

2009 Year in Review

Monitoring Analytics, LLC
Independent Market Monitor for PJM

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Joseph Bowring
Market Monitor



Monitoring Analytics

Table 1-1 Total price per MWh: Calendar year 2009

Category	\$/MWh	Percent
Load Weighted Energy	\$39.05	70.2%
Capacity	\$10.75	19.3%
Transmission Service Charges	\$4.00	7.2%
Operating Reserve (Uplift)	\$0.49	0.9%
Reactive	\$0.36	0.7%
Regulation	\$0.34	0.6%
PJM Administrative Fees	\$0.31	0.5%
Transmission Enhancement Cost Recovery	\$0.09	0.2%
Transmission Owner (Schedule 1A)	\$0.08	0.2%
Synchronized Reserves	\$0.05	0.1%
Black Start	\$0.02	0.0%
RTO Startup and Expansion	\$0.01	0.0%
NERC/RFC	\$0.01	0.0%
Load Response	\$0.00	0.0%
Transmission Facility Charges	\$0.00	0.0%
Total	\$55.58	100.0%

Table 3-37 PJM generation (By fuel source (GWh)): Calendar year 2009

	GWh	Percent
Coal	349,818.2	50.5%
Nuclear	249,392.3	36.0%
Gas	67,218.9	9.7%
Natural Gas	65,848.2	9.5%
Landfill Gas	1,368.5	0.2%
Biomass Gas	2.2	0.0%
Hydroelectric	14,123.0	2.0%
Waste	5,664.7	0.8%
Solid Waste	4,147.0	0.6%
Miscellaneous	1,517.7	0.2%
Wind	5,489.7	0.8%
Oil	1,568.1	0.2%
Heavy Oil	1,383.7	0.2%
Light Oil	162.9	0.0%
Diesel	14.4	0.0%
Kerosene	7.1	0.0%
Jet Oil	0.0	0.0%
Solar	3.5	0.0%
Battery	0.3	0.0%
Total	693,278.7	100.0%

**Table 2-33 Type of fuel used (By real-time marginal units):
Calendar year 2009**

Fuel Type	2009
Coal	74%
Natural Gas	22%
Petroleum	3%
Landfill Gas	1%
Interface	0%
Misc	0%

Figure 2-2 Actual PJM footprint summer peak loads: 1999 to 2009

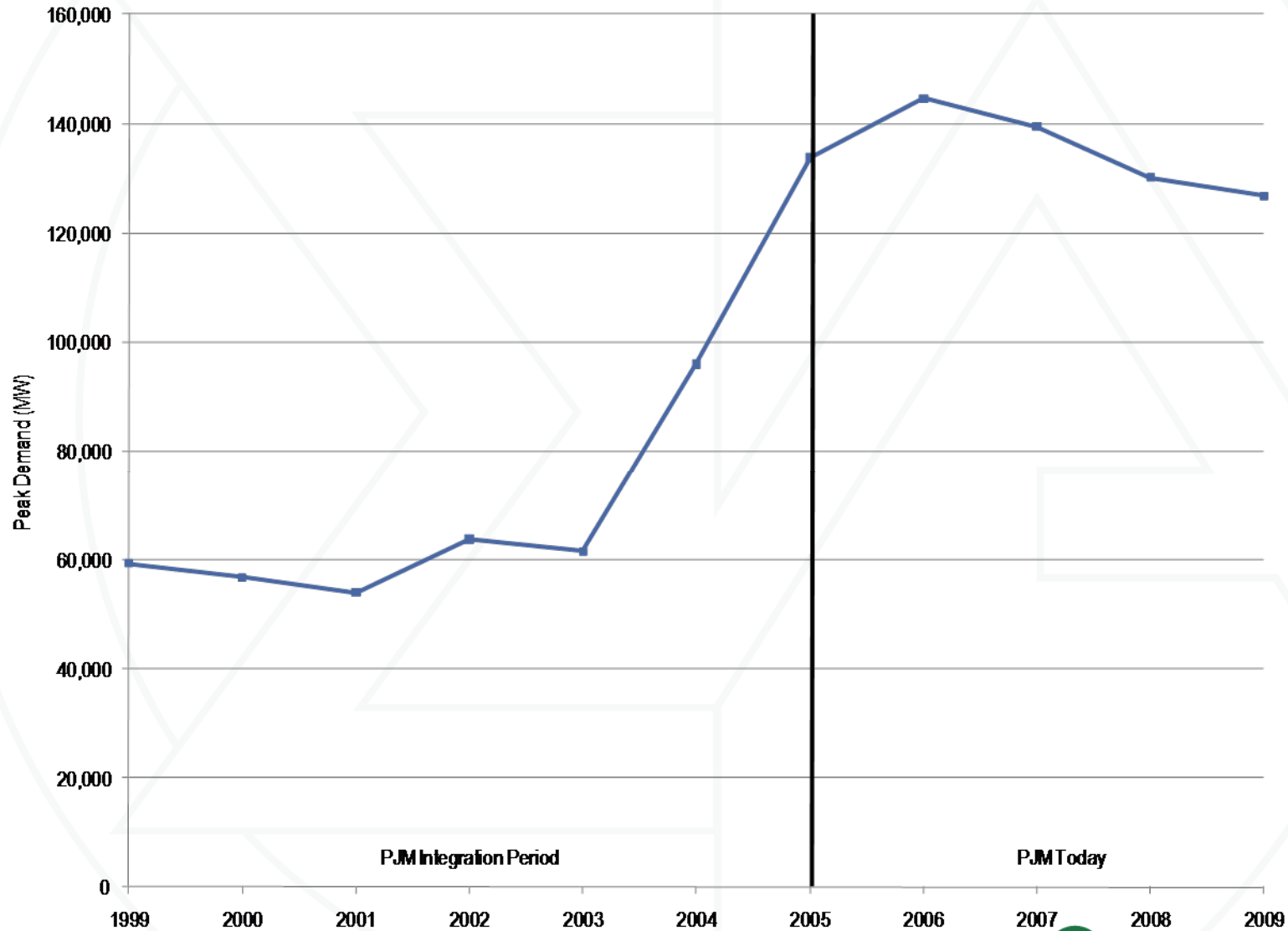


Table 2-49 PJM real-time average load: Calendar years 1998 to 2009

	PJM Real-Time Load (MWh)			Year-to-Year Change		
	Average	Median	Standard Deviation	Average	Median	Standard Deviation
1998	28,578	28,653	5,511	NA	NA	NA
1999	29,641	29,341	5,956	3.7%	2.4%	8.1%
2000	30,113	30,170	5,529	1.6%	2.8%	(7.2%)
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	76,035	75,471	13,260	(4.4%)	(3.8%)	(3.6%)

Table 2-59 PJM real-time, annual, load-weighted, average LMP (Dollars per MWh): Calendar years 1998 to 2009

	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%)

Figure 2-15 Spot average fuel price comparison: Calendar years 2008 to 2009

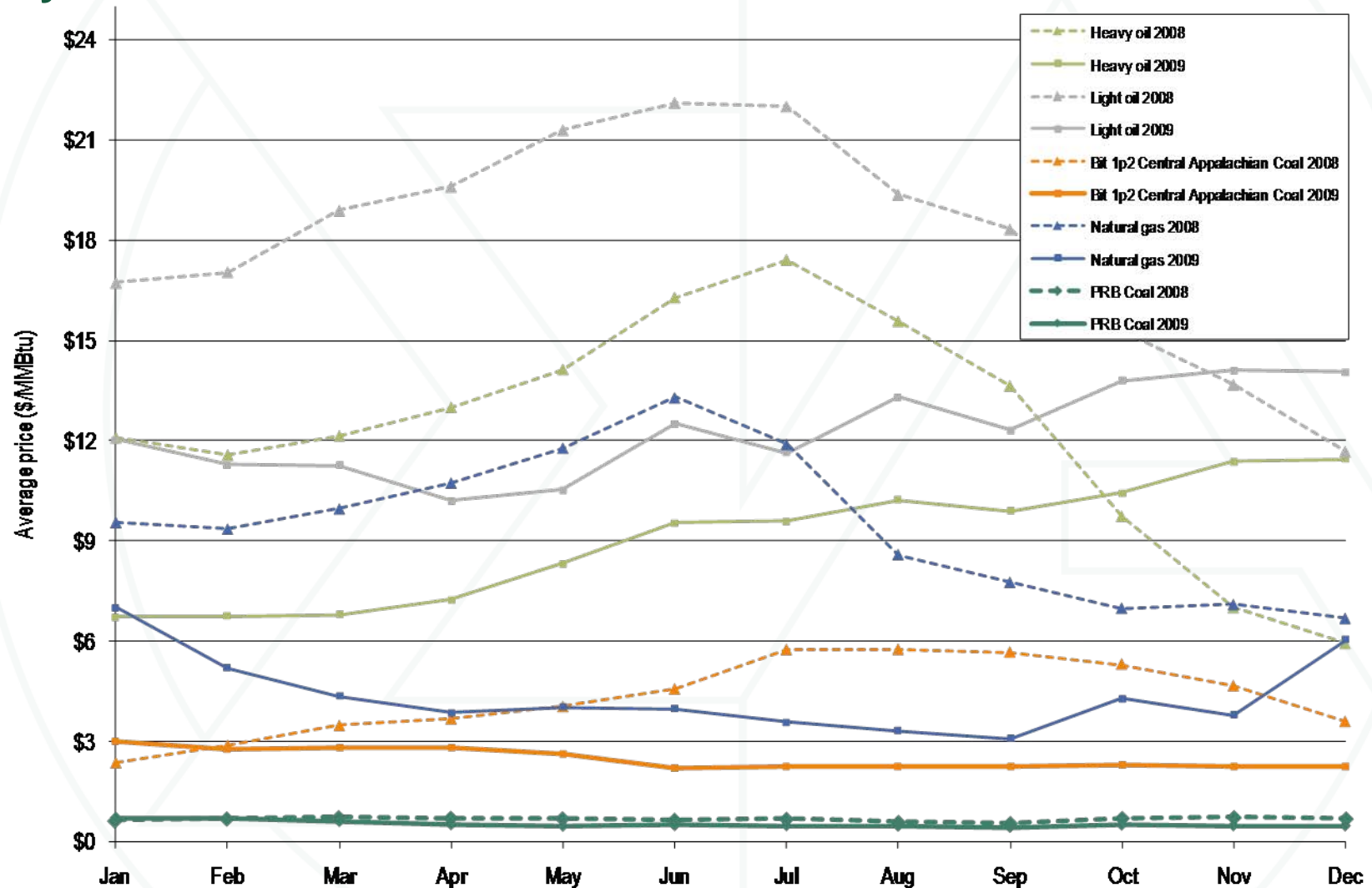


Table 2-63 PJM annual, fuel-cost-adjusted, load-weighted LMP (Dollars per MWh): Year-over-year method

	2008 Load-Weighted LMP	2009 Fuel-Cost-Adjusted, Load-Weighted LMP	Change
Average	\$71.13	\$63.66	(10.5%)

**Table 7-1 Total annual PJM congestion (Dollars (Millions)):
Calendar years 2003 to 2009**

	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%
Total	\$9,591		\$150,587	6%

Table 2-64 Components of PJM real-time, annual, load-weighted, average LMP: Calendar year 2009

Element	Contribution to LMP	Percent
Coal	\$20.53	52.6%
Natural Gas	\$12.10	31.0%
10% Cost Adder	\$3.73	9.6%
VOM	\$2.50	6.4%
Oil	\$0.88	2.3%
NO _x	\$0.80	2.1%
SO ₂	\$0.76	1.9%
CO ₂	\$0.61	1.6%
FMU Adder	\$0.17	0.4%
Offline CT Adder	\$0.03	0.1%
Municipal Waste	\$0.02	0.0%
NA	\$0.01	0.0%
Unit LMP Differential	\$0.00	0.0%
Shadow Price Limit Adder	(\$0.01)	(0.0%)
M2M Adder	(\$0.14)	(0.3%)
Dispatch Differential	(\$0.15)	(0.4%)
UDS Override Differential	(\$0.43)	(1.1%)
Markup	(\$2.38)	(6.1%)
LMP	\$39.05	100.0%

Table 2-82 Monthly volume of cleared and submitted INCs, DEC: Calendar year 2009

	Increment Offers				Decrement Bids			
	Average Cleared MW	Average Submitted MW	Average Cleared Volume	Average Submitted Volume	Average Cleared MW	Average Submitted MW	Average Cleared Volume	Average Submitted Volume
Jan	13,986	21,401	423	621	16,879	26,080	487	670
Feb	13,487	22,228	484	739	15,557	24,967	420	624
Mar	13,364	22,639	552	820	15,186	23,243	459	651
Apr	11,363	19,935	380	645	13,900	21,173	428	607
May	12,853	16,863	388	750	13,973	19,274	529	805
Jun	12,375	15,369	315	750	14,777	18,402	482	802
Jul	12,187	17,654	314	821	14,554	19,322	483	808
Aug	12,347	22,931	433	1,020	16,626	23,788	641	1,069
Sep	13,936	22,449	459	993	16,736	23,285	480	957
Oct	13,178	26,649	467	1,246	15,705	26,058	364	1,041
Nov	12,914	22,725	366	903	14,976	22,266	289	726
Dec	11,679	23,958	275	850	14,998	26,715	270	862
Annual	12,873	21,233	405	847	15,322	22,881	444	804

Table 2-84 PJM virtual bids by type of bid parent organization (MW): Calendar year 2009

	Category	Total Virtual Bids MW	Percentage
2009	Financial	106,470,151	31.8%
2009	Physical	228,583,038	68.2%
2009	Total	335,053,190	100%

Figure 3-4 New entrant CT real-time net revenue and 20-year levelized fixed cost as of 2009 by LDA (Dollars per installed MW-year): Calendar years 1999 to 2009

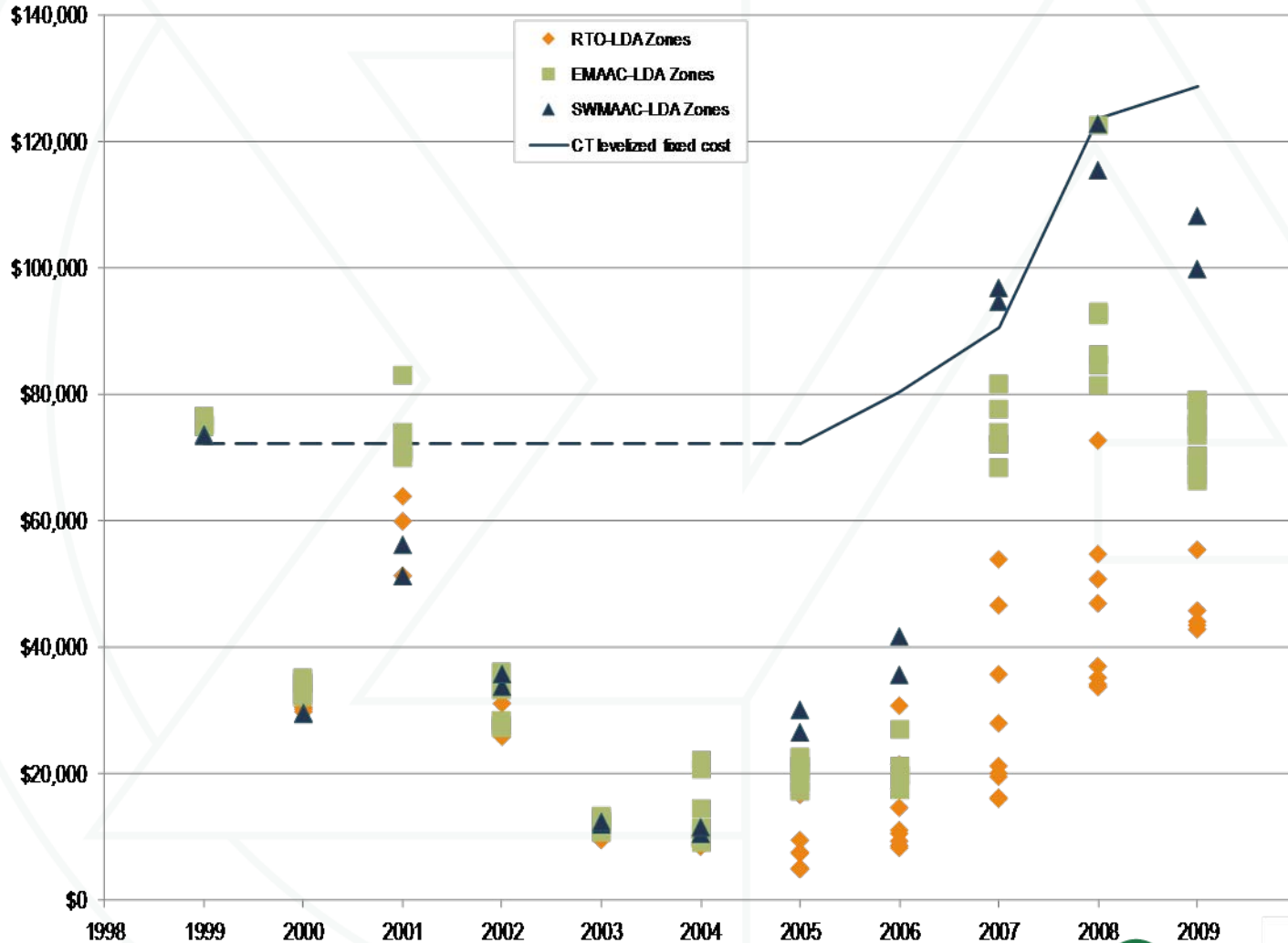


Figure 3-6 New entrant CC real-time net revenue and 20-year levelized fixed cost as of 2009 by LDA (Dollars per installed MW-year): Calendar years 1999 to 2009

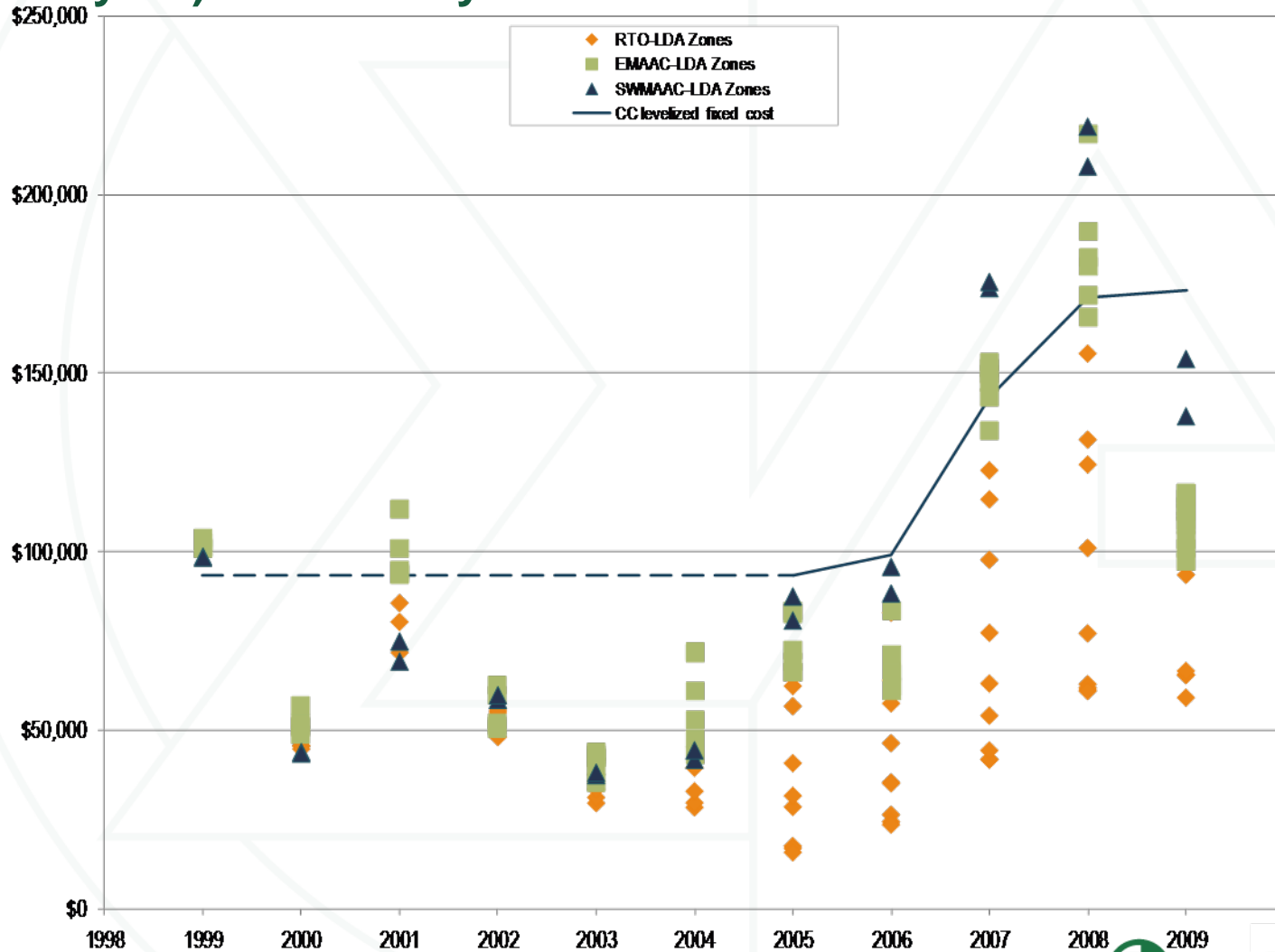


Figure 3-8 New entrant CP real-time net revenue and 20-year levelized fixed cost as of 2009 by LDA (Dollars per installed MW-year): Calendar years 1999 to 2009

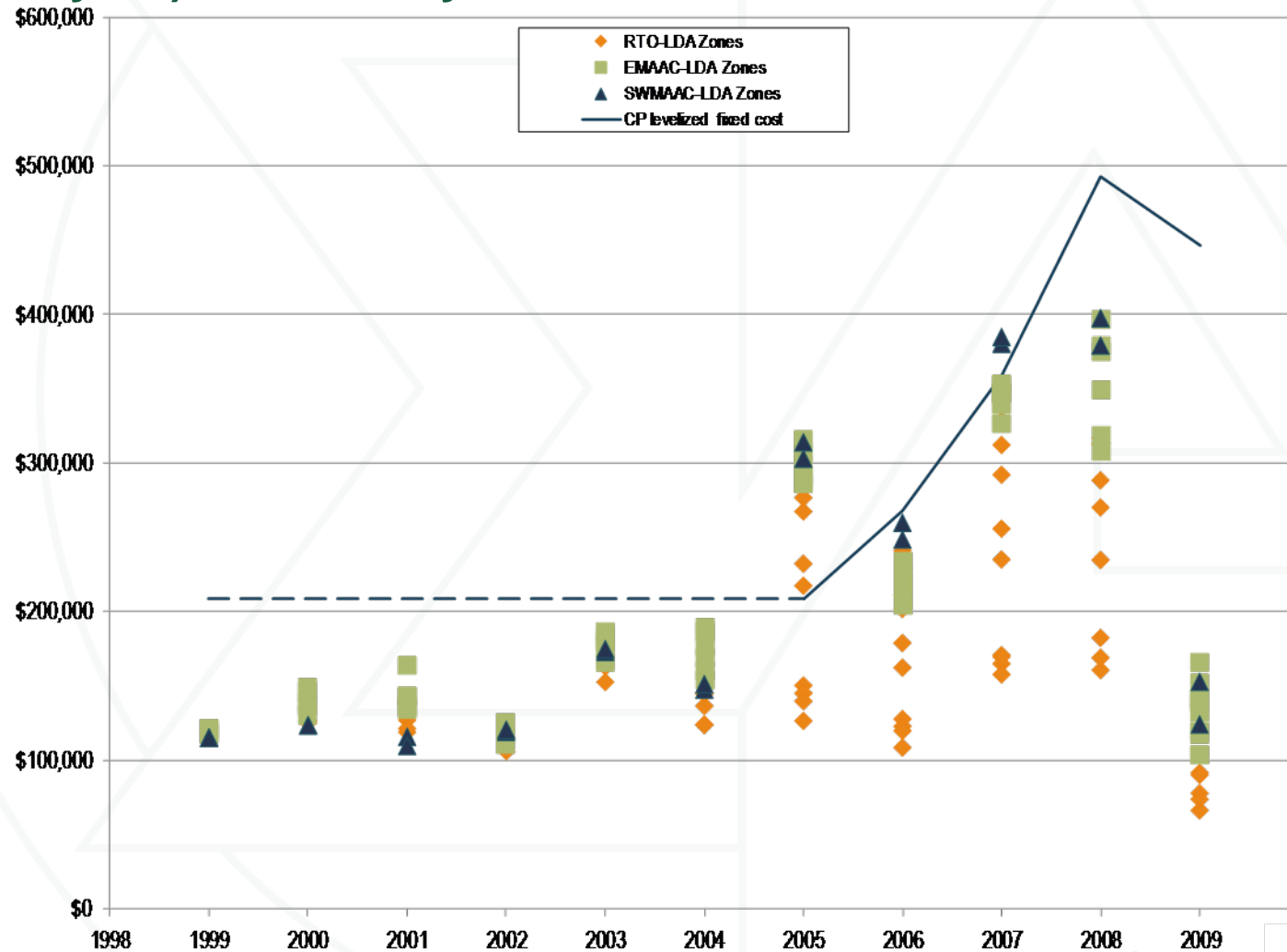


Table 3-33 Proportion of units recovering avoidable costs from energy and ancillary markets as well as total markets for calendar years 2007 through 2009

Technology	2007		2008		2009	
	full recovery from Energy Markets	Units with full recovery from all markets	full recovery from Energy Markets	Units with full recovery from all markets	full recovery from Energy Markets	Units with full recovery from all markets
CC - Two on One Frame F Technology	74%	90%	74%	100%	63%	93%
CT - Third Generation Aero (GE LM 6000)	45%	79%	41%	100%	28%	100%
CT - Third Generation Frame F	47%	100%	48%	100%	20%	100%
Nuclear	100%	100%	100%	100%	93%	100%
Sub-Critical Coal	93%	95%	85%	95%	25%	75%
Super Critical Coal	98%	100%	100%	100%	23%	86%

Table 5-5 PJM capacity summary (MW): June 1, 2008, through May 31, 2012

	01-Jun-07	01-Jun-08	01-Jun-09	01-Jun-10	01-Jun-11	01-Jun-12
Installed capacity (ICAP)	163,721.1	164,444.1	166,916.0	168,061.5	172,666.6	181,159.7
Unforced capacity	154,076.7	155,590.2	157,628.7	158,634.2	163,144.3	171,147.8
Cleared capacity	129,409.2	129,597.6	132,231.8	132,190.4	132,221.5	136,143.5
RPM reliability requirement (pre-FRR)	148,277.3	150,934.6	153,480.1	156,636.8	154,251.1	157,488.5
RPM reliability requirement (less FRR)	125,805.0	128,194.6	130,447.8	132,698.8	130,658.7	133,732.4
RPM net excess	5,240.5	5,011.1	8,265.5	1,149.2	3,156.6	5,754.4
Imports	2,809.2	2,460.3	2,505.4	2,750.7	6,420.0	3,831.6
Exports	(3,938.5)	(3,838.1)	(2,194.9)	(3,147.4)	(3,158.4)	(2,637.1)
Net exchange	(1,129.3)	(1,377.8)	310.5	(396.7)	3,261.6	1,194.5
DR cleared	127.6	536.2	892.9	939.0	1,364.9	7,047.2
EE cleared						568.9
ILR	1,636.3	3,608.1	6,481.5	2,110.5	1,593.8	
FRR DR	445.6	452.8	423.6	452.9	452.9	488.1
Short-Term Resource Procurement Target						3,343.3

Table 5-10 Capacity prices: 2007/2008 through 2012/2013 RPM Auctions

	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

