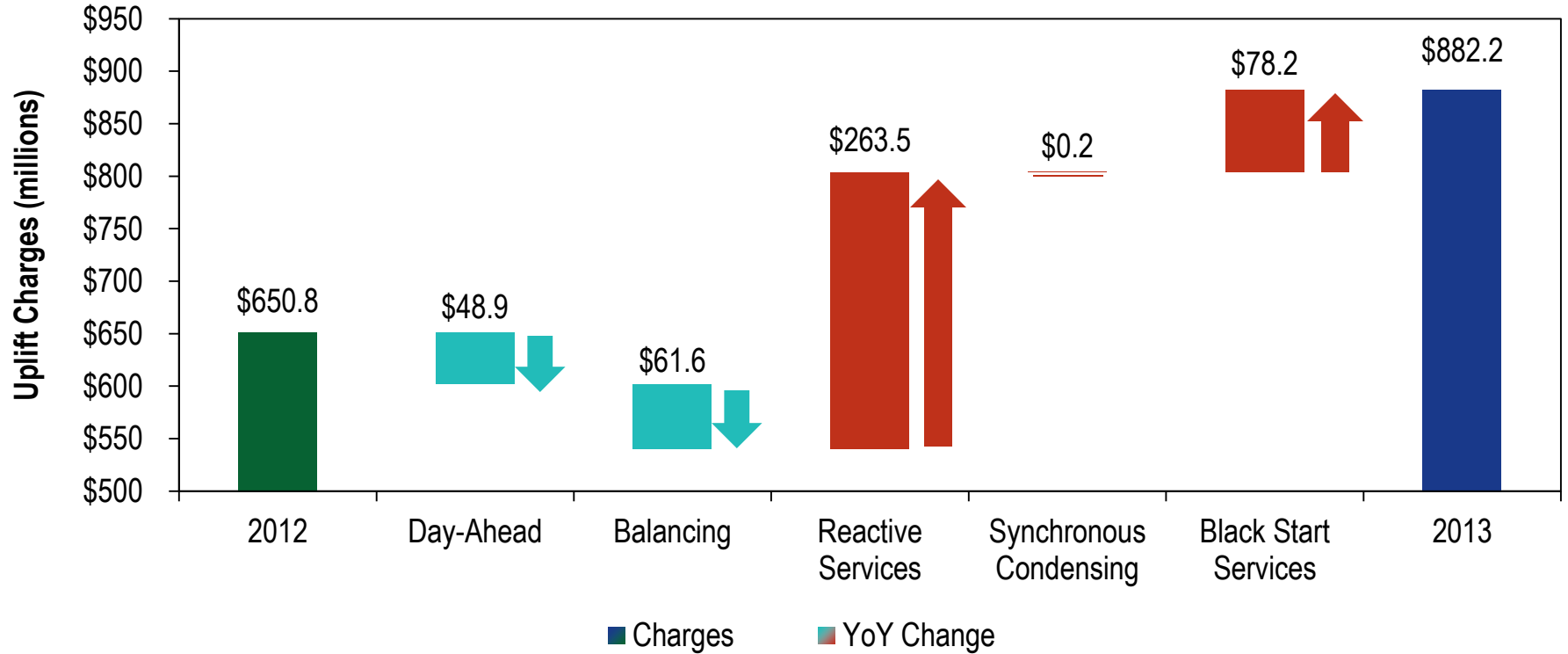
History of PJM capacity prices: 1999/2000 through 2016/2017



Total operating reserve charges: 2012 and 2013

	2012	2013	Change	Percentage Change
Total Operating Reserve Charges	\$650,777,886	\$882,219,896	\$231,442,009	35.6%
Operating Reserve as a Percent of Total PJM Billing	2.2%	2.6%	0.4%	16.8%

Uplift Charges: 2012 - 2013



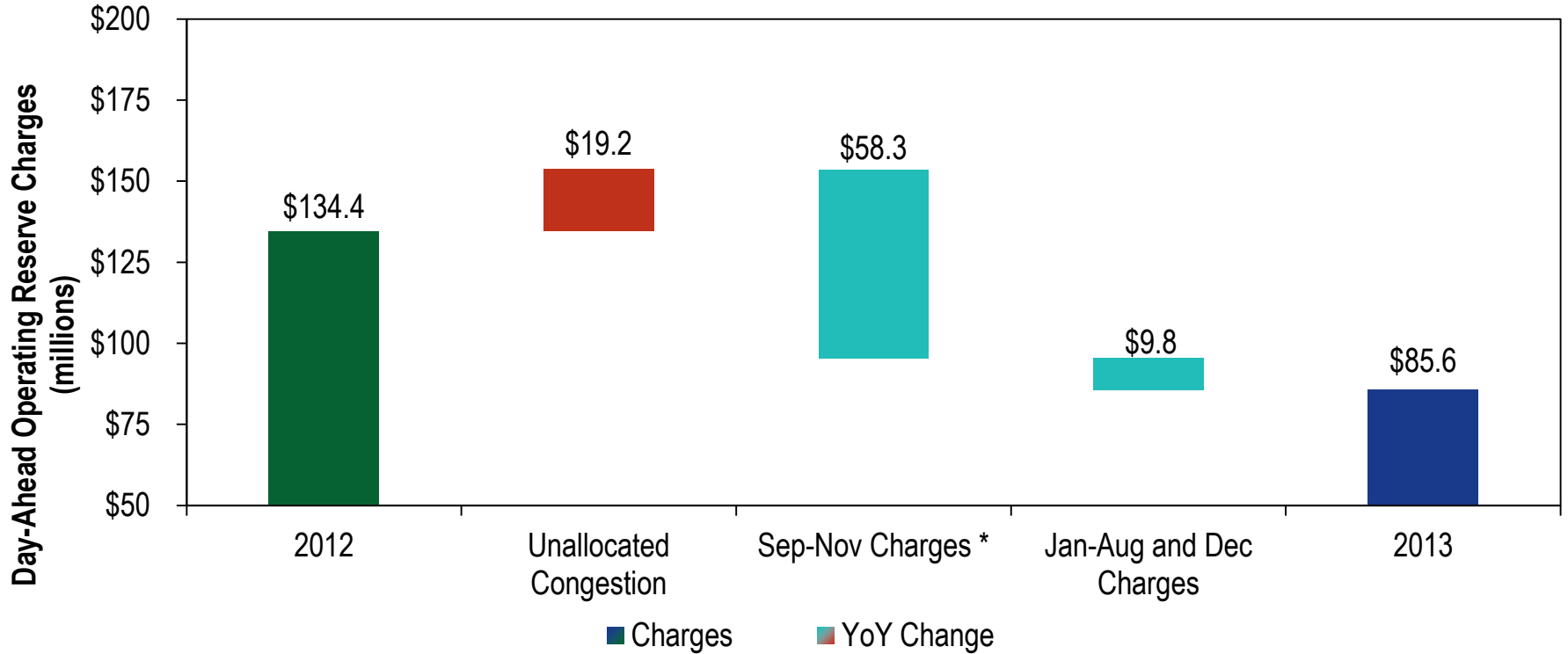
Uplift Charges: 2012 - 2013

Issues that impacted uplift in 2013:

- **Unallocated congestion costs (FTR)**
- **Black start and reactive support units scheduling, commitment and uplift allocation**
- **CT commitment (DA vs. RT)**
- **2013 winter vs. 2012 winter**
- **FMU adders**
- **Reactive services credits settlement issue (Aug-Dec)**



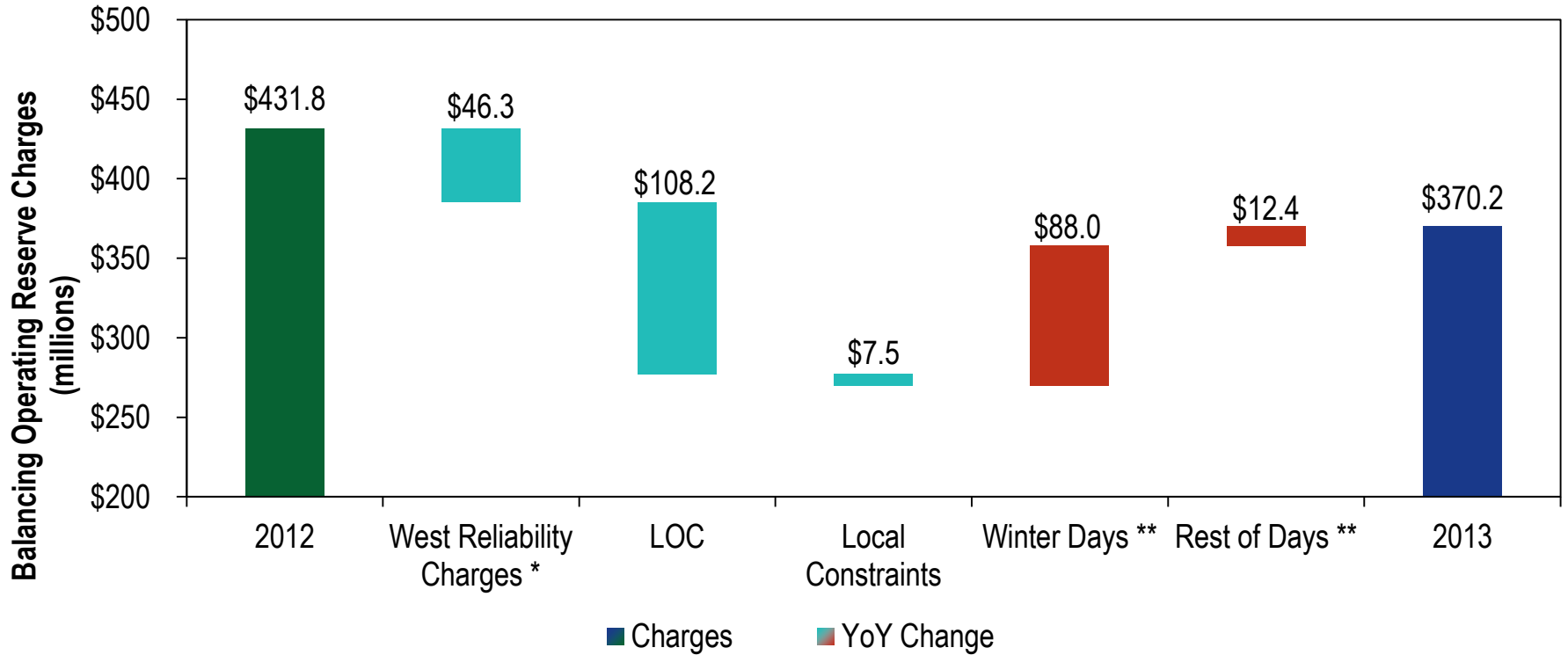
Day-Ahead Operating Reserves: 2012 - 2013



* During Sep-Nov 2012, uplift costs associated with units providing black start and reactive support were allocated as day-ahead operating reserve charges.



Balancing Operating Reserves: 2012 - 2013

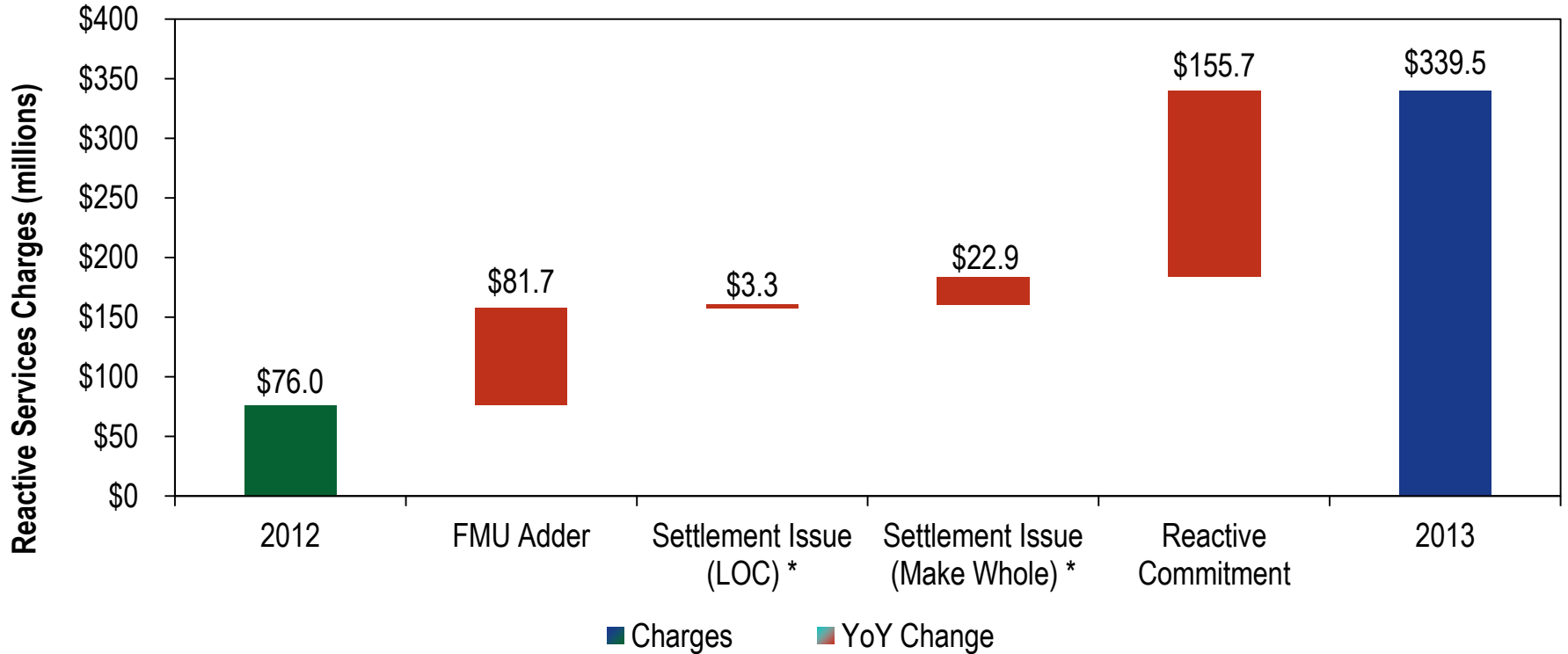


* During Jan-Aug 2012, uplift costs associated with units providing black start support were allocated as balancing operating reserve charges for reliability in the west region.

** BOR charges excluding BOR West Reliability charges and LOC related charges.



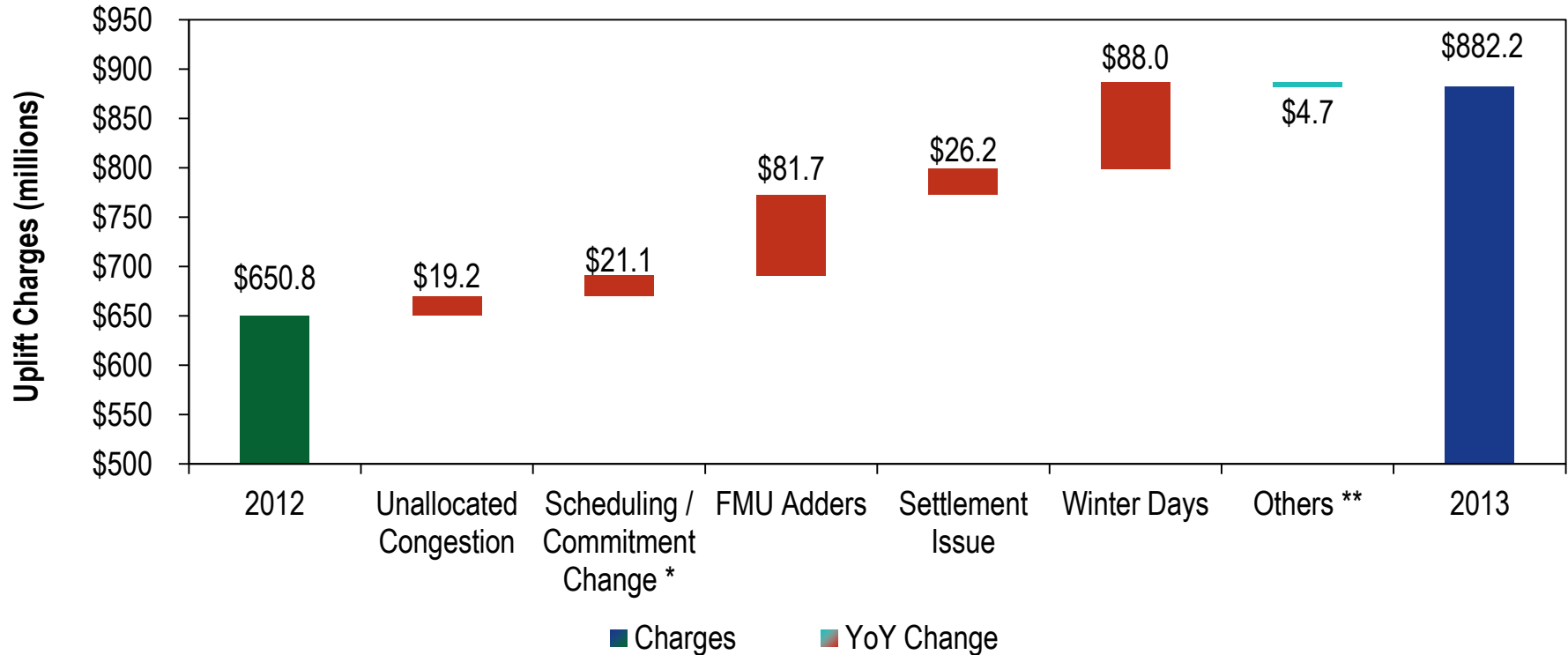
Reactive Services: 2012 - 2013



* Aug-Dec 2013 period.



Uplift (Revisited): 2012 - 2013



* Includes: DA Charges (Sep-Nov), BOR West Reliability Charges, LOC, Black Start and Reactive Commitment

** Includes: DA Charges (Jan-Aug and Dec), BOR (Non Winter, Non BOR West Reliability, Non LOC), Synchronous Condensing and Local Constraint Control.



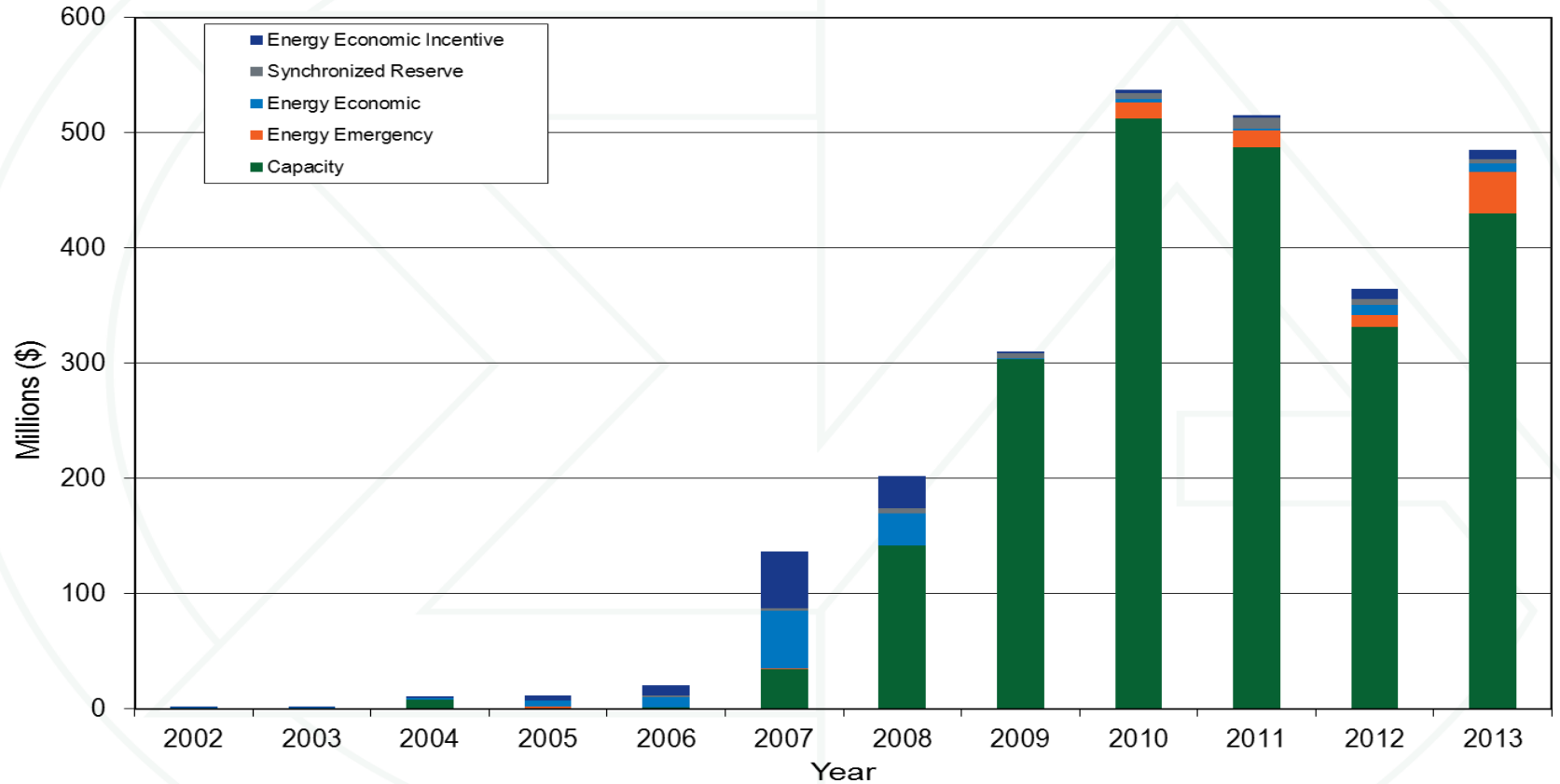
Operating reserve rates (\$/MWh): 2012 and 2013

Rate	2012 (\$/MWh)	2013 (\$/MWh)	Difference (\$/MWh)	Percentage Difference
Day-Ahead	0.161	0.079	(0.082)	(51.1%)
Day-Ahead with Unallocated Congestion	0.162	0.103	(0.059)	(36.5%)
RTO Reliability	0.025	0.051	0.026	107.2%
East Reliability	0.022	0.030	0.008	35.9%
West Reliability	0.115	0.004	(0.111)	(96.2%)
RTO Deviation	0.820	0.863	0.043	5.2%
East Deviation	0.333	1.868	1.535	460.8%
West Deviation	0.127	0.122	(0.006)	(4.6%)
Lost Opportunity Cost	1.329	0.705	(0.623)	(46.9%)
Canceled Resources	0.024	0.003	(0.021)	(87.8%)

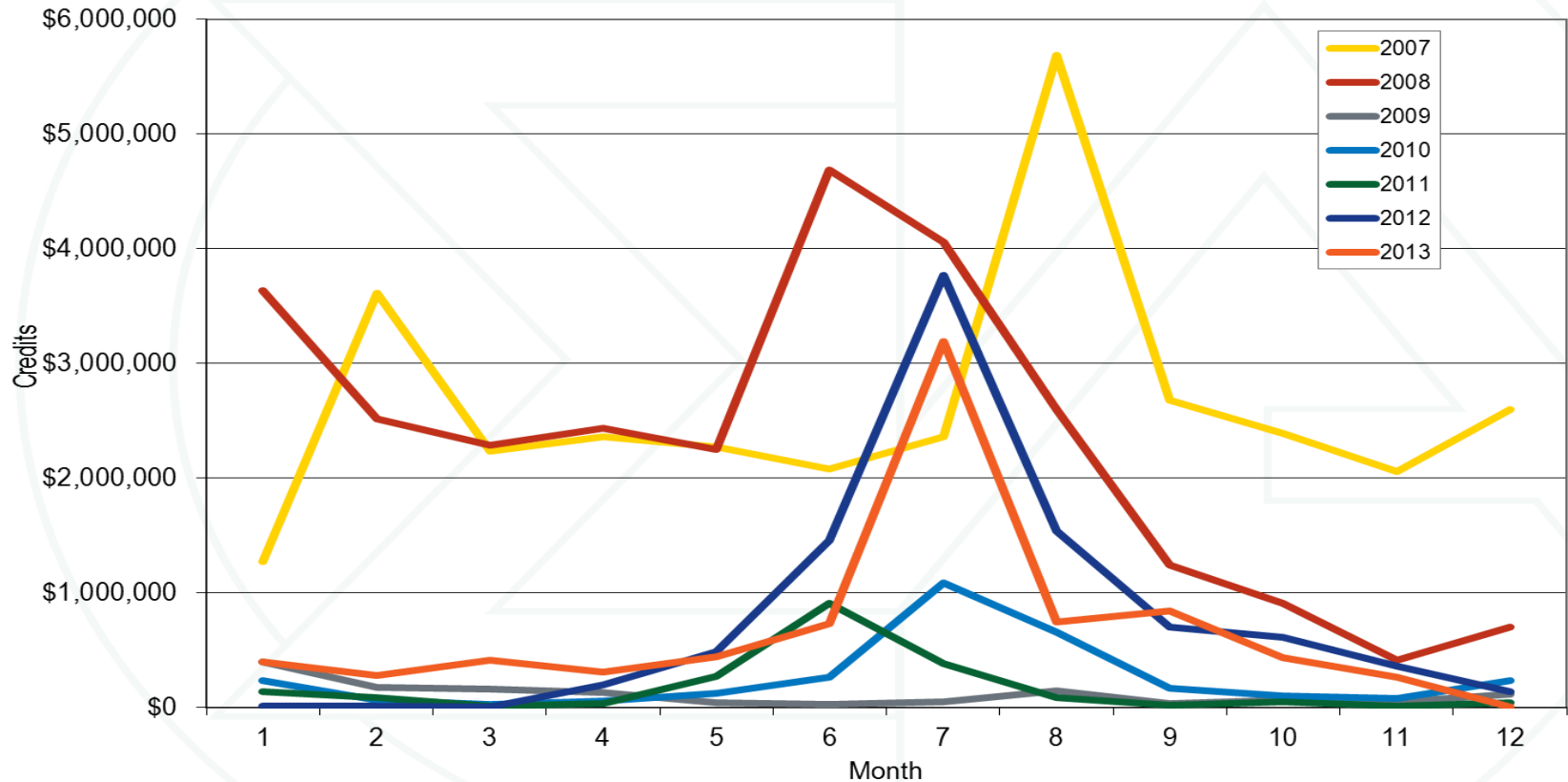
Top 10 operating reserve credits units (By percent of total system): 2001 through 2013

	Top 10 Units Credit Share	Percent of Total PJM Units
2001	46.7%	1.8%
2002	32.0%	1.5%
2003	39.3%	1.3%
2004	46.3%	0.9%
2005	27.7%	0.8%
2006	29.7%	0.8%
2007	29.7%	0.8%
2008	18.8%	0.8%
2009	37.1%	0.8%
2010	33.2%	0.8%
2011	28.1%	0.8%
2012	22.7%	0.7%
2013	38.0%	0.7%

Demand Response revenue by market: 2002 through 2013



Economic Program credits by month: 2007 through 2013



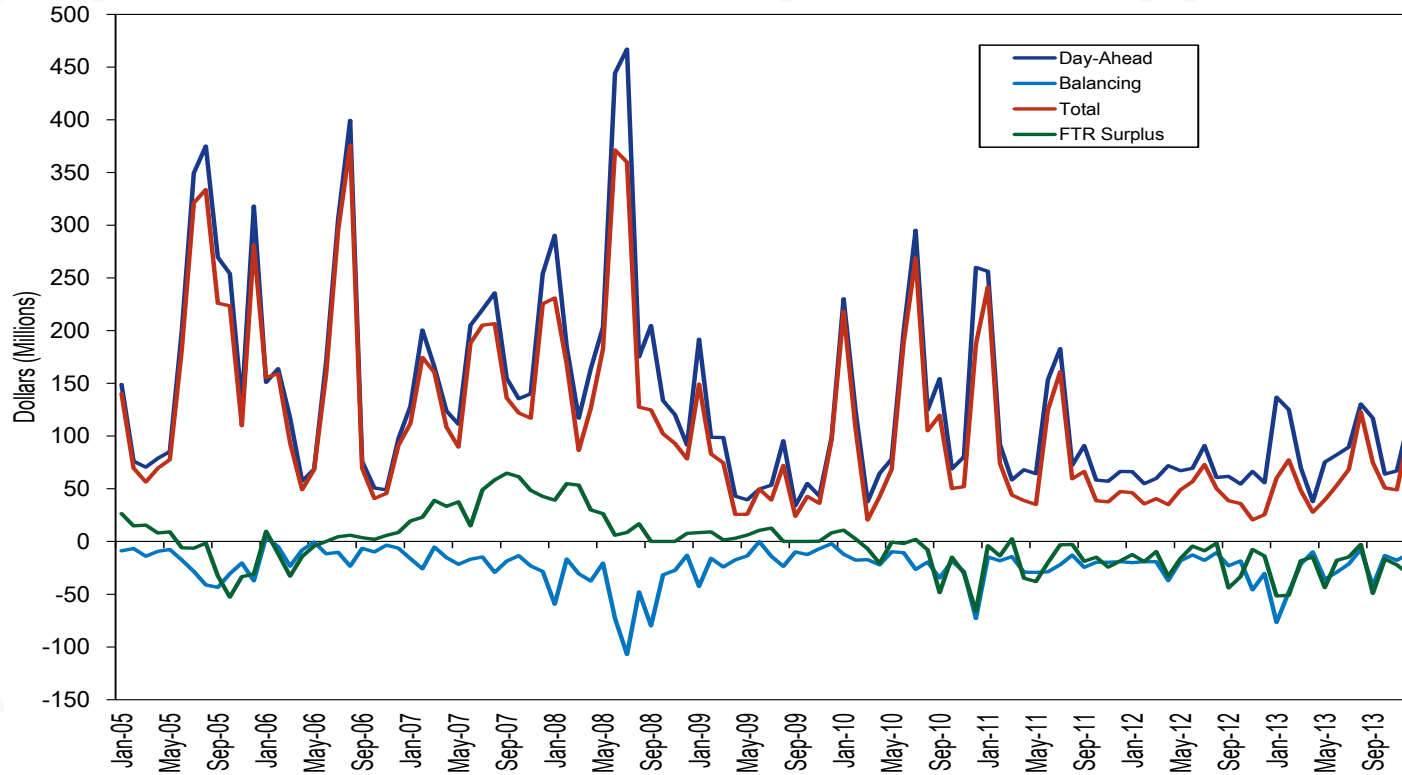
Distribution of participant event days across ranges of performance levels across the events in the 2013/2014 Delivery Year compliance period

Ranges of performance as a percentage of nominated ICAP MW	Number of participant event days	Proportion of participant event days	Cumulative proportion
0%, load increase, or no reporting	5,013	28%	28%
0% - 10%	1,345	7%	35%
10% - 20%	1,069	6%	41%
20% - 30%	906	5%	46%
30% - 40%	814	5%	51%
40% - 50%	705	4%	54%
50% - 60%	681	4%	58%
60% - 70%	635	4%	62%
70% - 80%	671	4%	65%
80% - 90%	674	4%	69%
90% - 100%	2,076	11%	81%
100% - 110%	1,381	8%	88%
110% - 125%	645	4%	92%
125% - 150%	588	3%	95%
150% - 175%	283	2%	97%
175% - 200%	163	1%	98%
200% - 300%	278	2%	99%
> 300%	158	1%	100%
Total	18,085	100%	

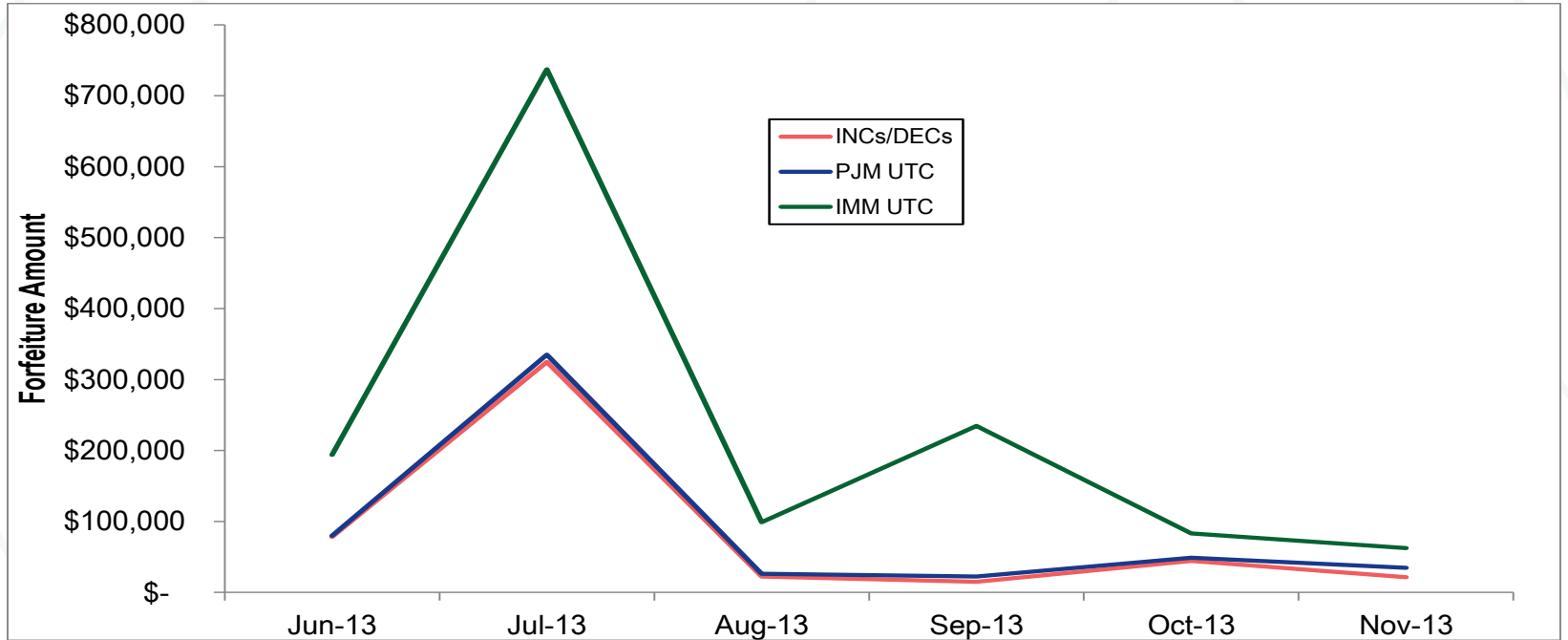
Comparison of average price and cost for PJM Regulation: 2007 through 2013

Period	Weighted Regulation Market Price	Weighted Regulation Market Cost	Regulation Price as Percent Cost
2007	\$36.86	\$52.91	70%
2008	\$42.09	\$64.43	65%
2009	\$23.56	\$29.87	79%
2010	\$18.08	\$32.07	56%
2011	\$16.21	\$29.28	55%
2012	\$20.35	\$26.41	77%
2013	\$30.14	\$34.57	87%

FTR Surplus and the collected Day-Ahead, Balancing and Total congestion: 2005 through 2013



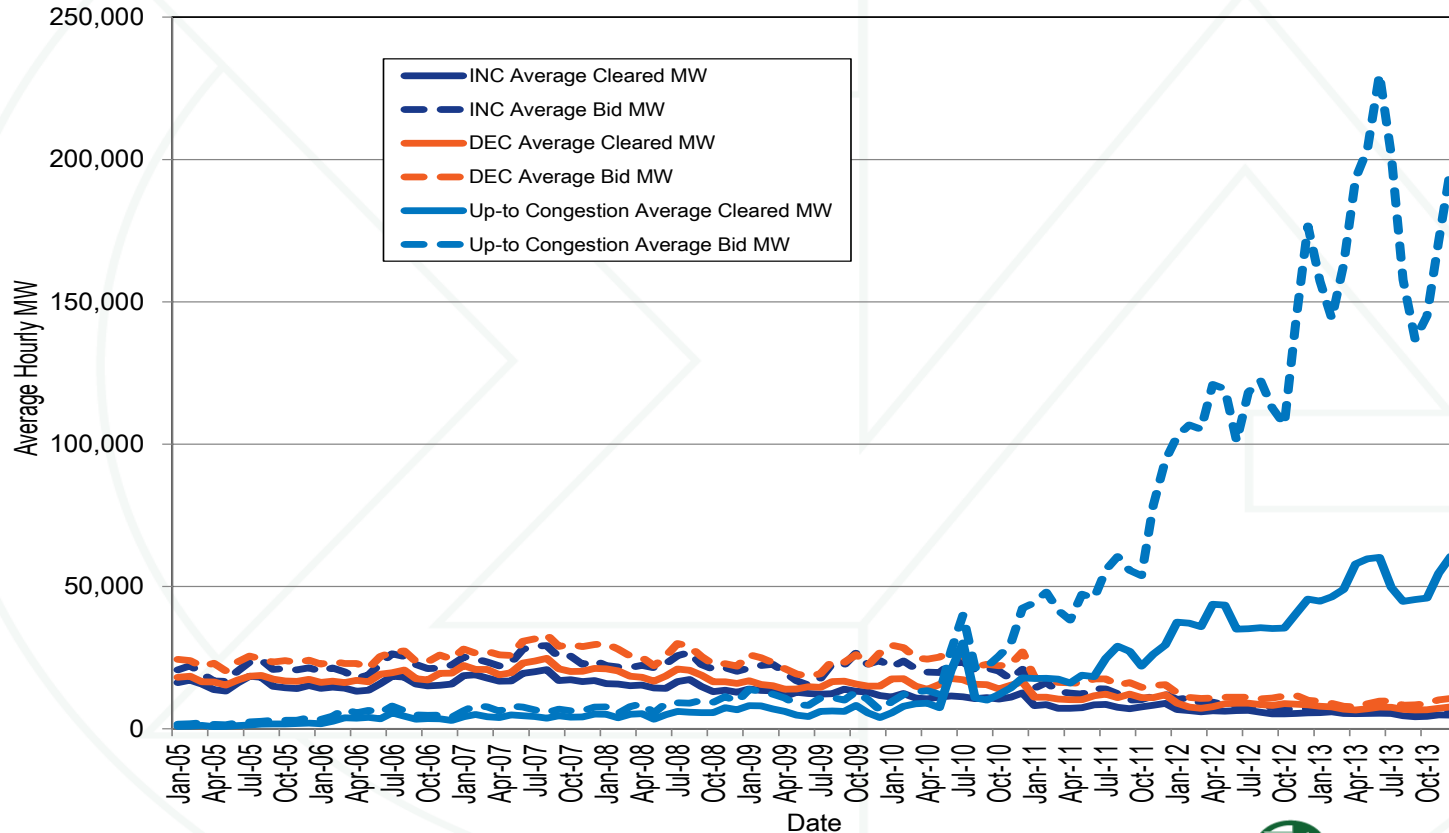
FTR Forfeitures



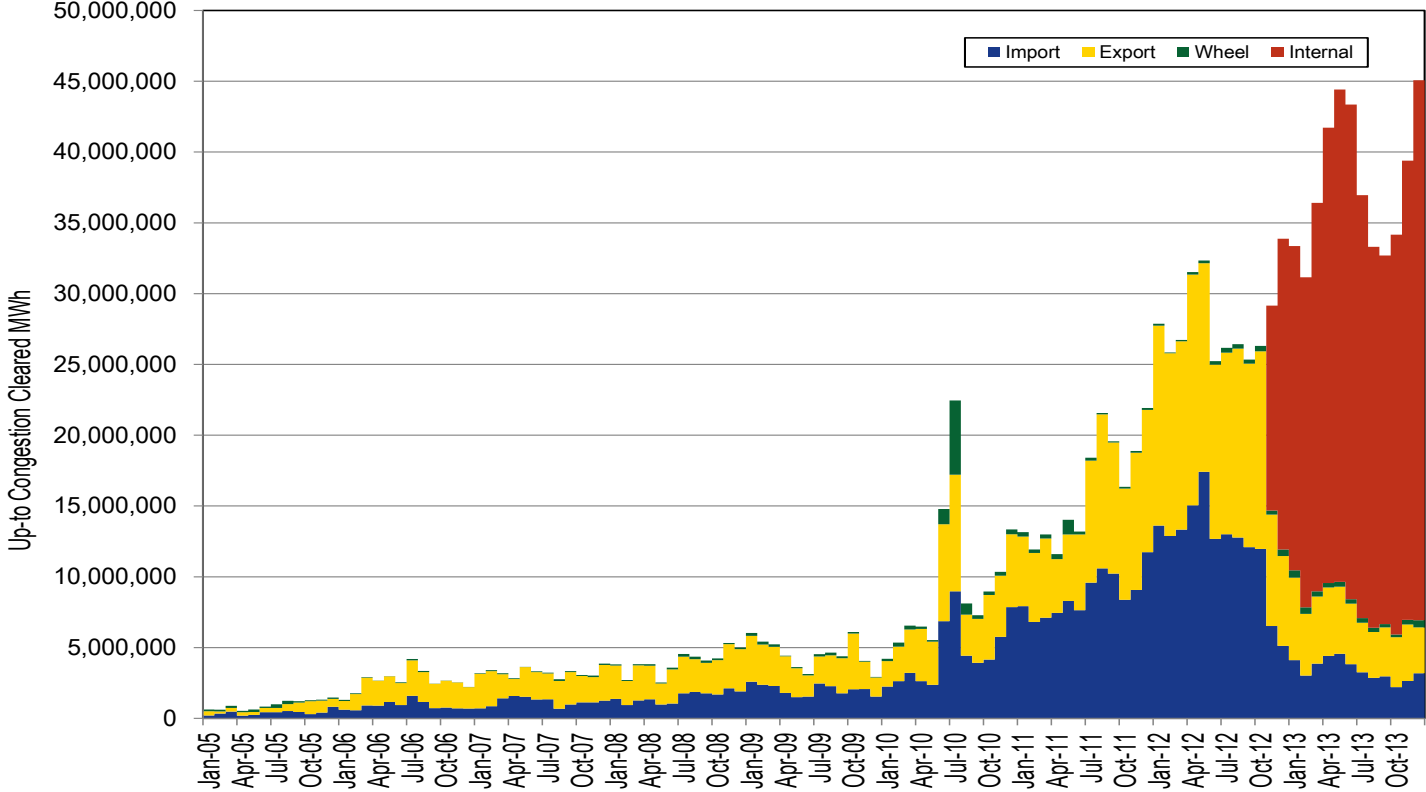
FTRs: Monthly positive and negative target allocations and payout ratios with and without hourly netting: Planning period 2012 to 2013 and 2013 to 2014

	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)
Jan-13	\$ 129,096,732	\$ (8,682,957)	\$ 233,783,161	\$ (113,347,680)	\$68,617,681	57.0%	77.8%
Feb-13	\$ 135,702,271	\$ (7,613,234)	\$ 259,657,461	\$ (131,557,526)	\$77,154,565	60.3%	80.4%
Mar-13	\$ 74,421,312	\$ (3,760,700)	\$ 146,552,085	\$ (75,878,638)	\$52,428,118	74.2%	87.6%
Apr-13	\$ 50,520,958	\$ (3,090,289)	\$ 108,760,047	\$ (61,325,460)	\$32,698,909	68.9%	86.5%
May-13	\$ 95,352,565	\$ (4,678,790)	\$ 190,798,195	\$ (100,110,478)	\$47,015,169	51.9%	77.1%
Jun-13	\$ 86,723,727	\$ (4,836,912)	\$ 164,066,220	\$ (82,101,063)	\$64,060,468	78.3%	89.1%
Jul-13	\$ 134,302,957	\$ (6,017,378)	\$ 255,724,128	\$ (127,113,708)	\$113,548,567	88.8%	94.1%
Aug-13	\$ 51,545,380	\$ (5,741,003)	\$ 104,601,365	\$ (58,796,985)	\$43,059,687	94.1%	97.4%
Sep-13	\$ 126,168,822	\$ (10,172,695)	\$ 279,972,757	\$ (163,977,565)	\$66,719,631	57.5%	82.4%
Oct-13	\$ 69,748,034	\$ (5,779,197)	\$ 158,354,017	\$ (94,365,761)	\$47,353,545	74.1%	89.5%
Nov-13	\$ 71,460,441	\$ (4,566,566)	\$ 156,649,135	\$ (89,755,253)	\$44,748,426	66.9%	85.9%
Dec-13	\$ 123,125,598	\$ (7,182,127)	\$ 256,139,289	\$ (140,195,812)	\$84,974,997	73.3%	87.9%
2012/2013 Total	\$ 992,878,752	\$ (86,061,137)	\$ 1,897,830,880	\$ (990,471,801)	\$ 614,014,377	67.7%	84.5%
2013/2014 Total	\$ 663,074,957	\$ (44,295,877)	\$ 1,375,506,911	\$ (674,205,083)	\$ 464,465,322	75.1%	82.8%

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



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



PJM up-to congestion transactions by type of parent organization (MW): 2012 and 2013

Category	2012		2013	
	Total Up-to Congestion MW	Percentage	Total Up-to Congestion MW	Percentage
Financial	318,217,668	94.7%	432,126,914	95.6%
Physical	17,660,315	5.3%	19,875,032	4.4%
Total	335,877,984	100.0%	452,001,946	100.0%

Figure 3-5 Frequently mitigated units and associated units (By month): February, 2006 through December, 2013

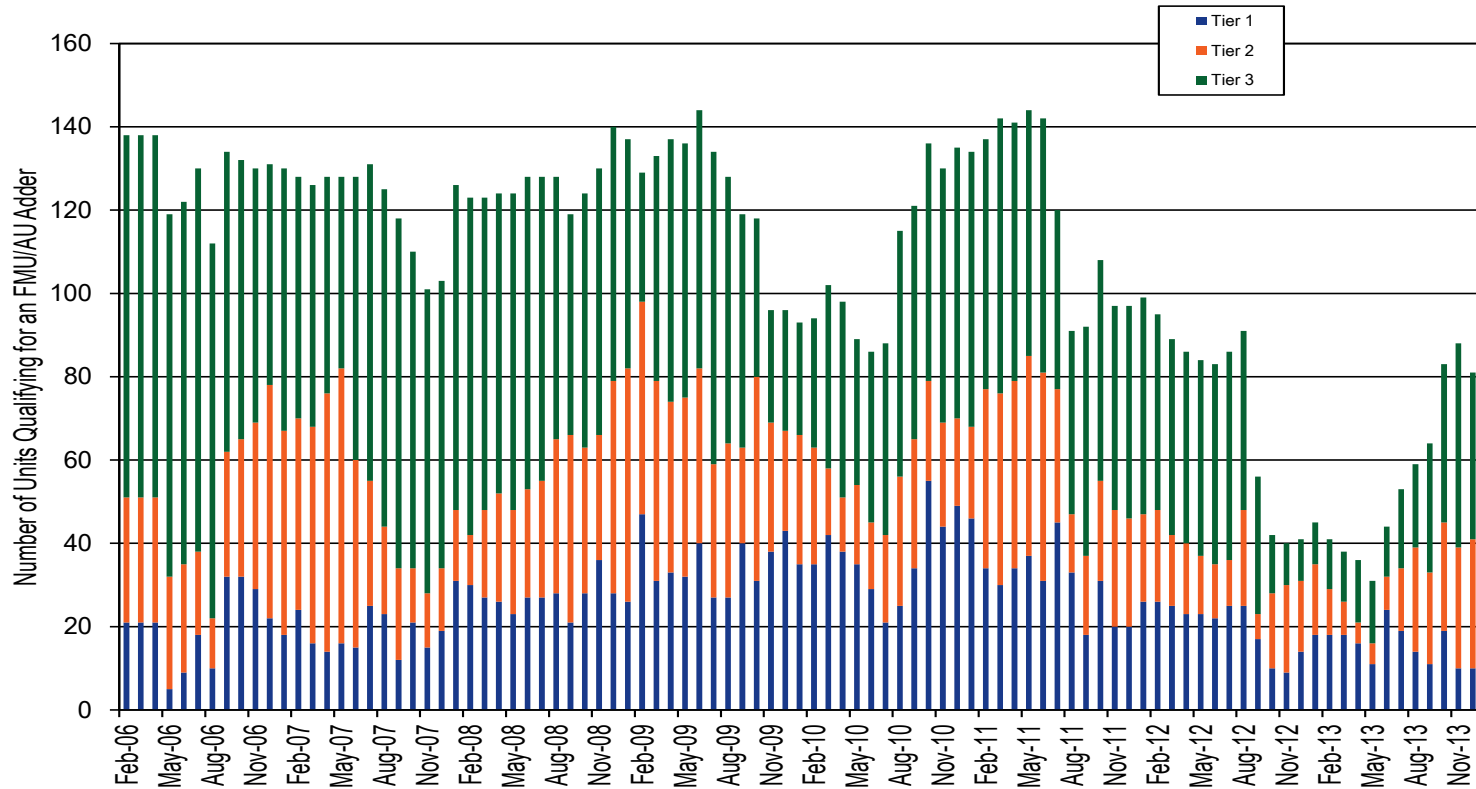
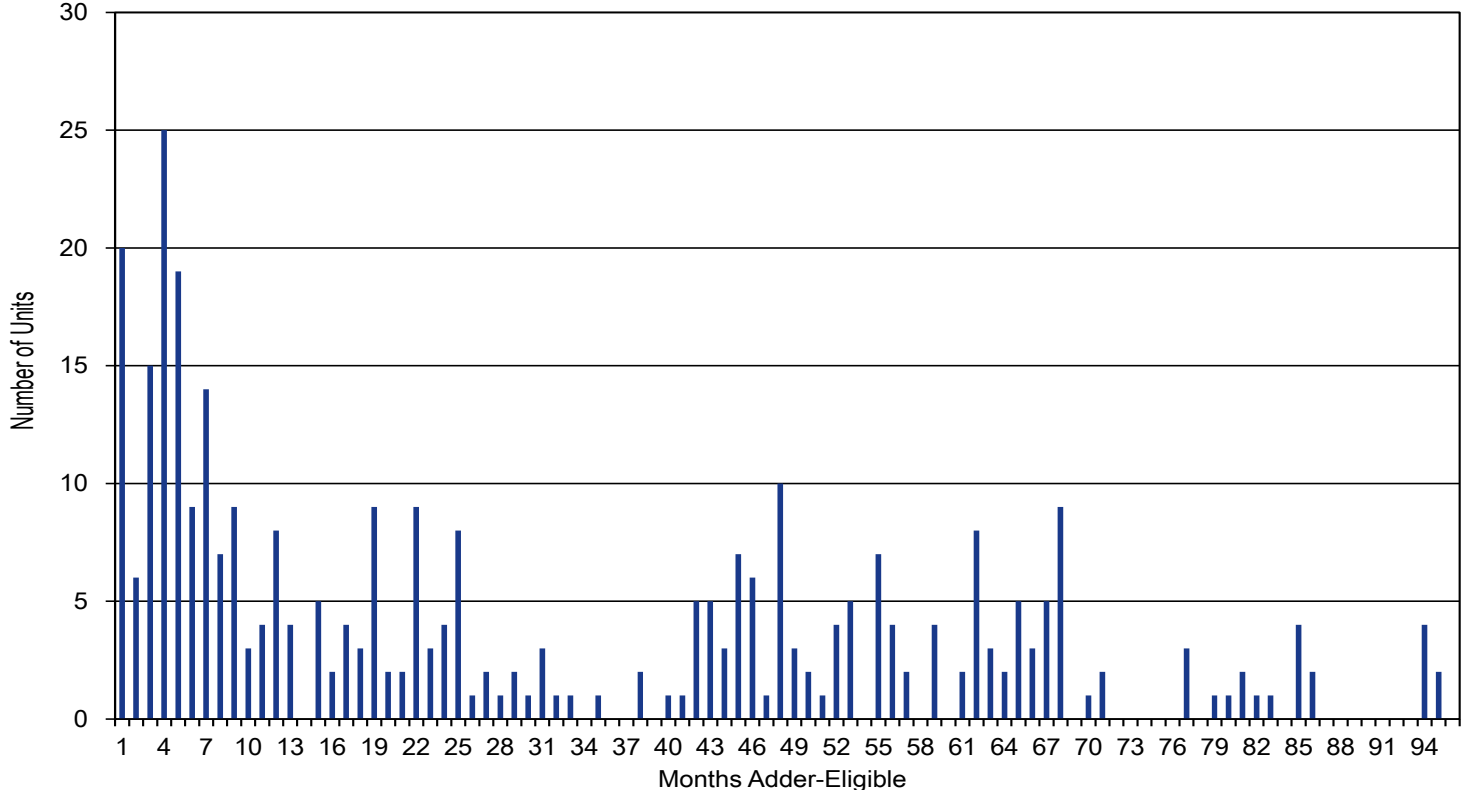


Figure 3-6 Frequently mitigated units and associated units total months eligible: February, 2006 through December, 2013



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