

# State of the PJM Market January through June, 2010

Members Committee  
August 12, 2010

Joseph Bowring



Monitoring Analytics

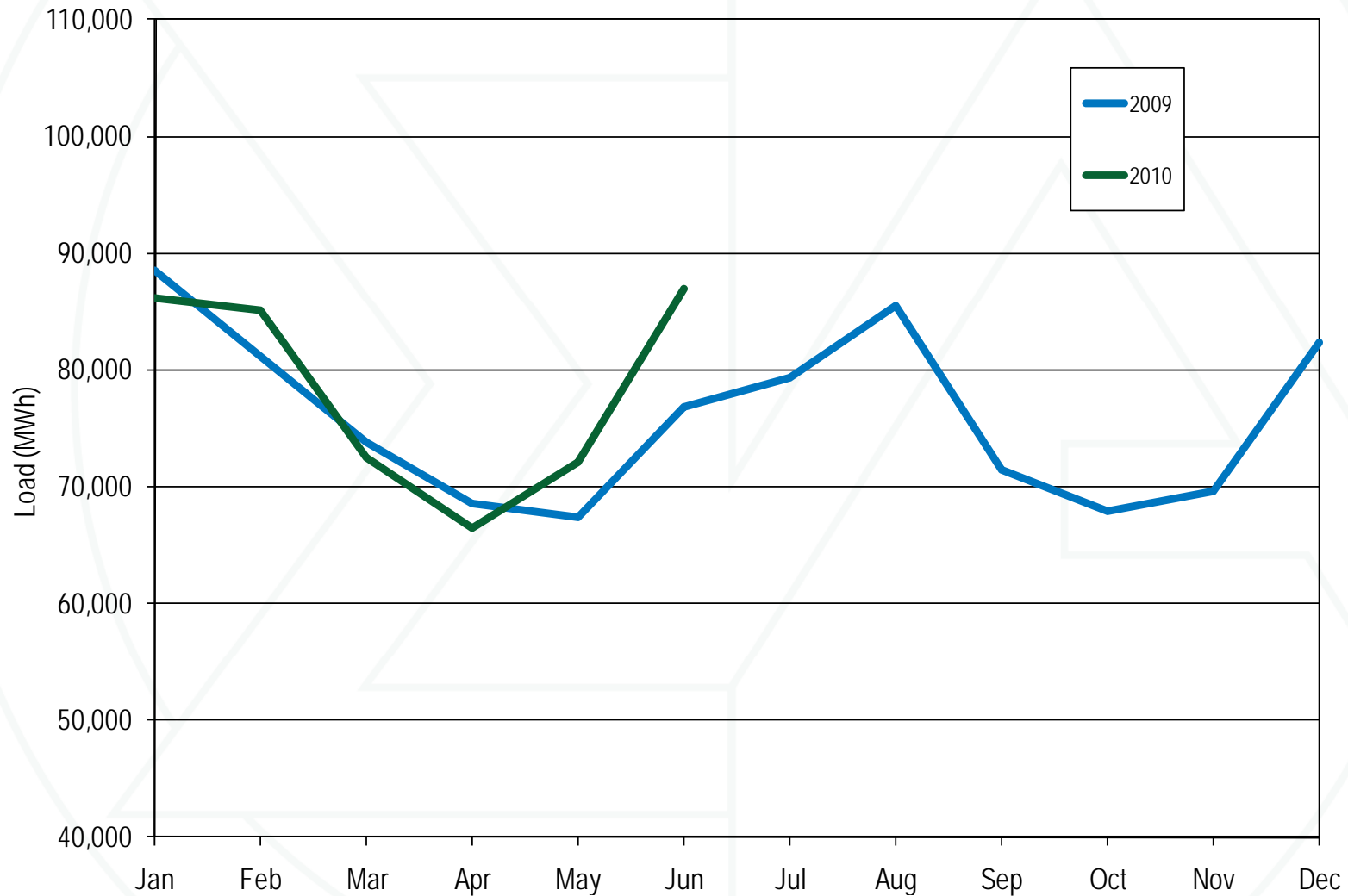
**Table 1-1 Total price per MWh by Category and Total Revenues by Category: January through December 2009 and January through June 2010 (See 2009 SOM, Table 1-1)**

Category	Totals (\$ Millions) Jan-Dec 2009	Totals (\$ Millions) Jan-Jun 2010	Jan-Dec 2009 \$/MWh	Jan-Jun 2010 \$/MWh	Jan-Dec 2009 Percent	Jan-Jun 2010 Percent
Energy	\$26,008.22	\$15,518.26	\$39.05	\$45.75	70.2%	71.9%
Capacity	\$7,162.71	\$3,966.86	\$10.75	\$11.69	19.3%	18.4%
Transmission Service Charges	\$2,664.73	\$1,359.44	\$4.00	\$4.01	7.2%	6.3%
Operating Reserves (Uplift)	\$324.15	\$244.18	\$0.49	\$0.72	0.9%	1.1%
PJM Administrative Fees	\$242.32	\$125.33	\$0.36	\$0.37	0.7%	0.6%
Reactive	\$228.18	\$124.67	\$0.34	\$0.37	0.6%	0.6%
Regulation	\$203.49	\$116.30	\$0.31	\$0.34	0.5%	0.5%
Transmission Enhancement Cost Recovery	\$63.21	\$48.88	\$0.09	\$0.14	0.2%	0.2%
Transmission Owner (Schedule 1A)	\$56.47	\$29.01	\$0.08	\$0.09	0.2%	0.1%
Synchronized Reserves	\$34.27	\$18.87	\$0.05	\$0.06	0.1%	0.1%
NERC/RFC	\$8.86	\$6.83	\$0.01	\$0.02	0.0%	0.0%
Black Start	\$14.27	\$5.36	\$0.02	\$0.02	0.0%	0.0%
RTO Startup and Expansion	\$9.12	\$4.55	\$0.01	\$0.01	0.0%	0.0%
Load Response	\$1.62	\$2.13	\$0.00	\$0.01	0.0%	0.0%
Transmission Facility Charges	\$1.39	\$0.67	\$0.00	\$0.00	0.0%	0.0%
Total	\$37,023.01	\$21,571.34	\$55.58	\$63.59	100.0%	100.0%

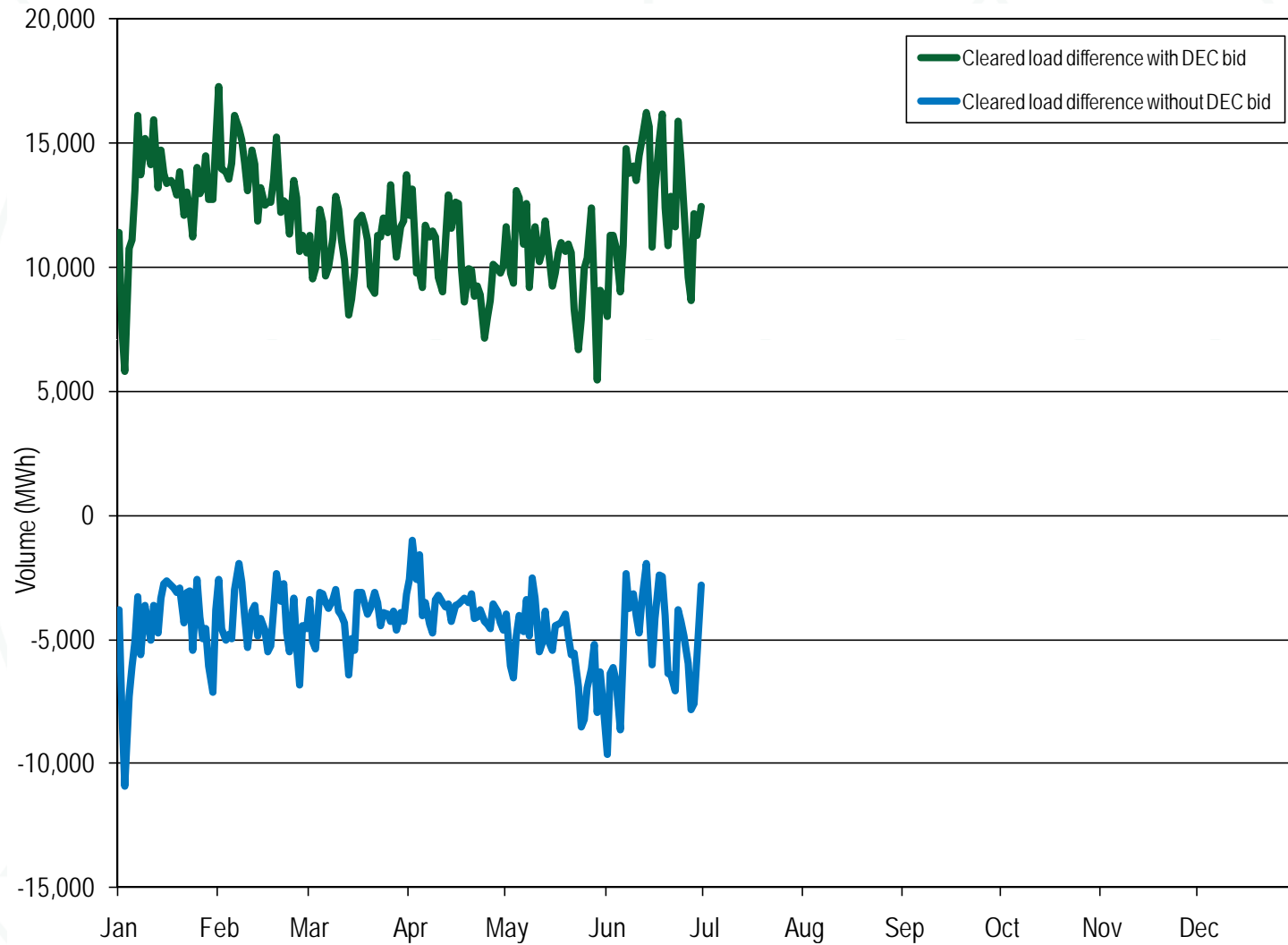
**Figure 2-2 Actual PJM footprint peak loads: April through June of 2003 to 2010 (See 2009 SOM, Figure 2-2)**



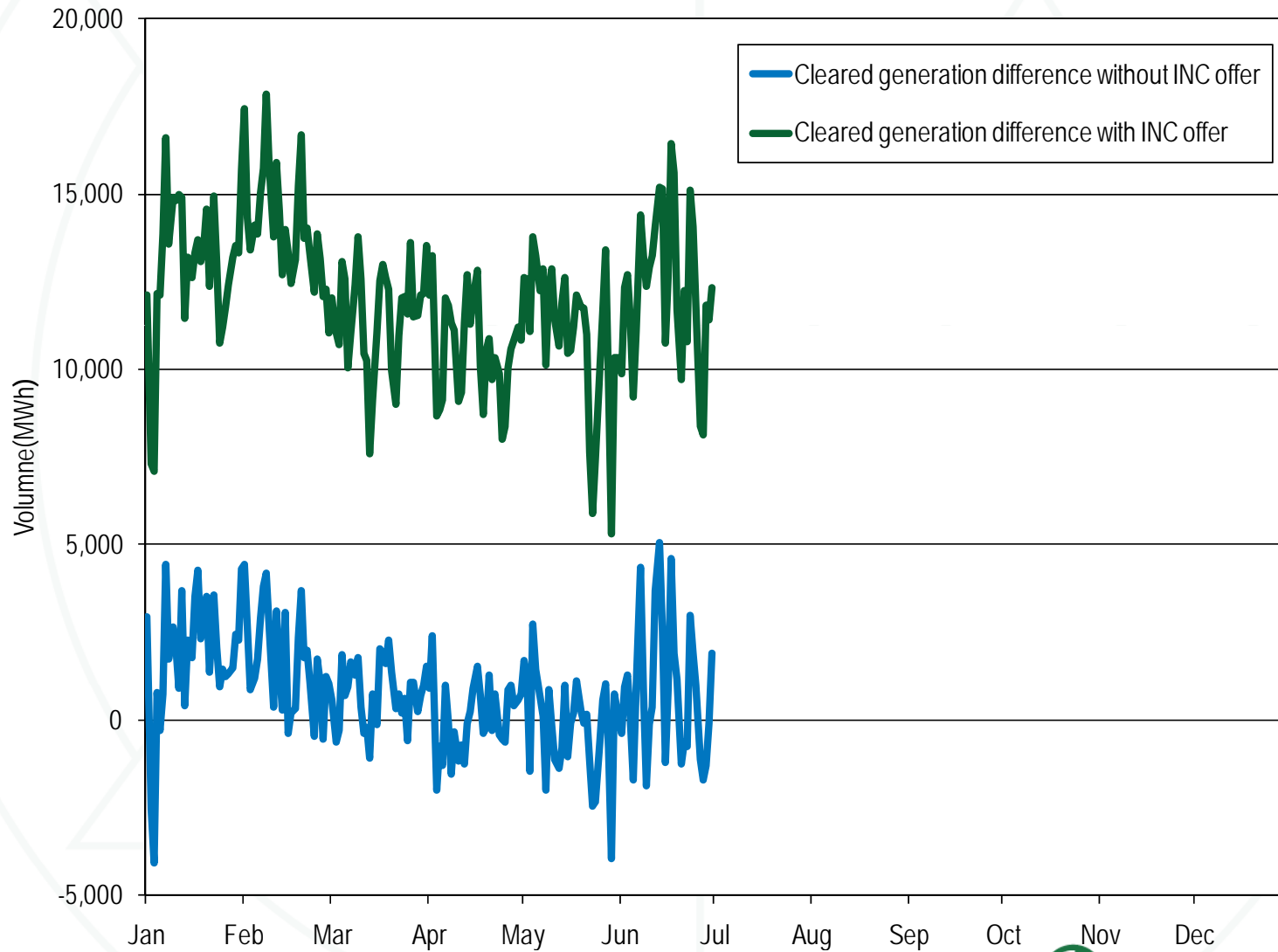
**Figure 2-8 PJM real-time average load: Calendar years 2009 through June 2010 (See 2009 SOM, Figure 2-8)**



**Figure 2-12 Day-ahead and real-time loads (Average daily volumes): January through June 2010 (New Figure)**



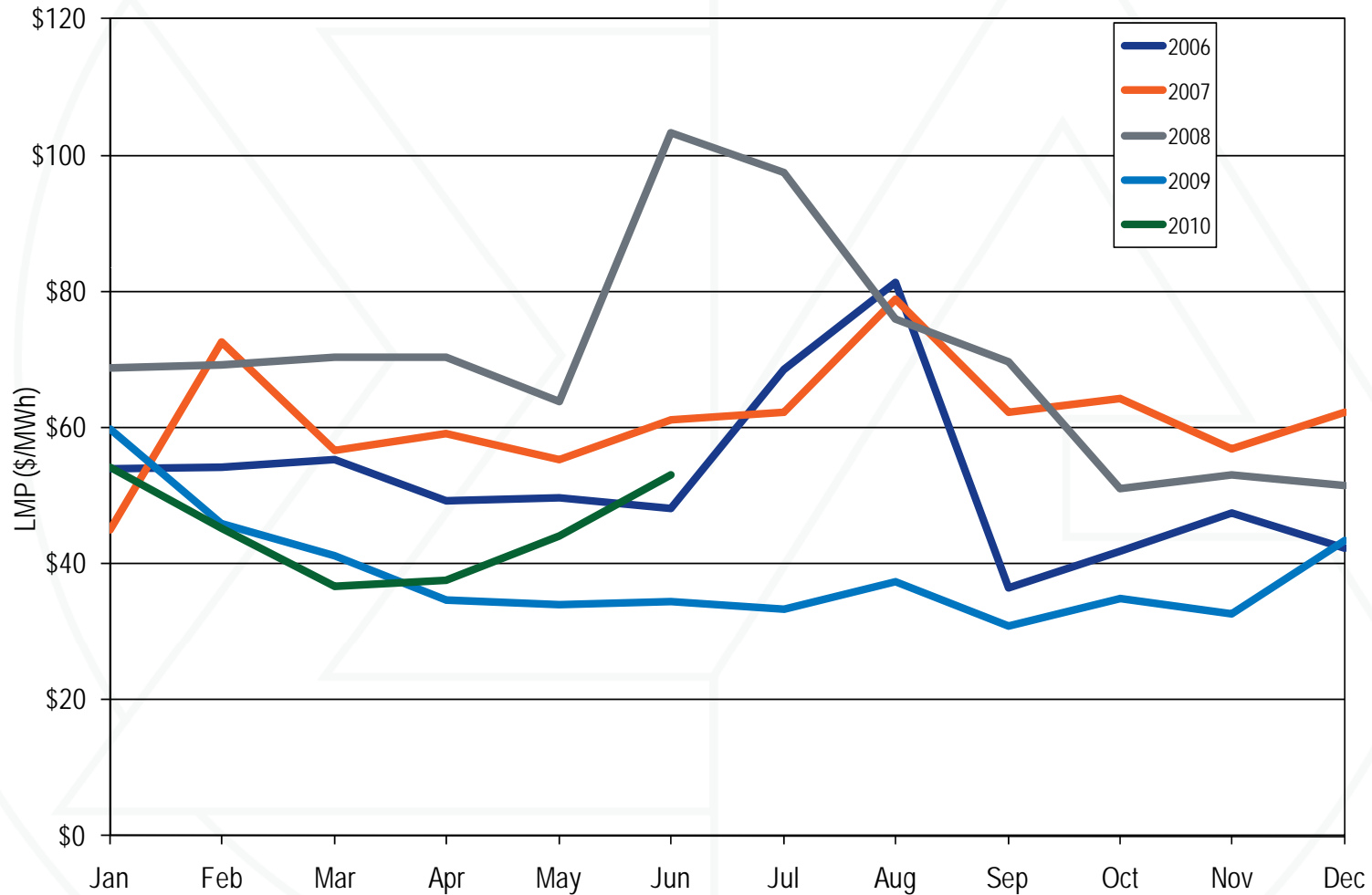
**Figure 2-14 Day-ahead and real-time generation (Average daily volumes): January through June 2010 (New Figure)**



**Table 2-52 PJM real-time, annual, load-weighted, average LMP  
(Dollars per MWh): Calendar years 1998 through June 2010  
(See 2009 SOM, Table 2-59)**

	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	\$45.75	\$38.78	\$23.60	17.2%	13.3%	29.6%

**Figure 2-16 PJM real-time, monthly, load-weighted, average LMP: Calendar years 2006 through June 2010 (See 2009 SOM, Figure 2-14)**





**Table 2-56 PJM real-time annual, fuel-cost-adjusted, load-weighted LMP (Dollars per MWh): January through June 2009 and 2010 (See 2009 SOM, Table 2-63)**

	2010 Load-Weighted LMP	2010 Fuel-Cost-Adjusted, Load-Weighted LMP	Change
Average	\$45.75	\$49.81	8.9%
	2009 Load-Weighted LMP	2010 Fuel-Cost-Adjusted, Load-Weighted LMP	Change
Average	\$42.48	\$49.81	17.3%
	2009 Load-Weighted LMP	2010 Load-Weighted LMP	Change
Average	\$42.48	\$45.75	7.7%

**Table 2-57 Components of PJM real-time, annual, load-weighted, average LMP: January 1, 2010, through June 30, 2010 (See 2009 SOM, Table 2-64)**

Element	Contribution to LMP	Percent
Coal	\$19.61	42.9%
Gas	\$18.06	39.5%
10% Cost Adder	\$4.28	9.4%
VOM	\$2.83	6.2%
NOX	\$1.21	2.6%
Oil	\$0.90	2.0%
CO2	\$0.58	1.3%
Dispatch Differential	\$0.33	0.7%
SO2	\$0.25	0.6%
FMU Adder	\$0.16	0.4%
NA	\$0.13	0.3%
M2M Adder	\$0.01	0.0%
Shadow Price Limit Adder	\$0.01	0.0%
Offline CT Adder	\$0.00	0.0%
Municipal Waste	(\$0.01)	(0.0%)
Markup	(\$1.15)	(2.5%)
UDS Override Differential	(\$1.47)	(3.2%)
LMP	\$45.75	100.0%

**Table 2-80 Day-ahead and real-time simple annual average LMP (Dollars per MWh): Calendar years 2000 through June 2010 (See 2009 SOM, Table 2-87)**

	Day Ahead	Real Time	Difference	Difference as Percent of Real Time
2000	\$31.97	\$30.36	(\$1.61)	(5.3%)
2001	\$32.75	\$32.38	(\$0.37)	(1.1%)
2002	\$28.46	\$28.30	(\$0.16)	(0.6%)
2003	\$38.73	\$38.28	(\$0.45)	(1.2%)
2004	\$41.43	\$42.40	\$0.97	2.3%
2005	\$57.89	\$58.08	\$0.18	0.3%
2006	\$48.10	\$49.27	\$1.17	2.4%
2007	\$54.67	\$57.58	\$2.90	5.0%
2008	\$66.12	\$66.40	\$0.28	0.4%
2009	\$37.00	\$37.08	\$0.08	0.2%
2010	\$43.81	\$43.27	(\$0.54)	(1.2%)

**Figure 2-23 Monthly simple average of real-time minus day-ahead LMP: January through June 2010 (See 2009 SOM, Figure 2-21)**



**Table 2-98 Demand Response (DR) offered and cleared in RPM Base Residual Auction: Delivery years 2007/2008 through 2013/2014 (See 2009 SOM, Table 2-107)**

Planning Year	DR Offered in BRA	DR Cleared in BRA
2007/2008	123.5	123.5
2008/2009	691.9	518.5
2009/2010	906.9	865.2
2010/2011	935.6	908.1
2011/2012	1,597.3	1,319.5
2012/2013	9,535.4	6,824.1
2013/2014	12,528.7	8,977.4

**Table 2-4 Annual real-time offer-capping statistics: Calendar years 2006 through June 2010 (See 2009 SOM, Table 2-4)**

	Real Time		Day Ahead	
	Unit Hours Capped	MW Capped	Unit Hours Capped	MW Capped
2006	1.0%	0.2%	0.4%	0.1%
2007	1.1%	0.2%	0.2%	0.0%
2008	1.0%	0.2%	0.2%	0.1%
2009	0.4%	0.1%	0.1%	0.0%
2010	1.0%	0.3%	0.3%	0.1%

**Table 2-26 Marginal unit contribution to PJM real-time, annual, load-weighted LMP (By parent company): January through June 2010 (See 2009 SOM, Table 2-32)**

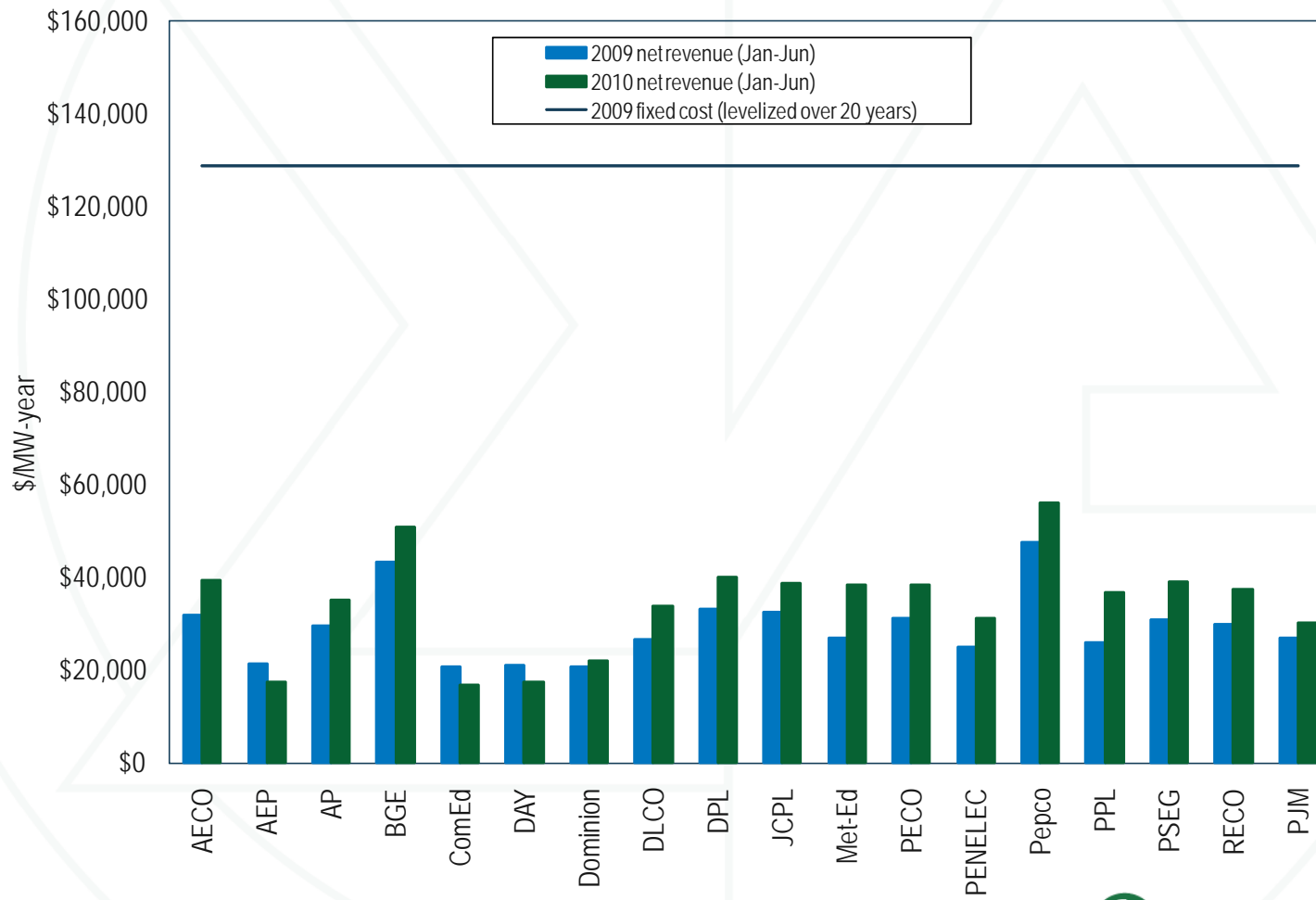
Company	Percent of Price
1	18%
2	14%
3	11%
4	6%
5	5%
6	5%
7	4%
8	3%
9	3%
Other (50 companies)	31%

**Table 2-27 Type of fuel used (By real-time marginal units):  
January through June 2010 (See 2009 SOM, Table 2-33)**

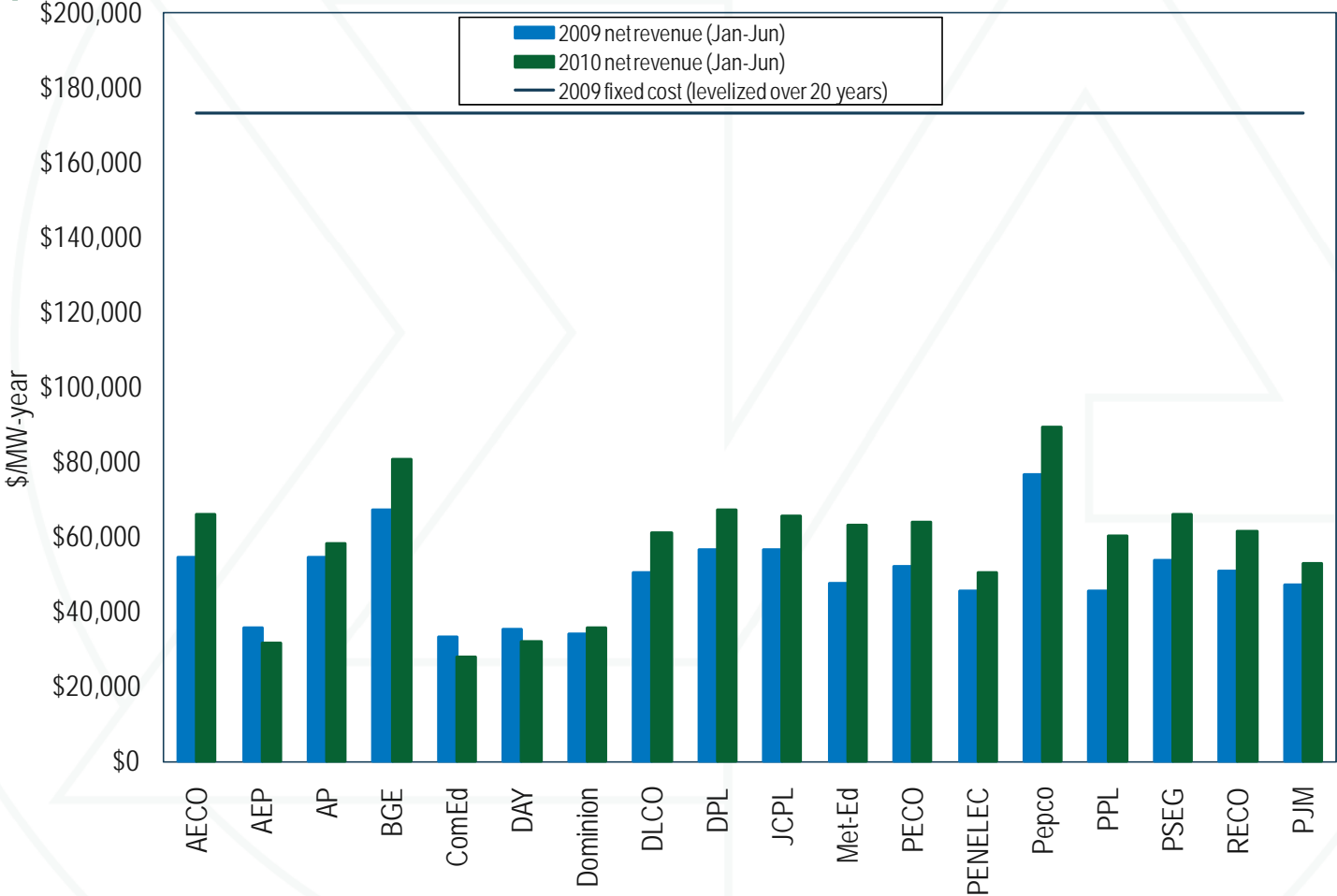
Fuel Type	2010
Coal	68%
Natural Gas	25%
Petroleum	3%
Wind	2%
Landfill Gas	1%
Misc	1%



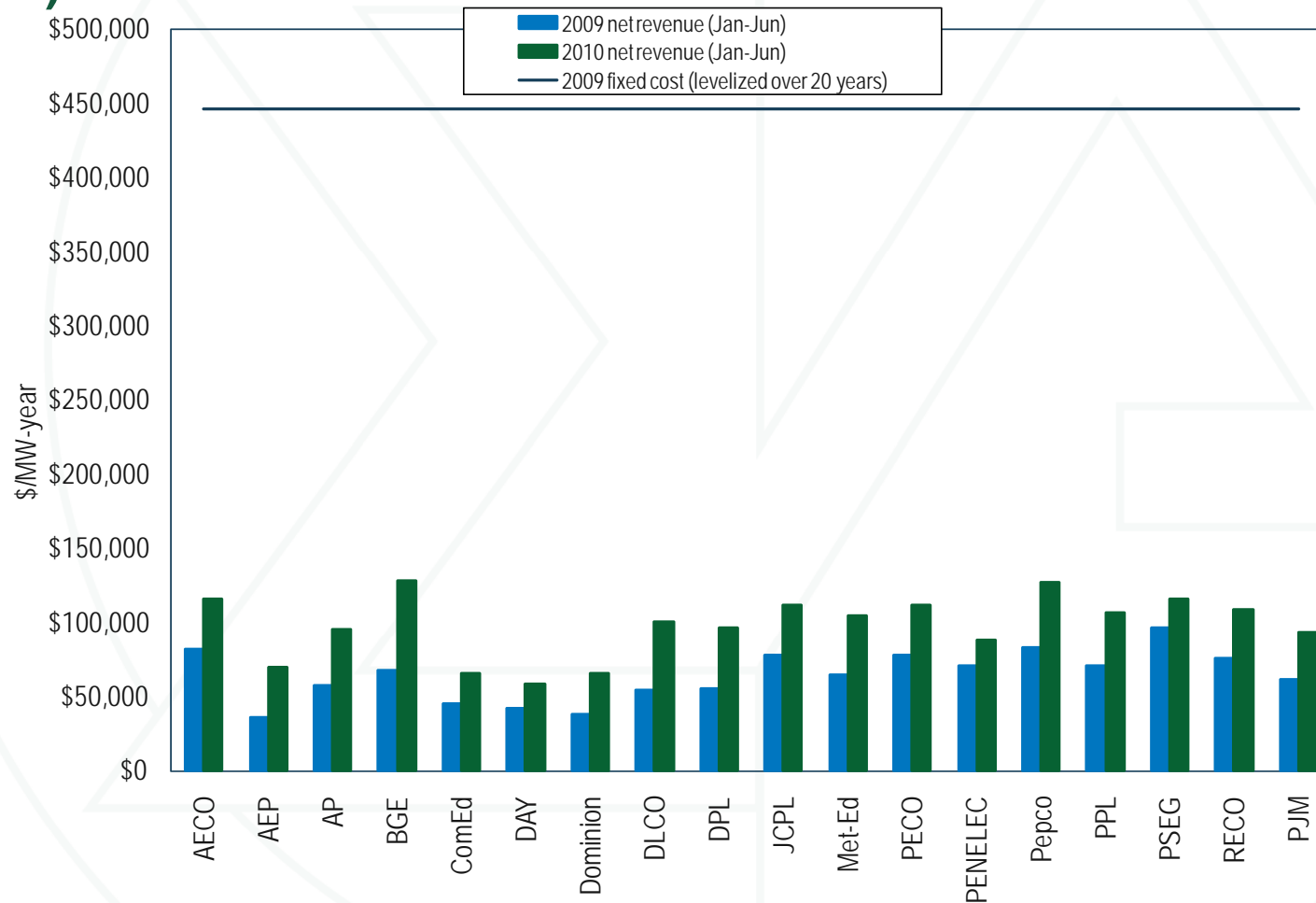
**Figure 3-1 New entrant CT real-time 2009 and 2010 net revenue for January through June and 20-year levelized fixed cost as of 2009 (Dollars per installed MW-year) (See 2009 SOM, Figure 3-3)**



**Figure 3-2 New entrant CC real-time 2009 and 2010 net revenue for January through June and 20-year levelized fixed cost as of 2009 (Dollars per installed MW-year) (See 2009 SOM, Figure 3-5)**



**Figure 3-3 New entrant CP real-time 2009 and 2010 net revenue for January through June and 20-year levelized fixed cost as of 2009 (Dollars per installed MW-year) (See 2009 SOM, Figure 3-7)**



**Table 3-23 PJM installed capacity (By fuel source): January 1, May 31, June 1, and June 30, 2010 (See 2009 SOM, Table 3-35)**

	1-Jan-10		31-May-10		1-Jun-10		30-Jun-10	
	MW	Percent	MW	Percent	MW	Percent	MW	Percent
Coal	68,382.1	40.7%	68,155.5	40.7%	67,991.1	40.8%	67,858.1	40.7%
Gas	49,238.8	29.3%	48,991.4	29.3%	48,424.5	29.0%	48,426.5	29.1%
Hydroelectric	7,921.9	4.7%	7,923.5	4.7%	7,923.5	4.8%	7,923.5	4.8%
Nuclear	30,611.9	18.2%	30,599.3	18.3%	30,619.0	18.4%	30,619.0	18.4%
Oil	10,700.1	6.4%	10,649.4	6.4%	10,645.5	6.4%	10,645.5	6.4%
Solid waste	672.1	0.4%	672.1	0.4%	672.1	0.4%	668.1	0.4%
Wind	326.9	0.2%	409.5	0.2%	481.1	0.3%	481.1	0.3%
Total	167,853.8	100.0%	167,400.7	100.0%	166,756.8	100.0%	166,621.8	100.0%

**Table 3-24 PJM generation (By fuel source (GWh)): January through June 2010 (See 2009 SOM, Table 3-36)**

	GWh	Percent
Coal	180,931.2	50.8%
Nuclear	126,789.7	35.6%
Gas	32,244.2	9.1%
Natural Gas	31,455.3	8.8%
Landfill Gas	788.7	0.2%
Biomass Gas	0.2	0.0%
Hydroelectric	8,146.2	2.3%
Wind	4,183.0	1.2%
Waste	3,020.1	0.8%
Solid Waste	2,325.0	0.7%
Miscellaneous	695.1	0.2%
Oil	875.5	0.2%
Heavy Oil	687.0	0.2%
Light Oil	175.0	0.0%
Diesel	10.3	0.0%
Kerosene	3.2	0.0%
Jet Oil	0.1	0.0%
Solar	2.1	0.0%
Battery	0.2	0.0%
<b>Total</b>	<b>356,192.2</b>	<b>100.0%</b>

**Table 3-40 Balancing operating reserve allocation process  
(See 2009 SOM, Table 3-52)**

	Reliability Credits	Deviation Credits
<u>RTO</u>	1.) <b>Reliability Analysis:</b> Conservative Operations and for TX constraints 500kV & 765kV 2.) <b>Real-Time Market:</b> LMP is not greater than or equal to offer for at least 4 intervals and for TX constraints 500kV & 765kV	1.) <b>Reliability Analysis:</b> Load + Reserves and for TX constraints 500kV & 765kV 2.) <b>Real-Time Market:</b> LMP is greater than or equal to offer for at least 4 intervals and for TX constraints 500kV & 765kV
<u>East</u>	1.) <b>Reliability Analysis:</b> Conservative Operations and for TX constraints 345kV, 230kV, 115kV, 69kV 2.) <b>Real-Time Market:</b> LMP is not greater than or equal to offer for at least 4 intervals and for TX constraints 345kV, 230kV, 115kV, 69kV	1.) <b>Reliability Analysis:</b> Load + Reserves and for TX constraints 345kV, 230kV, 115kV, 69kV 2.) <b>Real-Time Market:</b> LMP is greater than or equal to offer for at least 4 intervals and for TX constraints 345kV, 230kV, 115kV, 69kV
<u>West</u>	1.) <b>Reliability Analysis:</b> Conservative Operations and for TX constraints 345kV, 230kV, 115kV, 69kV 2.) <b>Real-Time Market:</b> LMP is not greater than or equal to offer for at least 4 intervals and for TX constraints 345kV, 230kV, 115kV, 69kV	1.) <b>Reliability Analysis:</b> Load + Reserves and for TX constraints 345kV, 230kV, 115kV, 69kV 2.) <b>Real-Time Market:</b> LMP is greater than or equal to offer for at least 4 intervals and for TX constraints 345kV, 230kV, 115kV, 69kV

**Table 3-64 Top 10 units and organizations receiving total operating reserve credits: January through June 2010 (See 2009 SOM, Table 3-81)**

Rank	Units			Organizations		
	Total Credit	Total Credit Share	Total Credit Cumulative Distribution	Total Credit	Total Credit Share	Total Credit Cumulative Distribution
1	\$26,565,270	11.4%	11.4%	\$74,478,710	31.9%	31.9%
2	\$19,227,389	8.2%	19.6%	\$33,759,344	14.4%	46.3%
3	\$14,170,856	6.1%	25.6%	\$33,170,782	14.2%	60.5%
4	\$13,069,594	5.6%	31.2%	\$15,360,288	6.6%	67.0%
5	\$10,953,365	4.7%	35.9%	\$9,600,111	4.1%	71.1%
6	\$3,475,866	1.5%	37.4%	\$8,824,067	3.8%	74.9%
7	\$3,164,328	1.4%	38.8%	\$8,477,542	3.6%	78.5%
8	\$3,084,478	1.3%	40.1%	\$7,873,726	3.4%	81.9%
9	\$2,740,601	1.2%	41.2%	\$5,108,985	2.2%	84.1%
10	\$2,523,122	1.1%	42.3%	\$3,830,642	1.6%	85.7%

**Table 3-69 Regional balancing charges allocation: January through June 2009 (New Table)**

	Reliability Charges			Deviation Charges				Total
	Real-Time Load	Real-Time Exports	Reliability Total	Demand Deviations	Supply Deviations	Generator Deviations	Deviations Total	
RTO	\$2,749,936 3.0%	\$108,748 0.1%	\$2,858,684 3.1%	\$34,212,966 36.8%	\$20,980,028 22.6%	\$10,893,912 11.7%	\$66,086,906 71.1%	\$68,945,590 74.2%
East	\$324,661 0.3%	\$11,529 0.0%	\$336,190 0.4%	\$3,382,299 3.6%	\$1,927,684 2.1%	\$989,854 1.1%	\$6,299,837 6.8%	\$6,636,027 7.1%
West	\$14,474,332 15.6%	\$667,966 0.7%	\$15,142,298 16.3%	\$1,111,579 1.2%	\$755,649 0.8%	\$369,206 0.4%	\$2,236,433 2.4%	\$17,378,731 18.7%
Total	\$17,548,928 18.9%	\$788,243 0.8%	\$18,337,172 19.7%	\$38,706,844 41.6%	\$23,663,360 25.5%	\$12,252,972 13.2%	\$74,623,176 80.3%	\$92,960,347 100%



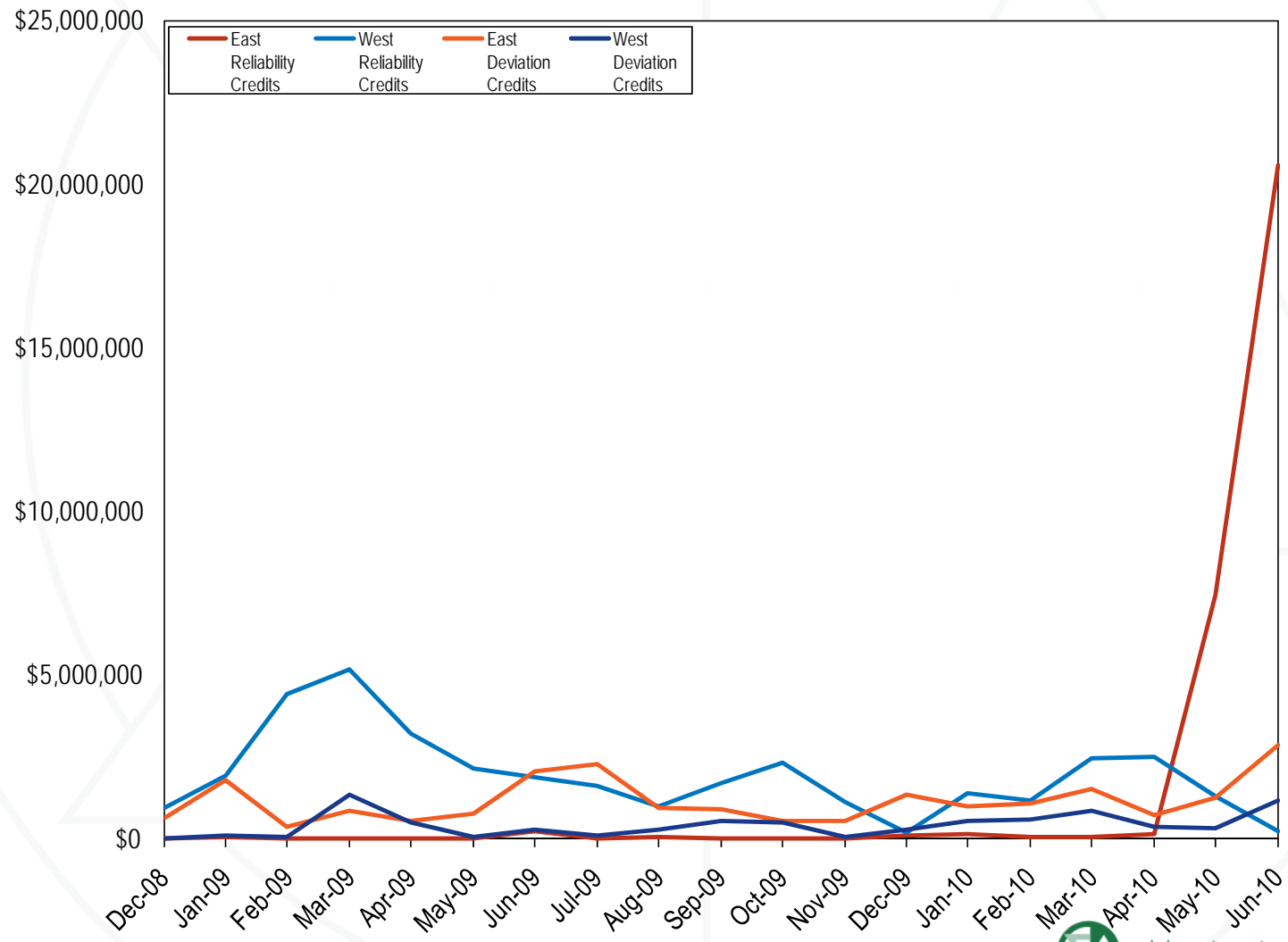
**Table 3-70 Regional balancing charges allocation: January through June 2010 (New Table)**

	Reliability Charges			Deviation Charges				Total
	Real-Time Load	Real-Time Exports	Reliability Total	Demand Deviations	Supply Deviations	Generator Deviations	Deviations Total	
RTO	\$15,917,613 11.3%	\$619,122 0.4%	\$16,536,736 11.7%	\$40,184,542 28.5%	\$22,663,866 16.1%	\$11,833,894 8.4%	\$74,682,303 53.0%	\$91,219,038 64.7%
East	\$27,351,105 19.4%	\$1,100,323 0.8%	\$28,451,428 20.2%	\$4,599,507 3.3%	\$2,650,810 1.9%	\$1,054,579 0.7%	\$8,304,896 5.9%	\$36,756,324 26.1%
West	\$8,784,110 6.2%	\$285,356 0.2%	\$9,069,466 6.4%	\$2,130,462 1.5%	\$961,154 0.7%	\$797,715 0.6%	\$3,889,331 2.8%	\$12,958,797 9.2%
Total	\$52,052,828 36.9%	\$2,004,802 1.4%	\$54,057,630 38.4%	\$46,914,512 33.3%	\$26,275,830 18.6%	\$13,686,188 9.7%	\$86,876,529 61.6%	\$140,934,159 100.0%

**Table 3-71 Differences between regional balancing charges allocation: January through June 2009 and 2010 (New Table)**

	Reliability Charges			Deviation Charges				Total
	Real-Time Load	Real-Time Exports	Reliability Total	Demand Deviations	Supply Deviations	Generator Deviations	Deviations Total	
RTO	\$13,167,677 8.3%	\$510,375 0.3%	\$13,678,052 8.7%	\$5,971,577 (8.3%)	\$1,683,838 (6.5%)	\$939,982 (3.3%)	\$8,595,397 (18.1%)	\$22,273,449 (9.4%)
East	\$27,026,444 19.1%	\$1,088,794 0.8%	\$28,115,238 19.8%	\$1,217,208 (0.4%)	\$723,127 (0.2%)	\$64,725 (0.3%)	\$2,005,059 (0.9%)	\$30,120,298 18.9%
West	(\$5,690,222) (9.3%)	(\$382,610) (0.5%)	(\$6,072,832) (9.9%)	\$1,018,884 0.3%	\$205,505 (0.1%)	\$428,509 0.2%	\$1,652,898 0.4%	(\$4,419,934) (9.5%)
Total	\$34,503,900 18.1%	\$1,216,559 0.6%	\$35,720,458 18.6%	\$8,207,668 (8.3%)	\$2,612,470 (6.8%)	\$1,433,216 (3.5%)	\$12,253,354 (18.6%)	\$47,973,812 0.0%

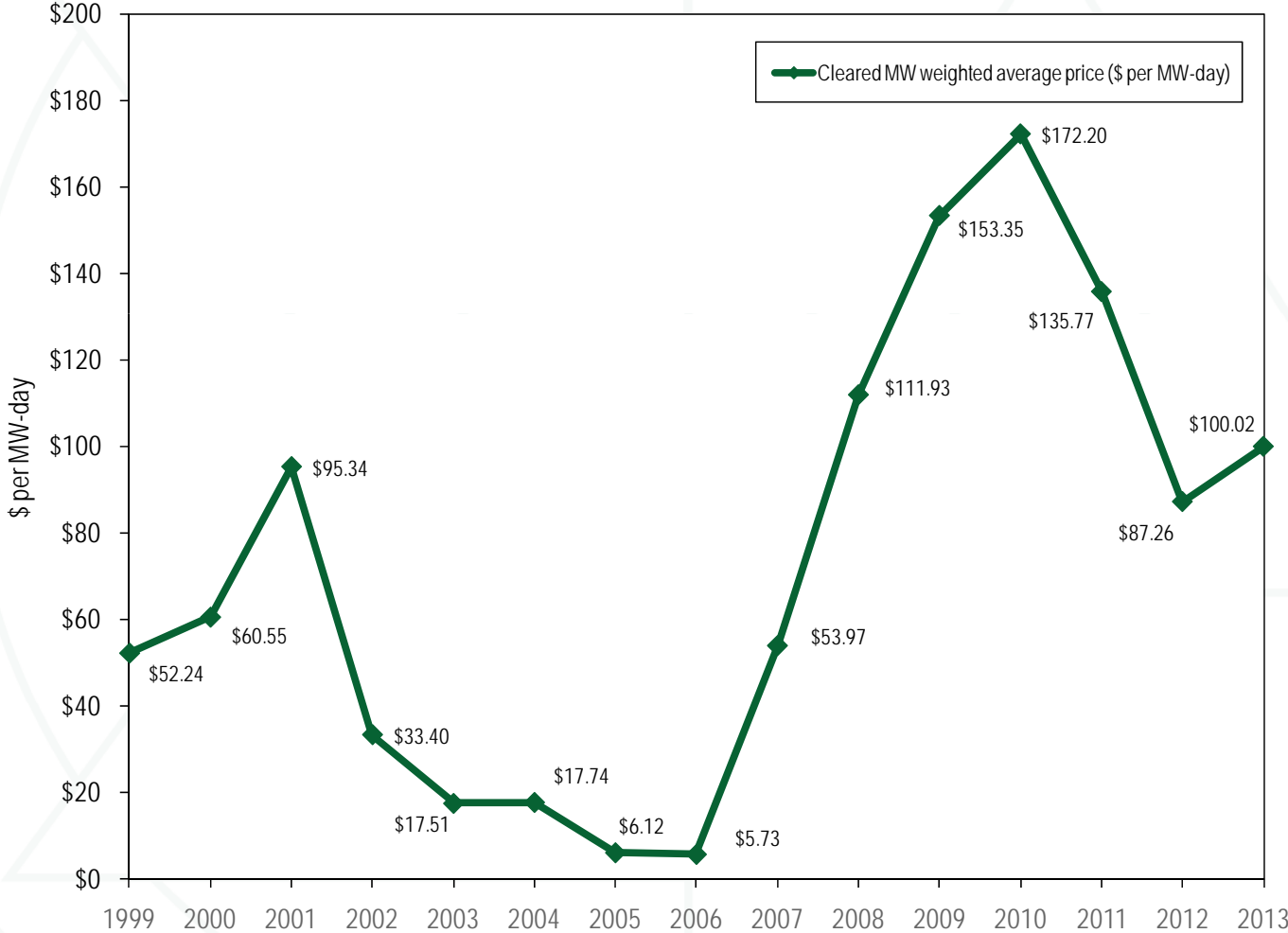
**Figure 3-10 Regional reliability and deviation balancing operating reserve credits: December 2008 through June 2010  
(New Figure)**



**Table 5-10 Capacity prices: 2007/2008 through 2013/2014 RPM Auctions (See 2009 SOM, Table 5-10)**

	RPM Clearing Price (\$ per MW-day)							
	RTO	MAAC	APS	EMAAC	SWMAAC	DPL South	PSEG North	Pepco
2007/2008 BRA	\$40.80	\$40.80	\$40.80	\$197.67	\$188.54	\$197.67	\$197.67	\$188.54
2008/2009 BRA	\$111.92	\$111.92	\$111.92	\$148.80	\$210.11	\$148.80	\$148.80	\$210.11
2008/2009 Third IA	\$10.00	\$10.00	\$10.00	\$10.00	\$223.85	\$10.00	\$10.00	\$223.85
2009/2010 BRA	\$102.04	\$191.32	\$191.32	\$191.32	\$237.33	\$191.32	\$191.32	\$237.33
2009/2010 Third IA	\$40.00	\$86.00	\$86.00	\$86.00	\$86.00	\$86.00	\$86.00	\$86.00
2010/2011 BRA	\$174.29	\$174.29	\$174.29	\$174.29	\$174.29	\$186.12	\$174.29	\$174.29
2010/2011 Third IA	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00	\$50.00
2011/2012 BRA	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00
2011/2012 First IA	\$55.00	\$55.00	\$55.00	\$55.00	\$55.00	\$55.00	\$55.00	\$55.00
2011/2012 ATSI FRR Integration Auction	\$108.89	\$108.89	\$108.89	\$108.89	\$108.89	\$108.89	\$108.89	\$108.89
2012/2013 BRA	\$16.46	\$133.37	\$16.46	\$139.73	\$133.37	\$222.30	\$185.00	\$133.37
2012/2013 ATSI FRR Integration Auction	\$20.46	\$20.46	\$20.46	\$20.46	\$20.46	\$20.46	\$20.46	\$20.46
2013/2014 BRA	\$27.73	\$226.15	\$27.73	\$245.00	\$226.15	\$245.00	\$245.00	\$247.14

Figure 5-1 History of capacity prices: Calendar year 1999 through 2013 (See 2009 SOM, Figure 5-1)



**Table 7-1 Total annual PJM congestion (Dollars (Millions)):  
Calendar years 2003 through June 2010 (See 2009 SOM, Table 7-1)**

	Congestion Charges	Percent Change	Total PJM Billing	Percent of PJM Billing
2003	\$464	NA	\$6,900	7%
2004	\$750	62%	\$8,700	9%
2005	\$2,092	179%	\$22,630	9%
2006	\$1,603	(23%)	\$20,945	8%
2007	\$1,846	15%	\$30,556	6%
2008	\$2,117	15%	\$34,306	6%
2009	\$719	(66%)	\$26,550	3%
2010 (Jan - Jun)	\$646	NA	\$16,314	4%
<b>Total</b>	<b>\$9,591</b>		<b>\$166,901</b>	<b>6%</b>