Competition In Wholesale Power Markets

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Kenneth Rose
The National Regulatory Research Institute
The Ohio State University
http://www.nrri.ohio-state.edu/roseken.htm

Topics

- How a firm's price leveraging ability is determined
- Detecting market power
- California, PJM, New York, and New England

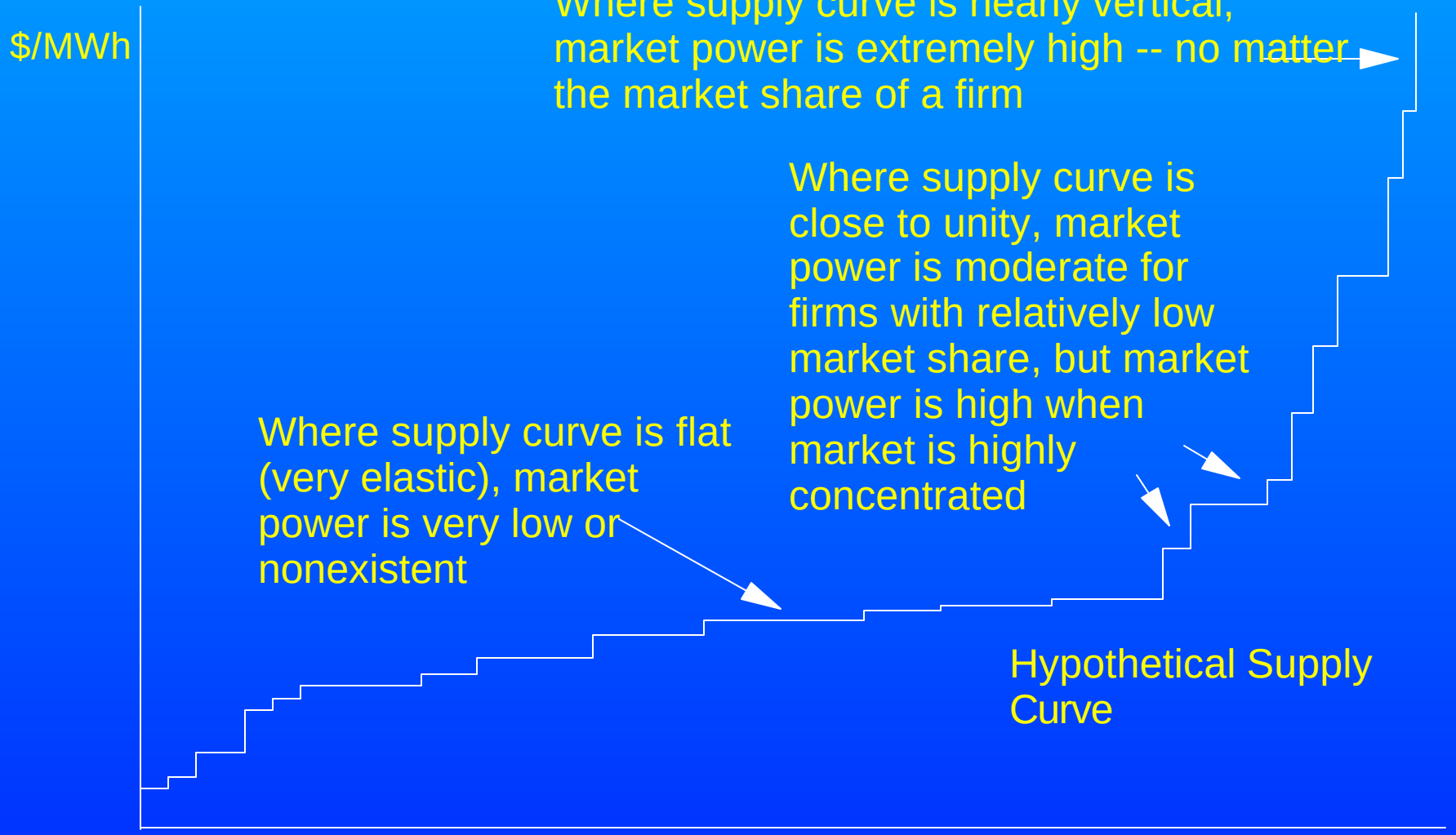
What Determines a Firm's Price Leveraging Ability?

- **A firm's price leverage increases as its demand becomes more inelastic**
- **A firm's demand becomes more inelastic:**
  1. **the more inelastic the supply from other firms,**
  2. **the market share of the firm increases, and**
  3. **the more inelastic the** *market* demand
- These characteristics provides a basis for detecting market power and developing policies to reduce it
- Unfortunately, all three indicate considerable market power in electric markets

Market Structure and Prospects for Competition

	Firm Demand	Firm Demand	
Supply Conditions (elasticity)	Short Run (demand elasticity = 0.2)	Long Run (demand elasticity = 1)	Market Power Prospects
Firm with 20% market share:			
Vertical (--> 0)	very inelastic	very inelastic	extremely high
Rising (= 1)	elastic	elastic	some market power
Flat (--> infinity)	very elastic	very elastic	low or zero
Firm with 80% market share:			
Vertical (--> 0)	very inelastic	very inelastic	extremely high
Rising (= 1)	inelastic	just over 1	high
Flat (--> infinity)	very elastic	very elastic	low or zero

A Firm's Price Leveraging Ability Depends On Where Supply Meets Demand



➡ Demand may intersect all three parts -- *on the same day*

Suppliers' Options

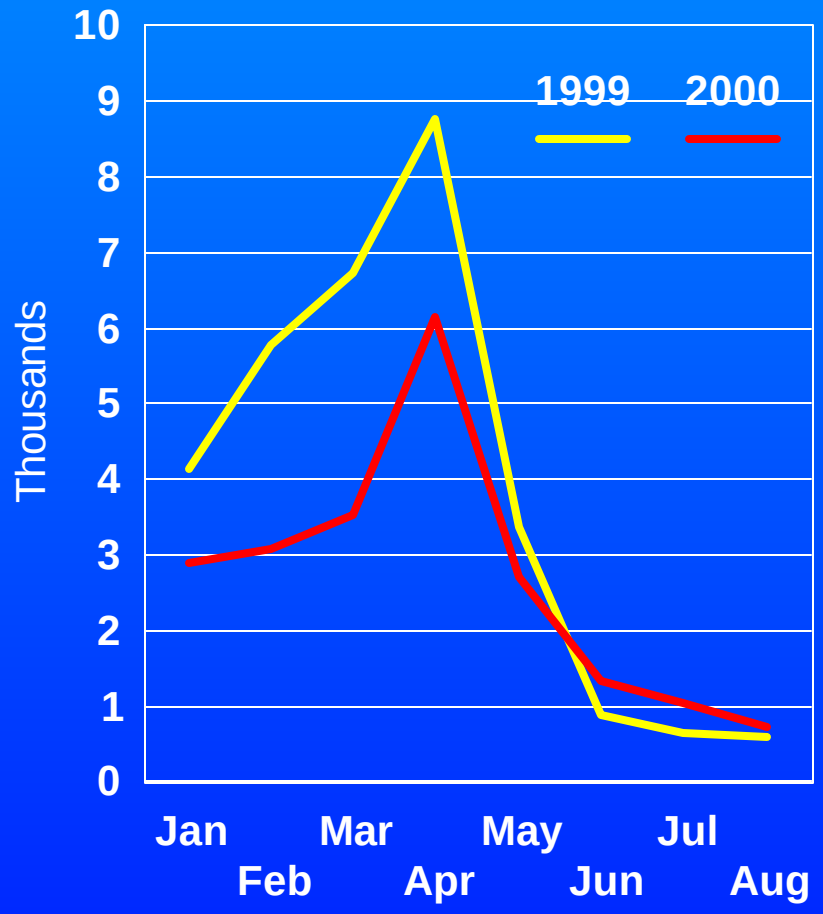
- Suppliers can physically withhold capacity to raise the price
- Suppliers can economically withhold capacity to raise the price by bidding a very high price
- Suppliers can sell at a price they determine (not the market) when they have market power
- Suppliers benefit from other suppliers' successful strategies to raise the price

How is Market Power Detected?

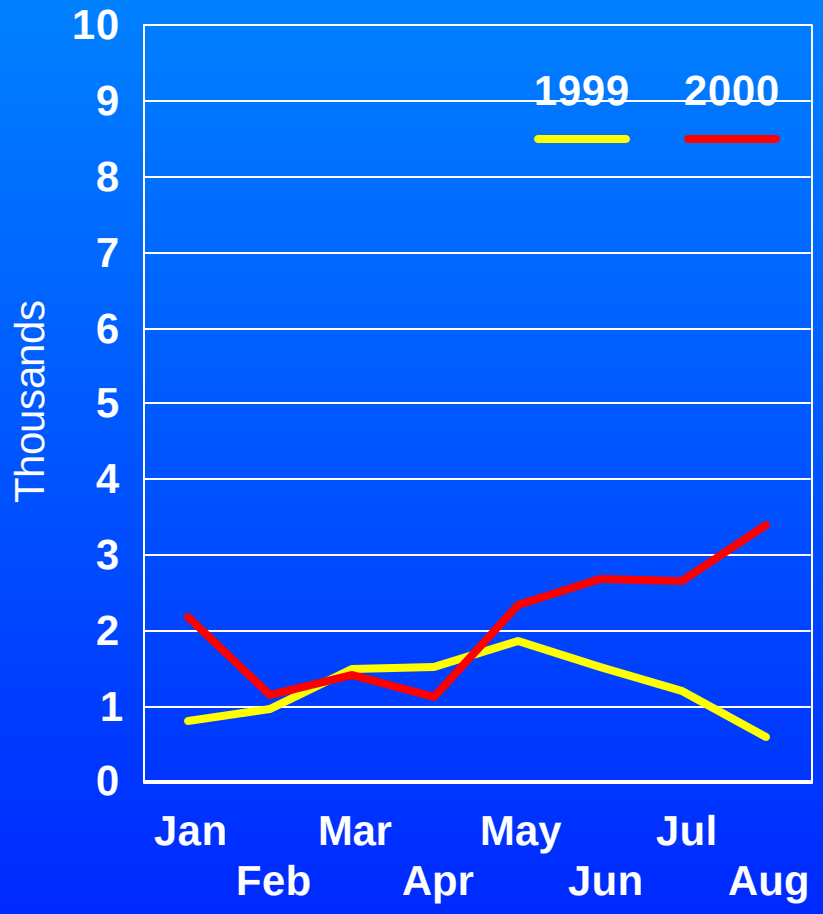
- Look for attempts to decrease other firms' supply elasticity by:
  - withholding generation (economic or physical)
  - strategic bidding
  - increasing or claiming transmission congestion
    - used as an artificial barrier to raise prices versus actual physical constraints
- The result is a price that is higher than what would occur in a competitive market

Average Megawatts Out of Service In California Last Year

Planned Outages



Unplanned Outages

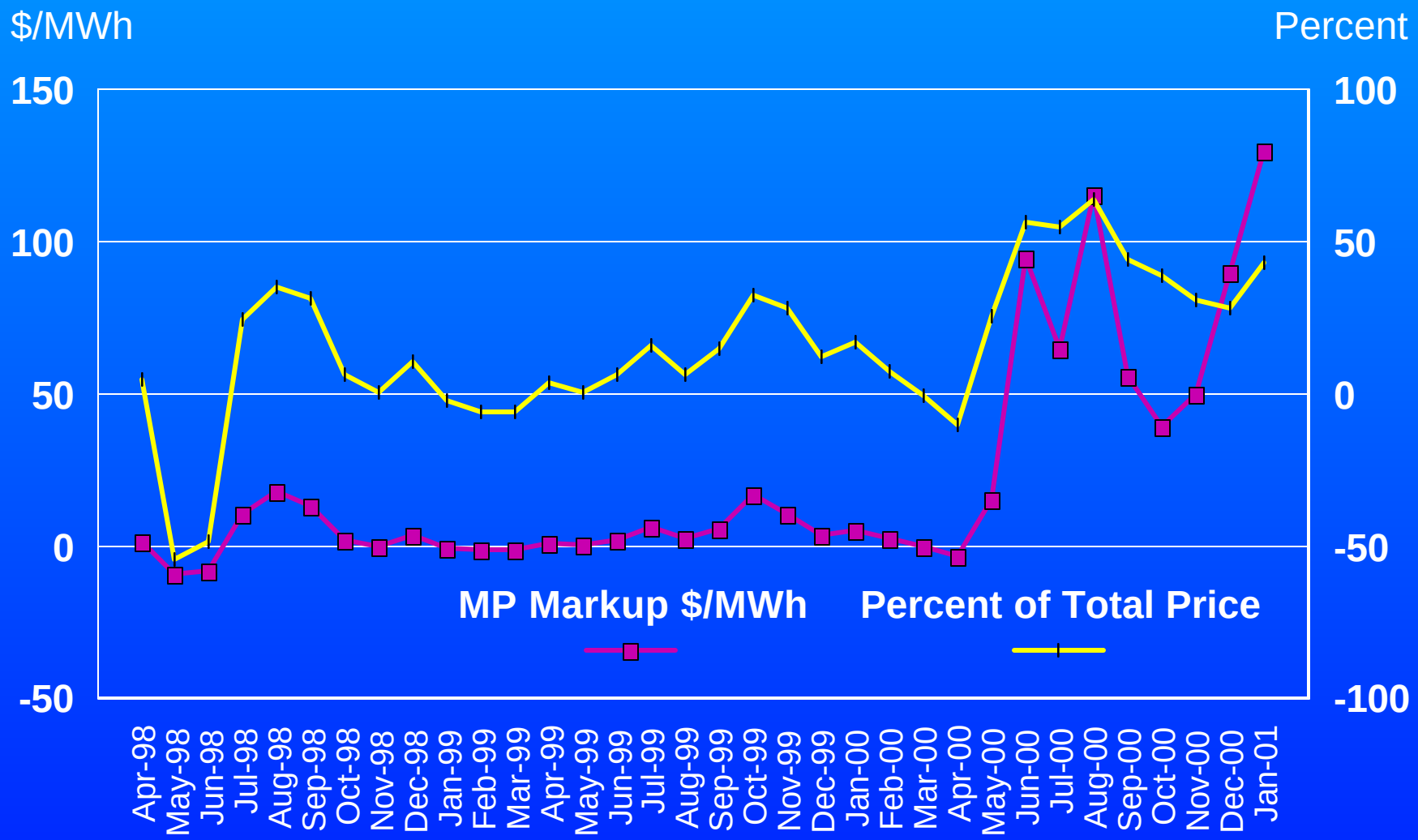


Source: FERC, Staff Report, Nov. 1, 2000.

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 as well

Average Market Power Markup and Percent of Wholesale Price in California

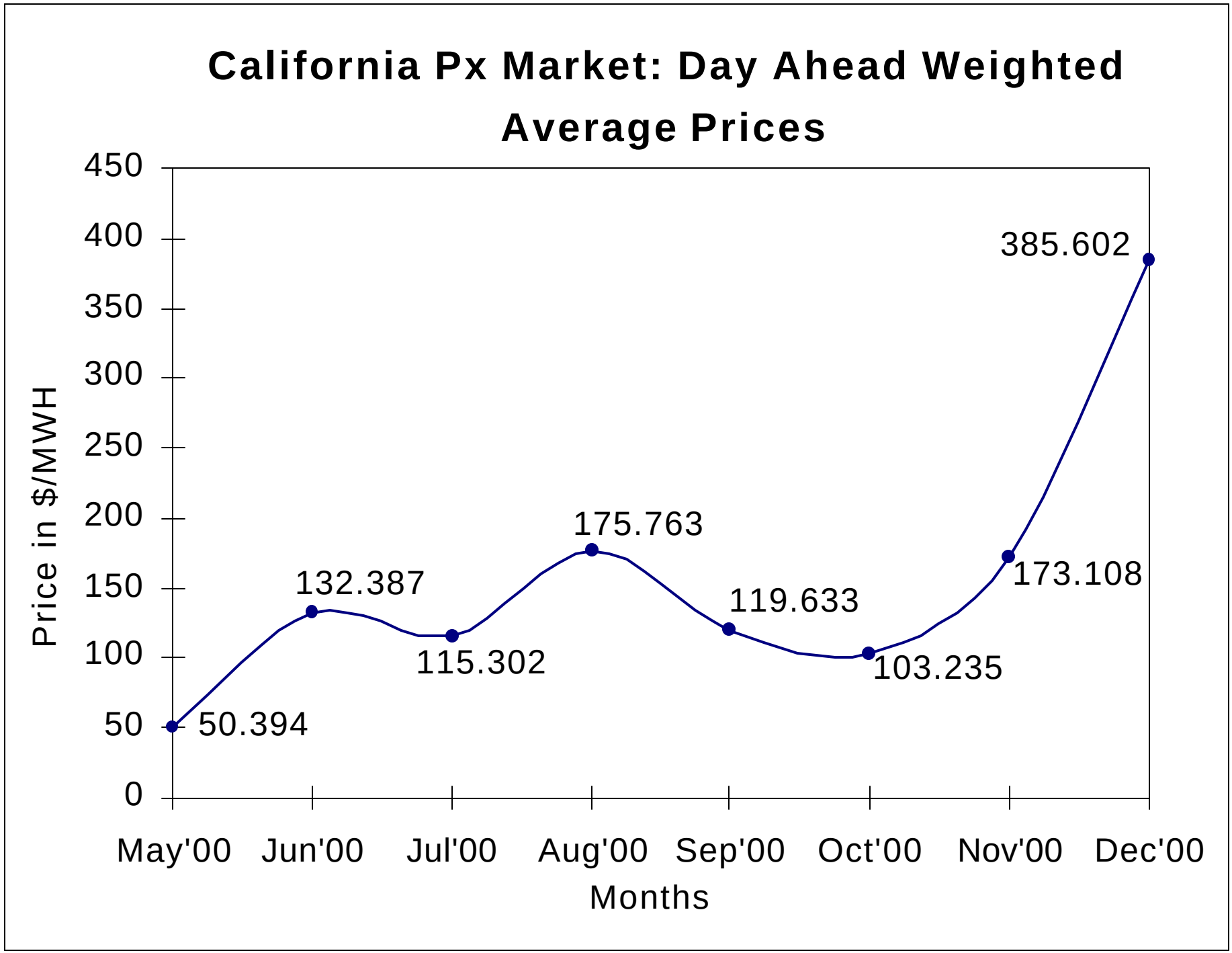


Source: Frank A. Wolak, "What Went Wrong with California's Re-structured Electricity Market? (And How to Fix It)"

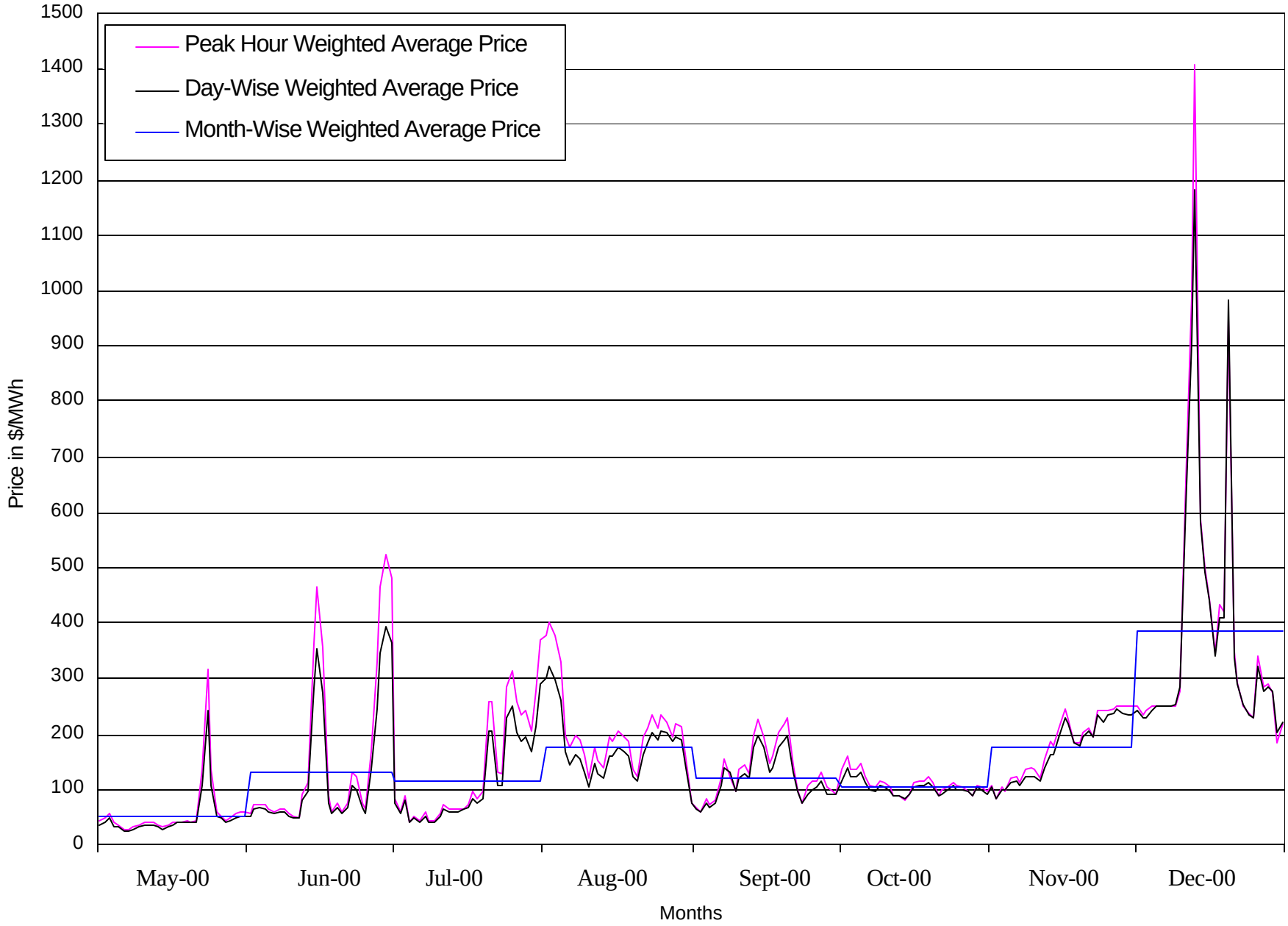
Average Market Power Markup and Percent of Wholesale Price in California

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)"


California Px Market: Day Ahead Weighted Average Prices
Price in $/MWH
450
400
350
300
250
200
150
100
50
0
50.394
132.387
115.302
175.763
119.633
103.235
173.108
385.602
May'00
Jun'00
Jul'00
Aug'00
Sep'00
Oct'00
Nov'00
Dec'00
Months

California Px Market: Day Ahead Prices

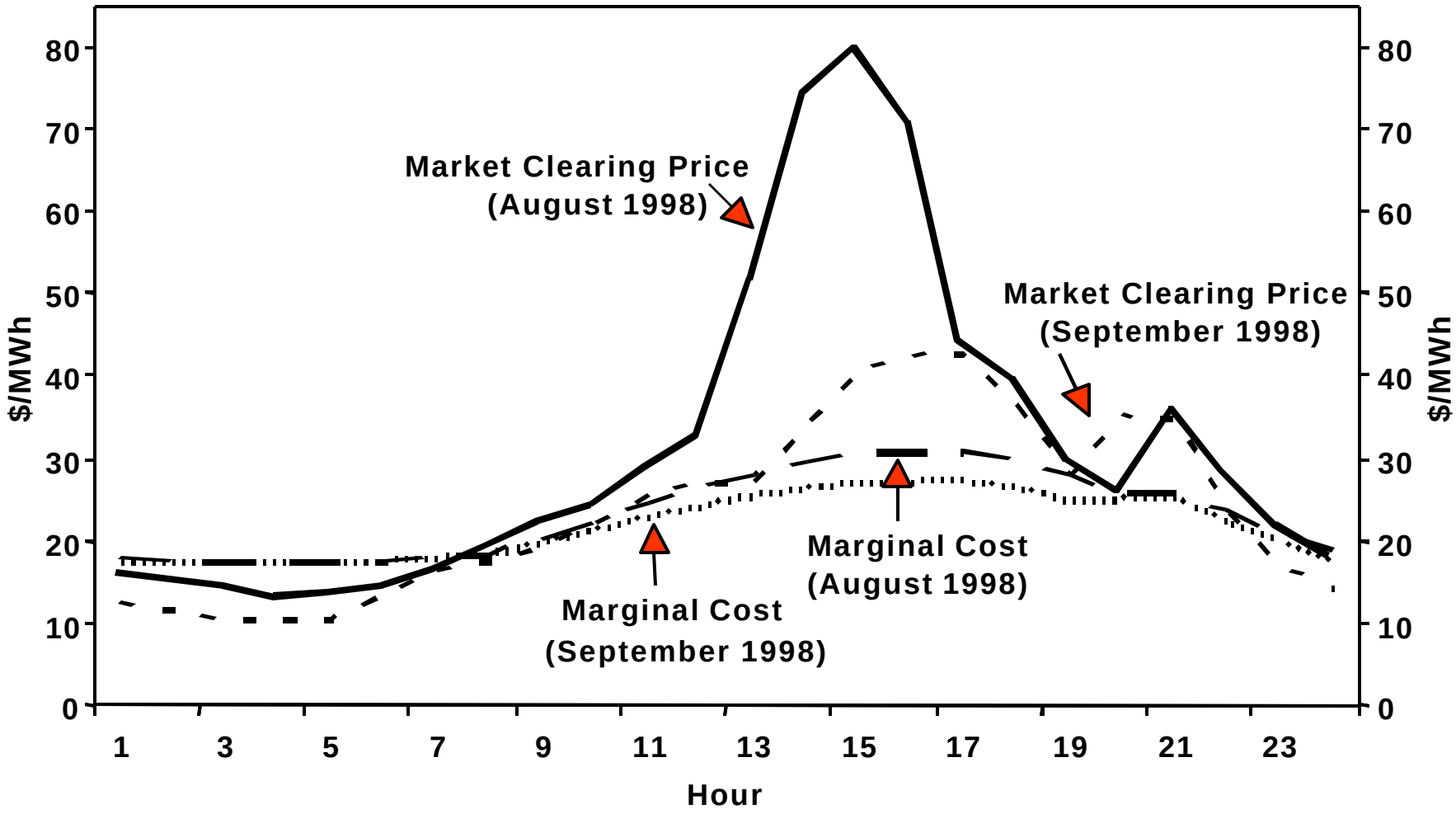


PJM "Storm Warning"*

- PJM's installed capacity (ICAP) market has shown signs of problems
- Prices have jumped from $3.74/mW-day in November and December 2000 to $181/mW-day earlier this year (for the first three months of the year, prices have been at or near the PJM capacity deficiency rate of $177/mW-day)
- 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: PennFuture, "E-cubed," Feb. 20 and April 5, 2001.

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.

New York

- New York (ConEd) had significant retail price increases because of higher wholesale prices
- New York City residential customer bills were 20.2% higher in June and 42.6% higher in July than the same months in 1999
- For 2000, customer bills were about 16% higher than 1999
- "Events" are under investigation in the New York ISO
- New York City area this summer? Some expect problems this summer, if temperatures are *normal*

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 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 when 5,965 MW was out of service -- a 83% relative increase
- These observations are not proof of market power, but suggests that careful monitoring is warranted