

Market Monitor Report: January through March 2016

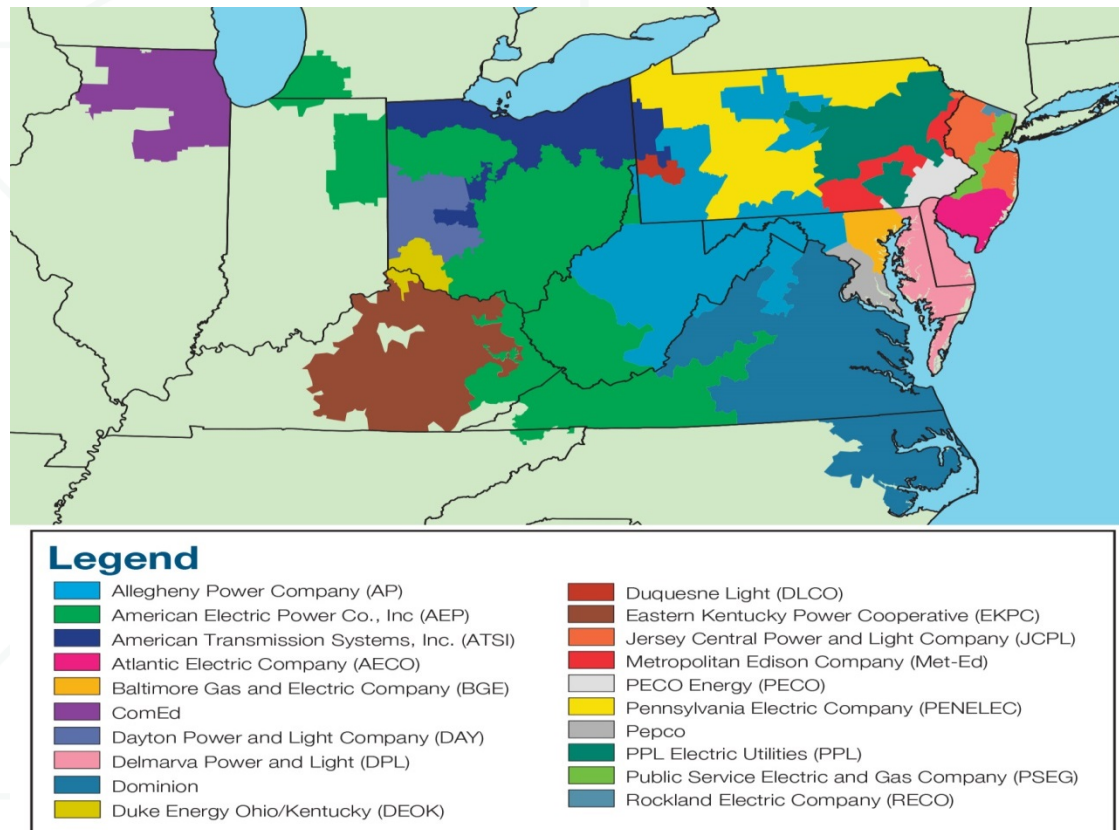
Members Committee
May 19, 2016

Joseph Bowring



Monitoring Analytics

Figure 1-1 PJM's footprint and its 20 control zones



The energy market results were competitive in Q1 2016

Market Element	Evaluation	Market Design
Market Structure: Aggregate Market	Competitive	
Market Structure: Local Market	Not Competitive	
Participant Behavior	Competitive	
Market Performance	Competitive	Effective

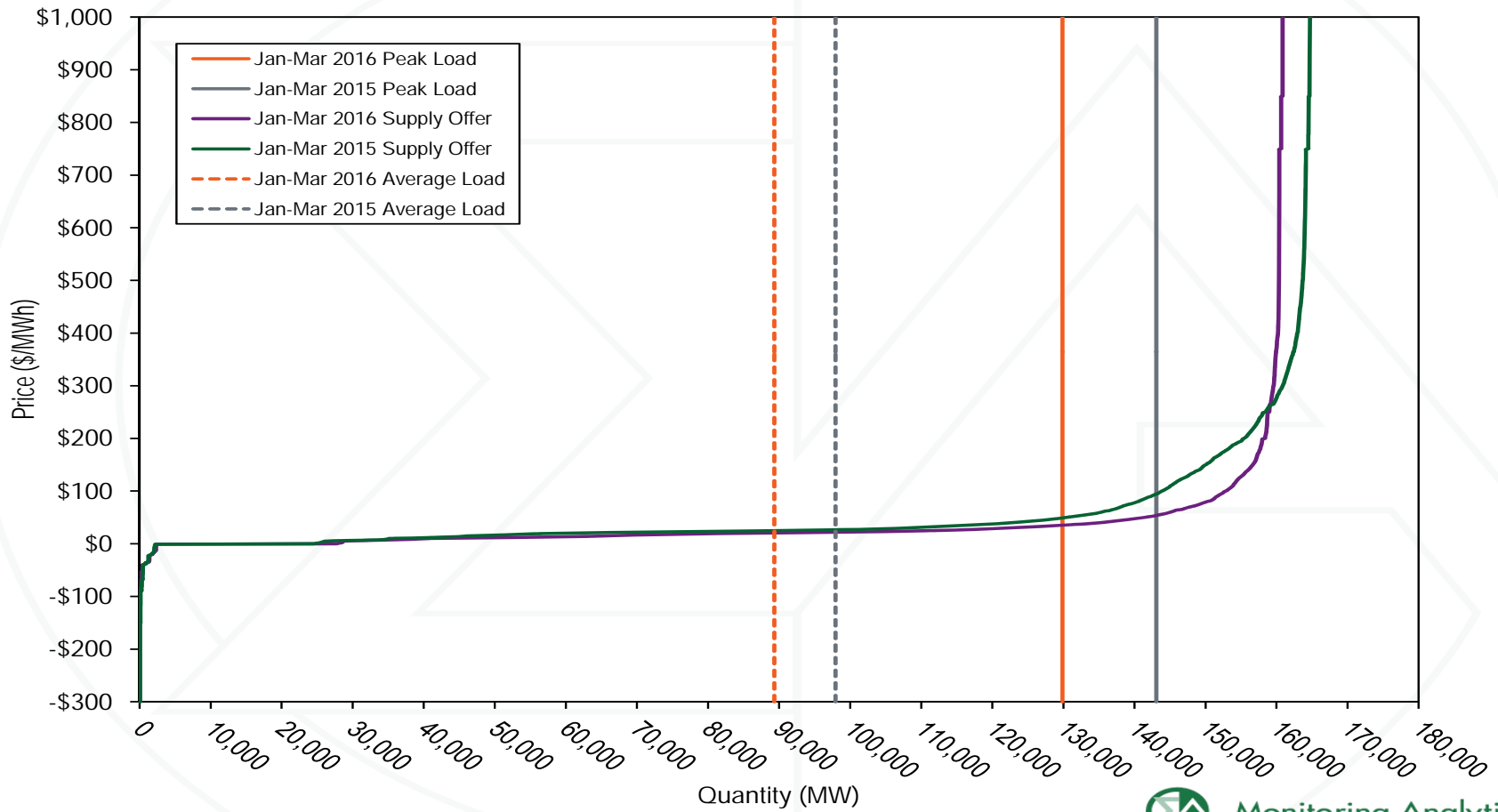


Total price per MWh by category

Category	Jan-Mar 2015 \$/MWh	Jan-Mar 2015 Percent of Total	Jan-Mar 2016 \$/MWh	Jan-Mar 2016 Percent of Total	Percent Change Totals
Load Weighted Energy	\$50.91	74.0%	\$26.80	55.6%	(47.4%)
Capacity	\$8.48	12.3%	\$12.26	25.4%	44.7%
Transmission Service Charges	\$6.28	9.1%	\$7.56	15.7%	20.4%
PJM Administrative Fees	\$0.44	0.6%	\$0.45	0.9%	2.0%
Reactive	\$0.36	0.5%	\$0.39	0.8%	7.8%
Energy Uplift (Operating Reserves)	\$0.82	1.2%	\$0.20	0.4%	(75.9%)
Transmission Enhancement Cost Recovery	\$0.42	0.6%	\$0.18	0.4%	(57.8%)
Regulation	\$0.32	0.5%	\$0.11	0.2%	(65.2%)
Transmission Owner (Schedule 1A)	\$0.09	0.1%	\$0.09	0.2%	0.6%
Black Start	\$0.07	0.1%	\$0.07	0.1%	(6.8%)
Synchronized Reserves	\$0.20	0.3%	\$0.04	0.1%	(79.7%)
NERC/RFC	\$0.03	0.0%	\$0.03	0.1%	4.1%
Non-Synchronized Reserves	\$0.03	0.0%	\$0.01	0.0%	(51.9%)
Load Response	\$0.01	0.0%	\$0.01	0.0%	(33.4%)
Inadvertent Cost	\$0.00	0.0%	\$0.00	0.0%	0.0%
Day Ahead Scheduling Reserve (DASR)	\$0.03	0.1%	\$0.00	0.0%	(87.2%)
RTO Startup and Expansion	\$0.01	0.0%	\$0.00	0.0%	(66.5%)
Transmission Facility Charges	\$0.00	0.0%	\$0.00	0.0%	46.3%
Capacity (FRR)	\$0.27	0.4%	\$0.00	0.0%	(100.0%)
Emergency Energy	\$0.00	0.0%	\$0.00	0.0%	0.0%
Emergency Load Response	\$0.00	0.0%	\$0.00	0.0%	0.0%
Total	\$68.78	100.0%	\$48.21	100.0%	(29.9%)



Average PJM aggregate real-time supply curves

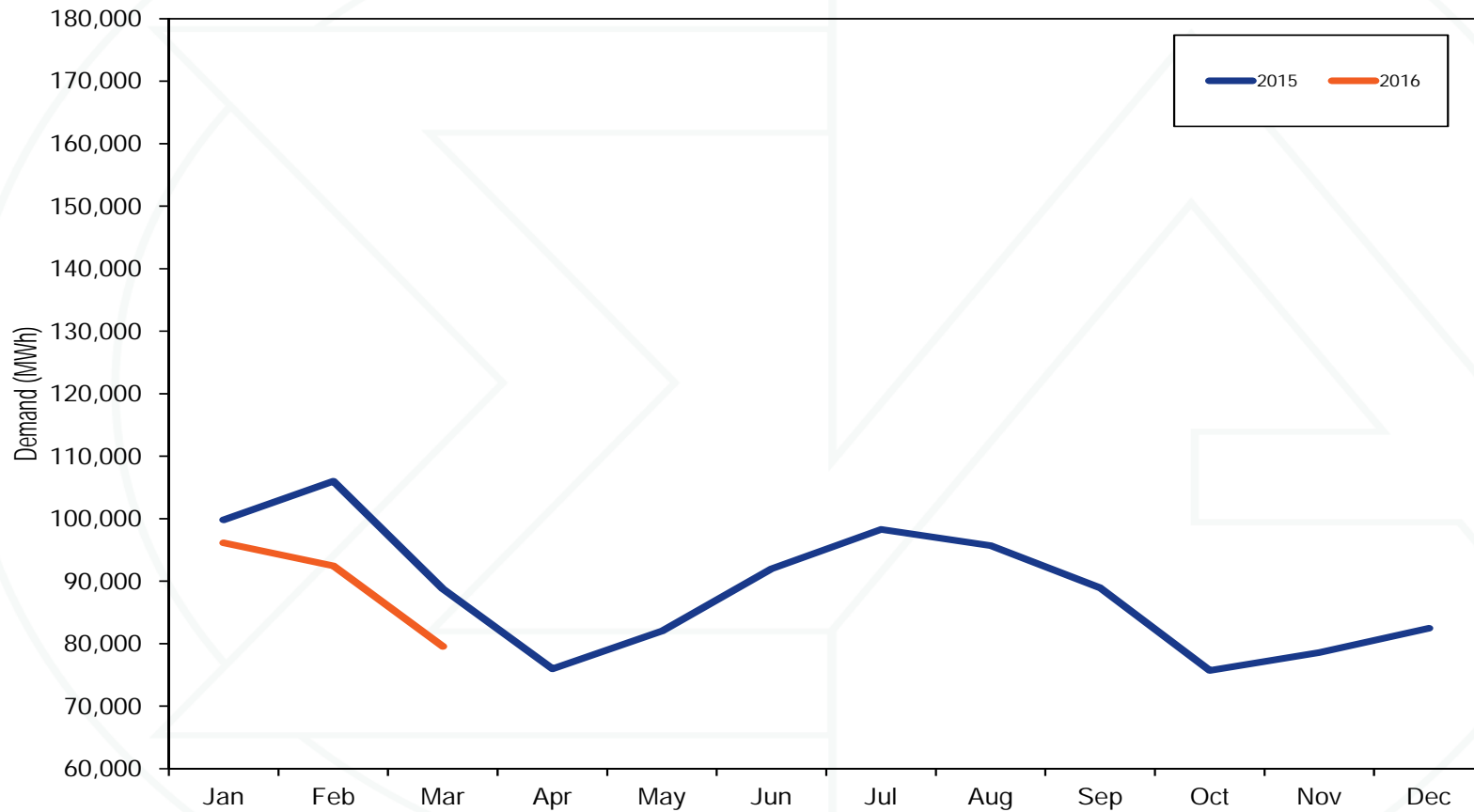


Real-time average hourly load

Jan-Mar	PJM Real-Time Demand (MWh)				Year-to-Year Change			
	Load		Load Plus Exports		Load		Load Plus Exports	
	Load	Standard Deviation	Demand	Standard Deviation	Load	Standard Deviation	Demand	Standard Deviation
1998	28,019	3,762	28,019	3,762	NA	NA	NA	NA
1999	29,784	4,027	29,784	4,027	6.3%	7.0%	6.3%	7.0%
2000	30,367	4,624	30,367	4,624	2.0%	14.8%	2.0%	14.8%
2001	31,254	3,846	33,452	3,704	2.9%	(16.8%)	10.2%	(19.9%)
2002	29,968	4,083	30,988	3,932	(4.1%)	6.1%	(7.4%)	6.1%
2003	39,249	5,546	41,600	5,701	31.0%	35.8%	34.2%	45.0%
2004	39,549	5,761	41,198	5,394	0.8%	3.9%	(1.0%)	(5.4%)
2005	71,388	8,966	79,319	9,587	80.5%	55.6%	92.5%	77.8%
2006	80,179	8,977	86,567	9,378	12.3%	0.1%	9.1%	(2.2%)
2007	84,586	12,040	90,304	12,012	5.5%	34.1%	4.3%	28.1%
2008	82,235	10,184	89,092	10,621	(2.8%)	(15.4%)	(1.3%)	(11.6%)
2009	81,170	11,718	86,110	11,948	(1.3%)	15.1%	(3.3%)	12.5%
2010	81,121	10,694	86,843	11,262	(0.1%)	(8.7%)	0.9%	(5.7%)
2011	81,018	10,273	86,635	10,613	(0.1%)	(3.9%)	(0.2%)	(5.8%)
2012	86,329	10,951	91,090	11,293	6.6%	6.6%	5.1%	6.4%
2013	91,337	10,610	95,835	10,452	5.8%	(3.1%)	5.2%	(7.4%)
2014	98,317	13,484	104,454	12,843	7.6%	27.1%	9.0%	22.9%
2015	97,936	13,445	102,821	13,855	(0.4%)	(0.3%)	(1.6%)	7.9%
2016	89,322	13,262	92,777	13,409	(8.8%)	(1.4%)	(9.8%)	(3.2%)



Real-time monthly average hourly load

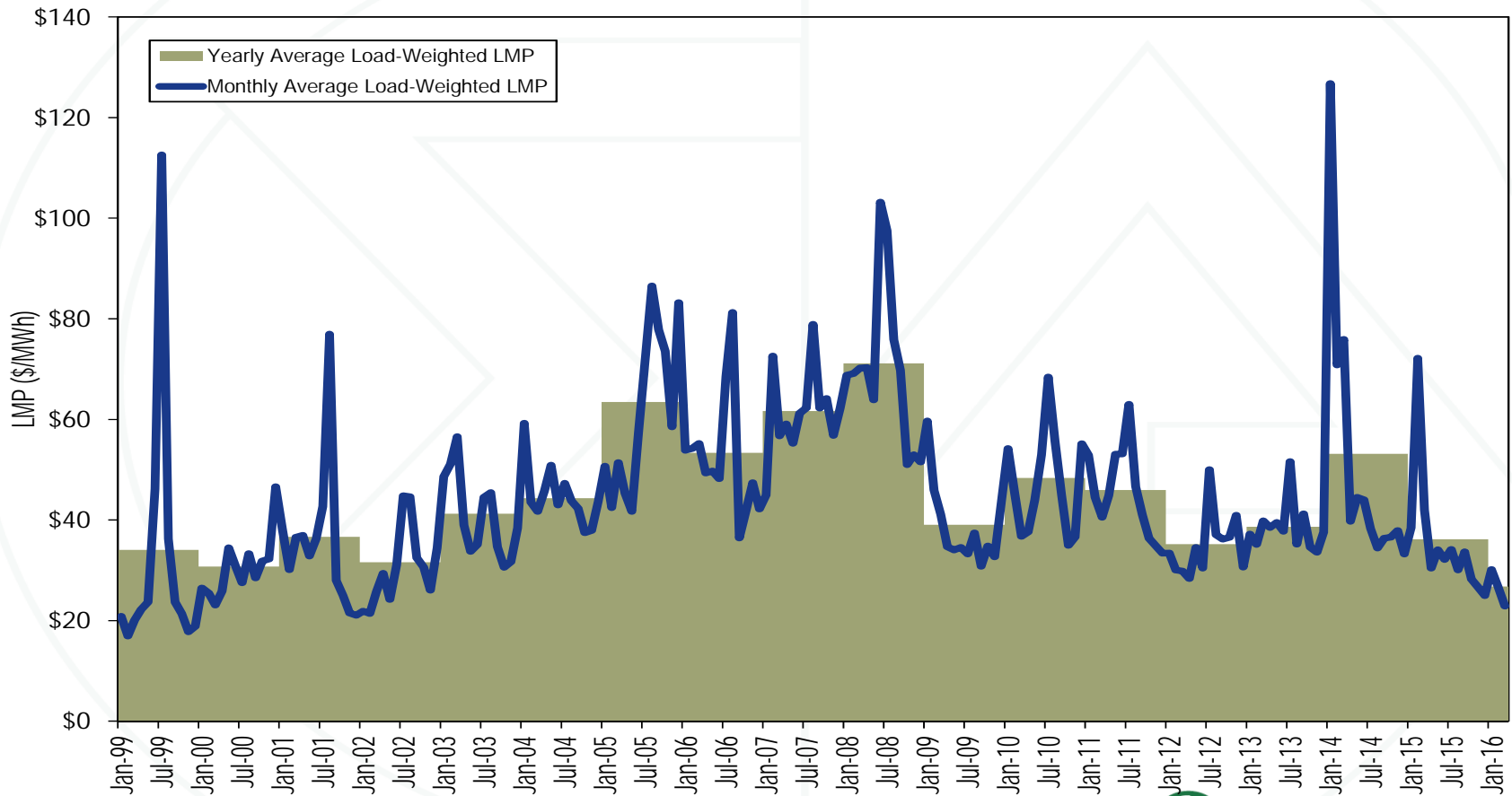


Real-time load-weighted average LMP

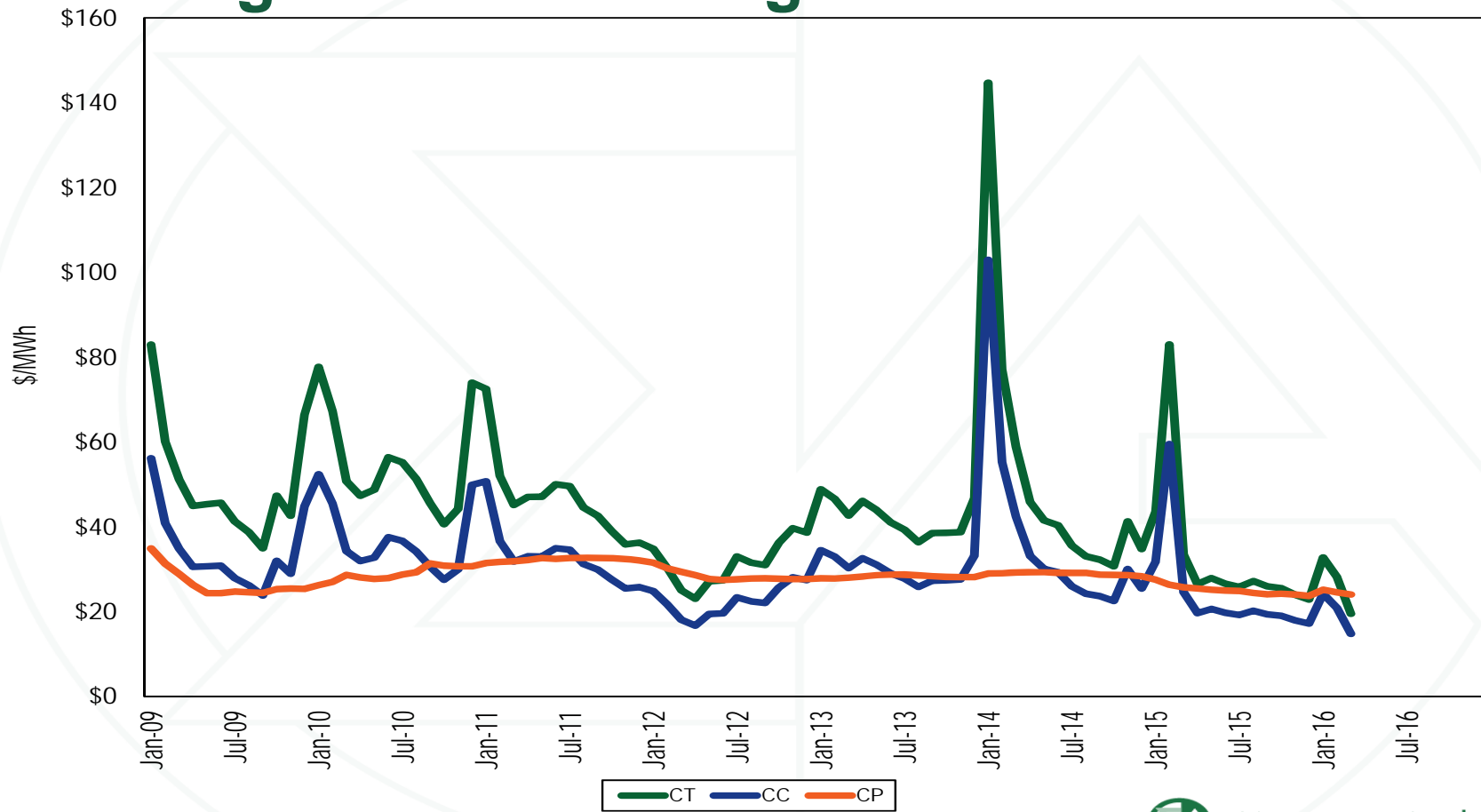
Jan-Mar	Real-Time, Load-Weighted, Average LMP			Year-to-Year Change		
	Average	Median	Standard Deviation	Average	Median	Standard Deviation
1998	\$18.13	\$15.80	\$8.14	NA	NA	NA
1999	\$19.38	\$16.90	\$7.66	6.9%	7.0%	(5.9%)
2000	\$25.10	\$18.25	\$17.22	29.5%	8.0%	124.9%
2001	\$35.16	\$27.38	\$21.52	40.1%	50.0%	25.0%
2002	\$23.01	\$19.89	\$9.93	(34.6%)	(27.4%)	(53.8%)
2003	\$51.93	\$46.12	\$30.99	125.6%	131.9%	211.9%
2004	\$48.77	\$43.22	\$24.62	(6.1%)	(6.3%)	(20.6%)
2005	\$48.37	\$42.20	\$22.62	(0.8%)	(2.4%)	(8.1%)
2006	\$54.43	\$47.62	\$23.69	12.5%	12.9%	4.7%
2007	\$58.07	\$50.60	\$34.44	6.7%	6.3%	45.4%
2008	\$69.35	\$60.11	\$36.56	19.4%	18.8%	6.2%
2009	\$49.60	\$42.23	\$23.38	(28.5%)	(29.8%)	(36.1%)
2010	\$45.92	\$39.01	\$22.99	(7.4%)	(7.6%)	(1.7%)
2011	\$46.35	\$39.11	\$24.26	0.9%	0.3%	5.5%
2012	\$31.21	\$29.25	\$12.02	(32.7%)	(25.2%)	(50.5%)
2013	\$37.41	\$32.79	\$19.90	19.9%	12.1%	65.7%
2014	\$92.98	\$51.62	\$134.40	148.5%	57.4%	575.3%
2015	\$50.91	\$33.51	\$46.43	(45.2%)	(35.1%)	(65.5%)
2016	\$26.80	\$23.45	\$13.98	(47.4%)	(30.0%)	(69.9%)



Real-time load-weighted average LMP



Average short run marginal costs



Real-time annual, fuel-cost adjusted, load-weighted average LMP

	2016 Load-Weighted LMP	2016 Fuel-Cost Adjusted, Load-Weighted LMP	Change
Average	\$26.80	\$34.85	30.1%
	2015 Load-Weighted LMP	2016 Fuel-Cost Adjusted, Load-Weighted LMP	Change
Average	\$50.91	\$34.85	(31.5%)
	2015 Load-Weighted LMP	2016 Load-Weighted LMP	Change
Average	\$50.91	\$26.80	(47.4%)

Generation by fuel source

	Jan-Mar	2015		2016		Change in Output
		GWh	Percent	GWh	Percent	
Coal		91,883.7	43.1%	62,765.4	32.1%	(31.7%)
	Standard Coal	90,891.9	42.6%	61,925.7	31.7%	(31.9%)
	Waste Coal	991.8	0.5%	839.7	0.4%	(15.3%)
Nuclear		70,167.1	32.9%	71,578.3	36.6%	2.0%
Gas		41,641.4	19.5%	49,557.4	25.4%	19.0%
	Natural Gas	40,680.6	19.1%	48,584.0	24.9%	19.4%
	Landfill Gas	610.0	0.3%	583.3	0.3%	(4.4%)
	Biomass Gas	350.8	0.2%	390.1	0.2%	11.2%
Hydroelectric		2,869.5	1.3%	4,155.8	2.1%	44.8%
	Pumped Storage	1,132.3	0.5%	1,073.7	0.5%	(5.2%)
	Run of River	1,737.2	0.8%	3,018.3	1.5%	73.7%
Wind		4,876.8	2.3%	5,802.6	3.0%	19.0%
Waste		1,082.0	0.5%	1,106.3	0.6%	2.2%
	Solid Waste	935.5	0.4%	979.4	0.5%	4.7%
	Miscellaneous	146.5	0.1%	126.9	0.1%	(13.4%)
Oil		502.6	0.2%	176.7	0.1%	(64.8%)
	Heavy Oil	379.3	0.2%	125.4	0.1%	(66.9%)
	Light Oil	82.8	0.0%	47.3	0.0%	(42.9%)
	Diesel	38.8	0.0%	3.9	0.0%	(89.9%)
	Kerosene	1.7	0.0%	0.1	0.0%	(93.0%)
	Jet Oil	0.0	0.0%	0.0	0.0%	NA
Solar, Net Energy Metering		94.1	0.0%	181.3	0.0%	92.6%
Battery		1.2	0.0%	4.2	0.0%	243.2%
Total		213,118.5	100.0%	195,328.0	100.0%	(8.3%)



Capacity factor by unit type

Unit Type	2015 (Jan-Mar)		2016 (Jan-Mar)		Change in 2016 from 2015
	Generation (GWh)	Capacity Factor	Generation (GWh)	Capacity Factor	
Battery	1.2	0.4%	4.2	0.6%	0.2%
Combined Cycle	37,894.5	62.4%	45,011.7	64.0%	1.6%
Combustion Turbine	2,007.7	3.1%	2,061.3	3.3%	0.2%
Diesel	146.5	15.7%	130.8	13.5%	(2.2%)
Diesel (Landfill gas)	384.6	47.1%	355.5	43.2%	(3.9%)
Fuel Cell	56.4	87.1%	56.2	85.9%	(1.2%)
Nuclear	70,167.1	96.3%	71,578.3	97.2%	0.9%
Pumped Storage Hydro	1,137.0	9.6%	1,199.8	11.0%	1.5%
Run of River Hydro	1,732.5	29.4%	2,956.0	48.8%	19.4%
Solar	93.1	12.1%	174.4	14.4%	2.3%
Steam	94,614.1	54.8%	65,990.2	41.7%	(13.1%)
Wind	4,876.8	34.2%	5,802.6	38.2%	4.0%
Total	213,111.4	52.4%	195,321.1	48.8%	(3.6%)



Offer capping statistics – energy only

(Jan-Mar)	Real-Time		Day-Ahead	
	Unit Hours Capped	MW Capped	Unit Hours Capped	MW Capped
2012	1.0%	0.5%	0.1%	0.2%
2013	0.3%	0.1%	0.1%	0.0%
2014	1.1%	0.4%	0.3%	0.2%
2015	0.6%	0.2%	0.3%	0.1%
2016	0.4%	0.2%	0.1%	0.1%



Components of real-time load-weighted LMP

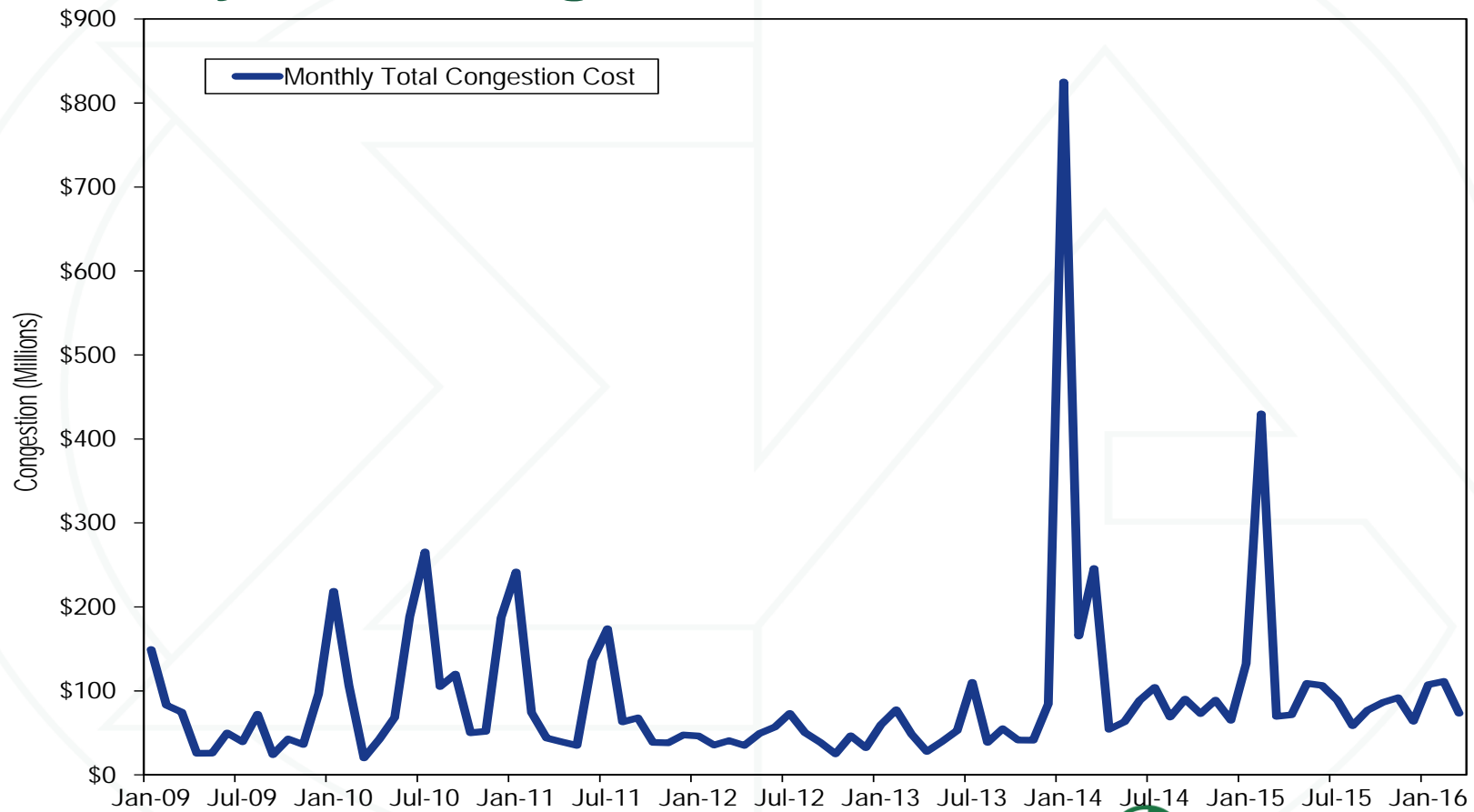
Element	2015 (Jan-Mar)		2016 (Jan-Mar)		Change Percent
	Contribution to LMP	Percent	Contribution to LMP	Percent	
Coal	\$18.31	36.0%	\$14.54	54.2%	18.3%
Gas	\$16.50	32.4%	\$5.97	22.3%	(10.1%)
VOM	\$2.60	5.1%	\$2.07	7.7%	2.6%
Ten Percent Adder	\$2.29	4.5%	\$0.86	3.2%	(1.3%)
NA	\$0.99	1.9%	\$0.83	3.1%	1.2%
NO _x Cost	\$0.02	0.0%	\$0.52	1.9%	1.9%
LPA Rounding Difference	\$0.31	0.6%	\$0.49	1.8%	1.2%
Oil	\$3.97	7.8%	\$0.47	1.8%	(6.0%)
Markup	\$3.54	7.0%	\$0.46	1.7%	(5.2%)
Ancillary Service Redispatch Cost	\$1.78	3.5%	\$0.30	1.1%	(2.4%)
Increase Generation Adder	\$0.34	0.7%	\$0.17	0.6%	(0.0%)
SO ₂ Cost	\$0.01	0.0%	\$0.09	0.3%	0.3%
Other	\$0.04	0.1%	\$0.07	0.3%	0.2%
Market-to-Market Adder	\$0.01	0.0%	\$0.01	0.0%	0.0%
FMU Adder	\$0.01	0.0%	\$0.00	0.0%	(0.0%)
Municipal Waste	\$0.01	0.0%	\$0.00	0.0%	(0.0%)
CO ₂ Cost	\$0.29	0.6%	\$0.00	0.0%	(0.6%)
Uranium	(\$0.00)	(0.0%)	\$0.00	0.0%	0.0%
Constraint Violation Adder	(\$0.00)	(0.0%)	\$0.00	0.0%	0.0%
LPA-SCED Differential	(\$0.00)	(0.0%)	(\$0.01)	(0.0%)	(0.0%)
Decrease Generation Adder	(\$0.08)	(0.2%)	(\$0.02)	(0.1%)	0.1%
Wind	(\$0.02)	(0.0%)	(\$0.04)	(0.1%)	(0.1%)
Total	\$50.91	100.0%	\$26.80	100.0%	0.0%



Total congestion

Congestion Costs (Millions)				
(Jan - Mar)	Congestion Cost	Percent Change	Total PJM Billing	Percent of PJM Billing
2008	\$486	NA	\$7,718	6.3%
2009	\$307	(36.8%)	\$7,515	4.1%
2010	\$345	12.4%	\$8,415	4.1%
2011	\$360	4.3%	\$9,584	3.8%
2012	\$122	(66.0%)	\$6,938	1.8%
2013	\$186	51.9%	\$7,762	2.4%
2014	\$1,236	564.8%	\$21,070	5.9%
2015	\$632	(48.9%)	\$14,040	4.5%
2016	\$292	(53.7%)	\$9,500	3.1%

Monthly total congestion



The capacity market results were competitive in Q1

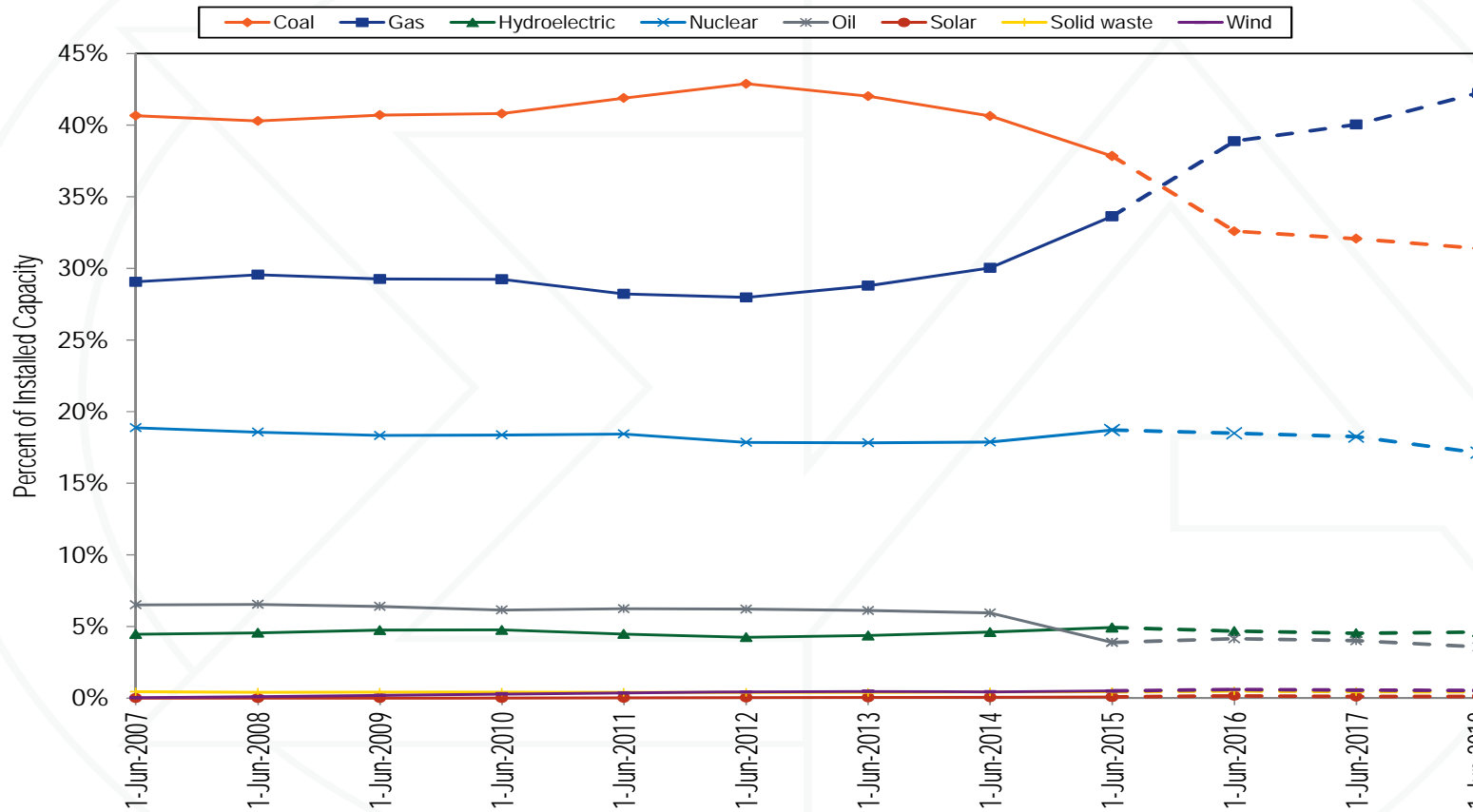
Market Element	Evaluation	Market Design
Market Structure: Aggregate Market	Not Competitive	
Market Structure: Local Market	Not Competitive	
Participant Behavior	Competitive	
Market Performance	Competitive	Mixed



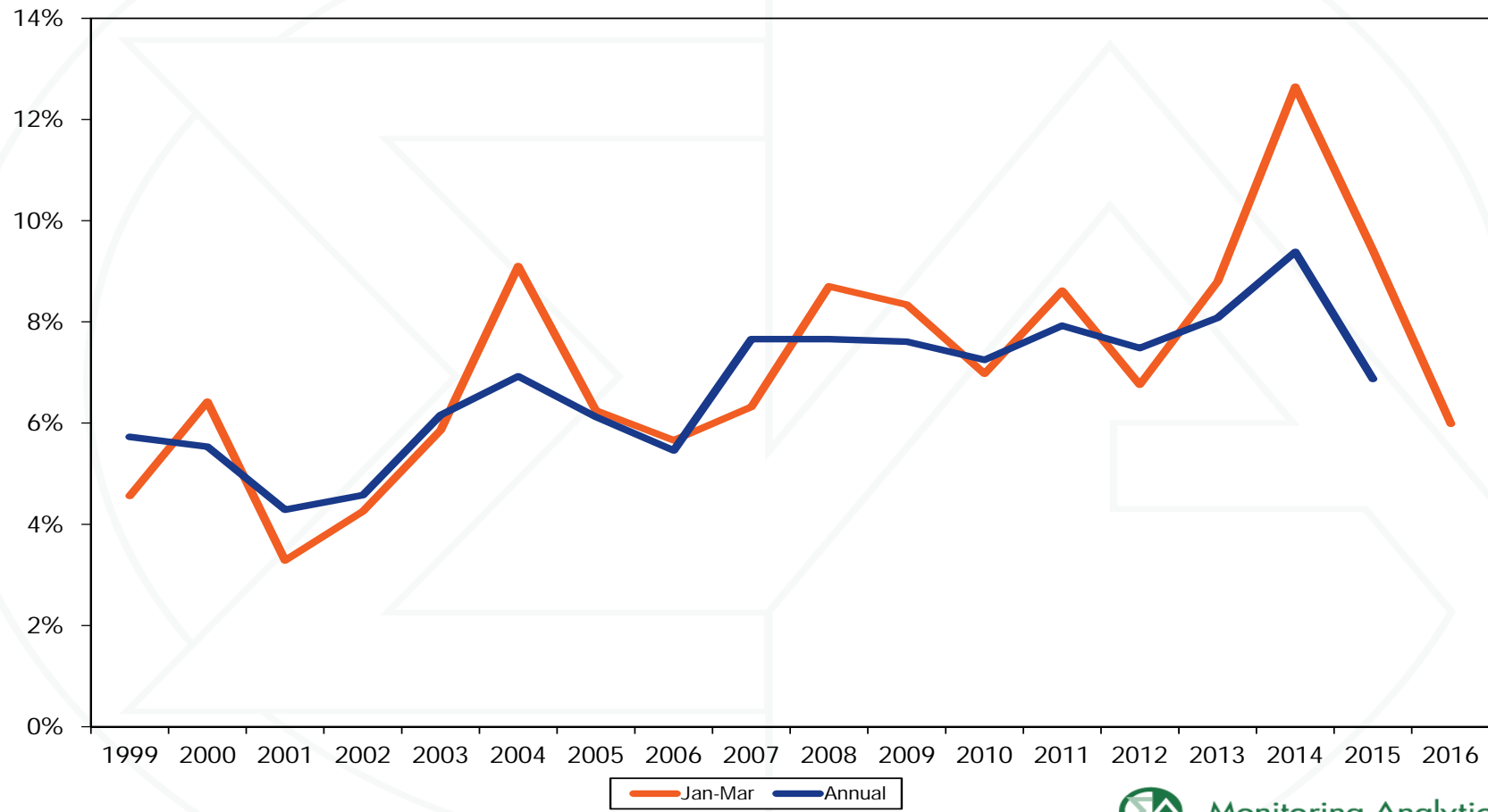
Installed capacity by fuel source

	1-Jan-16		31-Jan-16		29-Feb-16		31-Mar-16	
	MW	Percent	MW	Percent	MW	Percent	MW	Percent
Coal	66,674.8	37.5%	66,674.8	37.3%	66,672.7	37.4%	66,672.7	37.4%
Gas	60,487.4	34.0%	61,180.9	34.3%	61,144.8	34.3%	61,187.9	34.3%
Hydroelectric	8,787.5	4.9%	8,846.4	5.0%	8,846.4	5.0%	8,854.8	5.0%
Nuclear	33,071.5	18.6%	33,175.5	18.6%	33,175.5	18.6%	33,175.5	18.6%
Oil	6,851.8	3.9%	6,851.8	3.8%	6,787.2	3.8%	6,787.2	3.8%
Solar	128.0	0.1%	128.0	0.1%	128.0	0.1%	128.0	0.1%
Solid waste	769.4	0.4%	769.4	0.4%	767.5	0.4%	767.5	0.4%
Wind	912.4	0.5%	918.4	0.5%	918.4	0.5%	918.4	0.5%
Total	177,682.8	100.0%	178,545.2	100.0%	178,440.5	100.0%	178,492.0	100.0%

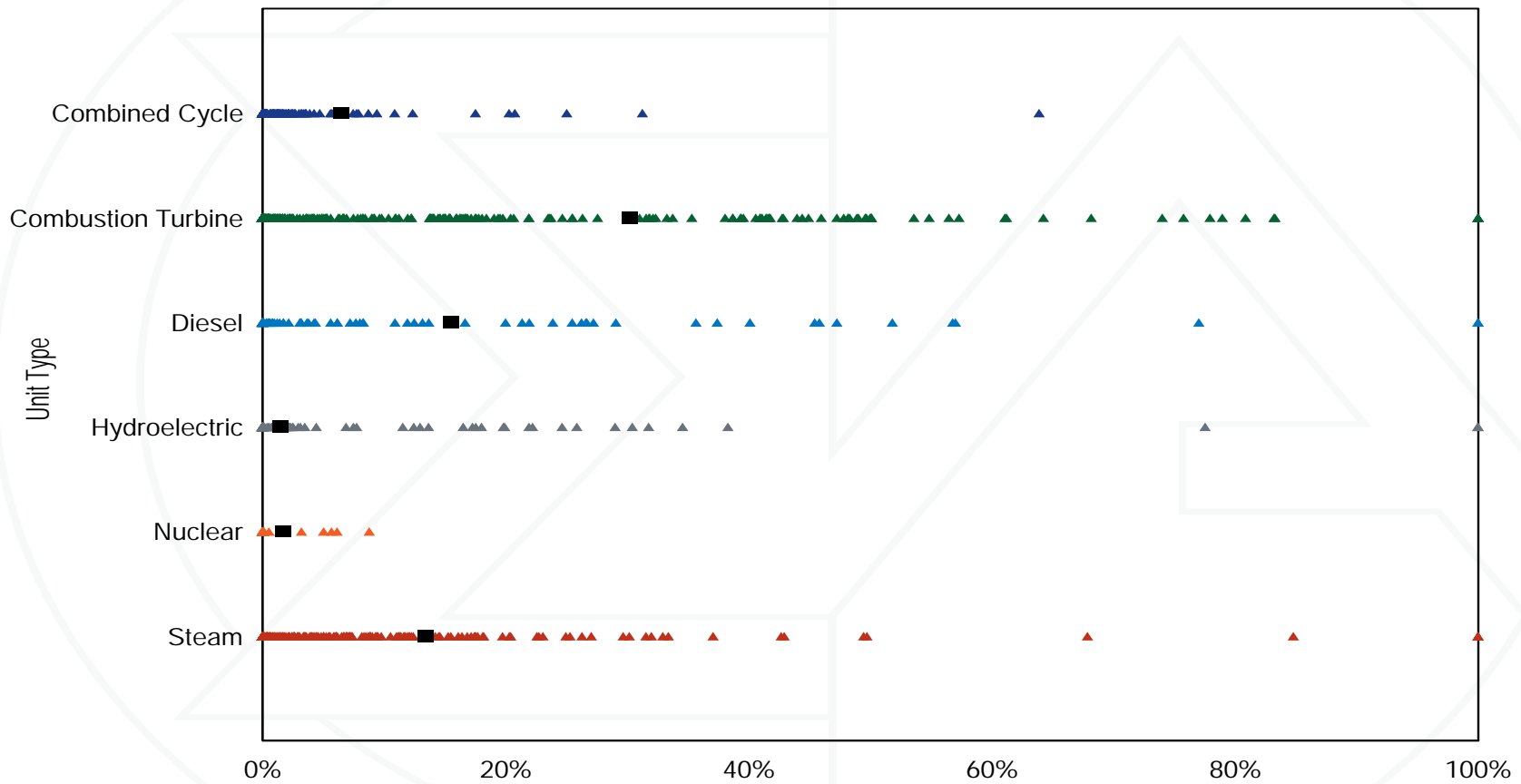
Share of installed capacity by fuel source



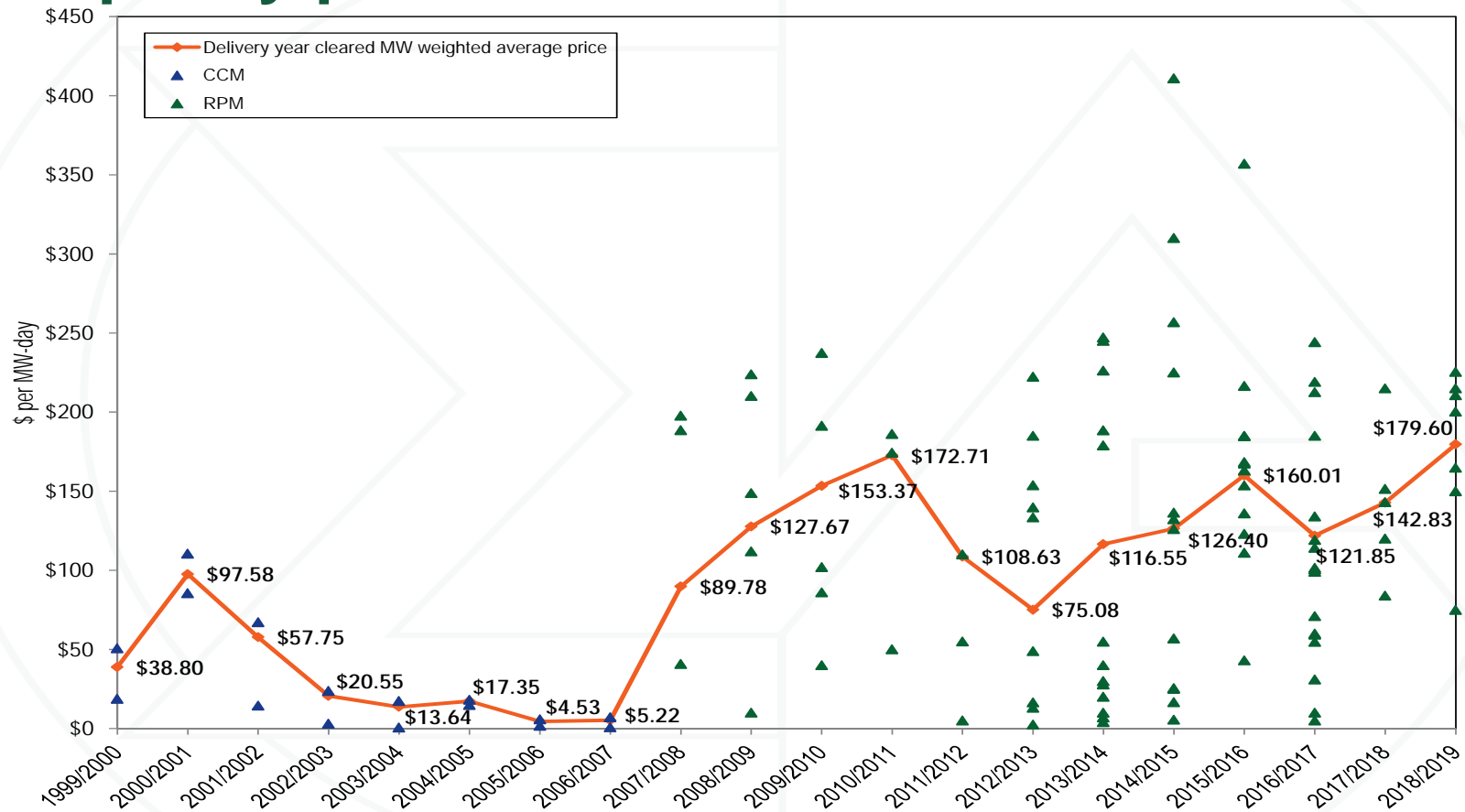
EFORd: 1999 through 2016



EFORd by unit type



Capacity prices



Unit retirements by fuel (MW)

	Coal	Diesel	Heavy Oil	Kerosene	Landfill Gas	Light Oil	Natural Gas	Nuclear	Wind	Wood Waste	Total
Retirements 2011	543.0	0.0	0.0	0.0	0.0	63.7	522.5	0.0	0.0	0.0	1,129.2
Retirements 2012	5,907.9	0.0	0.0	0.0	0.0	788.0	250.0	0.0	0.0	16.0	6,961.9
Retirements 2013	2,589.9	2.9	166.0	0.0	3.8	85.0	0.0	0.0	0.0	8.0	2,855.6
Retirements 2014	2,427.0	50.0	0.0	184.0	15.3	0.0	294.0	0.0	0.0	0.0	2,970.3
Retirements 2015	7,661.8	10.3	0.0	644.2	2.0	212.0	1,319.0	0.0	10.4	0.0	9,859.7
Retirements 2016	0.0	51.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	53.0
Planned Retirements 2016	566.0	8.0	74.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	649.5
Planned Retirements Post-2016	697.0	0.0	34.0	0.0	0.0	0.0	661.8	614.5	0.0	0.0	2,007.3
Total	20,392.6	122.2	274.0	828.2	24.6	1,148.7	3,047.3	614.5	10.4	24.0	26,486.5

Total energy uplift charges

(Jan-Mar)	Total Energy Uplift Charges (Millions)	Change (Millions)	Percent Change
2001	\$63.4	NA	NA
2002	\$26.7	(\$36.7)	(57.9%)
2003	\$97.9	\$71.2	266.6%
2004	\$98.7	\$0.9	0.9%
2005	\$109.0	\$10.3	10.4%
2006	\$69.8	(\$39.2)	(35.9%)
2007	\$113.0	\$43.2	61.8%
2008	\$103.9	(\$9.1)	(8.1%)
2009	\$101.7	(\$2.2)	(2.1%)
2010	\$105.7	\$4.1	4.0%
2011	\$130.3	\$24.6	23.2%
2012	\$122.7	(\$7.6)	(5.9%)
2013	\$258.9	\$136.2	111.0%
2014	\$742.8	\$483.9	186.9%
2015	\$186.4	(\$556.3)	(74.9%)
2016	\$39.1	(\$147.3)	(79.0%)



Changes in energy uplift charges

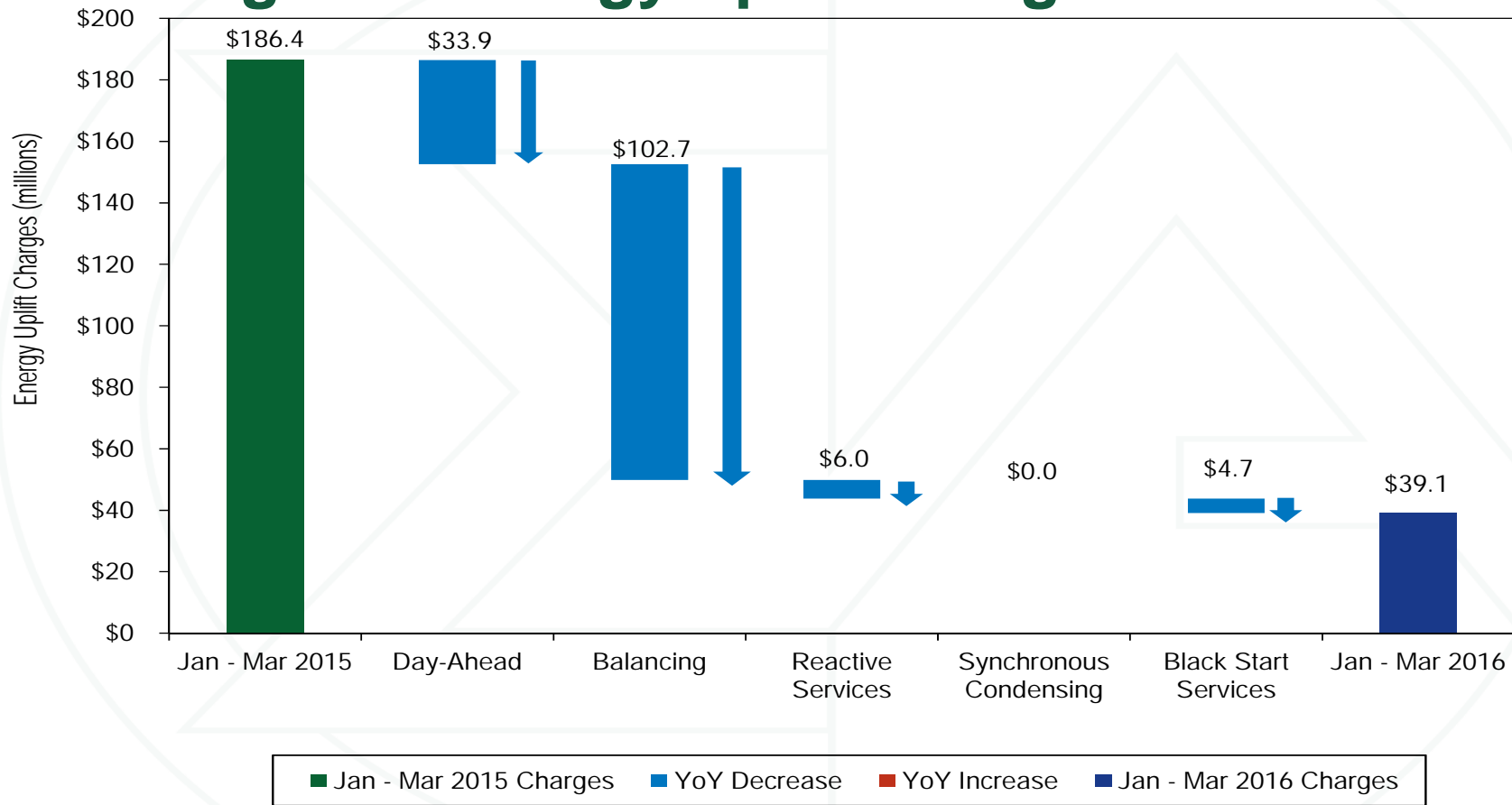


Table 4-20 Top 10 units and organizations energy uplift credits: January through March 2016

Category	Type	Top 10 Units		Top 10 Organizations	
		Credits (Millions)	Credits Share	Credits (Millions)	Credits Share
Day-Ahead	Generators	\$16.3	76.3%	\$21.0	98.4%
	Canceled Resources	\$0.0	100.0%	\$0.0	100.0%
Balancing	Generators	\$4.9	37.5%	\$11.0	84.5%
	Local Constraints Control	\$0.1	100.0%	\$0.1	100.0%
	Lost Opportunity Cost	\$2.5	56.6%	\$3.9	88.4%
Reactive Services		\$0.2	99.7%	\$0.3	100.0%
Synchronous Condensing		\$0.0	0.0%	\$0.0	0.0%
Black Start Services		\$0.0	100.0%	\$0.0	100.0%
Total		\$21.1	54.0%	\$33.9	86.9%



Table 4-13 Operating reserve rates statistics (\$/MWh): January through March, 2016

Region	Transaction	Rates Charged (\$/MWh)			Standard Deviation
		Maximum	Average	Minimum	
East	INC	4.886	0.378	0.008	0.609
	DEC	4.907	0.483	0.047	0.597
	DA Load	0.402	0.105	0.002	0.072
	RT Load	0.297	0.031	0.000	0.053
	Deviation	4.886	0.378	0.008	0.609
West	INC	1.805	0.250	0.008	0.278
	DEC	1.829	0.355	0.047	0.274
	DA Load	0.402	0.105	0.002	0.072
	RT Load	0.091	0.017	0.000	0.021
	Deviation	1.805	0.250	0.008	0.278



Table 4-37 Current and proposed average energy uplift rate by transaction: 2015 and January through March 2016

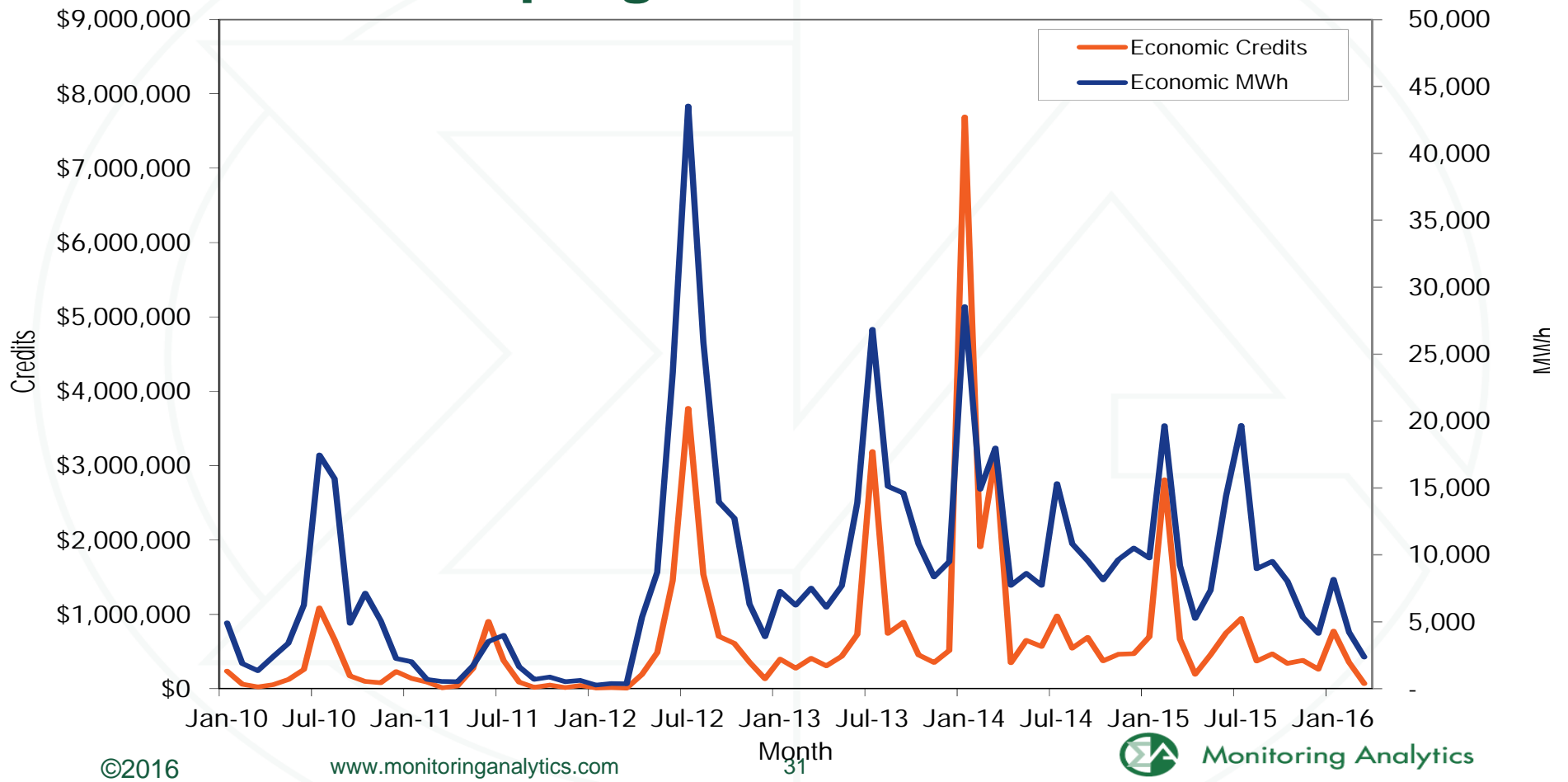
Transaction	2015			Jan - Mar 2016		
	Current Rates (\$/MWh)	Proposed Rates - 100% UTC (\$/MWh)	Proposed Rates - 0% UTC (\$/MWh)	Current Rates (\$/MWh)	Proposed Rates - 100% UTC (\$/MWh)	Proposed Rates - 0% UTC (\$/MWh)
East	INC	1.063	0.148	0.378	0.378	0.154
	DEC	1.178	0.148	0.378	0.483	0.154
	DA Load	0.115	0.013	0.015	0.105	0.006
	RT Load	0.050	0.117	0.117	0.031	0.088
	Deviation	1.063	0.498	0.726	0.378	0.290
West	INC	1.027	0.146	0.379	0.250	0.101
	DEC	1.143	0.146	0.379	0.355	0.101
	DA Load	0.115	0.013	0.015	0.105	0.004
	RT Load	0.042	0.117	0.117	0.017	0.088
	Deviation	1.027	0.430	0.661	0.250	0.150
UTC	East to East	NA	0.296	0.756	NA	0.308
	West to West	NA	0.291	0.757	NA	0.203
	East to/from West	NA	0.294	0.757	NA	0.255

Credit risk associated with potential uplift: 09.08.14 through 12.07.15

Uplift (\$/MWh)	Credit risk if uplift is applied to both sides of UTC
\$0.05	\$18,530,389
\$0.10	\$37,060,778
\$0.15	\$55,591,167
\$0.20	\$74,121,556
\$0.25	\$92,651,945
\$0.30	\$111,182,334
\$0.35	\$129,712,724
\$0.40	\$148,243,113
\$0.45	\$166,773,502
\$0.50	\$185,303,891
\$0.55	\$203,834,280
\$0.60	\$222,364,669
\$0.65	\$240,895,058
\$0.70	\$259,425,447
\$0.75	\$277,955,836
\$0.80	\$296,486,225
\$0.85	\$315,016,614
\$0.90	\$333,547,003
\$0.95	\$352,077,393
\$1.00	\$370,607,782



Economic DR program credits and MWh



©2016

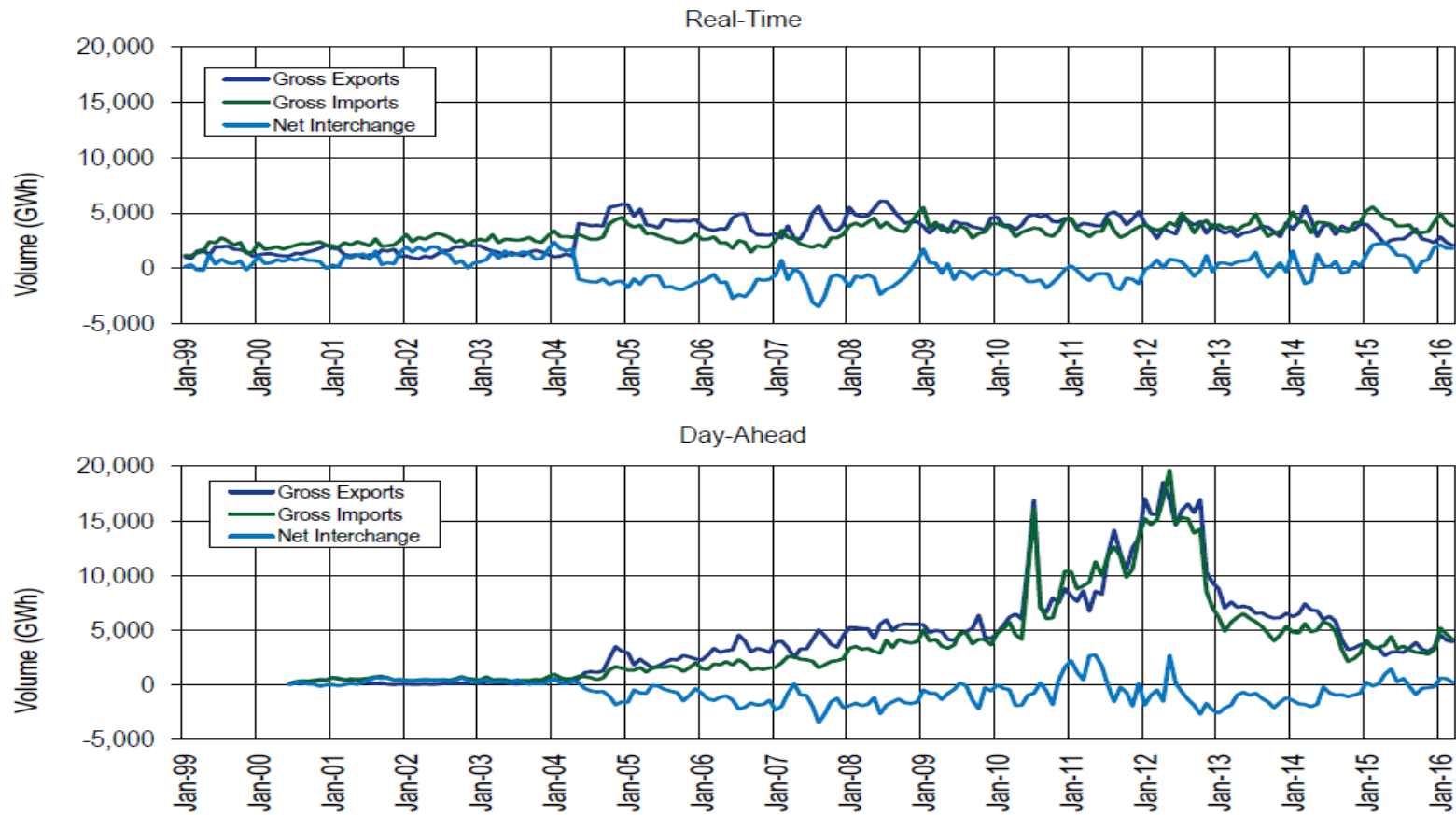
www.monitoringanalytics.com

Month
31



Monitoring Analytics

Scheduled import and export transaction



The Regulation Market results were competitive in Q1

Market Element	Evaluation	Market Design
Market Structure	Not Competitive	
Participant Behavior	Competitive	
Market Performance	Competitive	Flawed



The Tier 2 Synchronized Reserve Market results were competitive in Q1

Market Element	Evaluation	Market Design
Market Structure: Regional Markets	Not Competitive	
Participant Behavior	Competitive	
Market Performance	Competitive	Mixed



Ancillary services costs per MWh of Load

Year (Jan-Mar)	Regulation	Scheduling, Dispatch, and System Control	Reactive	Synchronized Reserve	Total
2004	\$0.53	\$0.63	\$0.26	\$0.17	\$1.59
2005	\$0.46	\$0.51	\$0.25	\$0.07	\$1.29
2006	\$0.48	\$0.46	\$0.28	\$0.09	\$1.31
2007	\$0.58	\$0.46	\$0.30	\$0.11	\$1.45
2008	\$0.59	\$0.47	\$0.29	\$0.07	\$1.42
2009	\$0.37	\$0.37	\$0.34	\$0.16	\$1.24
2010	\$0.34	\$0.38	\$0.35	\$0.05	\$1.12
2011	\$0.27	\$0.33	\$0.39	\$0.12	\$1.11
2012	\$0.18	\$0.41	\$0.49	\$0.03	\$1.11
2013	\$0.28	\$0.41	\$0.63	\$0.04	\$1.36
2014	\$0.63	\$0.38	\$0.37	\$0.56	\$1.94
2015	\$0.32	\$0.41	\$0.36	\$0.20	\$1.28
2016	\$0.11	\$0.42	\$0.39	\$0.04	\$0.96

Average price and cost for PJM Regulation

Year (Jan-Mar)	Weighted Regulation Market Price	Weighted Regulation Market Cost	Regulation Price as Percent Cost
2011	\$11.52	\$25.03	46.0%
2012	\$12.62	\$16.75	75.3%
2013	\$33.91	\$39.36	86.2%
2014	\$92.98	\$112.31	82.8%
2015	\$47.90	\$58.23	82.3%
2016	\$15.55	\$17.92	86.8%



Tier 1 synchronized reserve issue

Year	Month	Total Hours When NSRMCP>\$0	Weighted Average SRMCP for Hours When NSRMCP>\$0	Total Tier 1 MW Credited for Hours When NSRMCP>\$0	Total Tier 1 Credits Paid When NSRMCP>\$0	Average Tier 1 MW Paid
2015	Jan	148	\$13.59	274,996	\$3,727,945	1,858.1
2015	Feb	194	\$24.83	369,111	\$9,164,267	1,902.6
2015	Mar	181	\$16.33	305,967	\$4,985,446	1,690.4
2015	Apr	66	\$25.56	102,117	\$2,587,076	1,547.2
2015	May	72	\$20.35	106,027	\$2,158,080	1,472.6
2015	Jun	95	\$17.64	185,148	\$3,183,436	1,948.9
2015	Jul	46	\$35.12	64,516	\$2,265,614	1,402.5
2015	Aug	38	\$22.40	48,479	\$1,078,199	1,275.8
2015	Sep	36	\$31.53	51,968	\$1,522,913	1,060.5
2015	Oct	113	\$17.10	126,879	\$2,169,670	1,122.8
2015	Nov	29	\$14.65	29,156	\$427,056	1,005.4
2015	Dec	51	\$16.07	53,898	\$865,969	1,005.4
Total	Total	1,069	\$21.26	1,718,263	\$34,135,671	1,441.0
2016	Jan	37	\$15.22	57,571	\$876,367	1,556.0
2016	Feb	14	\$9.42	24,752	\$233,208	1,768.0
2016	Mar	69	\$6.42	100,265	\$643,893	1,453.1
2016	Total	120	\$9.60	182,588	\$1,753,468	1,592.4

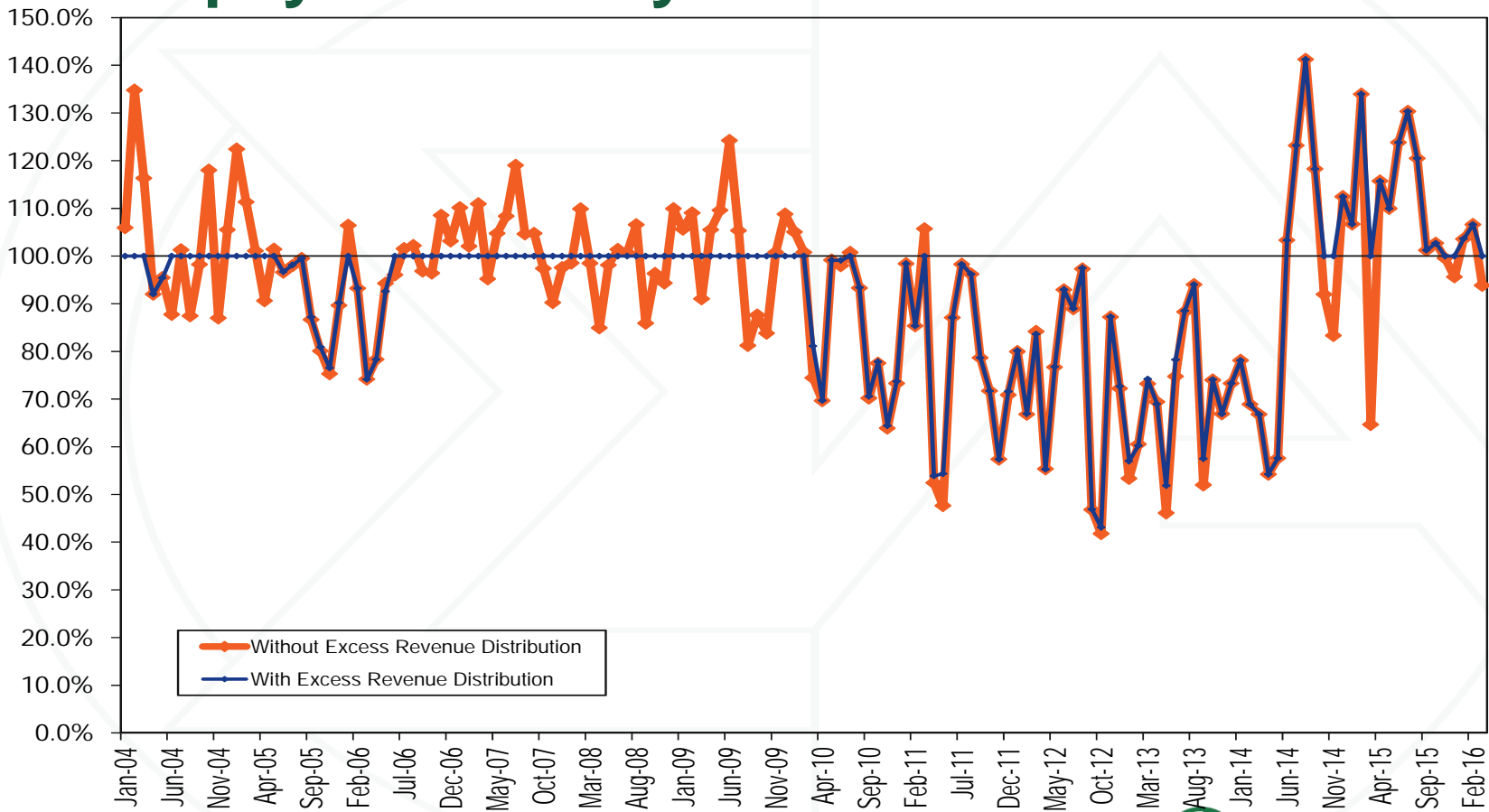


The FTR Auction Markets results were competitive in Q1

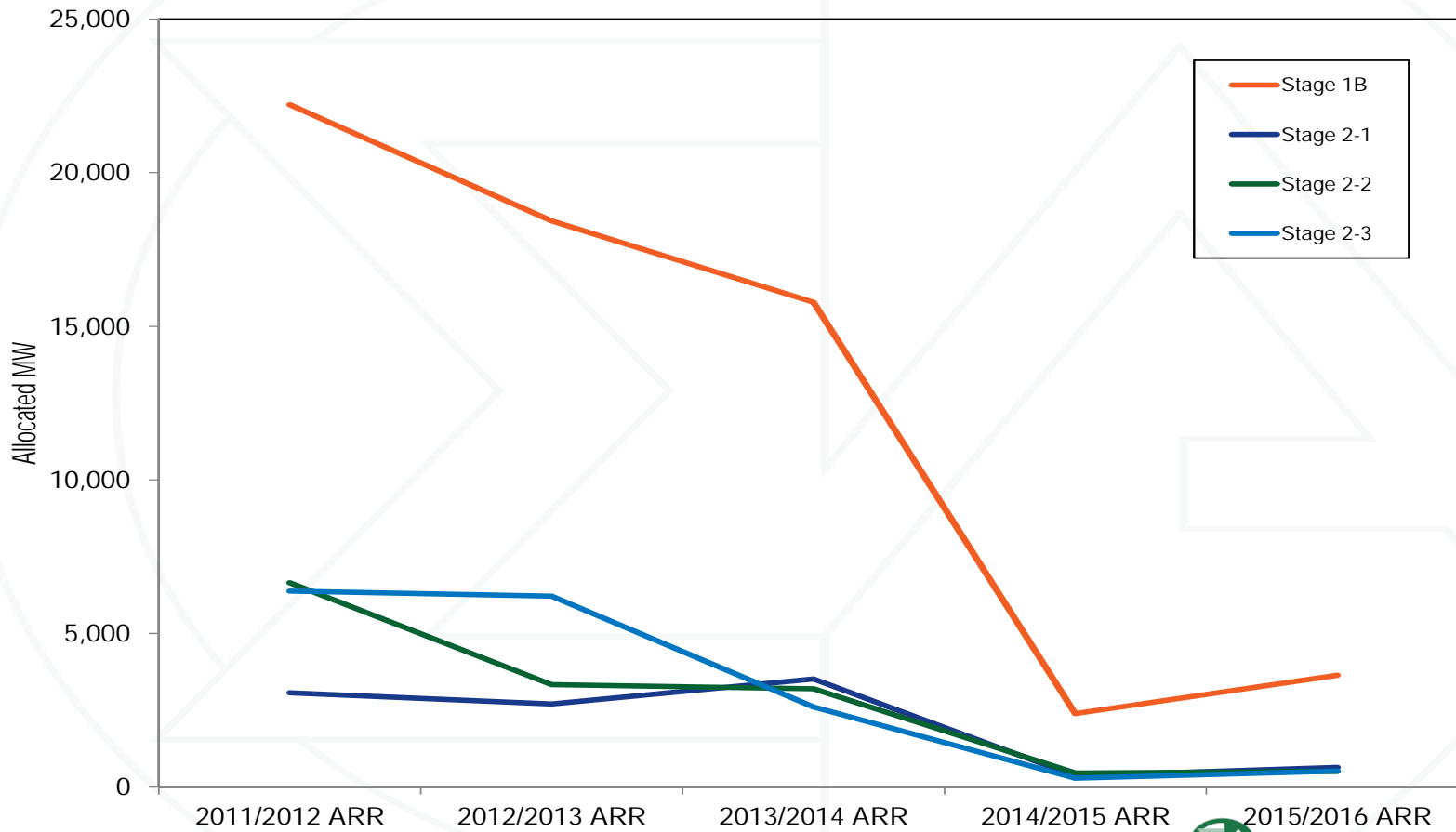
Market Element	Evaluation	Market Design
Market Structure	Competitive	
Participant Behavior	Competitive	
Market Performance	Competitive	Flawed



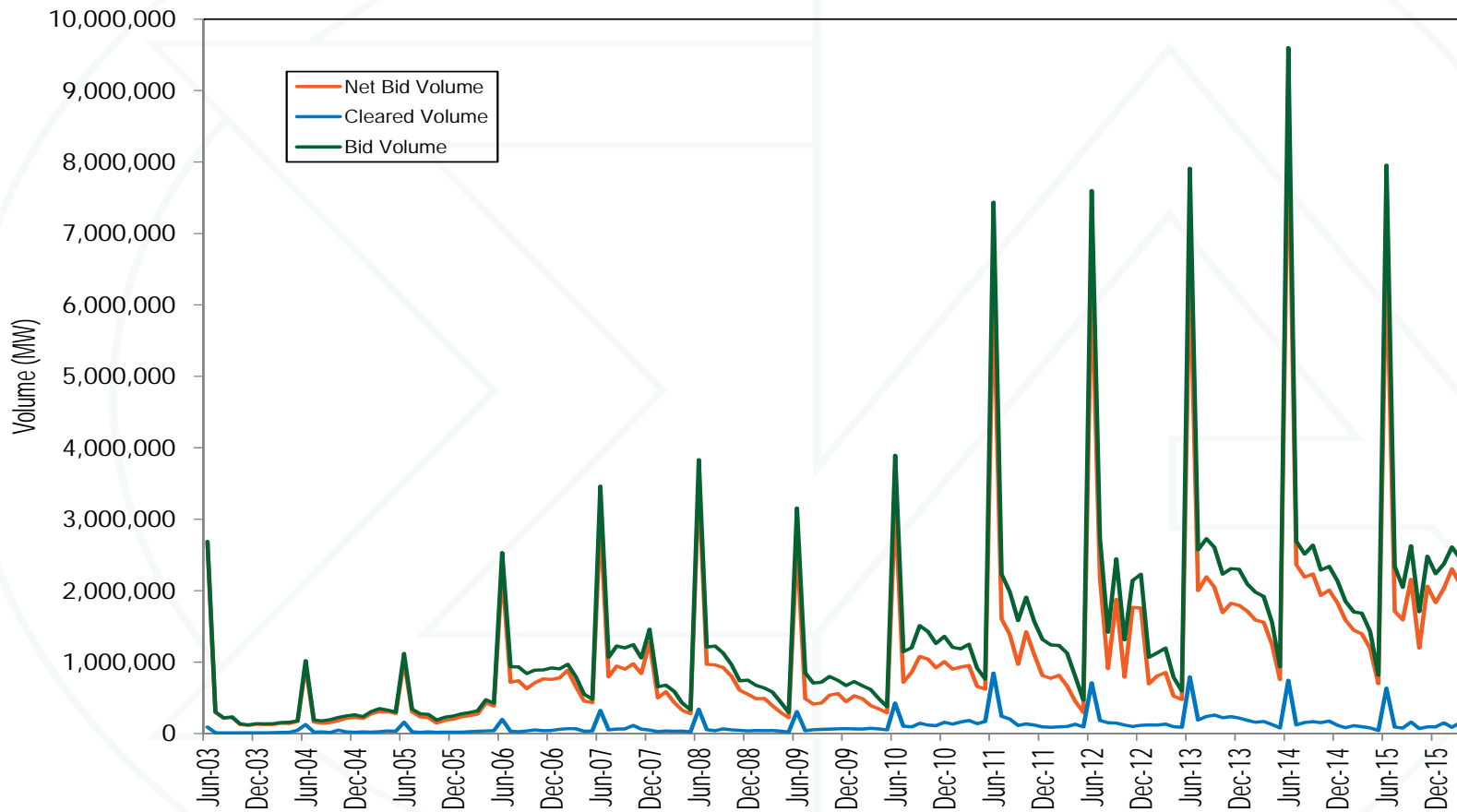
FTR payout ratio by month



Stage 1B and Stage 2 ARR Allocations



Total FTR Auction bid and cleared volume



Load total congestion offset: ARR and FTRs

Planning Period	ARR Credits	FTR Credits	Total Congestion	Total ARR/FTR Offset	Percent Offset
2011/2012	\$512.2	\$249.8	\$770.6	\$762.0	98.9%
2012/2013	\$349.5	\$181.9	\$575.8	\$531.4	92.3%
2013/2014	\$337.7	\$456.4	\$1,777.1	\$794.0	44.7%
2014/2015	\$482.4	\$404.4	\$1,390.9	\$886.8	63.8%
2015/2016*	\$529.9	\$193.5	\$865.2	\$723.4	83.6%
*Through March 31, 2016					

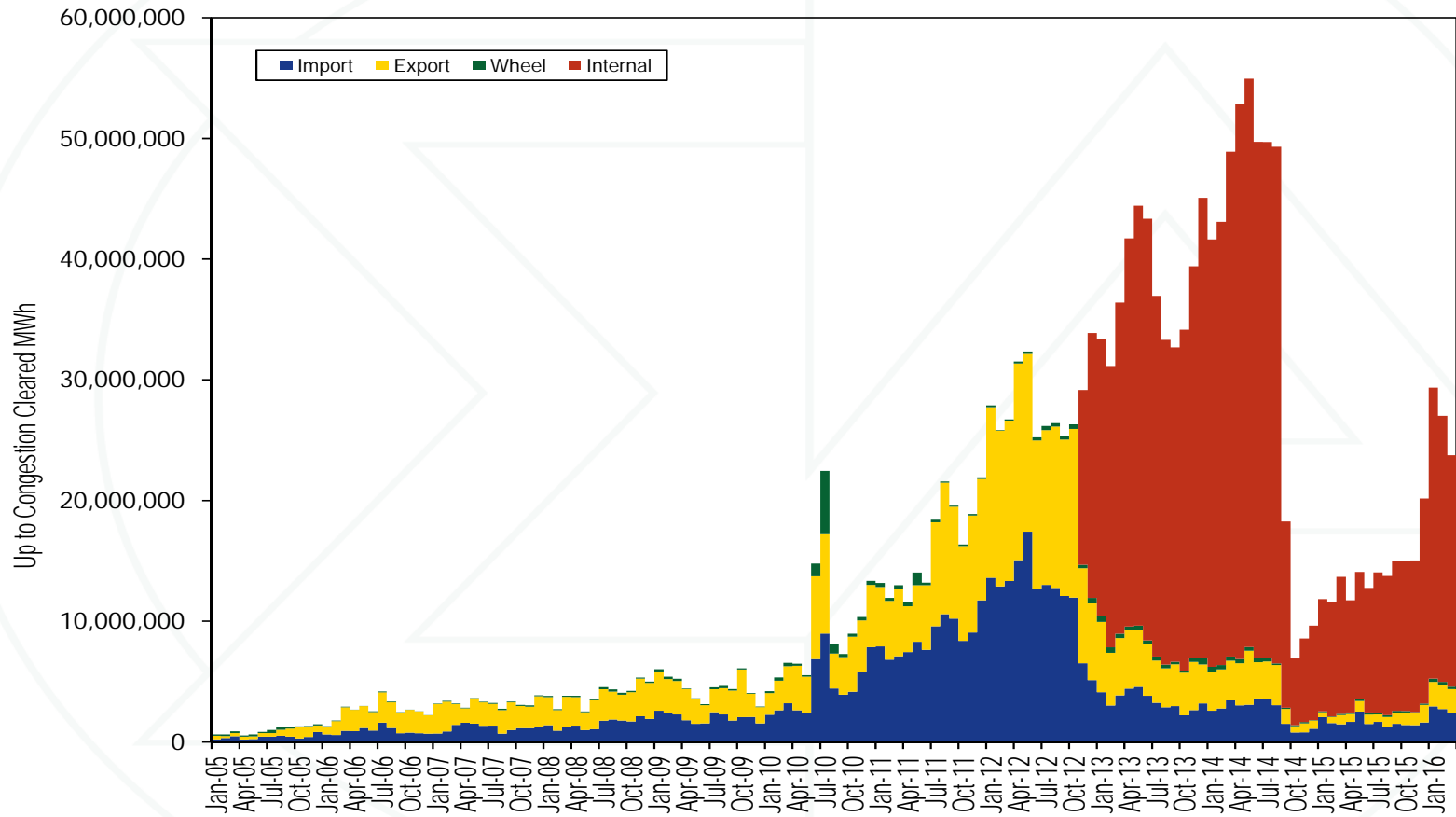


Monthly FTR profits by organization type

Month	Organization Type			Total
	Physical	Self Scheduled Physical FTRs	Financial	
Jan	(\$4,531,571)	\$23,079,268	\$25,805,666	\$44,353,362
Feb	\$5,541,933	\$24,807,245	\$19,982,800	\$50,331,977
Mar	\$6,510,598	\$13,351,520	\$1,132,906	\$20,995,025
Total	\$7,520,959	\$61,238,033	\$46,921,372	\$115,680,364



Cleared UTCs by type



UTCs by type of parent organization (MW)

Category	Jan-Mar 2015		Jan-Mar 2016	
	Total Up to Congestion MW	Percent	Total Up to Congestion MW	Percent
Financial	31,266,760	84.3%	71,900,985	89.7%
Physical	5,836,951	15.7%	8,226,179	10.3%
Total	37,103,711	100.0%	80,127,163	100.0%



Monitoring Analytics, LLC
2621 Van Buren Avenue
Suite 160
Eagleville, PA
19403
(610) 271-8050
MA@monitoringanalytics.com
www.MonitoringAnalytics.com

