



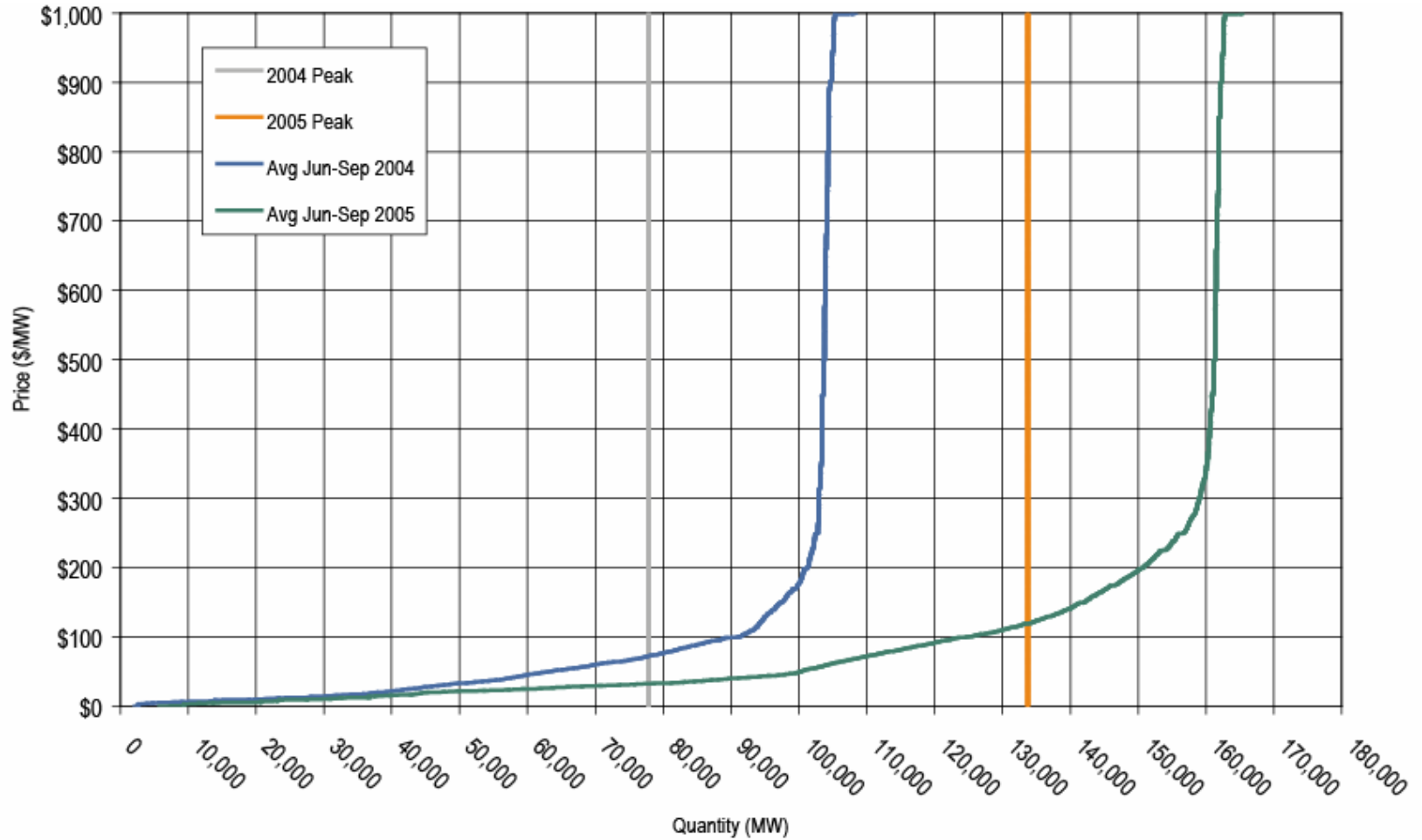
Factors Contributing to Wholesale Electricity Prices

November 30, 2006

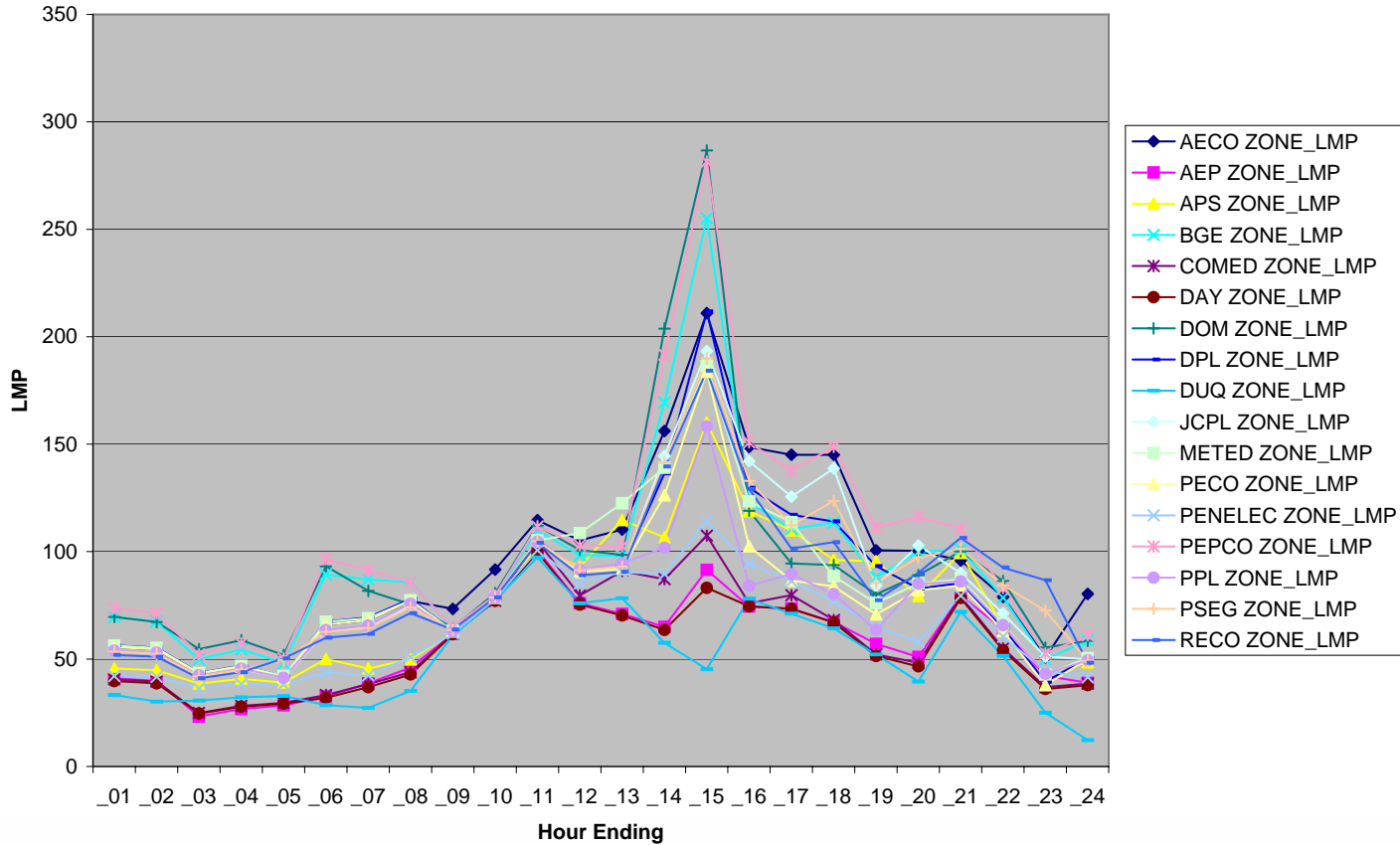
Howard J. Haas
Market Monitoring Unit

- Prices a function of the interaction of supply and demand via least cost security constrained dispatch
 - Prices set by marginal resources
 - Can have multiple marginal units
 - Multiple concurrent market clearing prices
- Unique:
 - It is not generally storable
 - Short-term demand is inelastic
 - Instantaneous market where Supply *must* equal Demand

Figure 2-1 - Average PJM aggregate supply curves:
Summers 2004 and 2005



7-27-06 RT Zonal LMP



10-26-06 RT Zonal LMP

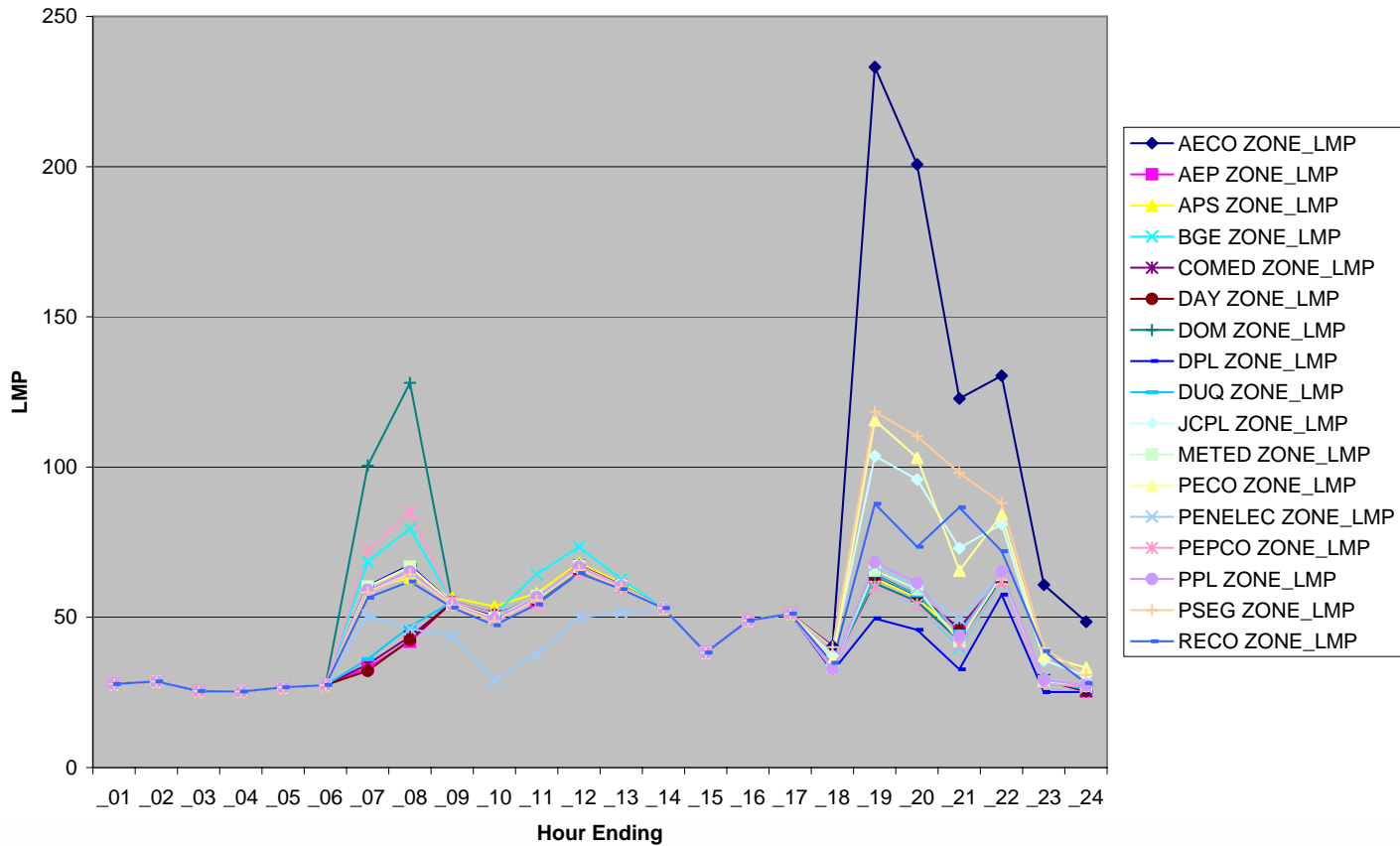




Figure 7-1 - Annual average zonal LMP differences (Reference to Western Hub): Calendar years 2002 to 2005

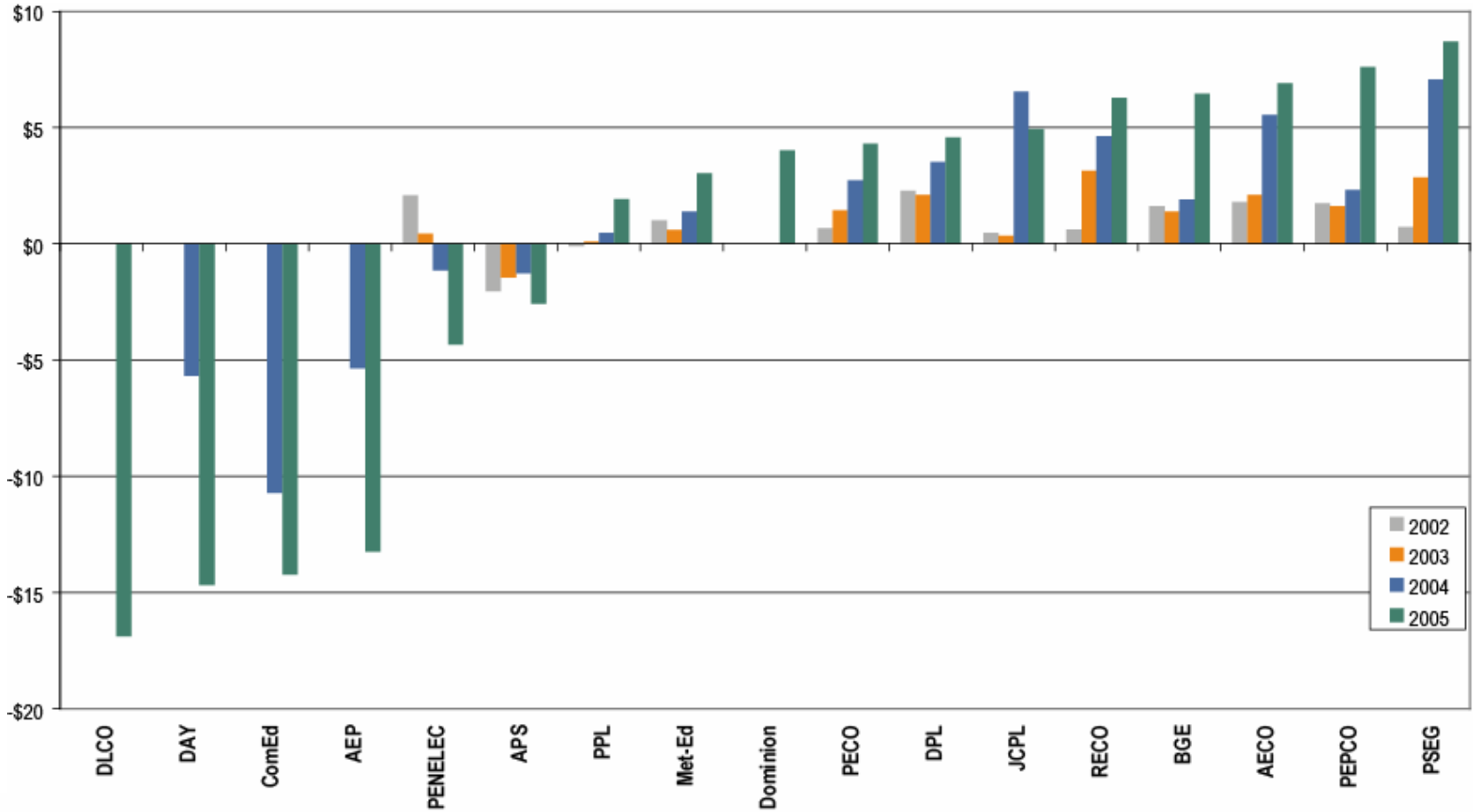
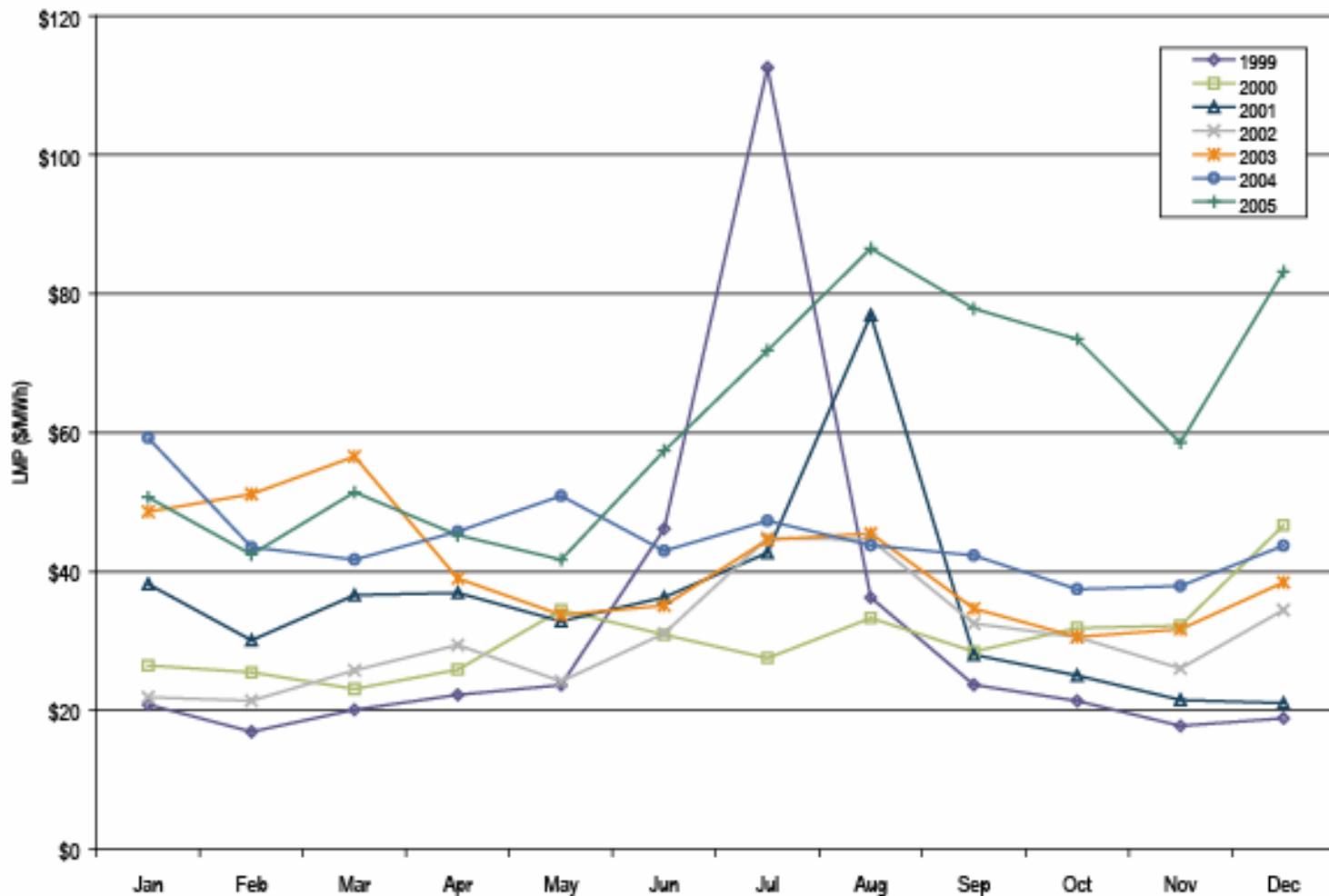


Figure 2-13 - Monthly load-weighted, average LMP:
Calendar years 1999 through 2005

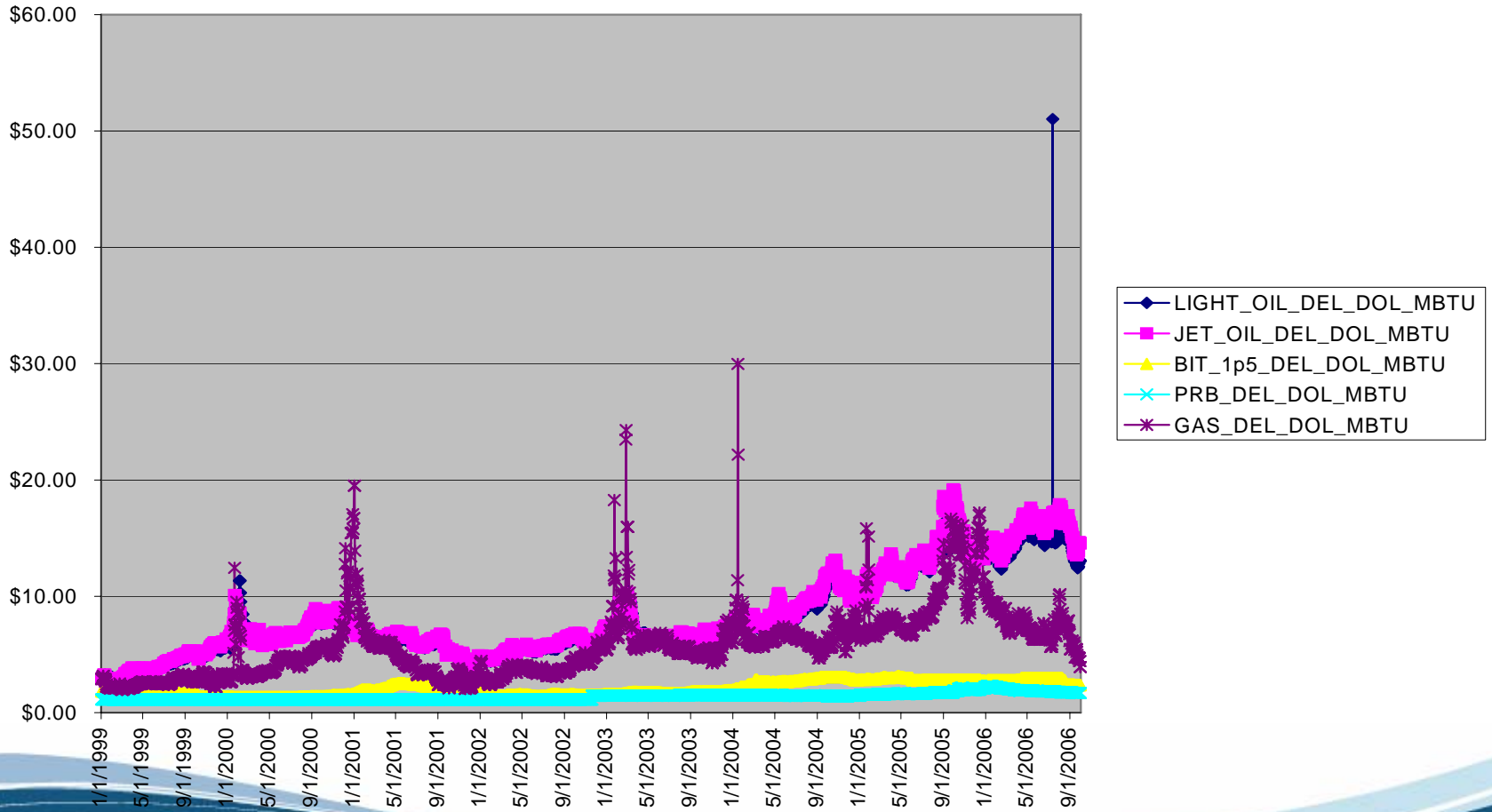


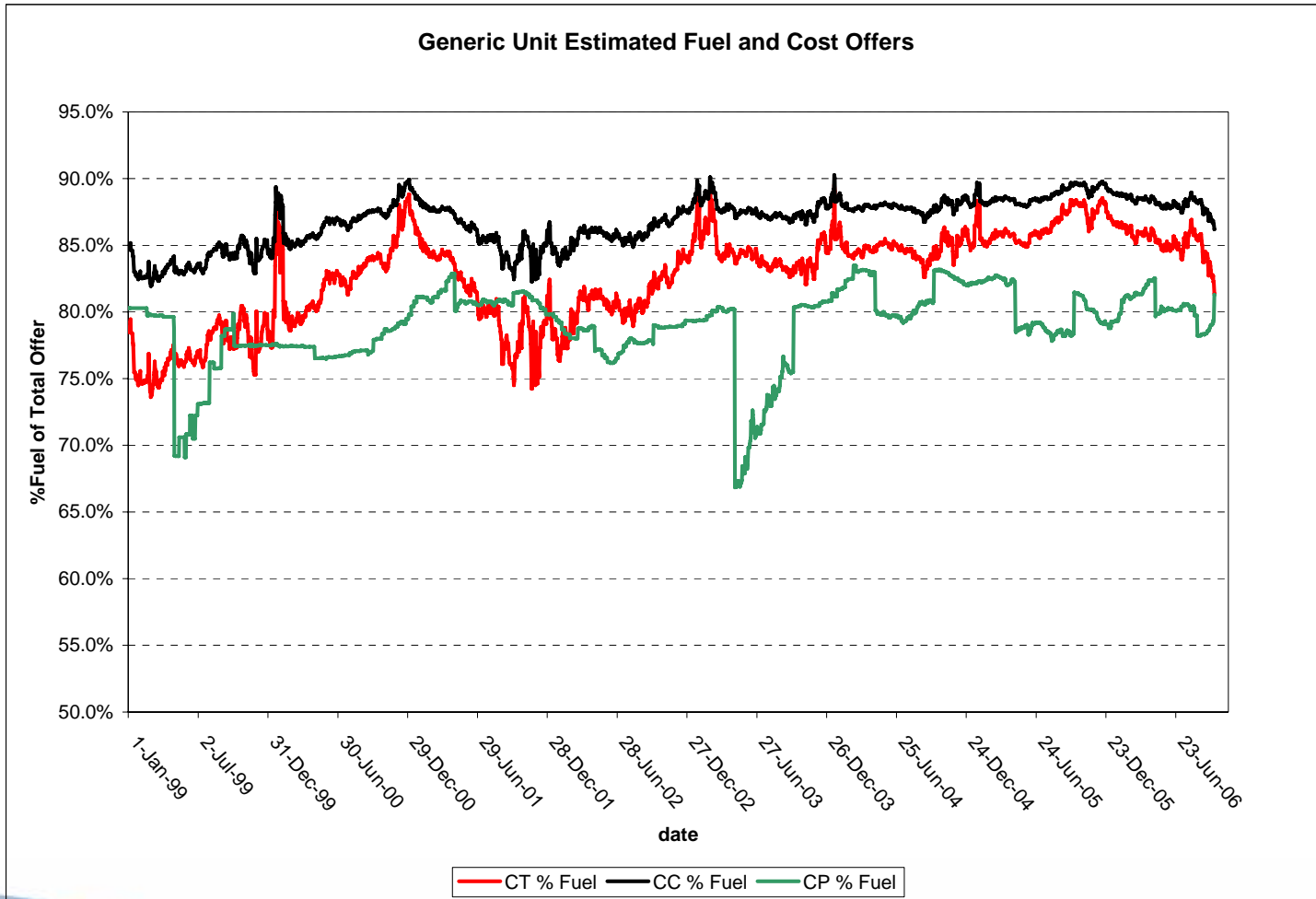
- Inputs to the marginal cost of generation
 - Fuel cost
 - 80 to 90%
 - Emission allowance costs
 - Seasonal effects
 - VOM
 - Opportunity costs

Variables that affect the system “solution”

- Load
- Constraints
- Outages

Delivered Fuel Prices per MBtu





Estimated Cost Based Offers

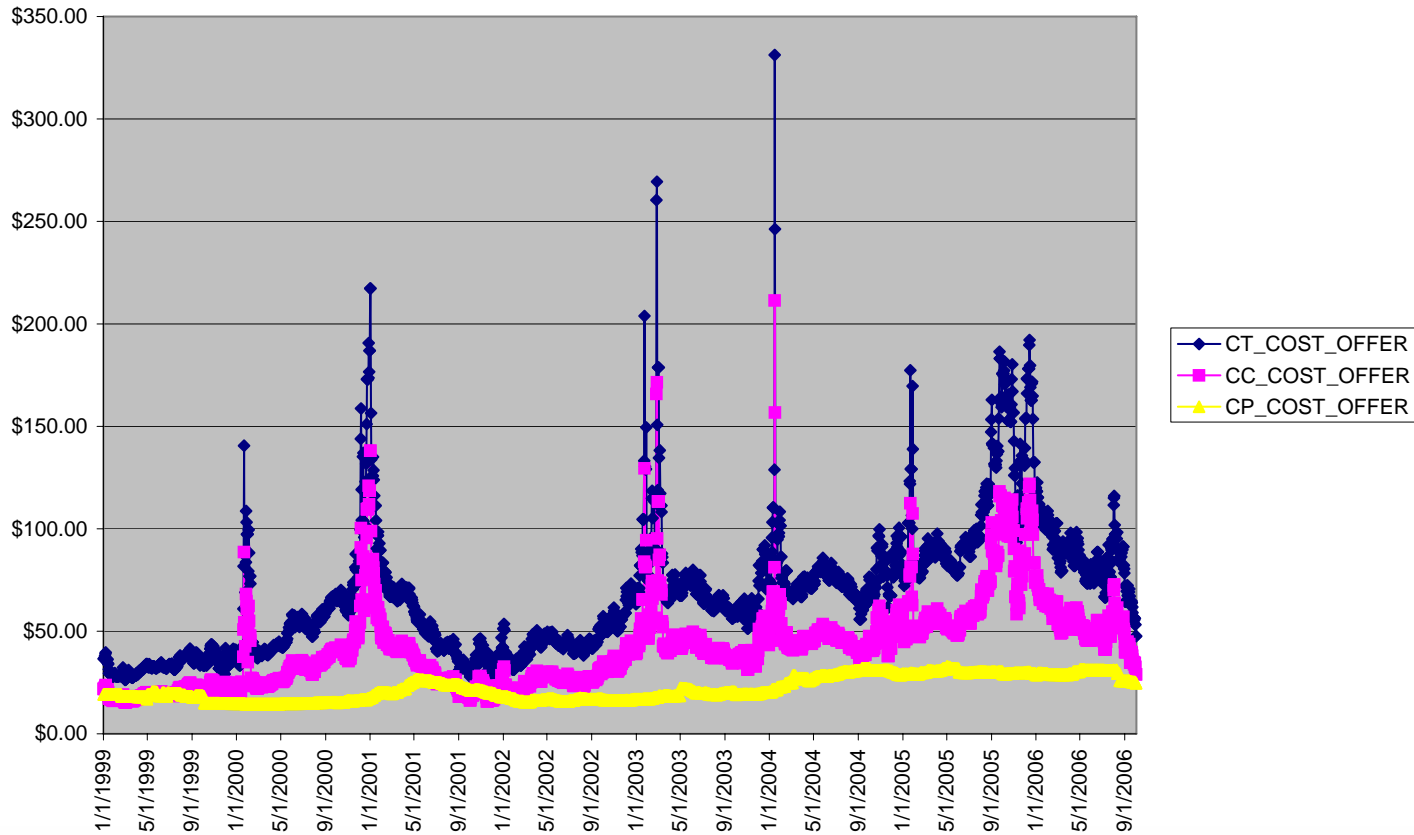
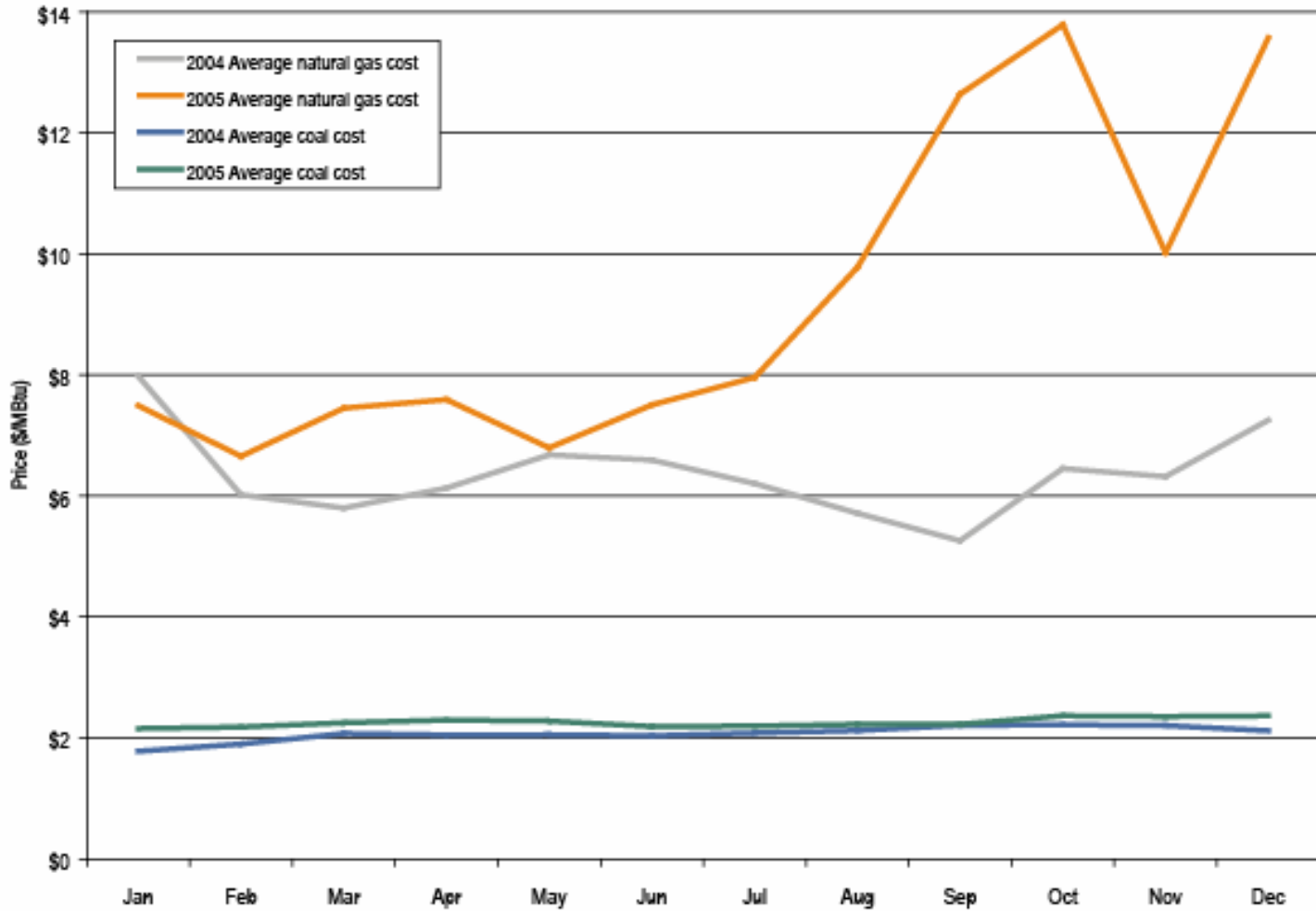
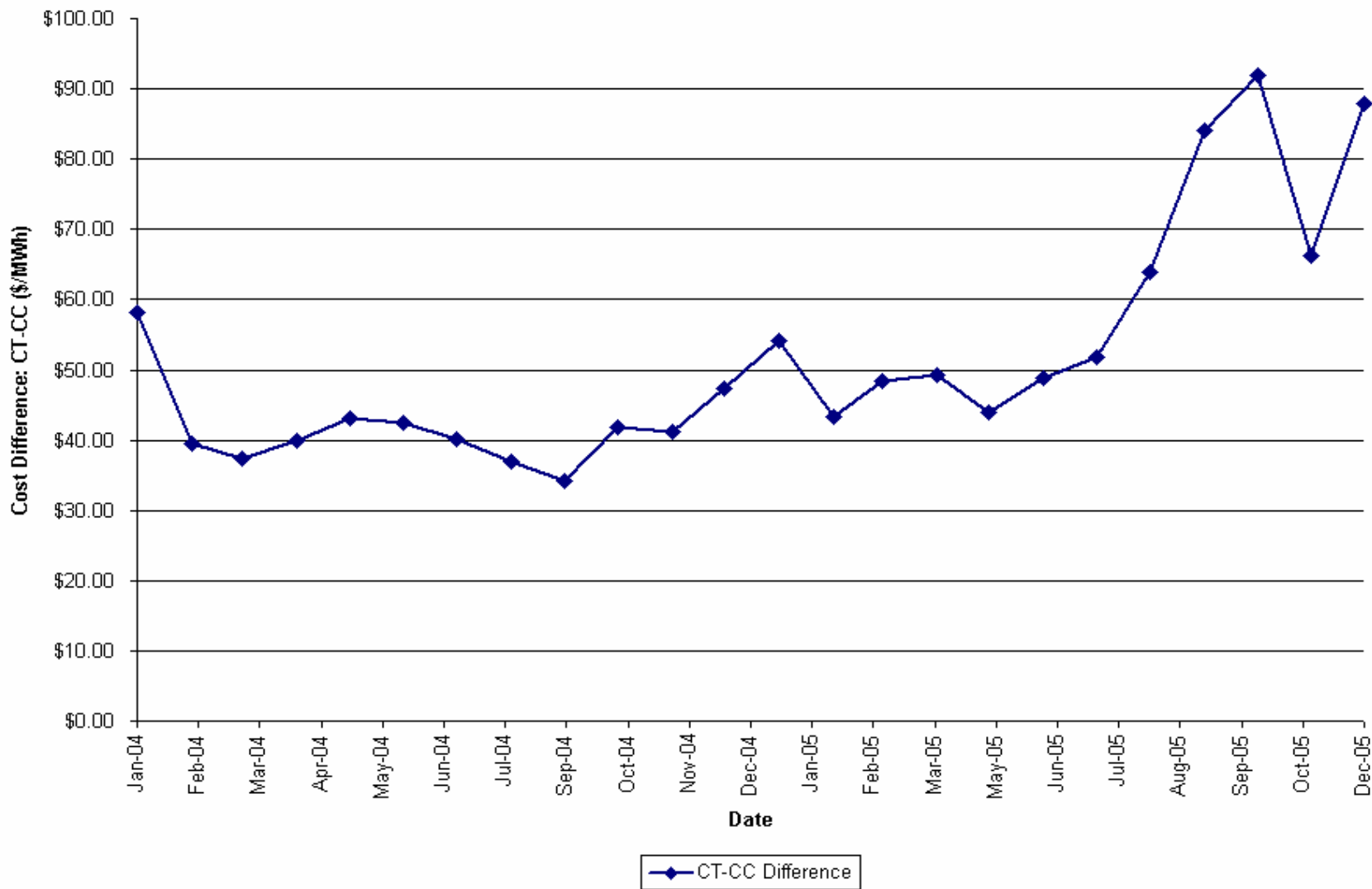


Figure 2-14 - Spot coal and natural gas price comparison:
Calendar years 2004 through 2005



Difference in cost: Gas-fired CT and gas-fired CC



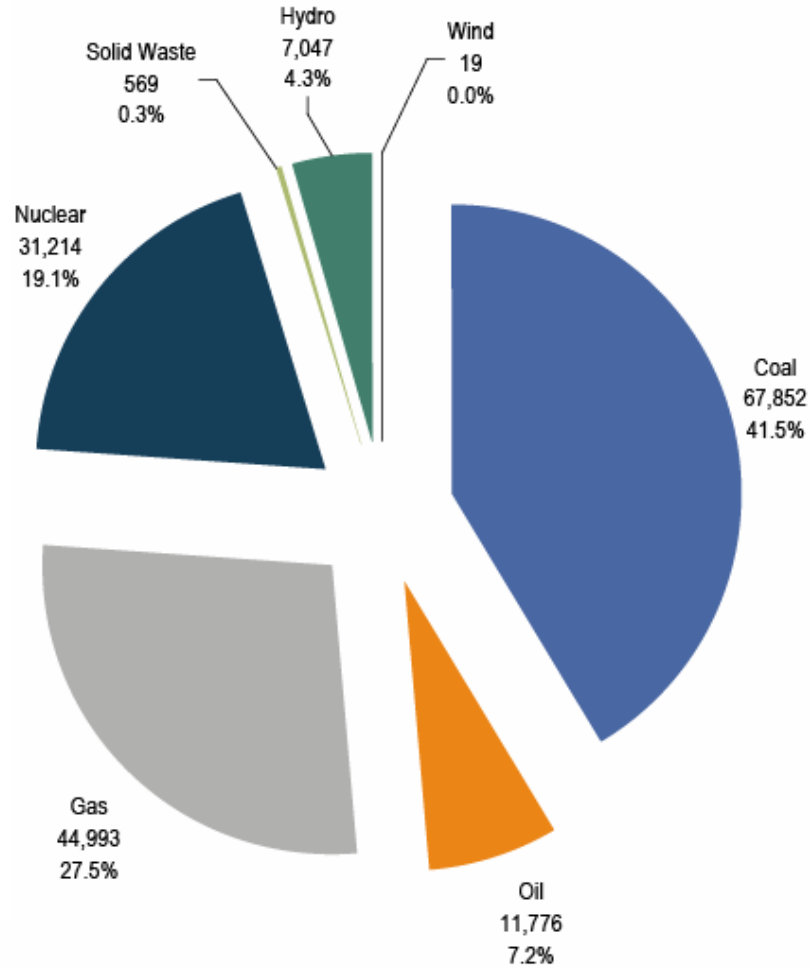


Figure 3-5 - PJM generation [By fuel source (In GWh)]:
Calendar year 2005

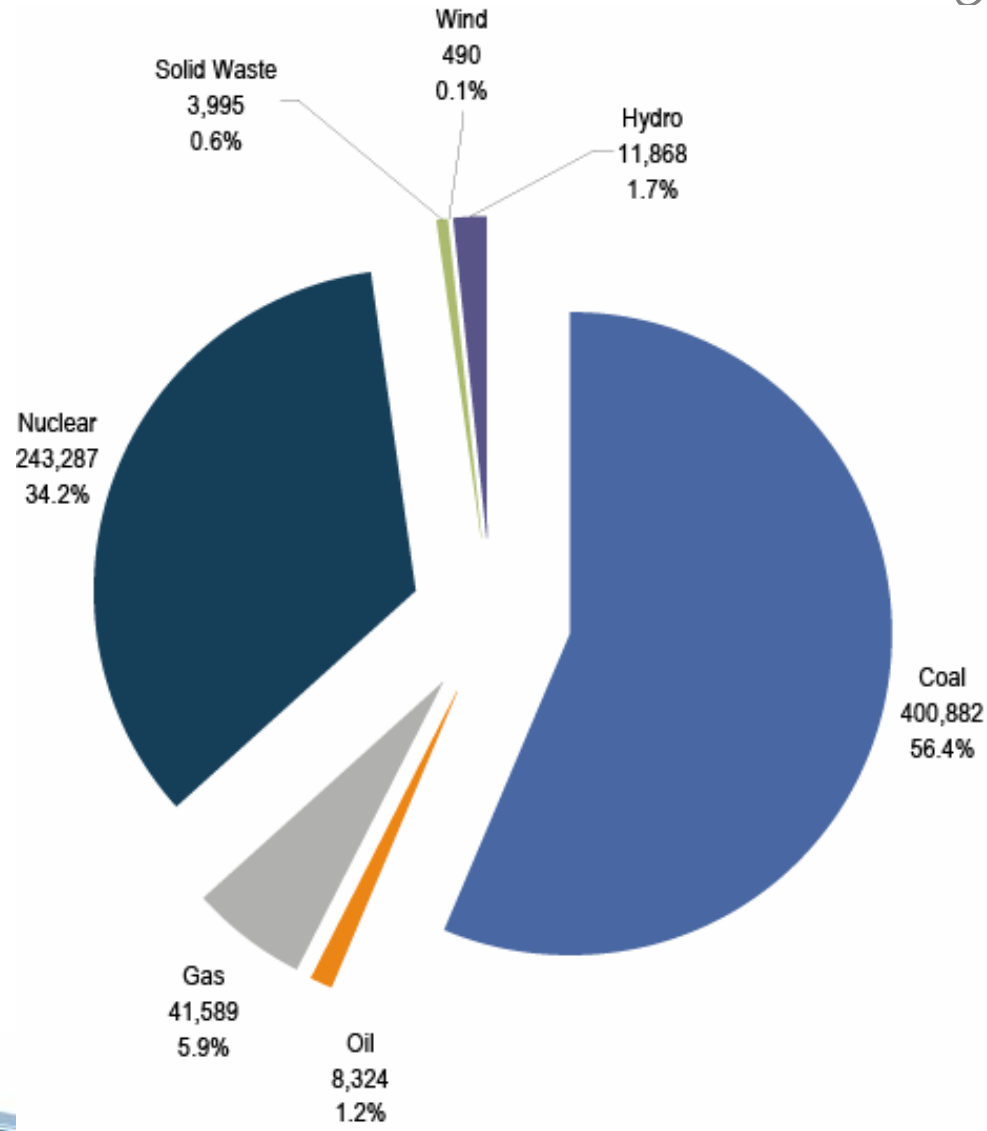


Table 2-18 - Type of fuel used by marginal units:
Calendar years 2001 to 2005

Fuel Type	2001	2002	2003	2004	2005
Coal	49%	55%	52%	56%	62%
Misc	0%	0%	0%	0%	0%
Natural gas	18%	23%	29%	31%	26%
Nuclear	1%	0%	1%	0%	0%
Petroleum	32%	21%	18%	12%	11%



Table 2-35 - PJM fuel-cost-adjusted, load-weighted LMP
(Dollars per MWh): Year-over-year method

	2004	2005	Change
Average	\$44.34	\$45.02	1.5%
Median	\$40.16	\$38.75	(3.5%)
Standard Deviation	\$21.25	\$25.68	20.8%



Table 2-34 - PJM load-weighted, average LMP (Dollars per MWh): Calendar years 1998 through 2005

	Load-Weighted, Average LMP			Year-to-Year Changes		
	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%	132.9%
2000	\$30.72	\$20.51	\$28.38	(9.8%)	7.8%	(69.0%)
2001	\$36.65	\$25.08	\$57.26	19.3%	22.3%	101.8%
2002	\$31.58	\$23.40	\$26.73	(13.8%)	(6.7%)	(53.3%)
2003	\$41.23	\$34.95	\$25.40	30.6%	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%

Table 2-4 - Actual PJM footprint summer peak loads: From 1999 to 2005

	Date	EPT Hour Ending	PJM Load (MW)	Difference (MW)
1999	06-Jul-99	1400	59,365	NA
2000	26-Jun-00	1600	56,727	(2,638)
2001	09-Aug-01	1500	54,015	(2,712)
2002	14-Aug-02	1600	63,762	9,747
2003	22-Aug-03	1600	61,500	(2,262)
2004	03-Aug-04	1700	77,887	16,387
2005	26-Jul-05	1600	133,763	55,876



Table 2-2 - Actual 2005 summer peak demand and calculated Phase 3, 4 and 5 coincident summer peak demand: For 2001 through 2004

	Date	EPT Hour Ending	PJM Load (MW)	Difference (MW)
2001	09-Aug-01	1500	126,099	NA
2002	01-Aug-02	1700	128,135	2,036
2003	21-Aug-03	1700	126,288	(1,847)
2004	09-Jun-04	1700	120,353	(5,935)
2005	26-Jul-05	1600	133,763	13,410

Figure 2-17 - Price duration curves for the PJM Real-Time Energy Market: Calendar years 2001 through 2005

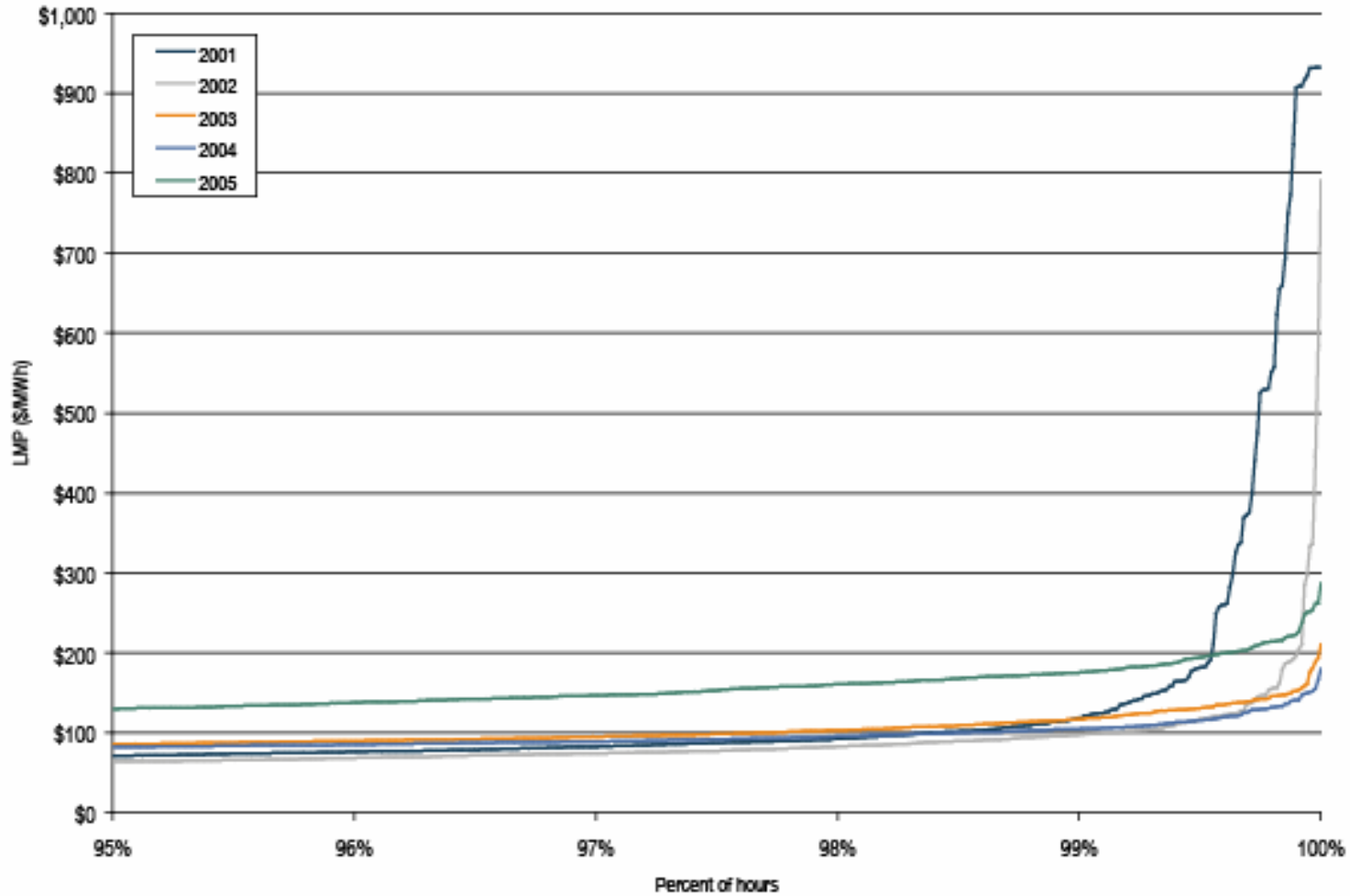


Figure 7-5 - Regional constraints and congestion-event hours
(By facility): Calendar years 2002 to 2005

