2009 Quarterly State of the PJM Market: January through September

Members Committee November 19, 2009 **Joseph Bowring**



Table 1-1 Total price per MWh: January through September2009 (New Table)

Category	\$/MWh	Percent
Load Weighted Energy	\$39.57	73.4%
Capacity	\$9.03	16.8%
Transmission Service	\$3.54	6.6%
Operating Reserves (Uplift)	\$0.44	0.8%
Regulation	\$0.33	0.6%
Reactive	\$0.32	0.6%
PJM Administrative	\$0.31	0.6%
Transmission Cost Recovery	\$0.18	0.3%
Transmission Owner (Schedule 1A)	\$0.08	0.1%
Synchronized Reserves	\$0.03	0.1%
Black Start Services	\$0.02	0.0%
RTO Startup and Expansion	\$0.01	0.0%
NERC/RFC	\$0.01	0.0%
Load Response	\$0.00	0.0%
Total	\$53.87	100.0%







Figure 2-1 Average PJM aggregate supply curves: July through September 2008 and 2009 (See 2008 SOM, Figure 2-1)





Table 2-1 Actual PJM footprint quarter three peak loads: 2005 to 2009 (See 2008 SOM, Table 2-2)

Year	Date	Hour Ending (EPT)	PJM Load (MW)	Difference (MW)
2005	26-Jul-05	1600	133,761	NA
2006	02-Aug-06	1700	144,644	1 0,883
2007	08-Aug-07	1600	139,428	(5,216)
2008	17-Jul-08	1700	129,481	(9,947)
2009	10-Aug-09	1700	126,805	(2,676)





Table 2-32 Type of fuel used (By real-time marginal units):January through September 2009 (See 2007 SOM, Table 2-32)

	Percent on the
Fuel Type	Margin
Coal	73%
Natural Gas	20%
Petroleum	5%
Landfill Gas	1%
Interface	1%
Misc	0%



Table 2-34 The markup component of the overall PJM realtime, load-weighted, average LMP by primary fuel type and unit type: January through September 2009 (New Table)

Fuel Type	Unit Type	Markup Component of LMP	Percent
Coal	Steam	(\$3.04)	82.9%
Gas	CC	(\$0.68)	18.6%
Gas	CT	\$0.02	(0.5%)
Gas	Diesel	\$0.00	(0.1%)
Gas	Steam	\$0.01	(0.3%)
Interface	Interface	(\$0.00)	0.0%
Municipal Waste	Diesel	\$0.00	0.0%
Municipal Waste	Steam	(\$0.02)	0.5%
Oil	CC	(\$0.00)	0.0%
Oil	CT	\$0.04	(1.1%)
Oil	Diesel	(\$0.02)	0.4%
Oil	Steam	\$0.02	(0.5%)
Uranium	Steam	(\$0.00)	0.0%
Water	Hydro	\$0.00	0.0%
Wind	Wind	\$0.00	(0.0%)
Total		(\$3.67)	100.0%





Table 2-37 Average real-time markup component (By price category): January through September 2009 (See 2008 SOM, Table 2-41)

	Average Markup Component	Frequency
Below \$20	(\$0.29)	5.1%
\$20 to \$40	(\$5.49)	73.7%
\$40 to \$60	(\$3.44)	23.6%
\$60 to \$80	\$0.72	5.7%
\$80 to \$100	\$9.01	2.3%
\$100 to \$120	\$0.76	0.7%
\$120 to \$140	\$40.38	0.4%
\$140 to \$160	\$13.87	0.2%
Above \$160	\$52.56	0.2%



7



Table 2-46 PJM real-time average load: Calendar years 2000through September 2009 (See 2008 SOM, Table 2-44)

	PJM Real-Time Load (MWh)			Yea	Year-to-Year Change		
			Standard				
	Average	Median	Deviation	Average	Median	Deviation	
2000	30,113	30,170	5,529	NA	NA	NA	
2001	30,297	30,219	5,873	0.6%	0.2%	6.2%	
2002	35,731	34,746	8,013	17.9%	15.0%	36.5%	
2003	37,398	37,031	6,832	4.7%	6.6%	(14.7%)	
2004	49,963	48,103	13,004	33.6%	29.9%	90.3%	
2005	78,150	76,247	16,296	56.4%	58.5%	25.3%	
2006	79,471	78,473	14,534	1.7%	2.9%	(10.8%)	
2007	81,681	80,914	14,618	2.8%	3.1%	0.6%	
2008	79,515	78,481	13,758	(2.7%)	(3.0%)	(5.9%)	
2009	76,956	76,355	13,879	(3.2%)	(2.7%)	0.9%	



8



Figure 2-6 PJM real-time average load: Calendar years 2008 through September 2009 (See 2008 SOM, Figure 2-5)



Table 2-49 Cleared day-ahead and real-time load (MWh): January through September 2009 (See 2008 SOM, Table 2-47)

	Day Ahead			Real Time	Average	Difference
Cleared Fixed	Cleared Price	Cleared				Total Load
Demand	Sensitive	DEC Bid	Total Load	Total Load	Total Load	Minus DEC Bid
72,973	1,603	15,104	89,680	76,956	12,724	(2,380)
72,358	1,609	15,369	89,515	76,355	13,160	(2,209)
13,129	458	2,660	15,756	13,879	1,877	(783)
	Cleared Fixed Demand 72,973 72,358 13,129	Day ArClearedClearedFixedPriceDemandSensitive72,9731,60372,3581,60913,129458	Day Ahead Cleared Cleared Fixed Price Cleared Demand Sensitive DEC Bid 72,973 1,603 15,104 72,358 1,609 15,369 13,129 458 2,660	Day Ahead Cleared Cleared Fixed Price Cleared Demand Sensitive DEC Bid Total Load 72,973 1,603 15,104 89,680 72,358 1,609 15,369 89,515 13,129 458 2,660 15,756	Day Ahead Real Time Cleared Cleared Fixed Price Cleared Demand Sensitive DEC Bid Total Load Total Load 72,973 1,603 15,104 89,680 76,956 72,358 1,609 15,369 89,515 76,355 13,129 458 2,660 15,756 13,879	Day Ahead Real Time Average Cleared Cleared



Figure 2-9 Day-ahead and real-time loads (Average hourly volumes): January through September 2009 (See 2008 SOM, Figure 2-8)





11



Table 2-50 Day-ahead and real-time generation (MWh): January through September 2009 (See 2008 SOM, Table 2-48)

	Day Ahead			Real Time	Averag	e Difference
	Cleared	Cleared INC	Cleared Generation		Cleared	Generation Plus
	Generation	Offer	Plus INC Offer	Generation	Generation	INC Offer
Average	79,502	12,684	92,186	78,850	652	13,336
Median	79,455	12,553	92,109	78,316	1,139	13,793
Standard deviation	15,458	1,615	16,220	14,242	1,216	1,978



Figure 2-10 Day-ahead and real-time generation (Average hourly volumes): January through September 2009 (See 2008 SOM, Figure 2-9)





Figure 2-11 Price duration curves for the PJM Real-Time Energy Market during hours above the 95th percentile: Calendar years 2005 through September 2009 (See 2008 SOM, Figure 2-10)





Table 2-55 PJM real-time, annual, load-weighted, average LMP (Dollars per MWh): Calendar years 2000 through September 2009 (See 2008 SOM, Table 2-53)

	Real-Time, Loa	d-Weighted, A	verage LMP	Year	r-to-Year Chai	nge
			Standard			Standard
	Average	Median	Deviation	Average	Median	Deviation
2000	\$30.72	\$20.51	\$28.38	NA	NA	NA
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	\$39.57	\$34.57	\$19.04	(44.4%)	(41.9%)	(53.5%)



Figure 2-12 PJM real-time, monthly, load-weighted, average LMP: Calendar years 2005 through September 2009 (See 2008 SOM, Figure 2-11)



2 SECTION

Figure 2-13 Spot average fuel price comparison: Calendar years 2008 through September 2009 (See 2008 SOM, Figure 2-12)



Figure 2-14 Spot average emission price comparison: Calendar years 2008 through September 2009 (See 2008 SOM, Figure 2-13)





Table 2-58 PJM real-time, fuel-cost-adjusted, load-weighted LMP (Dollars per MWh): January through September 2009, year-over-year method

	2008 (Jan - Sep) Load	2009 (Jan - Sep) Fuel-Cost-Adjusted,	
	Weighted LMP	Load-Weighed LMP	Change
Average	\$77.27	\$68.61	(11.2%)



Table 2-59 Components of PJM annual, load-weighted, average LMP: January through September 2009 (See 2008 SOM, Table 2-57)

	Element	Contribution to LMP	Percent
	Coal	\$22.06	55.8%
	Gas	\$12.10	30.6%
	Oil	\$3.26	8.2%
	Uranium	\$0.00	0.0%
	Municipal Waste	\$0.02	0.0%
	FMU Adder	\$0.19	0.5%
	SO2	\$1.33	3.4%
	NOX	\$0.49	1.2%
	VOM	\$4.40	11.1%
	Markup	(\$3.67)	(9.3%)
	Offline CT Adder	\$0.05	0.1%
	UDS Override Differential	(\$0.38)	(1.0%)
	Dispatch Differential	(\$0.21)	(0.5%)
	M2M Adder	(\$0.18)	(0.5%)
	Flow violation Adjustment	(\$0.01)	(0.0%)
	Unit LMP Differential	(\$0.00)	(0.0%)
	NA	\$0.12	0.3%
	LMP	\$39.56	100.0%





Table 2-78 Day-Ahead and Real-Time Energy Market LMP (Dollars per MWh): January through September 2009 (See 2008 SOM, Table 2-78)

				Difference as Percent
	Day Ahead	Real Time	Difference	Real Time
Average	\$37.35	\$37.42	\$0.08	0.2%
Median	\$35.29	\$33.00	(\$2.29)	(7.0%)
Standard deviation	\$14.32	\$17.92	\$3.60	20.1%





Table 2-79 Day-Ahead and Real-Time Energy Market LMP (Dollars per MWh): Calendar years 2000 through September 2009 (See 2008 SOM, Table 2-79)

Voor	Day Aboad	Deal Time	Difference	Difference as Percent
rear	Day Anead	Real Time	Difference	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	\$37.35	\$37.42	\$0.08	0.2%



Figure 2-18 Hourly real-time minus hourly day-ahead LMP: January through September 2009 (See 2008 SOM, Figure 2-17)





Figure 2-20 PJM system hourly average LMP: January through September 2009 (See 2008 SOM, Figure 2-19)





Table 2-83 Monthly average percentage of real-time self-supply load, bilateral-supply load and spot-supply load based on parent companies: 2008 through September 2009 (See 2008 SOM, Table 2-83)

	2008				2009		Difference in Percentage Points		
	Bilateral		Self-	Bilateral			Bilateral		Self-
	Contract	Spot	Supply	Contract	Spot	Self-Supply	Contract	Spot	Supply
Jan	14.3%	17.3%	68.4%	12.6%	15.4%	72.0%	(1.7%)	(1.9%)	3.6%
Feb	15.2%	17.3%	67.5%	13.4%	14.5%	72.1%	(1.7%)	(2.9%)	4.6%
Mar	16.0%	17.1%	66.9%	13.8%	16.7%	69.5%	(2.3%)	(0.4%)	2.6%
Арг	16.6%	18.0%	65.4%	13.5%	17.2%	69.3%	(3.1%)	(0.8%)	3.9%
May	16.0%	18.8%	65.3%	14.6%	18.8%	66.7%	(1.4%)	(0.0%)	1.4%
Jun	13.1%	21.0%	65.9%	12.5%	16.5%	71.0%	(0.6%)	(4.5%)	5.1%
Jul	13.7%	20.6%	65.7%	12.6%	16.9%	70.5%	(1.2%)	(3.7%)	4.8%
Aug	14.9%	22.6%	62.4%	11.7%	16.0%	72.3%	(3.2%)	(6.6%)	9.9%
Sep	14.7%	23.0%	62.2%	12.5%	18.1%	69.4%	(2.3%)	(4.9%)	7.2%
Oct	15.1%	22.7%	62.2%						
Nov	14.8%	22.9%	62.3%						
Dec	12.1%	20.5%	67.4%						
Annual	14.6%	20.1%	65.2%	13.0%	16.6%	70.4%	(1.7%)	(3.5%)	5.2%



25



Table 2-84 Monthly average percentage of day-ahead selfsupply load, bilateral supply load, and spot-supply load based on parent companies: 2008 through September 2009 (See 2008 SOM, Table 2-84)

		2008			2009		Difference in Percentage Points		
	Bilateral		Self-	Bilateral		Self-	Bilateral		Self-
	Contract	Spot	Supply	Contract	Spot	Supply	Contract	Spot	Supply
Jan	4.2%	15.6%	80.2%	4.4%	13.9%	81.7%	0.2%	(1.7%)	1.5%
Feb	4.5%	16.0%	79.5%	4.5%	12.7%	82.9%	(0.1%)	(3.3%)	3.4%
Mar	4.7%	16.0%	79.3%	4.3%	13.2%	82.5%	(0.4%)	(2.8%)	3.2%
Apr	5.0%	16.8%	78.2%	4.4%	14.1%	81.5%	(0.5%)	(2.7%)	3.3%
May	5.0%	18.2%	76.8%	4.6%	15.9%	79.5%	(0.4%)	(2.3%)	2.7%
Jun	5.5%	20.2%	74.3%	4.7%	14.2%	81.2%	(0.8%)	(6.1%)	6.9%
Jul	5.6%	20.4%	74.0%	5.6%	16.3%	78.2%	(0.0%)	(4.2%)	4.2%
Aug	4.9%	20.2%	75.0%	5.1%	15.5%	79.3%	0.3%	(4.6%)	4.4%
Sep	5.4%	19.3%	75.3%	4.7%	16.3%	78.9%	(0.7%)	(2.9%)	3.6%
Oct	5.4%	20.3%	74.3%						
Nov	5.6%	18.9%	75.5%						
Dec	4.6%	19.1%	76.3%						
Annual	5.0%	18.4%	76.5%	4.7%	14.5%	80.8%	(0.3%)	(4.0%)	4.3%





Table 3-1 2009 Calendar Year PJM RPM auction-clearing capacity prices and capacity revenues by LDA and zone: Effective for January through September 2009 (See 2008 SOM, Table 3-3)

		Delivery Year 2008/20)09	[Delivery Year 2009/2	010	RPM Revenue 2009
Zone	LDA	\$/MW-Day	\$/MW in 2009	LDA	\$/MW-Day	\$/MW in 2009	(Jan - Sep) \$/MW
AECO	EMAAC	\$148.80	\$22,469	MAAC+APS	\$191.32	\$23,341	\$45,810
AEP	RTO	\$111.92	\$16,900	rto	\$102.04	\$12,449	\$29,349
AP	RTO	\$111.92	\$16,900	MAAC+APS	\$191.32	\$23,341	\$40,241
BGE	SWMAAC	\$210.11	\$31,727	SWMAAC	\$237.33	\$28,954	\$ 60,681
ComEd	RTO	\$111.92	\$16,900	RTO	\$102.04	\$12,449	\$29,349
DAY	RTO	\$111.92	\$16,900	RTO	\$102.04	\$12,449	\$29,349
DLCO	RTO	\$111.92	\$16,900	RTO	\$102.04	\$12,449	\$29,349
Dominion	RTO	\$111.92	\$16,900	RTO	\$102.04	\$12,449	\$29,349
DPL	EMAAC	\$148.80	\$22,469	MAAC+APS	\$191.32	\$23,341	\$45,810
JCPL	EMAAC	\$148.80	\$22,469	MAAC+APS	\$191.32	\$23,341	\$45,810
Met-Ed	RTO	\$111.92	\$16,900	MAAC+APS	\$191.32	\$23,341	\$40,241
PECO	EMAAC	\$148.80	\$22,469	MAAC+APS	\$191.32	\$23,341	\$45,810
PENELEC	RTO	\$111.92	\$16,900	MAAC+APS	\$191.32	\$23,341	\$40,241
Рерсо	SWMAAC	\$210.11	\$31,727	SWMAAC	\$237.33	\$28,954	\$60,681
PPL	RTO	\$111.92	\$16,900	MAAC+APS	\$191.32	\$23,341	\$40,241
PSEG	EMAAC	\$148.80	\$22,469	MAAC+APS	\$191.32	\$23,341	\$45,810
RECO	EMAAC	\$148.80	\$22,469	MAAC+APS	\$191.32	\$23,341	\$45,810
PJM	N/A	\$124.58	\$18,812	N/A	\$138.46	\$16,892	\$35,703





Table 3-2 Capacity revenue by PJM zones (Dollars per MW-year): January through September 2009 (See 2008 SOM, Table 3-4)

Zone	2008 (Jan - Sep)	2009 (Jan - Sep)	Percent Change
AECO	\$48,199	\$45,810	(5%)
AEP	\$19,856	\$29.349	48%
AP	\$19,856	\$40,241	103%
BGE	\$54,292	\$60,681	12%
ComEd	\$19,856	\$29,349	48%
DAY	\$19,856	\$29,349	48%
DLCO	\$19,856	\$29,349	48%
Dominion	\$19,856	\$29,349	48%
DPL	\$48,199	\$45,810	(5%)
JCPL	\$48,199	\$45,810	(5%)
Met-Ed	\$19,856	\$40,241	103%
PECO	\$48,199	\$45,810	(5%)
PENELEC	\$19,856	\$40,241	103%
Рерсо	\$54,292	\$60,681	12%
PPL	\$19,856	\$40,241	103%
PSEG	\$48,199	\$45,810	(5%)
RECO	\$48,199	\$45,810	(5%)
PJM	\$28,588	\$35,703	25%



Figure 3-1 New entrant CT zonal net revenue with 20-year levelized fixed cost as of 2008 (Dollars per installed MW-year): January through September 2008 and 2009 (See 2008 SOM, Figure 3-3)



Figure 3-2 New entrant CC zonal net revenue with 20-year levelized fixed cost as of 2008 (Dollars per installed MW-year): January through September 2008 and 2009 (See 2008 SOM, Figure 3-5)



Figure 3-3 New entrant CP zonal net revenue with 20-year levelized fixed cost as of 2008 (Dollars per installed MW-year): January through September 2008 and 2009 (See 2008 SOM, Figure 3-7)



Monitoring Analytics

SECTOR

Table 3-23 PJM installed capacity (By fuel source): January 1, May 31, June 1, September 30, 2009 (See 2008 SOM, Table 3-30)

	1-Jan-	1-Jan-09		iy-09	1-Ju	1-Jun-09 30-Sep-0		
	MW	Percent	MW	Percent	MW	Percent	MW	Percent
Coal	67,064.7	40.7%	67,025.3	40.6%	68,159.0	40.7%	68,137.6	40.7%
Gas	48,333.9	29.3%	48,506.9	29.4%	48,979.3	29.2%	48,810.6	29.2%
Hydroelectric	7,476.3	4.5%	7,550.1	4.6%	7,939.9	4.7%	7,939.9	4.7%
Nuclear	30,478.0	18.5%	30,542.5	18.5%	30,701.5	18.3%	30,701.5	18.4%
Oil	10,714.9	6.5%	10,674.3	6.5%	10,704.3	6.4%	10,700.1	6.4%
Solid waste	664.7	0.4%	664.7	0.4%	672.1	0.4%	672.1	0.4%
Wind	166.4	0.1%	182.9	0.1%	297.8	0.2%	306.9	0.2%
Total	164,898.9	100.0%	165,146.7	100.0%	167,453.9	100.0%	167,268.7	100.0%



32

Sector

Table 3-24 PJM generation (By fuel source (GWh)): Januarythrough September 2009 (See 2008 SOM, Table 3-31)

	GWh	Percent
Coal	263,486.1	50.3%
Nuclear	187,626.8	35.8%
Natural Gas	52,694.5	10.1%
Hydroelectric	10,280.2	2.0%
Wind	3,446.5	0.7%
Solid Waste	3,125.5	0.6%
Miscellaneous	1,176.3	0.2%
Heavy Oil	1,127.0	0.2%
Landfill Gas	1,007.9	0.2%
Light Oil	156.5	0.0%
Kerosene	7.0	0.0%
Solar	2.9	0.0%
Biomass Gas	2.1	0.0%
Battery	0.1	0.0%
Jet Oil	0.0	0.0%
Total	524,139.5	100.0%





Sector

Table 3-33 Capacity factor of wind units in PJM, January through September 2009 (New Table)

Type of Resource	Capacity Factor	Total Hours	Installed Capacity
Energy-Only Resource	24.9%	122,624	1,744
Capacity Resource	27.5%	69,361	798
All Units	26.0%	191,985	2,542



SECTION

Table 3-34 Wind resources in Real-Time offering at a negative price in PJM, June through September 2009 (New Table)

	Average MW Offered Daily	Intervals Marginal	Percent of All Intervals
At Negative Price	83.0	85	0.15%
All Wind	828.9	473	0.81%



Figure 3-4 Average hourly real-time generation of wind units in PJM, January through September 2009 (New Figure)



Section Section

Figure 3-6 Marginal fuel displacement by wind generation in PJM, January through September 2009 (New Figure)



Monitoring Analytics

Sector

Table 3-35 Monthly operating reserve charges: January through September 2008 and 2009 (See 2008 SOM, Table 3-45)

		2008 (Jan-Sep)) Charges	2009 (Jan-Sep) Charges					
		Synchronous				Synchronous			
	Day-Ahead	Condensing	Balancing	Total	Day-Ahead	Condensing	Balancing	Total	
Jan	\$4,126,221	\$456,972	\$39,935,491	\$44,518,684	\$9,260,150	\$1,328,814	\$30,001,637	\$40,590,601	
Feb	\$3,731,017	\$200,456	\$23,165,838	\$27,097,312	\$7,434,068	\$839,679	\$16,508,010	\$24,781,756	
Mar	\$2,904,498	\$249,900	\$18,916,241	\$22,070,639	\$9,549,963	\$108,664	\$25,945,310	\$35,603,936	
Apr	\$4,213,578	\$209,366	\$22,559,577	\$26,982,522	\$6,998,364	\$19,929	\$13,246,434	\$20,264,727	
May	\$10,873,205	\$202,397	\$22,970,363	\$34,045,964	\$6,024,108	\$5,543	\$15,476,784	\$21,506,435	
Jun	\$7,064,877	\$575,927	\$65,597,311	\$73,238,115	\$6,722,329	\$0	\$19,224,687	\$25,947,016	
Jul	\$7,038,834	\$874,234	\$48,041,415	\$55,954,483	\$8,210,636	\$38,643	\$17,312,974	\$25,562,253	
Aug	\$6,140,554	\$143,857	\$26,212,547	\$32,496,959	\$7,697,174	\$1	\$20,711,506	\$28,408,680	
Sep	\$4,581,147	\$405,308	\$27,809,898	\$32,796,353	\$6,057,598	\$13,611	\$13,450,468	\$19,521,678	
Total	\$50,673,931	\$3,318,419	\$295,208,680	\$349,201,030	\$67,954,390	\$2,354,884	\$171,877,810	\$242,187,084	
Share of Annual Charges	14.5%	1.0%	84.5%	100.0%	28.1%	1.0%	71.0%	100.0%	







SECTOR

Table 3-36 Regional balancing charges allocation: January through September 2008 and 2009 (New table)

	Reli	Reliability Charges				Deviation Charges			
	Real-Time Load	Real-Time Exports	Reliability Total	Demand Deviations	Supply Deviations	Generator Deviations	Deviations Total	Total	
RTO	\$3,432,227	\$134,849	\$3,567,076	\$49,355,811	\$28,883,393	\$14,803,890	\$93,043,094	\$96,610,170	
RTO	2.6%	0.1%	2.7%	37.9%	22.2%	11.4%	71.5%	74.2%	
East	\$393,809	\$13,683	\$407,492	\$5,824,239	\$3,067,879	\$ 1,559,973	\$10,452,090	\$10,859,583	
East	0.3%	0.0%	0.3%	4.5%	2.4%	1.2%	8.0%	8.3%	
West	\$18,628,965	\$829,980	\$19,458,945	\$1,640,297	\$1,080,901	\$560,559	\$3,281,757	\$22,740,702	
West	14.3%	0.6%	14.9%	1.3%	0.8%	0.4%	2.5%	17.5%	
Total	\$22,455,001	\$978,512	\$23,433,513	\$56,820,347	\$33,032,173	\$16,924,422	\$106,776,941	\$130,210,454	
Total	17.2%	0.8%	18.0%	43.6%	25.4%	13.0%	<mark>82.0%</mark>	100.0%	



39

Table 3-39 Average regional balancing operating reserve rates:January through September 2009 (See 2008 SOM, Table 3-48)

	Reliability	Deviations
RTO	0.0062	0.6479
East	0.0014	0.1219
West	0.0872	0.0568



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Figure 3-9 Operating reserve credits: January through September 2009 (See 2008 SOM, Figure 3-11)



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Table 3-47 Top 10 units and organizations receiving total operating reserve credits: January through September 2009 (See 2008 SOM, Table 3-57)

Units				Organizations			
			Total Credit			Total Credit	
	Total	Total	Cumulative	Total	Total	Cumulative	
Rank	Credit	Credit Share	Distribution	Credit	Credit Share	Distribution	
1	\$24,528,324	10.2%	10.2%	\$70,296,769	29.2%	29.2%	
2	\$17,238,165	7.2%	17.4%	\$48,586,092	20.2%	49.4%	
3	\$10,021,474	4.2%	21.5%	\$24,600,093	10.2%	59.7%	
4	\$8,495,009	3.5%	25.1%	\$15,209,491	6.3%	66.0%	
5	\$6,847,966	2.8%	27.9%	\$13,079,299	5.4%	71.4%	
6	\$5,983,837	2.5%	30.4%	\$10,049,183	4.2%	75.6%	
7	\$3,423,767	1.4%	31.8%	\$8,715,685	3.6%	79.3%	
8	\$3,362,806	1.4%	33.2%	\$5,556,467	2.3%	81.6%	
9	\$3,360,659	1.4%	34.6%	\$4,086,988	1.7%	83.3%	
10	\$2,855,522	1.2%	35.8%	\$3,729,968	1.6%	84.8%	





Table 3-54 Regional balancing operating reserve credits:January through September 2009 (New table)

	Reliability Credits	Deviation Credits	Total Credits
RTO	\$3,567,076	\$93,0 <mark>43,</mark> 094	\$96,610,170
East	\$407,492	\$10,452,090	\$10,859,583
West	\$19,458,945	\$3,281,757	\$22,740,702
Total	\$23,433,5 <mark>1</mark> 3	\$106,776,941	\$130,210,454





Table 3-55 Total deviations: January through September 2009 (New table)

	Demand	Supply	Generator	Deviations
	Deviations	Deviations	Deviations	Total
Total (MWh)	72,956,743	42,432,853	21,193,699	136,583,296



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Figure 4-3 PJM scheduled import and export transaction volume history: 1999 through September 2009 (See 2008 SOM, Figure 4-3)



Volume (GWh)

Figure 4-13 PJM, NYISO and Midwest ISO real-time border price averages: January through September 2009 (See 2008 SOM, Figure 4-9)





Figure 4-15 Credits for coordinated congestion management: January through September 2009 (See 2008 SOM, Figure 4-10)





Figure 4-22 Spot import service utilization: January through September 2009 (See 2008 SOM, Figure 4-12)





Table 5-7 Capacity prices: 2007/2008 through 2012/2013 RPM Auctions (See 2008 SOM, Table 5-10)

	RPM Clearing Price (\$ per MW-day)							
	RTO	MAAC+APS	MAAC	EMAAC	SWMAAC	DPL-South	PSEG North	
2007/2008 BRA	\$40.80			\$197.67	\$188.54			
2008/2009 BRA	\$111.92			\$148.80	\$210.11			
2008/2009 Third IA	\$10.00				\$223.85			
2009/2010 BRA	\$102.04	\$191.32			\$237.33			
2009/2010 Third IA	\$40.00	\$86.00						
2010/2011 BRA	\$174.29					\$178.27		
2011/2012 BRA	\$110.00							
2011/2012 First IA	\$55.00							
2012/2013 BRA	\$16.46		\$133.37	\$139.73		\$222.30	\$185.00	





Figure 5-1 History of capacity prices: Calendar year 1999 through 2012 (See 2008 SOM, Figure 5-1)





Figure 5-3 Trends in the PJM equivalent demand forced outage rate (EFORd): Calendar years 2005 to 2009 (January through August) (See 2008 SOM Figure 5-8)





Table 5-9 Contribution to EFORd by unit type (Percentage points): Calendar years 2005 to 2009 (January through August) (See 2008 SOM Table 5-17)

						2009
	2004	2005	2006	2007	2008	(Jan - Aug)
Combined Cycle	0.5	0.6	0.5	0.4	0.4	0.5
Combustion Turbine	1.3	1.3	1.4	1.6	1.5	1.4
Diesel	0.0	0.0	0.0	0.0	0.0	0.0
Hydroelectric	0.2	0.1	0.1	0.1	0.1	0.1
Nuclear	0.6	0.3	0.3	0.2	0.4	0.8
Steam	4.7	4.1	4.1	4.4	4.9	4.6
Total	7.3	6.4	6.4	6.8	7.4	7.4





Table 5-12 Contributions to Economic Outages: January through August 2009 (See 2008 SOM Table 5-21)

	Contribution to
	Economic Reasons
Lack of Fuel (OMC)	90.7%
Lack of Fuel (Non-OMC)	5.4%
Other Economic Problems	2.3%
Lack of Water (Hydro)	1.4%
Fuel Conservation	0.1%
Problems with Primary Fuel for Units with Secondary Fuel Operation	0.0%
Total	100.0%





Table 5-15 PJM EFORd vs. XEFORd by unit type: January through August 2009 (See 2008 SOM Table 5-24)

	EFORd	XEFORd	Difference
Combined Cycle	3.7%	3.5%	0.2%
Combustion Turbine	8.8%	7.6%	1.2%
Diesel	9.7%	8.2%	1.5%
Hydroelectric	2.8%	2.6%	0.1%
Nuclear	4.2%	4.1%	0.0%
Steam	9.6%	8.3%	1.3%
Total	7.4%	6.6%	0.8%



Table 5-19 PJM EFORd and EFORp data by unit type: Calendar year 2009 (January through August) (New table)

	EFORd	EFORp	Difference
Combined Cycle	3.7%	2.1%	1.6%
Combustion Turbine	8.8%	2.4%	6.4%
Diesel	9.7%	4.9%	4.8%
Hydroelectric	2.8%	2.9%	(0.2%)
Nuclear	4.2%	4.1%	0.1%
Steam	9.6%	4.6%	5.0%
Total	7.4%	3.8%	3.6%



Table 6-2 PJM regulation capability, daily offer and hourly eligible: January through September 2009 (See 2008 SOM Table 6-2)

Period	Regulation Capability (MW)	Average Daily Offer (MW)	Percentage of Capability Offered	Average Hourly Eligible (MW)	Percent of Capability Eligible
All Hours	7,629	6,313	83%	2,563	34%
Off Peak	7,629			2,236	29%
On Peak	7,629			2,925	38%



Figure 6-2 PJM Regulation Market daily average marketclearing price, lost opportunity cost and offer price (Dollars per MWh): January through September 2009 (See 2008 SOM Figure 6-2)



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Figure 6-3 Monthly average regulation demand (required) vs. price: January through September 2009 (See 2008 SOM Figure





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Figure 6-4 Monthly load weighted, average regulation cost and price: January through September 2009 (See 2008 SOM Figure 6-4)





59

Figure 6-5 RFC Synchronized Reserve Zone monthly average synchronized reserve required vs. Tier 2 scheduled MW: January through September 2009 (See 2008 SOM Figure 6-5)



Figure 6-6 RFC Synchronized Reserve Zone, Mid-Atlantic Subzone average hourly synchronized reserve required vs. Tier 2 scheduled: January through September 2009 (See 2008 SOM Figure 6-6)



Figure 6-10 Required Tier 2 synchronized reserve, synchronized reserve market clearing price, and DSR percent of Tier 2: January through September 2009 (See 2008 SOM **Figure 6-10)**



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Figure 6-13 Impact of Tier 2 synchronized reserve added MW to the RFC Synchronized Reserve Zone, Mid-Atlantic subzone: January through September 2009 (See 2008 SOM Figure 6-13)





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Figure 6-14 Comparison of RFC Tier 2 synchronized reserve price and cost (Dollars per MW): January through September 2009 (See 2008 SOM Figure 6-14)



Figure 6-15 PJM RFC Zone Tier 2 synchronized reserve scheduled MW: January through September 2009 (See 2008 SOM Figure 6-15)







Table 7-1 Total annual PJM congestion (Dollars (Millions)): Calendar years 2003 to September 2009 (See 2008 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	\$544	NA	\$19,932	3%
Total	\$9,415		\$143,969	7%





Table 7-2 Total annual PJM congestion costs by category (Dollars (Millions)): January through September 2008 and 2009 (New Table)

	Congestion Costs (Millions)						
	Load	Generation					
Year	Payments	Credits	Explicit	Total			
2008 (Jan-Sep)	\$921.9	(\$880.7)	(\$24.5)	\$1,778.2			
2009 (Jan-Sep)	\$210.6	(\$380.9)	(\$48.0)	\$543.6			





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Table 8-11 ARR and FTR congestion hedging: Planning periods2008 to 2009 and 2009 to 2010 (See 2008 SOM Table 8-28)

						Total Hedge -	
Planning			FTR Auction	Total ARR and		Congestion	Percent
Period	ARR Credits	FTR Credits	Revenue	FTR Hedge	Congestion	Difference	Hedged
2008/2009	\$2,361,292,807	\$1,748,201,585	\$2,489,609,470	\$1,619,884,922	\$1,489,647,665	\$130,237,257	>100%
2009/2010*	\$426,023,336	\$199,335,975	\$454,904,797	\$170,454,514	\$185,175,292	(\$14,720,777)	92.1%
* Chown four	months and ad 20	Son 00					

* Shows four months ended 30-Sep-09



