

Performance Review of Electric Power Markets

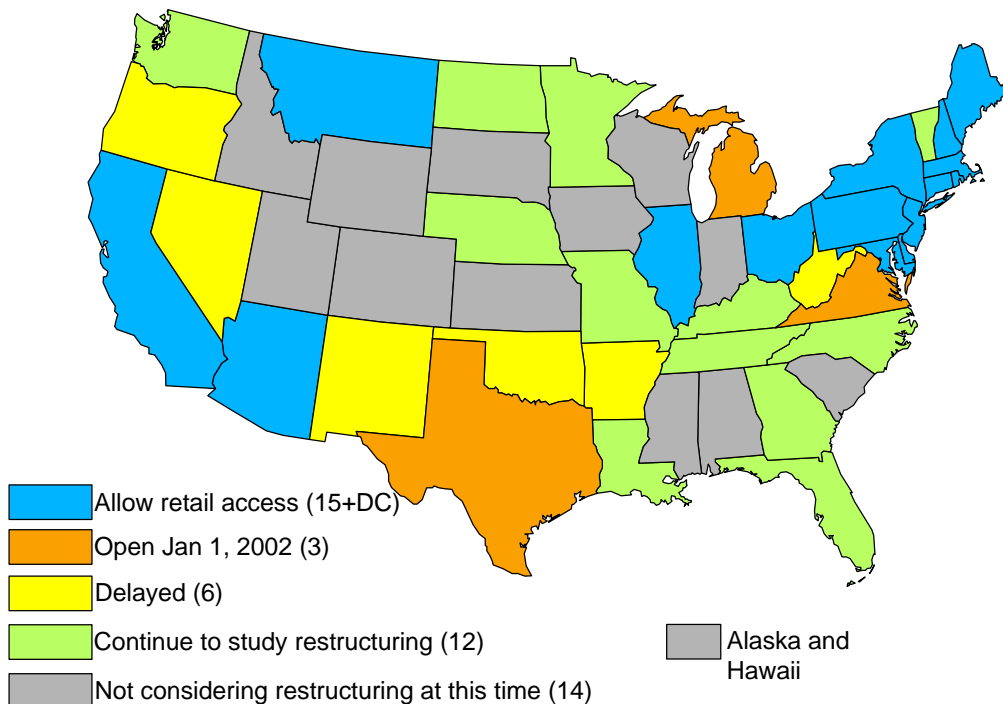
Presentation to the
Legislative Transition Task Force

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State Electric Industry Restructuring Status



Evaluation Criteria

- Retail market performance is based on:
 - ▶ number of offers, offers with savings opportunities, number of suppliers, type of offers, and percent of customers that selected an alternative supplier
- Wholesale market performance is based on:
 - ▶ how closely actual prices are tracking what would be expected in a fully competitive market--where suppliers have no or only limited ability to control the price

Fig. ES 3. Residential offers nationwide

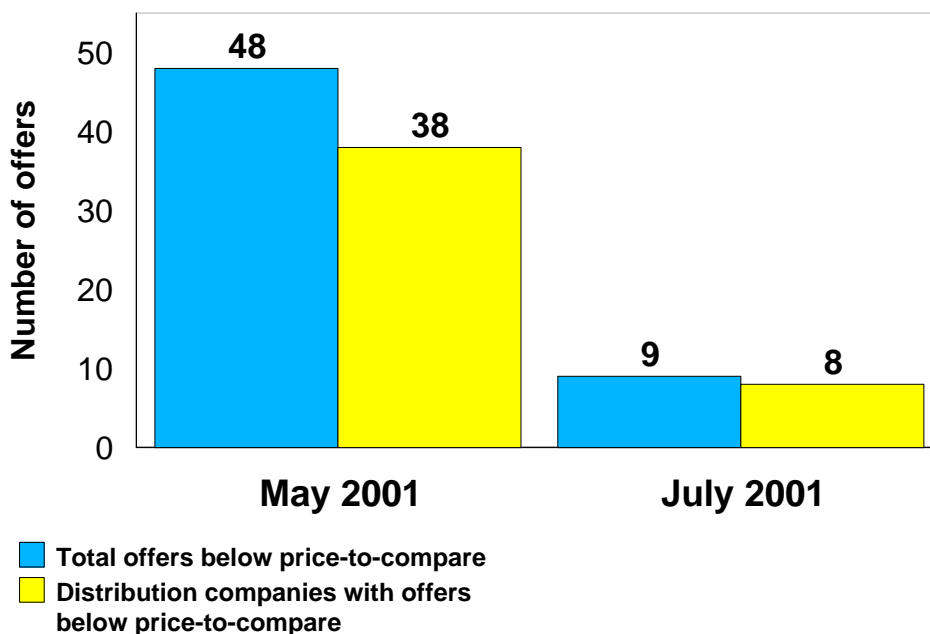
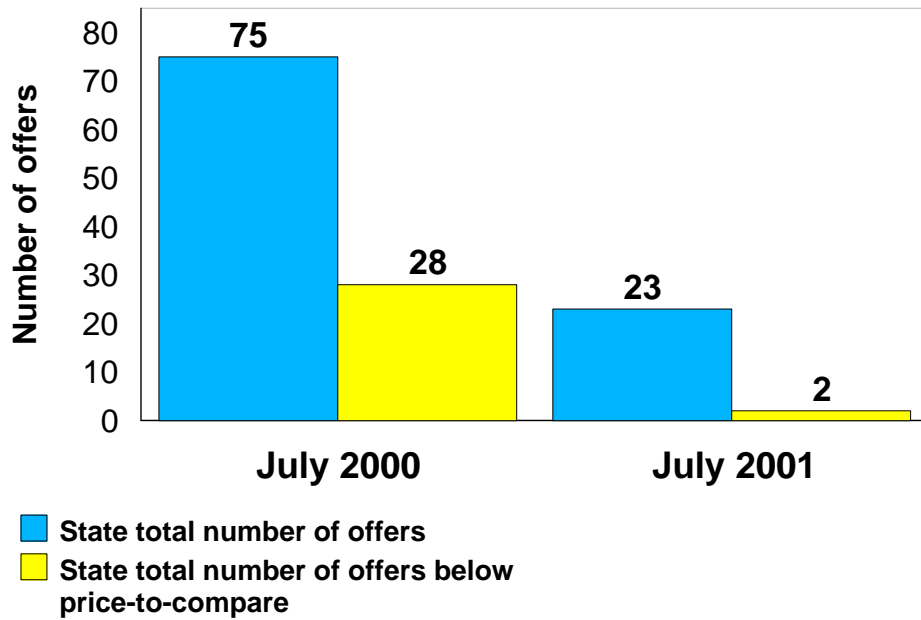
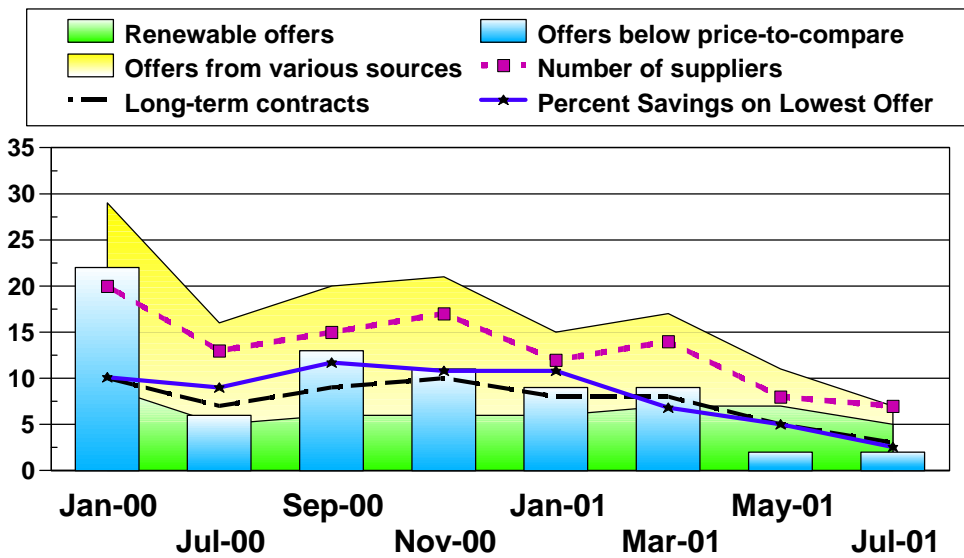


Fig. 6. Pennsylvania statewide residential offers

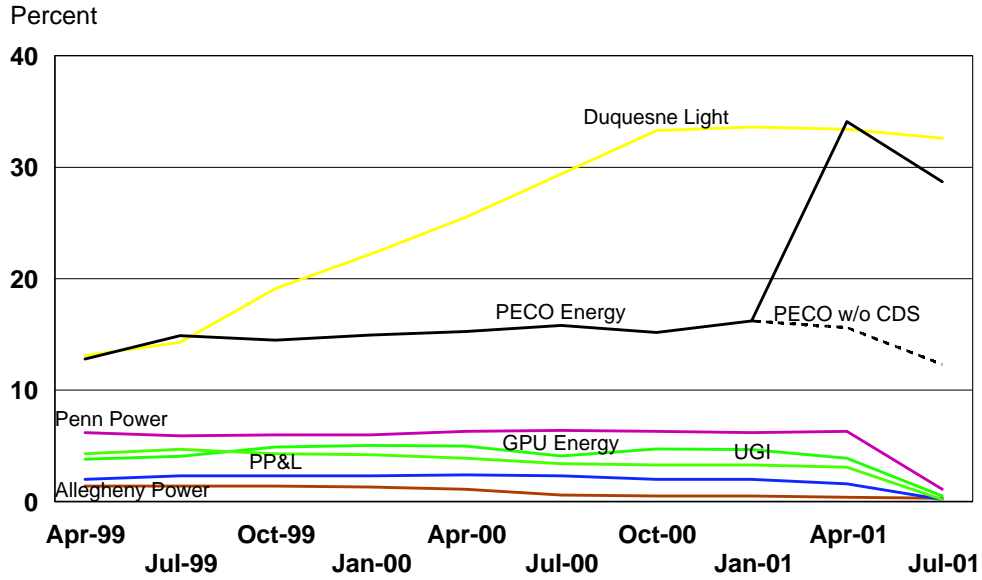


PECO Energy Trend



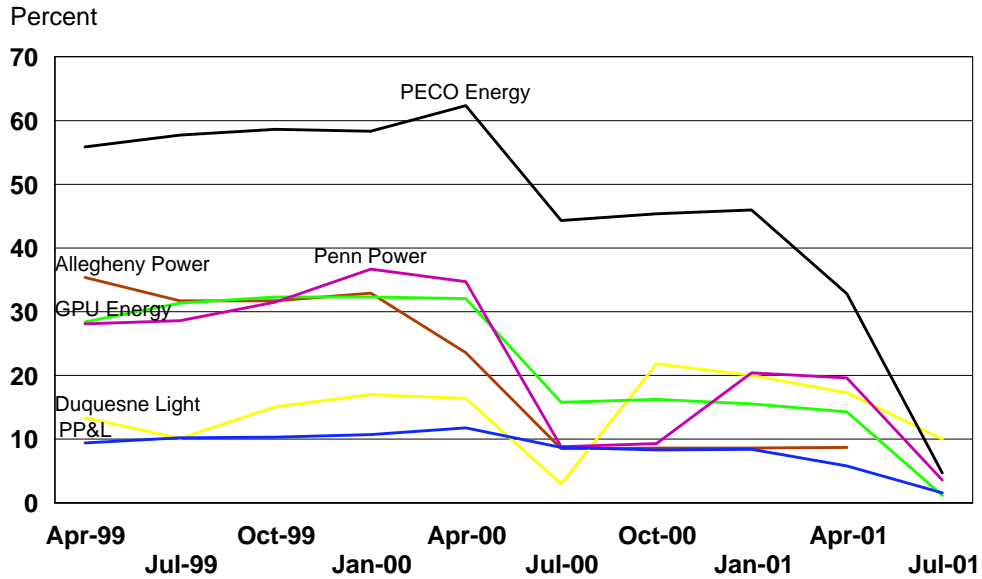
Data Source: Compiled from data obtained from Wattage Monitor (<http://www.wattagemonitor.com>)

Percent of Pennsylvania Residential Customers Served by Alternative Supplier



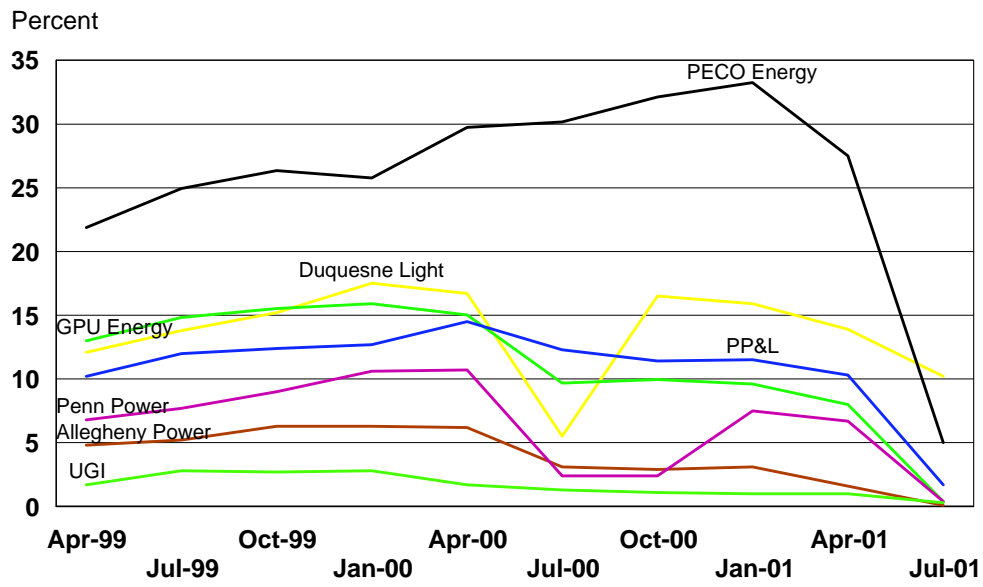
Data Source: Pennsylvania Office of Consumer Advocate

Percent of Pennsylvania Commercial Customers Served by Alternative Supplier



Data Source: Pennsylvania Office of Consumer Advocate

Percent of Pennsylvania Industrial Customers Served by Alternative Supplier



Data Source: Pennsylvania Office of Consumer Advocate

Fig. 8. Pennsylvania total load served by alternative suppliers

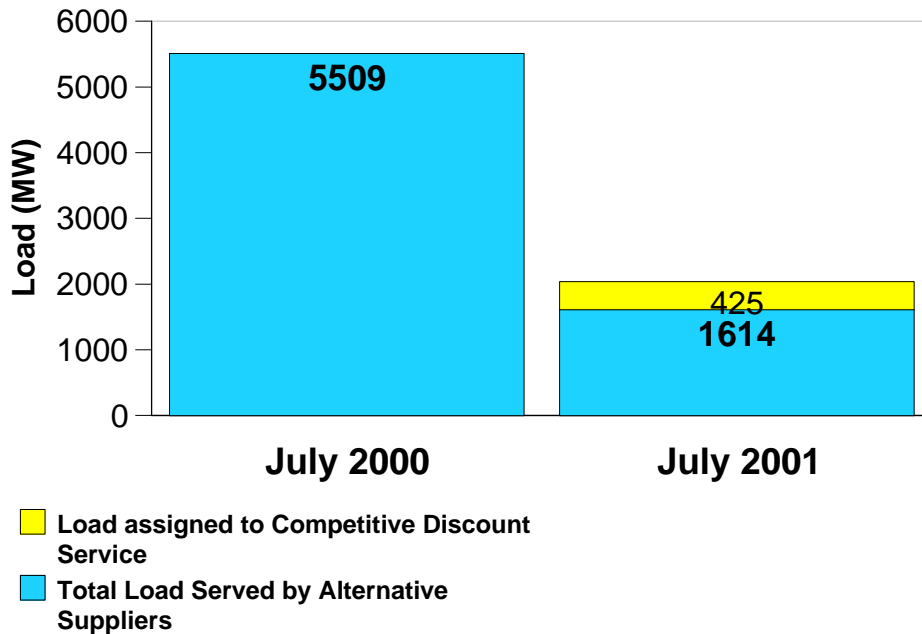
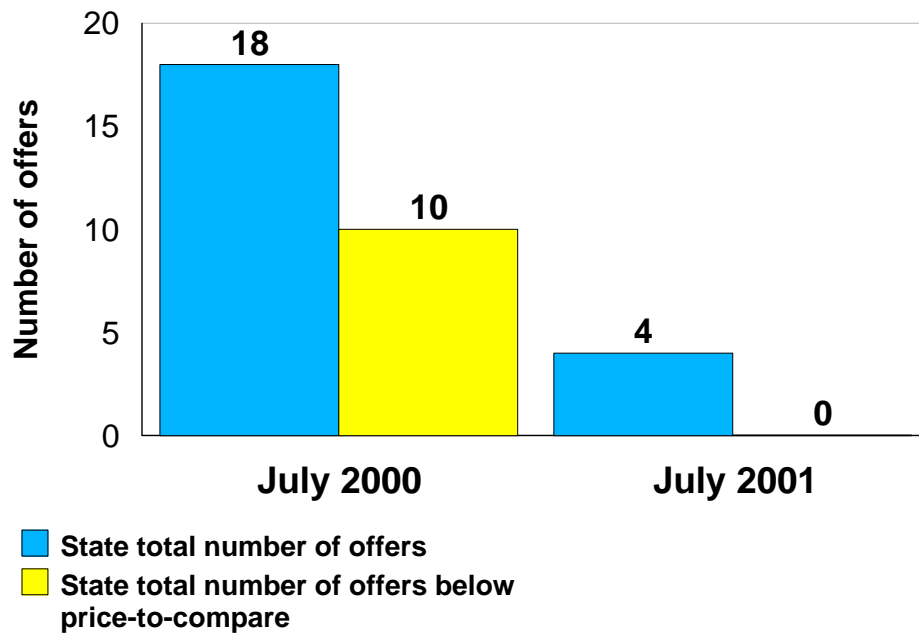


Fig. 5. New Jersey statewide residential offers



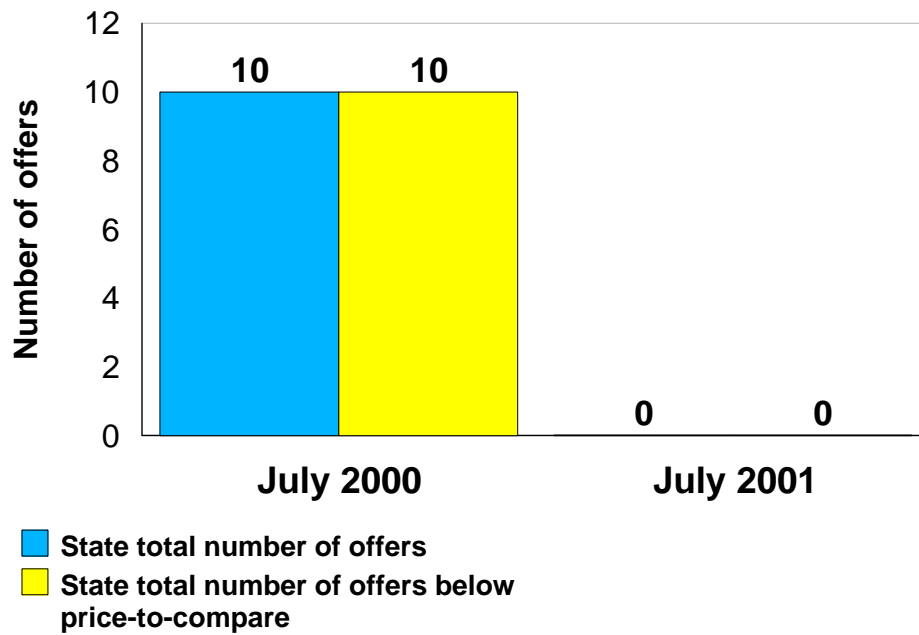
Percent of New Jersey Customers Served by an Alternative Supplier

Residential	Nov 2000	May 2001
Conectiv	5.9	1.5
GPU	1.0	0.2
PSE&G	1.8	1.5
State Total	2.2	1.1

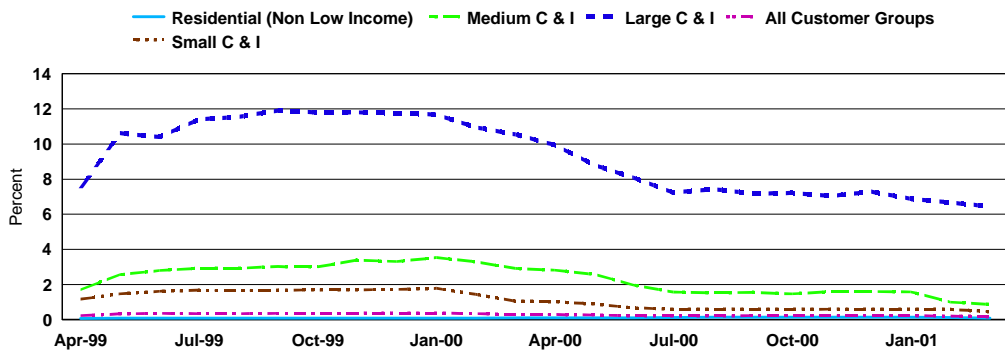
Non-Residential	Nov 2000	May 2001
Conectiv	11.8	1.1
GPU	5.8	1.1
PSE&G	6.3	5.2
State Total	6.9	3.4

Data Source: New Jersey Board of Public Utilities

Fig. 3. Massachusetts statewide residential offers



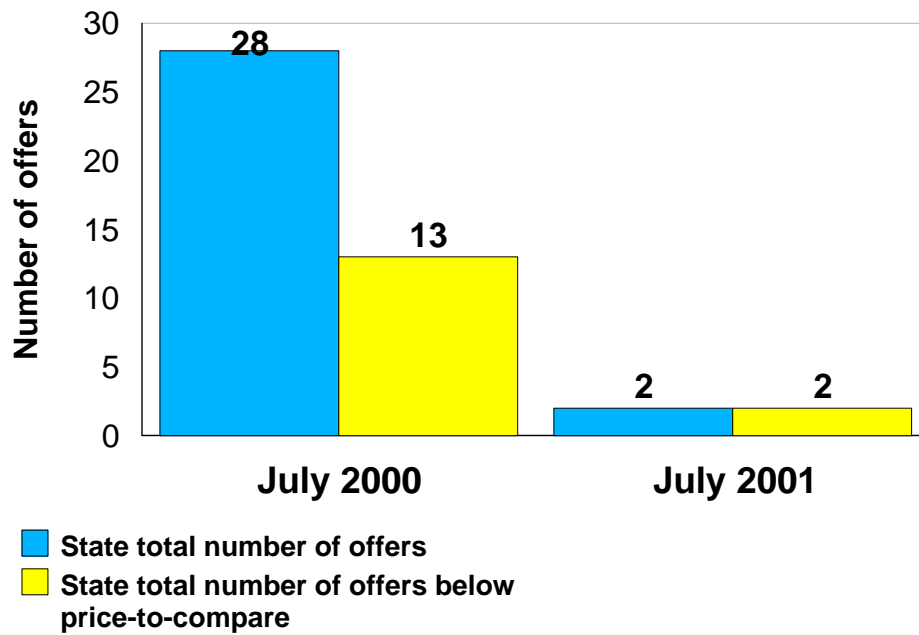
Massachusetts Customers Choosing a Competitive Supplier



	Apr-99	Jul-99	Oct-99	Jan-00	Apr-00	Jul-00	Oct-00	Jan-01	Mar-01
Residential (Non Low Income)	0.06	0.09	0.09	0.09	0.10	0.12	0.13	0.14	0.08
Small C & I	1.16	1.66	1.68	1.78	1.01	0.59	0.58	0.57	0.46
Medium C & I	1.71	2.93	2.99	3.53	2.82	1.55	1.46	1.57	0.86
Large C & I	7.48	11.40	11.78	11.68	9.94	7.22	7.21	6.88	6.44
All Customer Groups	0.23	0.34	0.35	0.37	0.28	0.21	0.22	0.23	0.15

Source: Massachusetts Division of Energy Resources

Fig. 2. California statewide residential offers



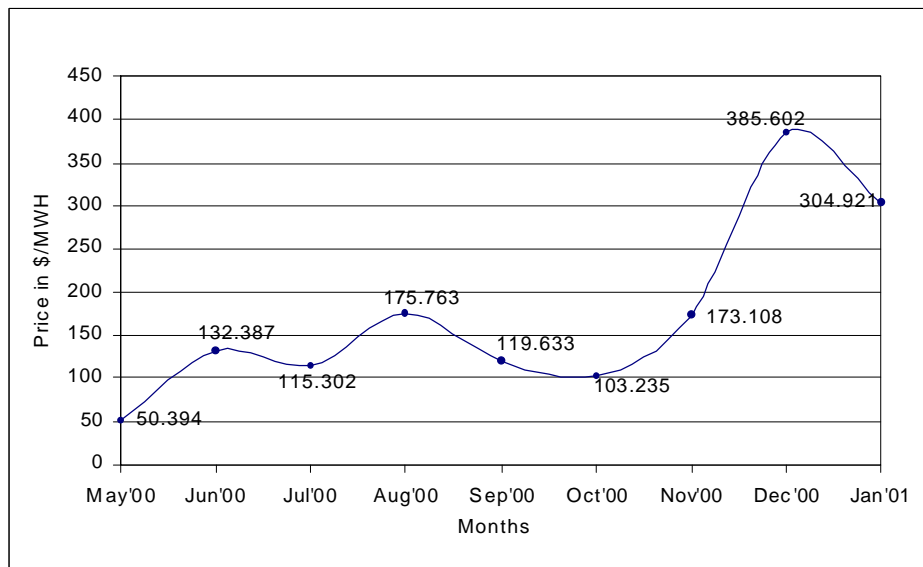
Percent "Direct Access" Customers - California

	June 15, 2000	May 15, 2001
Residential	1.8%	0.86%
Commercial <20 kW	4.1%	0.77%
Commercial 20 - 500 kW	7.3%	1.04%
Industrial > 500 kW	19.7%	2.55%
Agricultural	4.2%	0.32%
Total	2.2%	0.85%

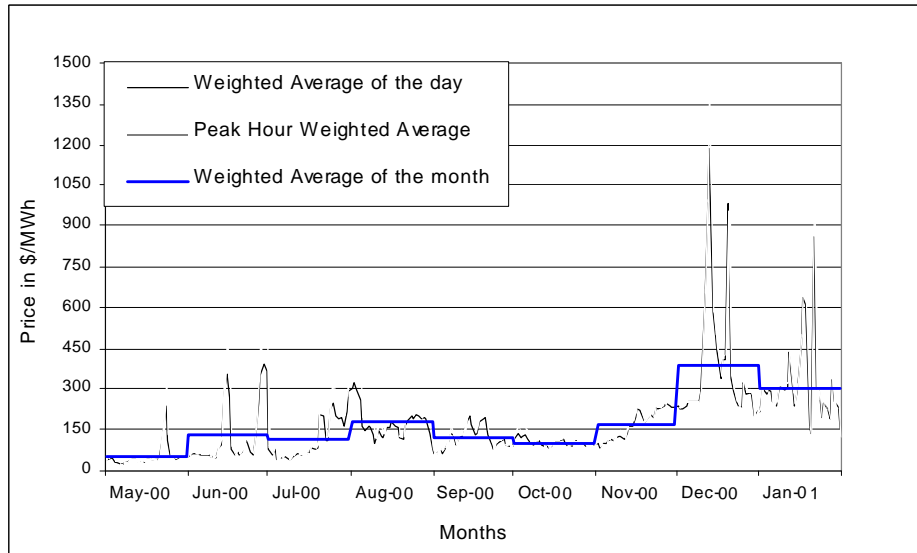
Why Pennsylvania's Retail Market Has Been Declining

- The highest "shopping credit" or price to compare for generation service in the state is for PECO Energy customers at 5.67 cents/kWh (annual average for regular residential service).
- If the energy price = \$50/MWh (as it averaged last December), adding \$10/MWh for capacity would put the total cost over \$60/MWh or 6 cents/kWh -- at least 0.33 cents/kWh over the price to compare.
- If the energy price is in the \$30 to \$40/MWh, as they averaged from January through May, and the retail cost of ICAP is as high as 1.8 cents/kWh for serving a residential customer (as some put the high end at), then the margin would be very thin and risky given the price volatility in both the energy and capacity markets
- This would leave little room for marketing costs, administrative costs, cost of risk management, or an adequate profit.

California Power Exchange: Load Weighted Day Ahead Average Prices



California Power Exchange: Day Ahead Prices



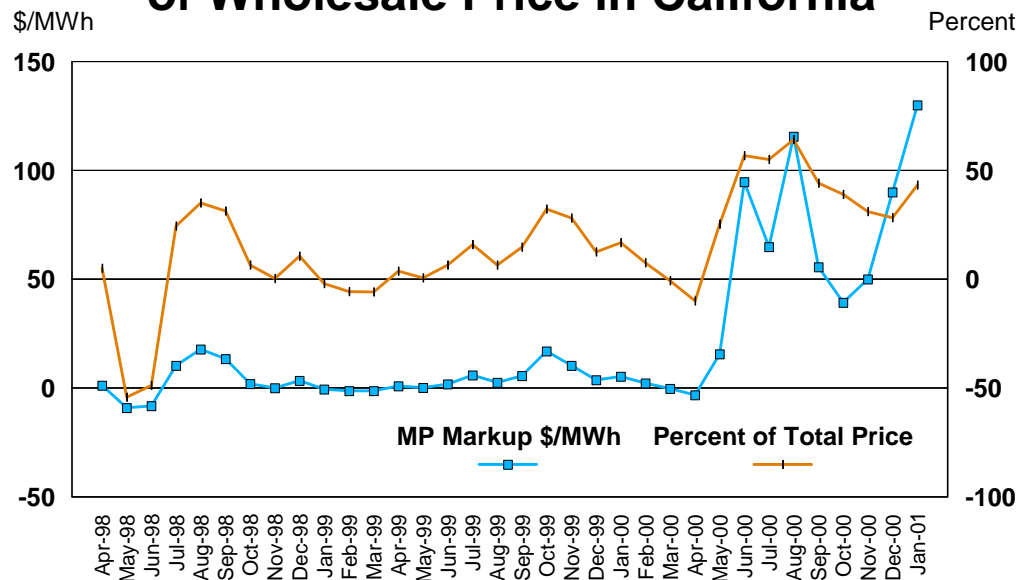
What is Market Power?

- Market power is the ability of a firm or group of firms to raise *and maintain* the product price *significantly* above a competitive level
- This is the price leverage a firm has to raise the price above a competitive price
- Must be large enough and persist for an appreciable amount of time to be of concern
- This violates the assumption that all suppliers are "price takers" in a market and cannot control the market price

Market Power in California

- Higher wholesale prices are a result of a combination of scarcity conditions (e.g., low hydroelectric generation), higher natural gas prices, and market power impacts
- Market power may be averaging over 40% of the wholesale price in California since June of 2000
- The California wholesale market power problem is a western states' wholesale problem

Average Market Power Markup and Percent of Wholesale Price in California



Source: Frank A. Wolak, "What Went Wrong with California's Re-structured Electricity Market? (And How to Fix It)"

Average Market Power Markup and Percent of Wholesale Price in California

Time Period	MP markup (\$/MWh)	Percent of Total Price
1998	3.5	1.2
1999	3.8	9
2000	44	30
Jun 00 - Jan 01	80	45
Aug 2000	116	64
Jan 2001	130	43

Source: Frank A. Wolak, "What Went Wrong with California's Re-structured Electricity Market? (And How to Fix It)"

Market Power in PJM*

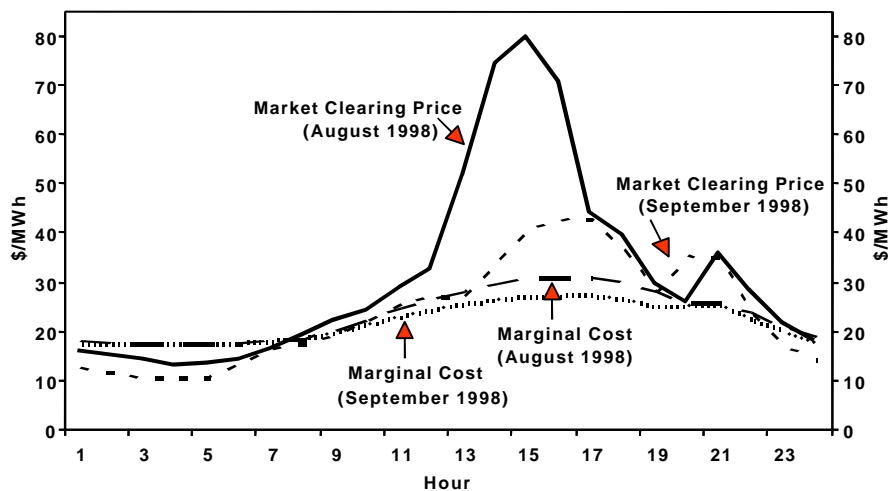
- Market imperfections in the spot market (10% to 15% of the market) for the period April through August of 1999 totaled \$224 million
- Total costs in PJM were 41% higher than under perfect competition
- When bilateral contracts are added (an additional 30% of the market) the sum of the spot market and bilateral contract costs is \$827 million, or a 48% increase over competitive costs
- Load-weighted Lerner Index was estimated at 0.293 for spot energy market and 0.323 when bilateral contracts are included

*Erin T. Mansur, "Pricing Behavior in the Initial Summer of the Restructured PJM Wholesale Electricity Market," University of California Energy Institute, April 2001.

Market Power in PJM (*continued*)

- The PJM's Market Monitoring Unit also estimated load-weighted Lerner Indices
 - ▶ for April through December of 1999, the average was about 0.02, with the maximum for the year in July at 0.08
 - ▶ for 2000 the average increased to 0.04, with the maximum in December at 0.14
- Differences in these estimations and Mansur's may be due to methodology and data access

PJM DATA: ENERGY-WEIGHTED AVERAGE MARKET CLEARING PRICE AND MARGINAL COST

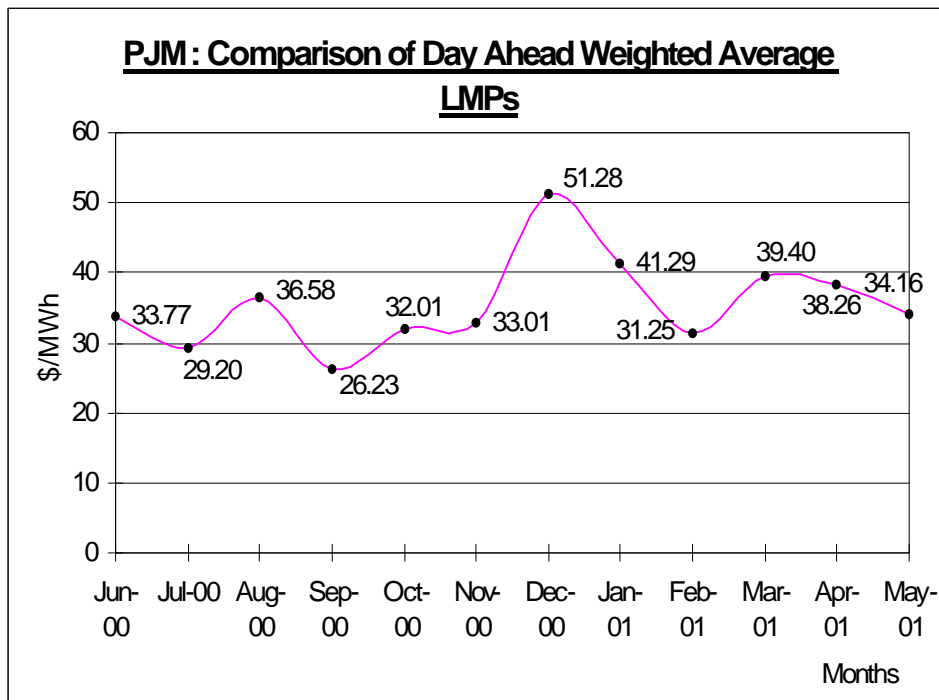


Source: F.T. Sparrow, State Utility Forecasting Group, Purdue University
"Deregulation In Indiana: Is Competition Good or Bad for Indiana Ratepayers?"
Electric Power Industry Special Institute, Columbus, Ohio, June 21-22, 2000.

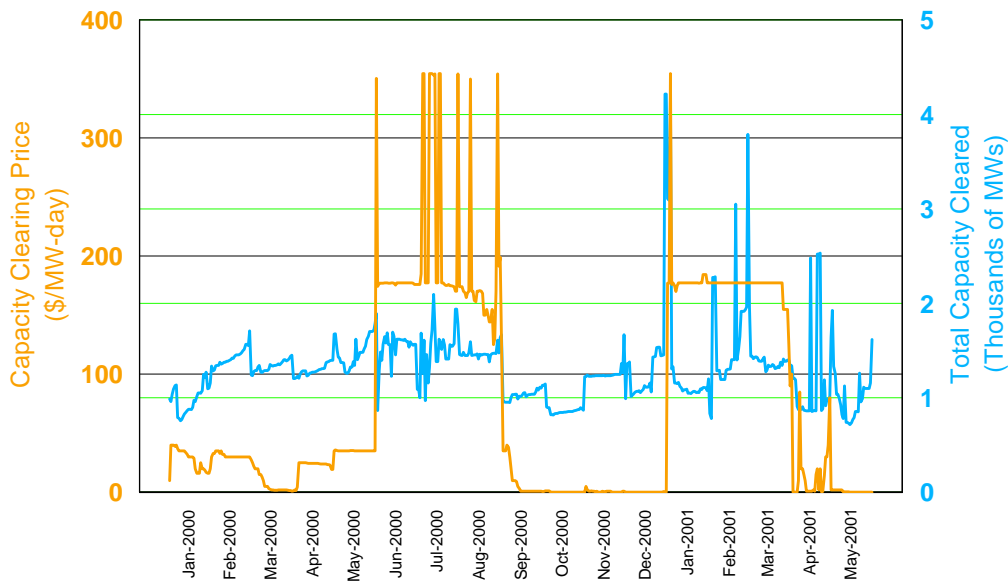
PJM's Installed Capacity Market*

- PJM's installed capacity (ICAP) market has shown signs of problems
- Prices for the first three months of the year were at or near the PJM capacity deficiency rate of \$177/mW-day (see graph)
- Retail cost of ICAP has increased from 0.6 cents/kWh to 1.8 cents/kWh for a residential customer
- Evidence of withholding of capacity last summer and this year to manipulate prices

*Source: PJM, Market Monitoring Unit, June 2001 and PennFuture, E-cubed, Feb. 20 and April 5, 2001 issues.



PJM Daily Capacity Credit Market



New York

- The New York ISO Market Advisor concluded that "electric markets in New York have been competitive under most conditions experienced to date"
- He did warn that to ensure the competitiveness of New York markets, entry of new generation and investment in transmission must be facilitated
 - ▶ "The lack of new construction will also increase the vulnerability of the market to abuses of market power as transmission constraints and tight supply cause withholding to have a larger effect on prices"

New York (*continued*)

- A New York Department of Public Service staff report found that there were:
 - ▶ "significant problems with the NYISO's day-ahead, hour-ahead, and real-time operations caused by software design problems; rules that do not work as intended; and gaming that occurs when market participants try to take advantage of the simultaneous existence of problems with software, rules, and procedures
 - ▶ "NYISO's market monitoring approach is insufficient to adequately protect consumers
 - ▶ "there is strong reason to suspect that there is the potential for millions of dollars in consumer harm"

New England*

- NEPOOL moved to a competitive bid based dispatch system on May 1, 1999
- During the first 12 months of an open wholesale generation market (May 1, 1999 - April 30, 2000), 47% more capacity was out of service (on an average weekday) than during the prior 12 month period and nearly double that of May 1997 through April 1998
- Fossil plant forced outage rates increased from 11.4%, during Jan. '97 - Apr. '99, to 23.6% for the period May '99 - Dec 99

*Source: Allen, Biewald, and Schlissel, "Generator Outage Increases," Jan. 7, 2001.

New England (*continued*)

- On May 8, 2000, the peak market clearing price reached \$6,000/MWh (\$6/kWh) when 8,440 MW was out of service -- a 66% increase relative to the average daily capacity out of service during the same month in the three years prior to competition
- On June 8, 1999, the peak market clearing price reached \$1,003/MWh (\$1.003/kWh) when 5,965 MW was out of service -- a 83% relative increase
- ISO New England concluded "that the \$6,000 per MWh price was reasonably related to the costs and risks faced in securing and arranging delivery of energy to New England"

Conclusions

- Wholesale power prices and volatility have hampered the development of retail markets
- The evidence suggests that generation owners have considerable market power in wholesale markets
- Given the characteristics of electric supply and demand, this market power may persist for some time
- The lack of price information in many regions of the country will also contribute to wholesale market power problems
- The transition to competitive retail markets has been more difficult and is taking longer than many had expected