

THE PJM INTERCONNECTION STATE OF THE MARKET REPORT 2001

Energy Market Committee June 19, 2002

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Energy Markets

- Basic tests of competition:
 - Net revenue
 - Price-cost mark up
 - Market structure
 - Prices



Net Revenue





Net Revenue





- CT at \$40/MWh
 - 2001: \$59,238/MW-year from energy market
 - 2001: \$36,700/MW-year from capacity market
 - 2001: \$7,126/MW-year from ancillary services and operating reserves
 - 2001 Total: \$103,064/MW-year
- CT at \$50/MWh
 - 2001: \$44,386/MW-year from energy market
 - 2001: \$36,700/MW-year from capacity market
 - 2001: \$7,126/MW-year from ancillary services and operating reserves
 - 2001 Total: \$88,212/MW-year



Net Revenues

- Conclusion
 - 1999 net revenues from all sources greater than adequate to cover annual fixed costs of new peaker
 - 2000 net revenues from all sources almost equal to cover annual costs of new peaker
 - 2001 net revenues from all sources greater than adequate to cover annual costs of new peaker
 - Overall: net revenue results consistent with finding that there was no systematic exercise of market power in the energy market in 2001, while there was a finding of market power in the capacity market in 2001



Mark up





Mark up





Mark up by unit type





Mark-Up Index

- Conclusion
 - Mark up index calculations consistent with conclusion that energy market was reasonably competitive in 2001
 - Complexities: opportunity cost not included in cost
 - Complexities: scarcity rent not reflected



Energy Market Structure

- FERC/DOJ HHI test:
 - HHI < 1000 : Unconcentrated
 - 1000 < HHI < 1800 : Moderately concentrated
 - HHI > 1800 : Highly concentrated

Table 2. 2001 PJM Hourly HHIs				
	Overall Overa			
	Minimum	Maximum		
Maximum	1885	2140		
Average	1375	1565		
Minimum	975	1275		



Energy Market Structure





Energy Market Structure

- FERC/DOJ HHI test:
 - HHI < 1000 : Unconcentrated
 - 1000 < HHI < 1800 : Moderately concentrated
 - HHI > 1800 : Highly concentrated

Table 4. 2001 PJM Hourly HHIs by Segment				
	Base	Intermediate	Peak	
Maximum	1725	4575	9080	
Average	1525	2925	5140	
Minimum	1325	1270	1200	



Market Structure

- Conclusion
 - Aggregate HHI results show that PJM energy markets are moderately concentrated
 - Aggregate HHI results do not give reason for confidence during times of high demand
 - HHI levels indicate highly concentrated segments of the supply curve at times
 - HHI levels indicate highly concentrated markets in areas defined by specific transmission constraints







Simple average prices

PJM Average Hourly LMP (\$/MWh)				
			Year	Over Year
			Perce	nt Change
	Average Standard			Standard
	LMP	Deviation	LMP	Deviation
1998	21.72	31.45		
1999	28.32	72.41	30.4%	130.2%
2000	28.14	25.69	-0.6%	-64.5%
2001	32.38	45.03	15.1%	75.3%



Load Weighted Average Prices

Table 5: PJM Load-Weighted Average LMP (\$/MWh)						
				Year Over Year		
				Percent Change		
	Average	Median	Standard	Average	Median	Standard
	LMP	LMP	Deviation	LMP	LMP	Deviation
1998	24.16	17.60	39.29			
1999	34.06	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%



Fuel Cost Adjusted Average Prices

Table 6: Load-Weighted, Fuel Cost Adjusted LMPs(\$/MWh)				
	2000	2001	% Increase	
Average LMP	30.72	33.05	7.6%	
Median LMP	20.51	23.49	14.5%	
Standard	28.38	55.34	95.0%	
Deviation				

Net of impact of high price week of August 6: Load-adjusted, fuel cost adjusted LMP = \$29.98/MWh Change in prices = (5.7%)



Table 7: Comparison of Real-Time and Day-Ahead Market LMPs (\$/MWh)

	Day- Ahead	Real- Time	Average Difference	Percent Over Real-Time
Average	32.75	32.38	-0.37	1.1%
LMP				
Median	27.05	22.98	-4.1	17.7%
LMP				
Standard	30.42	45.03	14.6	-32.5%
Deviation				



Day Ahead and Real Time LMP





Spot Market





Imports/Exports: 2001





Net Imports by Tie Line





- Conclusion
 - Prices are a good general indicator of competitive conditions
 - Energy prices in 2001 consistent with a competitive energy market
 - Net imports provide source of competition
 - Pattern of prices across hours illustrates potential for demand side price sensitivity



- Conclusion
 - Net revenue: energy market reasonably competitive in 2001
 - Price-cost markup: energy market reasonably competitive in 2001
 - Market structure:
 - Moderate overall concentration
 - High supply curve segment concentration
 - High regional concentration
 - Prices: energy market reasonably competitive in 2001
- Recommendations
 - Additional actions to increase demand side responsiveness
 - Retention of \$1,000 offer cap
 - Investigate incentives to reduce incentives to exercise market power



Capacity Markets

- Basic tests of competition:
 - Market structure
 - Outage rate performance
 - Prices
- Market power issue



- FERC/DOJ HHI test:
 - HHI < 1000 : Unconcentrated
 - 1000 < HHI < 1800 : Moderately concentrated
 - HHI > 1800 : Highly concentrated

2001 PJM Capacity Credit Market HHIs				
	Daily Monthly			
Maximum	5500	10000		
Average	2700	3800		
Minimum	1100	1700		



Forced Outage Rates





Supply and Demand





Capacity Markets



Capacity Markets





Supply and Demand





One Supplier and Residual Demand





Daily Capacity Prices





- Conclusion
 - Capacity markets were subject to the exercise of market power in 2001
 - MMU identified issues and PJM modified rules to reduce incentive to exercise market power
 - Concentration levels high
 - Positive outage rate results
 - Contribution to reliability
 - Potential exercise of market power remains a concern
 - Market design issues remain a concern
- Recommendations
 - Continue competitive enhancements to capacity market design
 - Adopt a single market design
 - Incorporate explicit market power mitigation rules



- Basic tests of competition:
 - Market structure
 - Availability
 - Performance
 - Price















- Conclusion
 - Concentration levels between 1700 and 1800
 - Supply substantially greater than demand
 - Prices were moderate
 - Performance improved after introduction of market and maintained level of performance in 2001
 - Regulation market was competitive in 2001
- Recommendation
 - Retain \$100 offer cap in regulation market



- Basic tests of competition:
 - Activity levels
 - Prices











- Conclusion
 - FTR auction market was competitive in 2001
 - FTR reassignment process constitutes a barrier to retail competition
- Recommendations
 - FTR reassignment process should be modified to eliminate barrier to retail competition
 - Develop an approach to identify areas where transmission expansion investments would relieve congestion where congestion may enhance market power and investments are needed to support competition



IF YOU HAVE QUESTIONS

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