Synapse
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LMP Electricity Markets:
Market Operations, Market Power, and Value for Consumers

EMRI Symposium

American Public Power Association

February 5, 2007

Presented by Ezra Hausman and Robert Fagan

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Relatively Weak, Short-Term Price Signals for Consumers who Can't Respond and Producers who would Prefer Not To

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Overview of Synapse LMP Report

SECTION I – LOCATIONAL MARGINAL PRICING

…how it is supposed to work

SECTION II – PRICE SIGNALING

…what it is supposed to do

SECTION III – COMPETITIVENESS AND MARKET POWER

…who makes the money

SECTION IV – IMPACTS ON CONSUMERS

…and who pays the price

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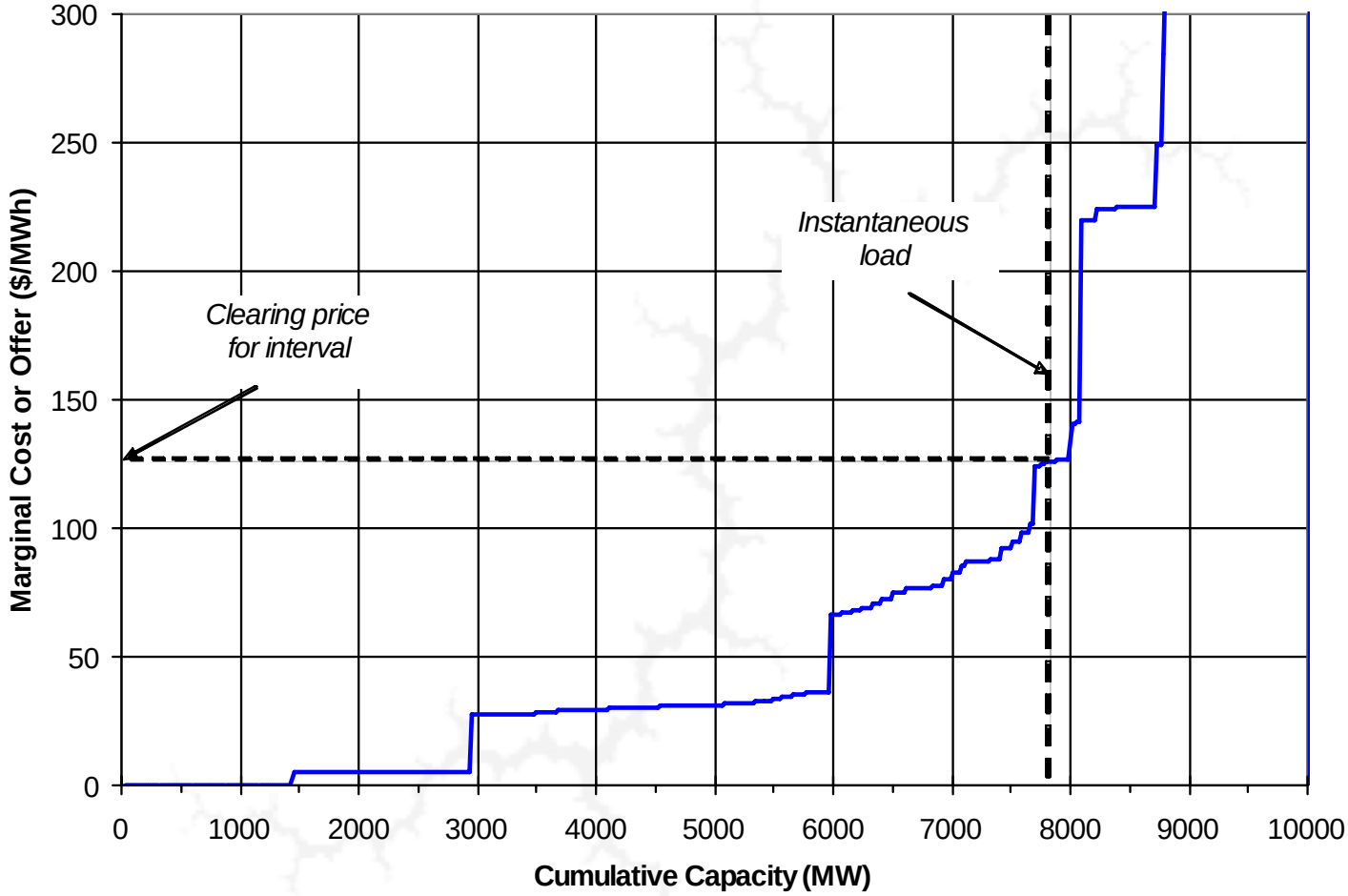
LMP: Single Clearing Price Markets



Rule: *Dispatch the cheap stuff first.*

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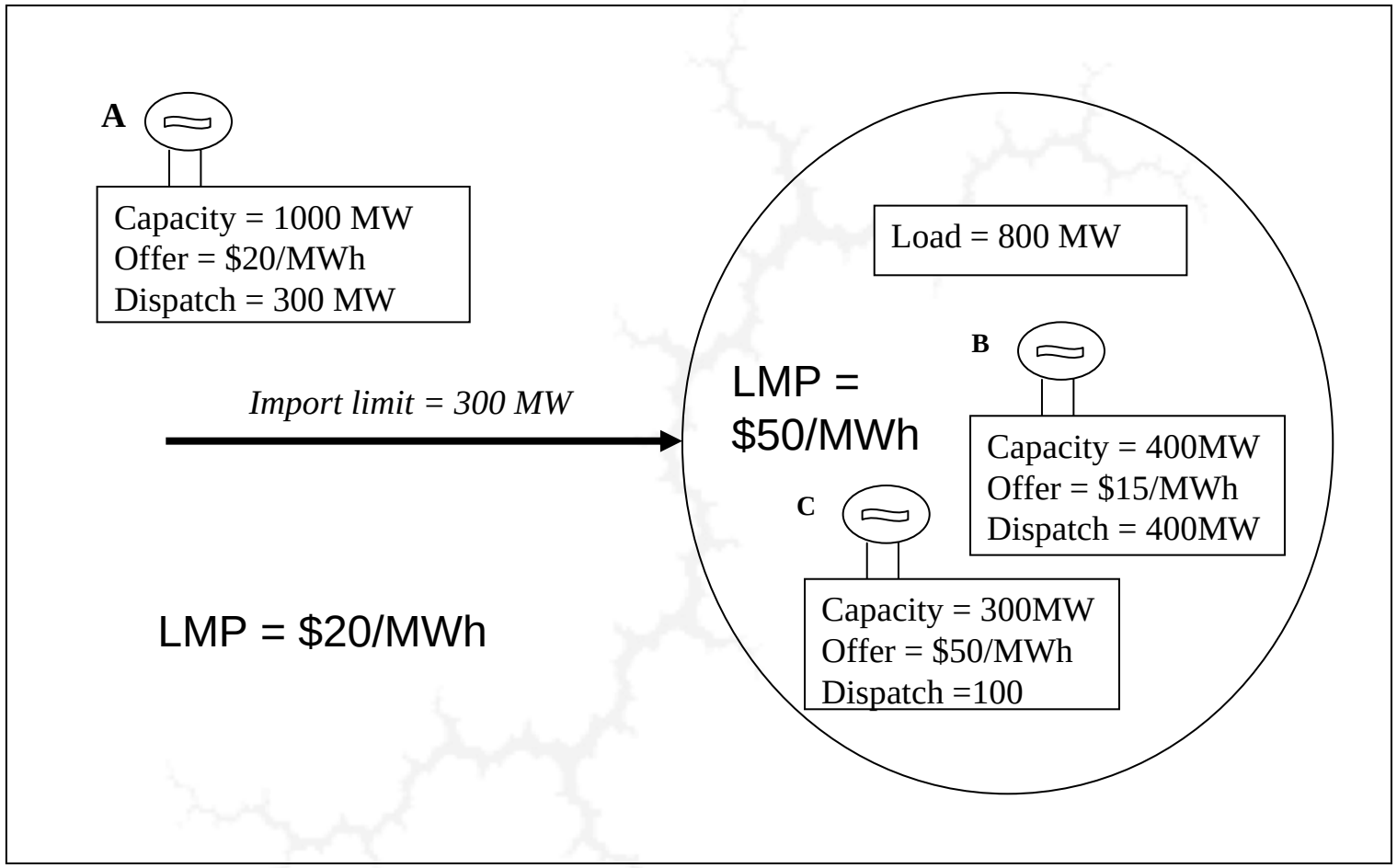
LMP: Locational Clearing Price Example



Rule: Dispatch the cheap stuff first…

…subject to transmission constraints

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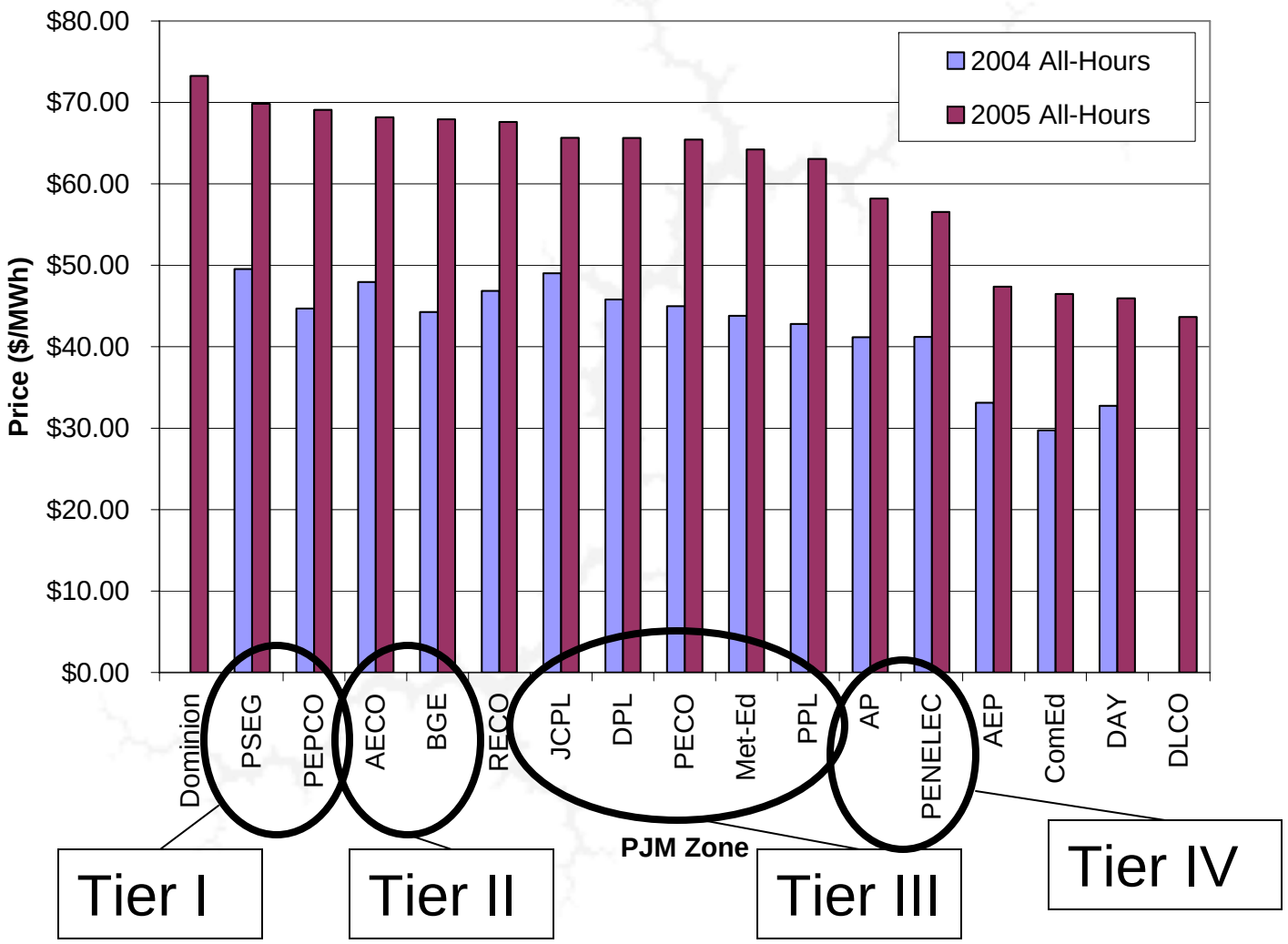
LMP Price Signaling



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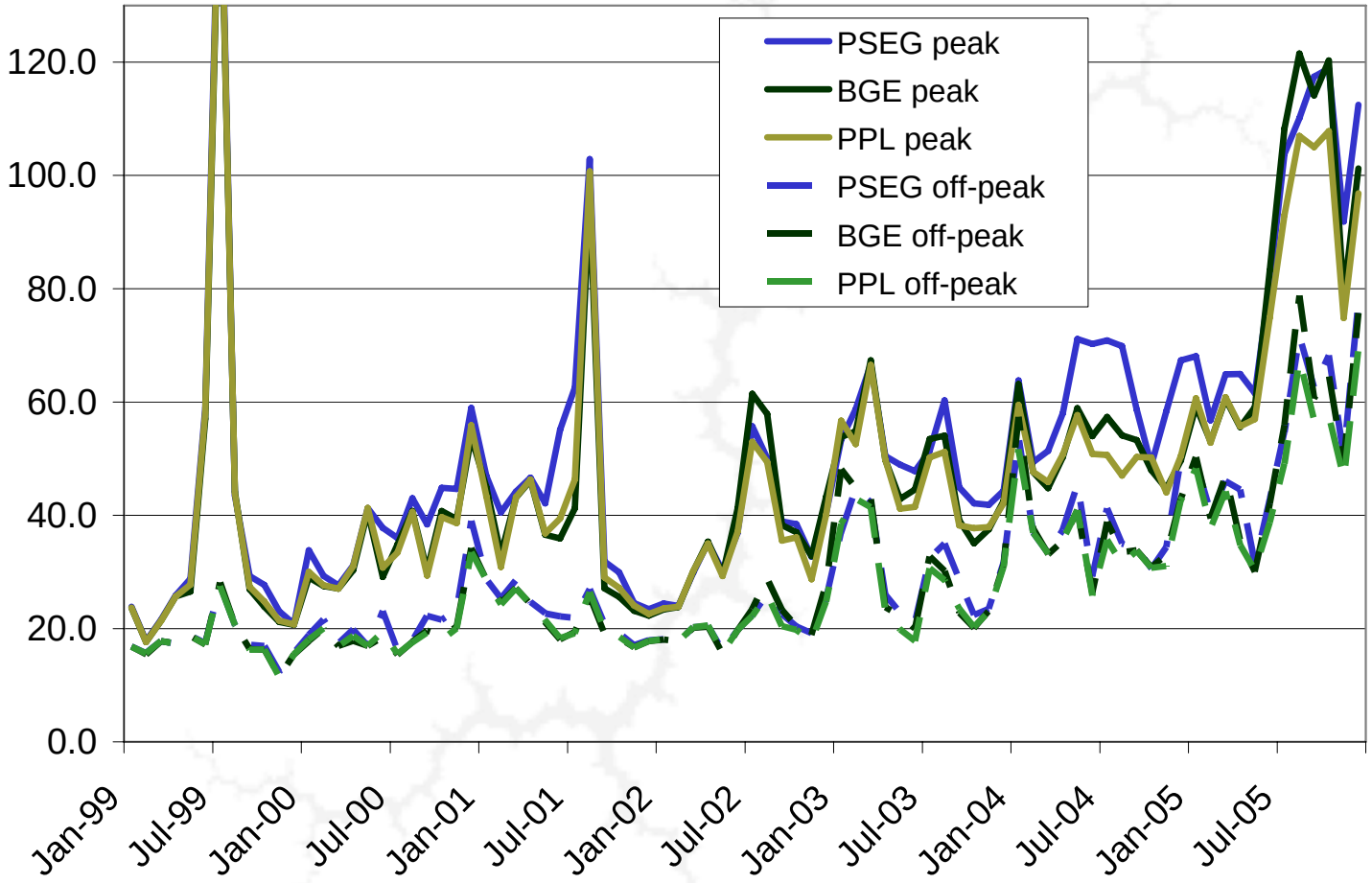
LMP Price Signaling



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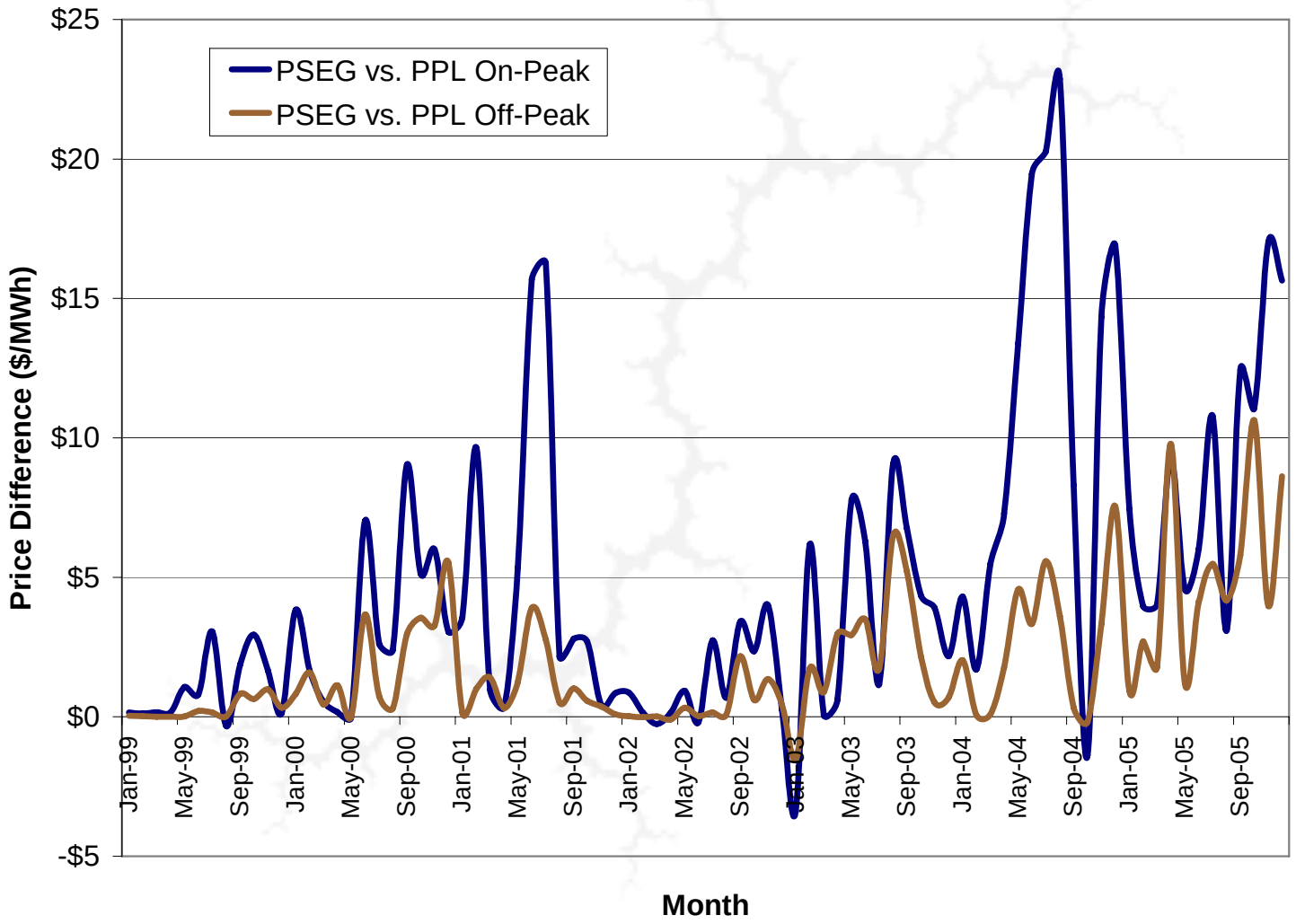
LMP Price Signaling



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LMP Price Signaling

We reviewed the response in terms of…

- Generation New Entry
- Generation Retirement
- Merchant Transmission
- Demand Response

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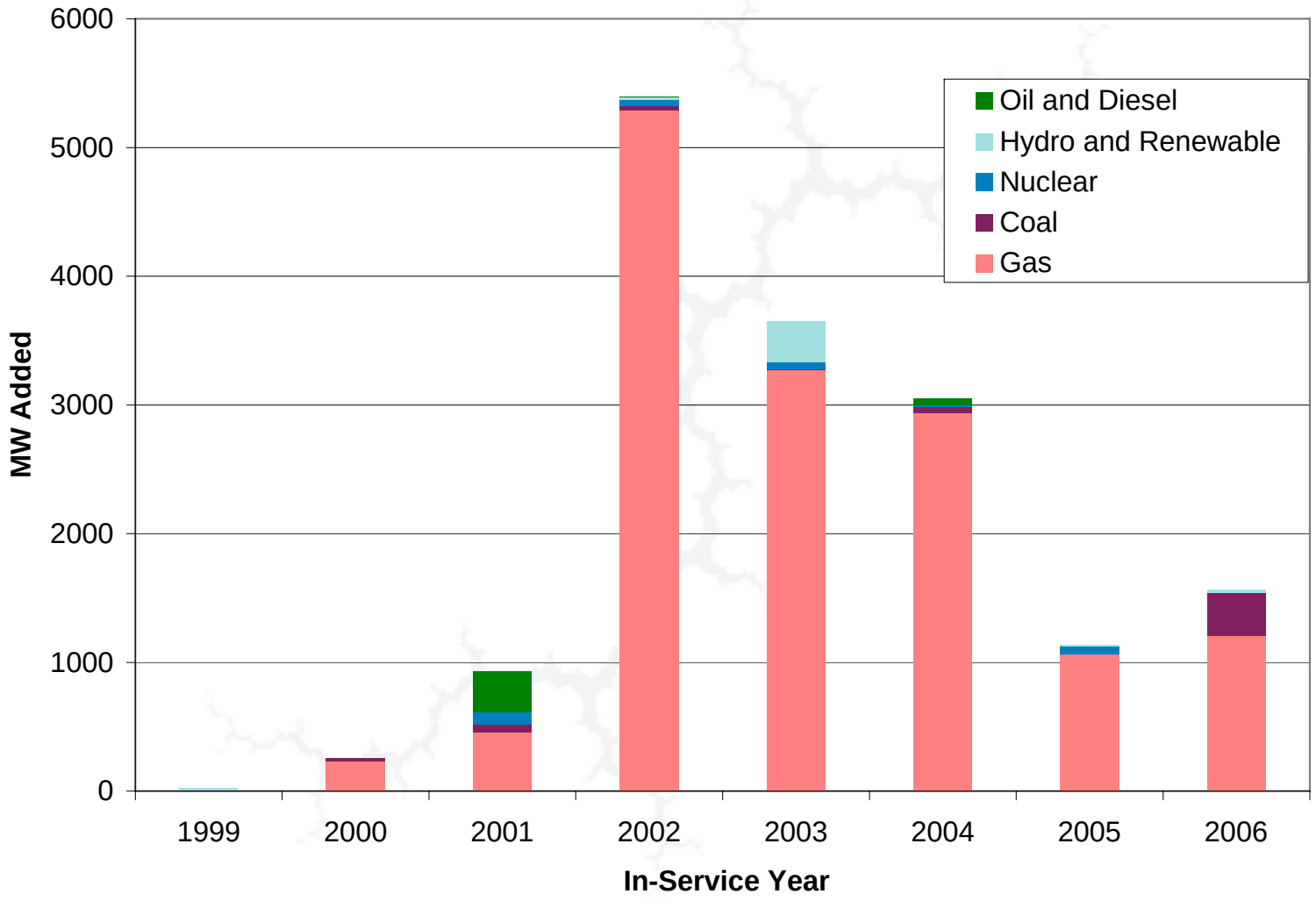
LMP Price Signaling: New Generation



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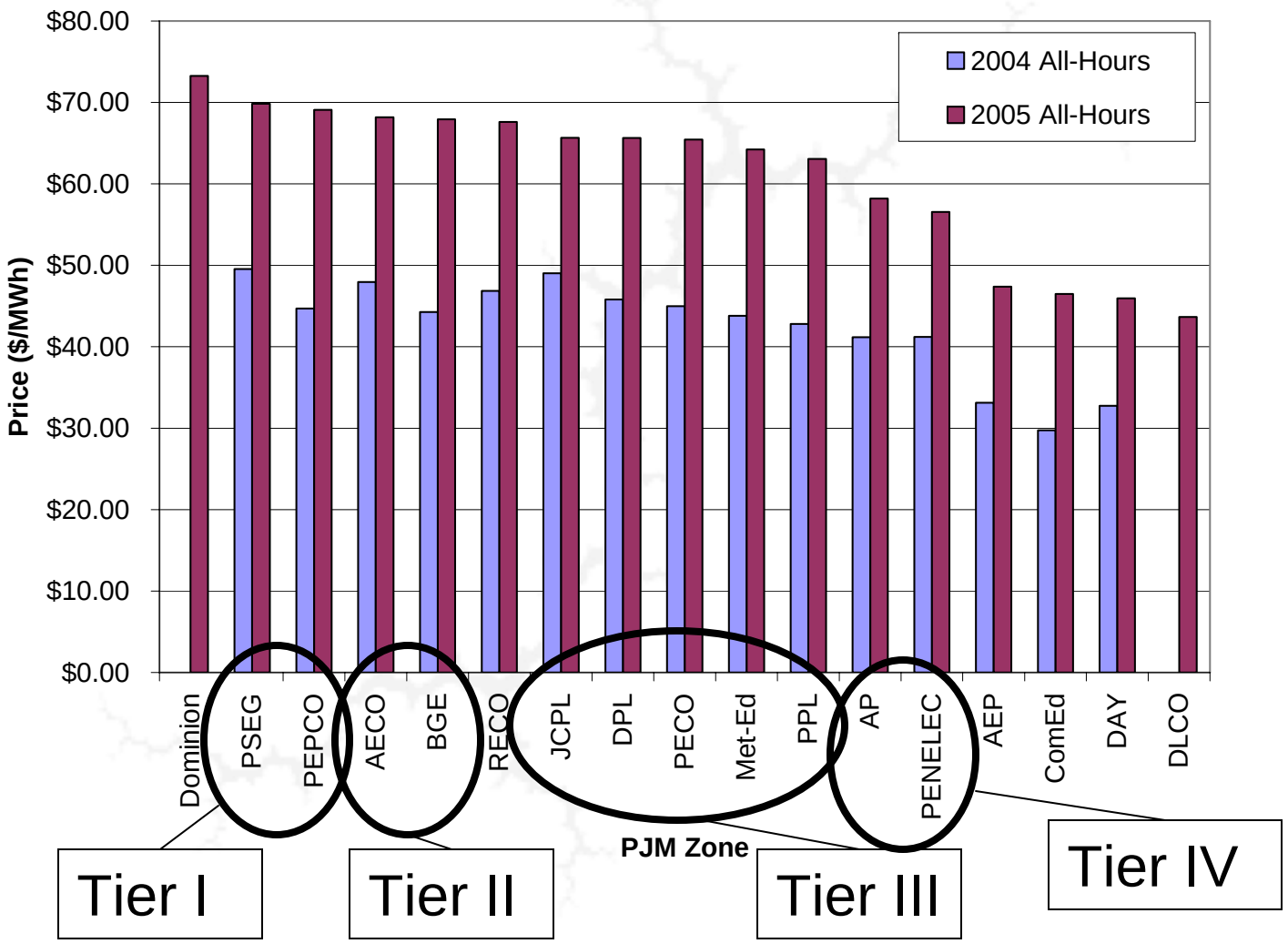
LMP Price Signaling



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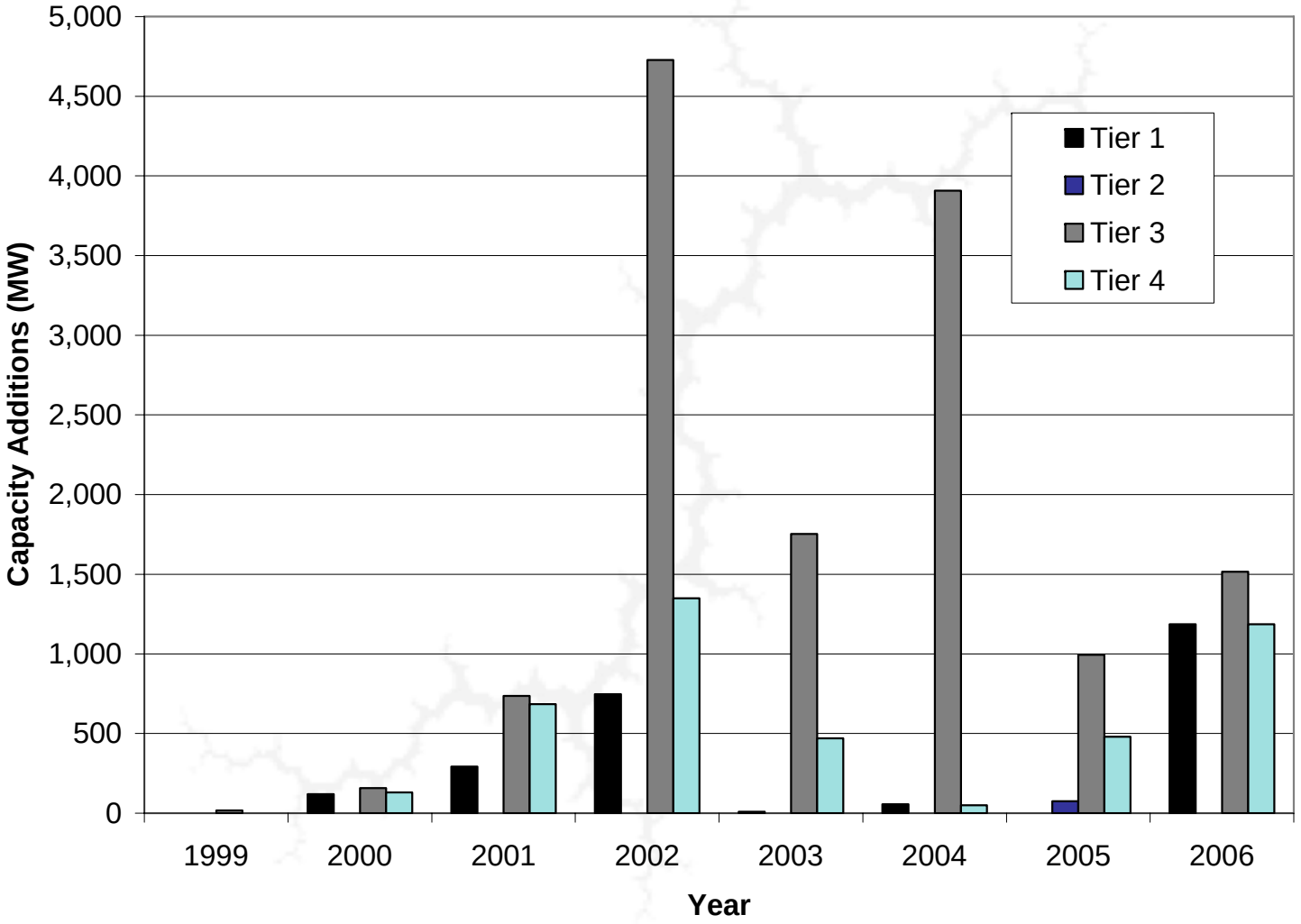
LMP Price Signaling: New Generation



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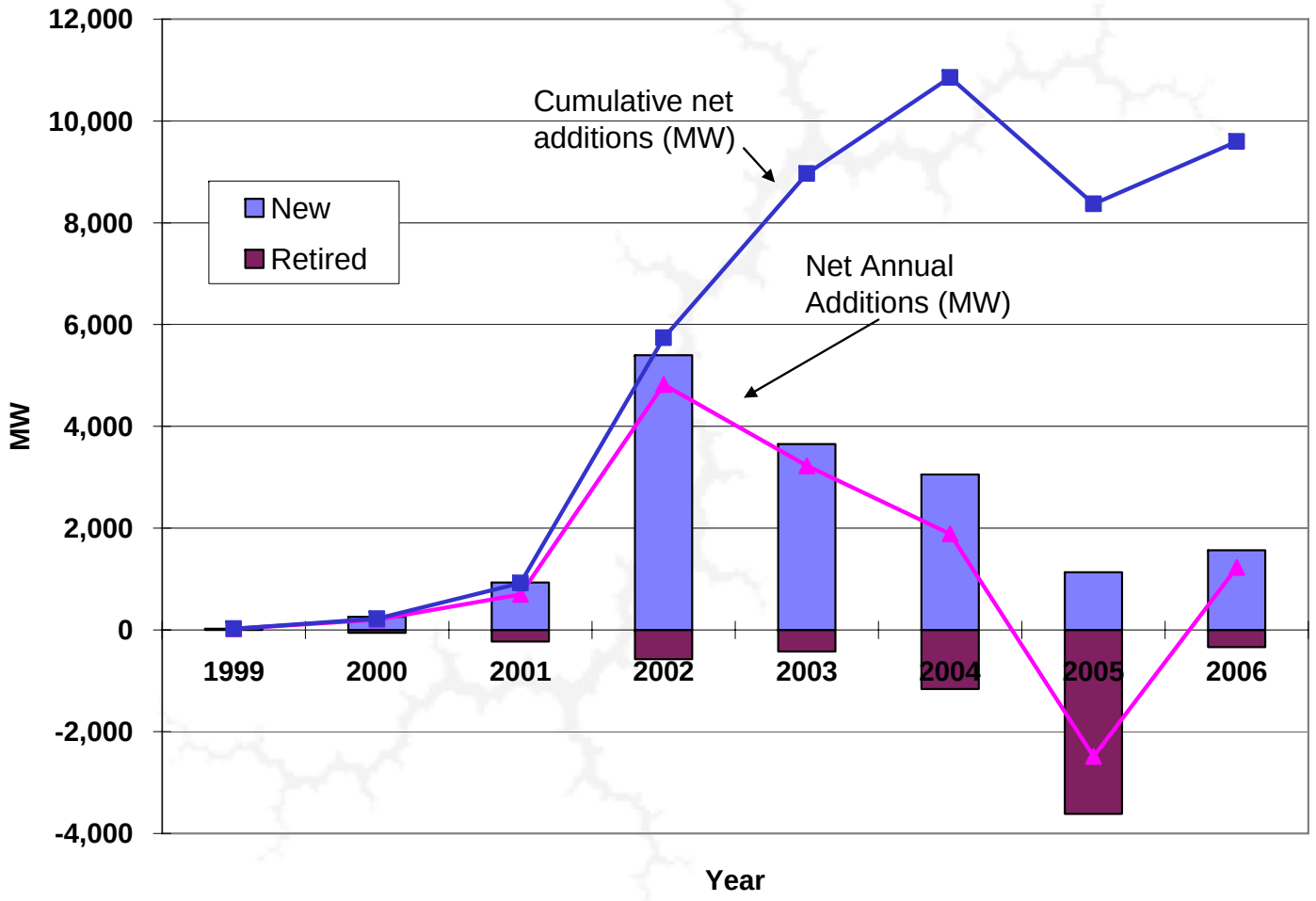
LMP Price Signaling: Retirements



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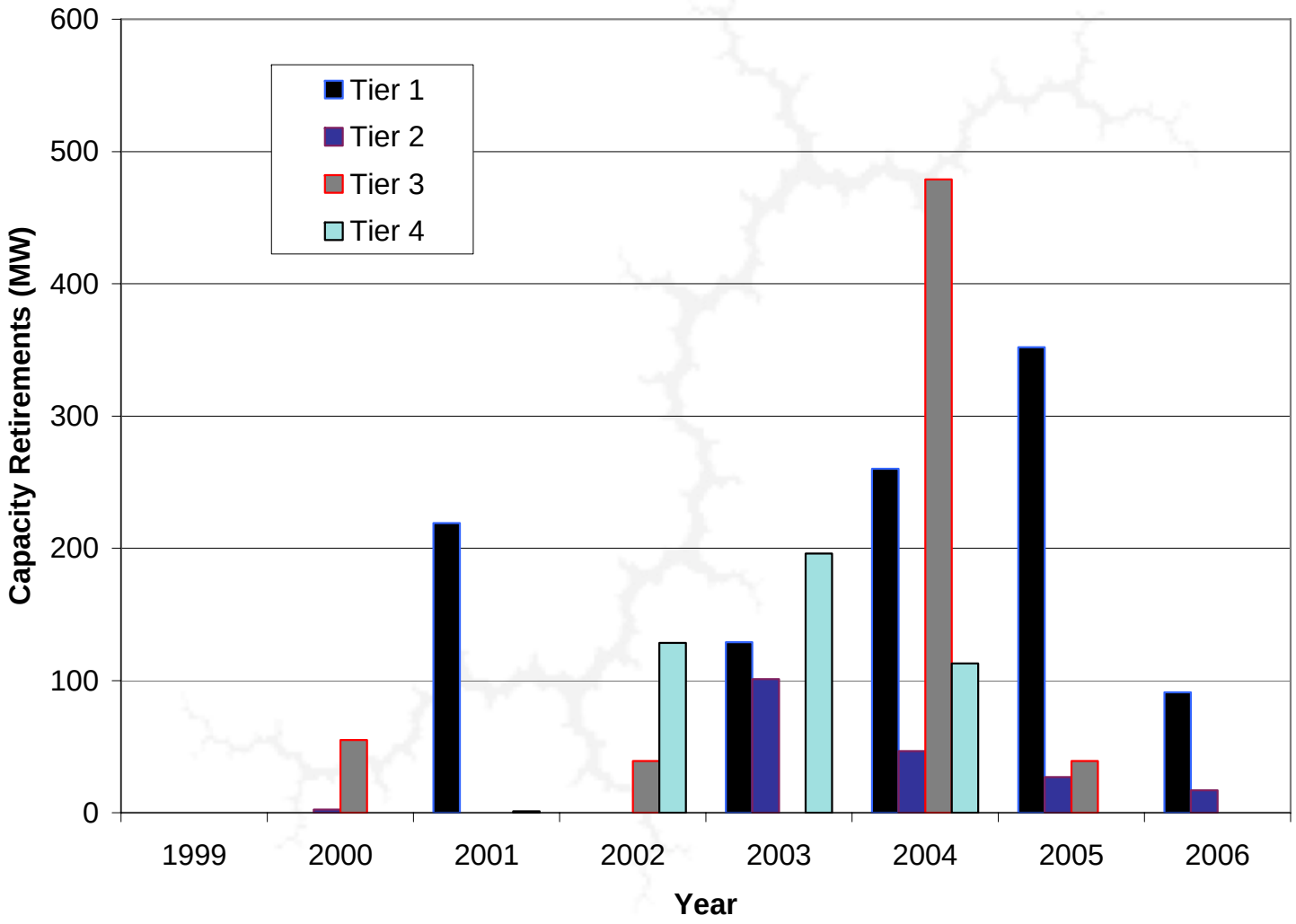
LMP Price Signaling: Retirements



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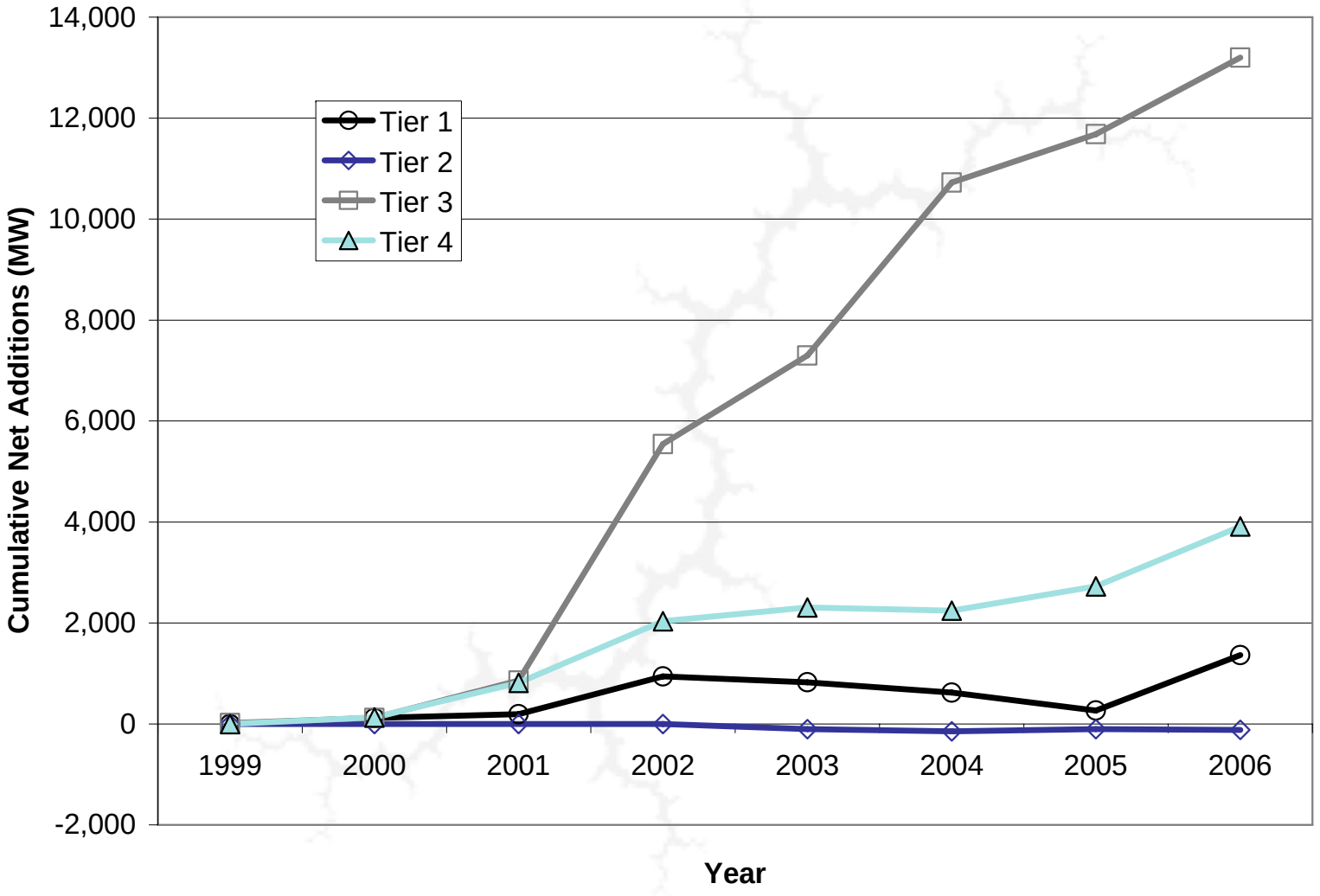
LMP Price Signaling: Net new entry



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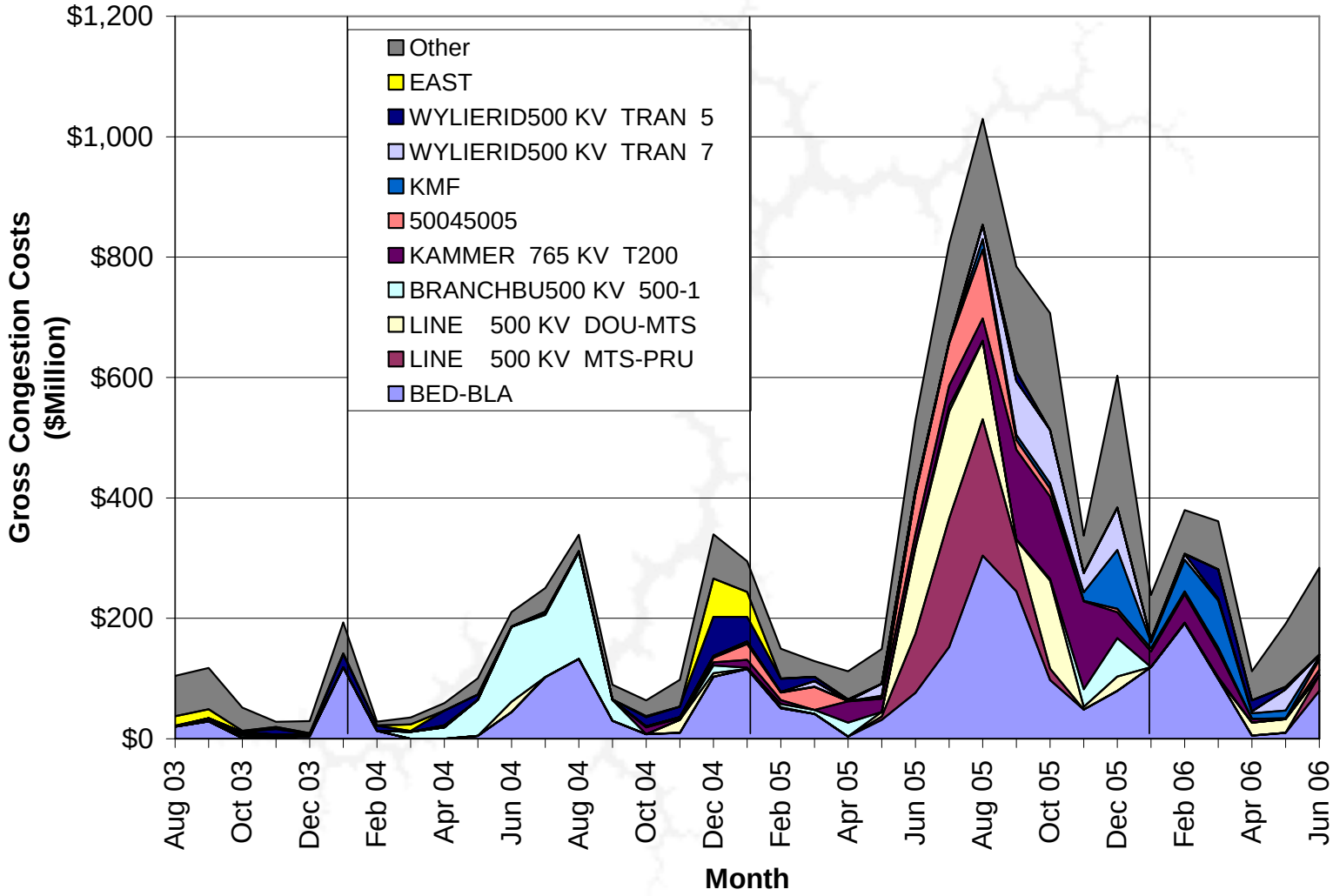
LMP Price Signaling: Congestion Costs



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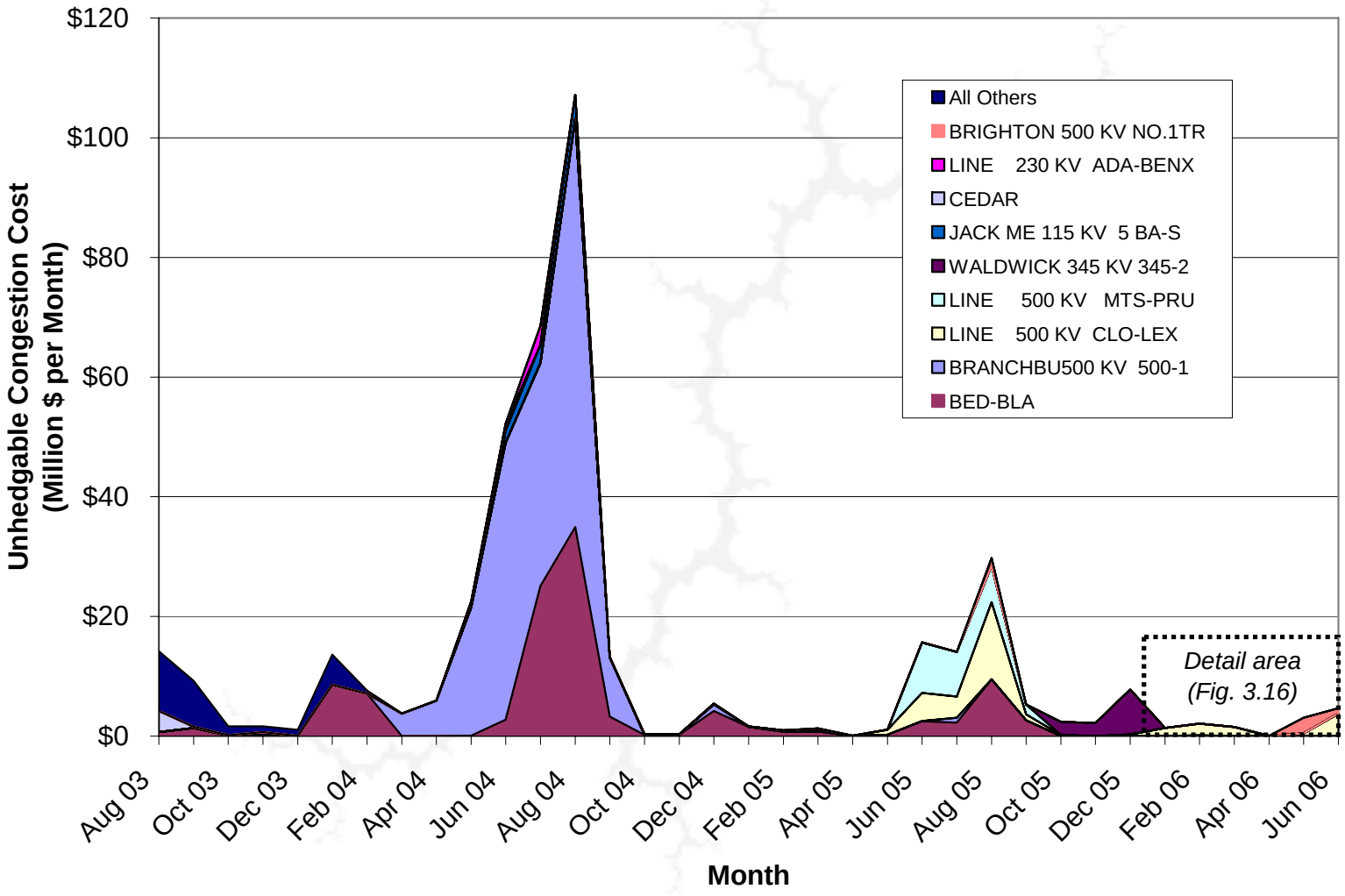
LMP Price Signaling: Congestion Costs



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LMP Price Signaling: Merchant Transmission

From PJM RTEP (April 2006):

2.4: Merchant Transmission Activity

Once thought to offer a long-term solution to long distance transmission needs, few merchant transmission proposals have emerged. Financing has proven difficult for projects given uncertain revenue streams in part the result of insufficient subscription up front. Further, the difficulties, risks and realities associated with securing rights-of-way and environmental clearances have also had a dampening effect on the emergence of long distance proposals.

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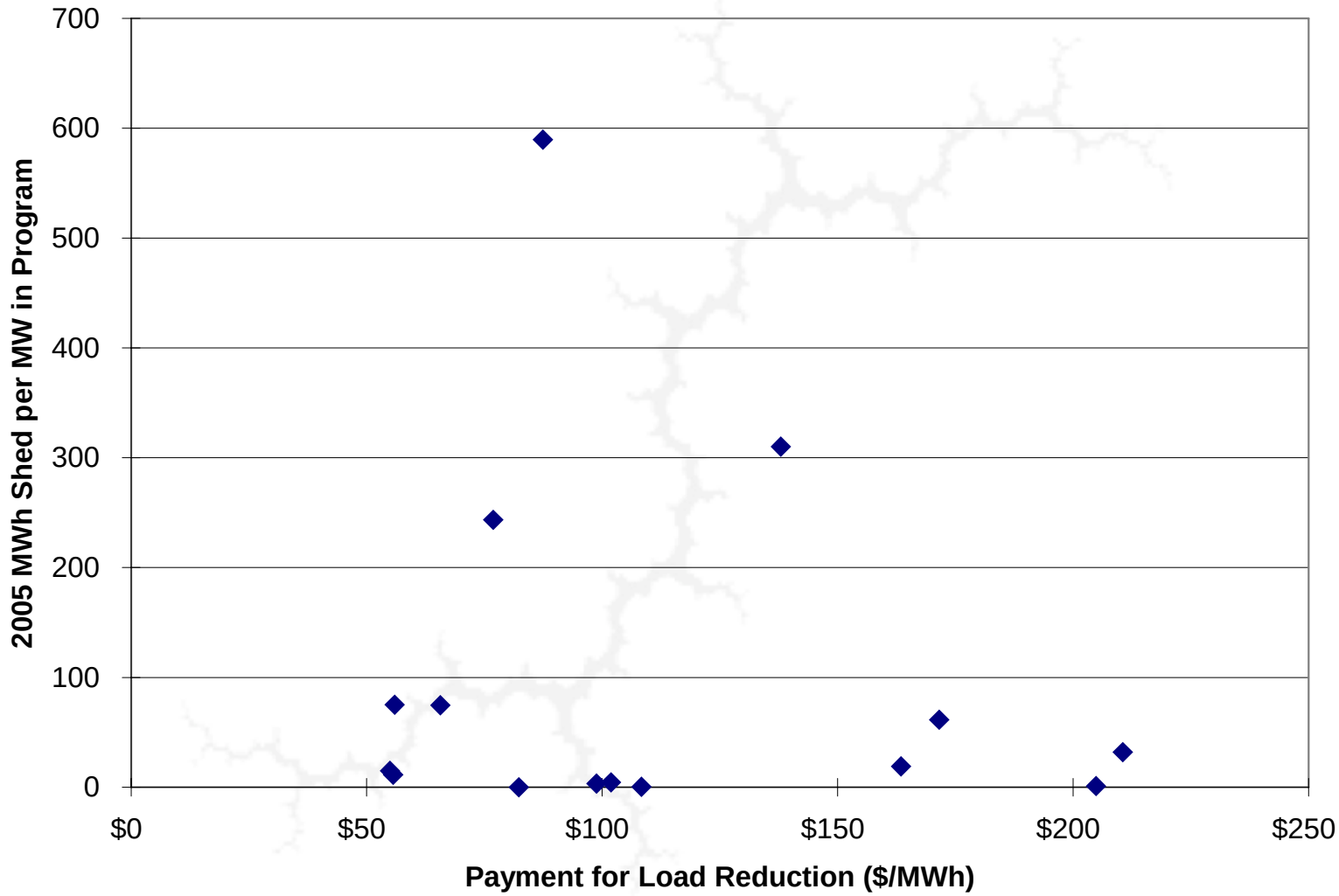
LMP Price Signaling: Demand Response



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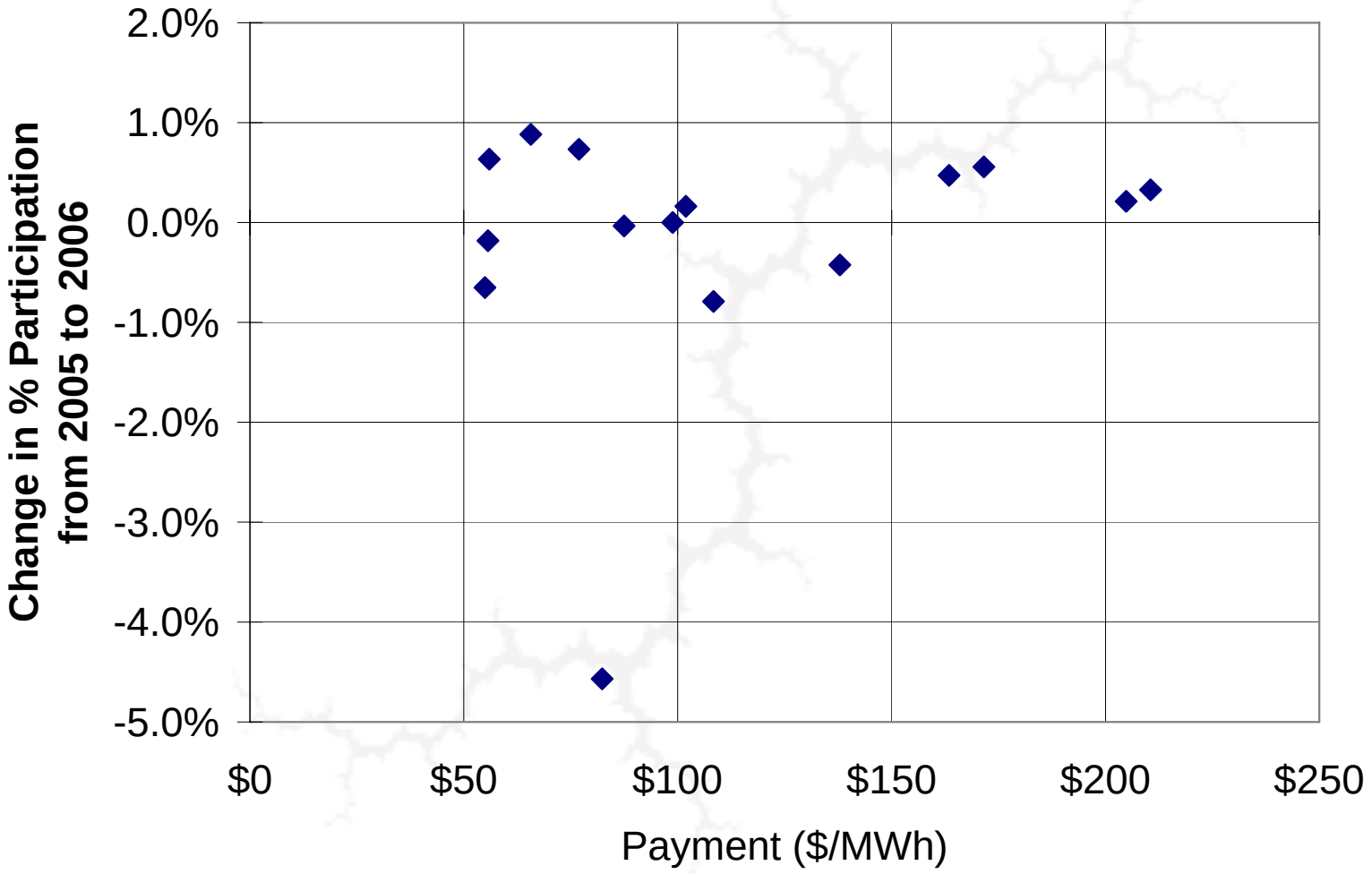
LMP Price Signaling: Demand Response



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LMP Price Signaling: Why doesn't it work?

- Short-term and volatile nature of price signals
- More compelling reasons for choosing sites, such as access to existing infrastructure, zoning restrictions, and local opposition.
- The lumpy nature of infrastructure investments
- Investments may curtail or eliminate the price signal
- Prices reflect bids, not cost
- Free riders
- No certainty of return on investment
- Relatively Weak, Short-Term Price Signals for Consumers who Can't Respond and Producers who would Prefer Not To

Is RPM the answer?

(RPM = Rate Payers' Money…)

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Competitiveness and Market Power in LMP RTOs

- Overview
- PJM Market Structure, Conduct, Performance
- PJM Monitoring / Mitigation
- Quantitative Analysis of Bid (Offer) Data in PJM and ISO NE

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Competitiveness and Market Power in LMP RTOs - Overview

- Competitiveness
  - Prerequisites: low supplier concentration, ease of entry, elastic demand, transparent information, foresight
  - These are not attributes of the electricity “marketplace”
  - Result: need for regulatory oversight, and/or mitigation
- Market Power
  - Supplier concentration
  - Demand elasticity
  - Product and geographic markets: energy, capacity, local constraint relief
- Market Monitoring and Mitigation
  - Present in all LMP RTOs, for spot markets

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Competitiveness and Market Power in LMP RTOs - PJM 2005 (after 5/1) Structural Concentration

- Low-to-moderate aggregate market concentration (low HHI), but averages mask locational, temporal, segment deviations

  HHIs (PJM SOM 2005):

  – Energy, Aggregate, 855-1565, average=1200

  – Energy, by Segment (base, intermediate, peak), 717-10,000, average= 1362/2793/4437

  – Capacity, 896-917

- Very high concentrations in local market power areas

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Competitiveness and Market Power in LMP RTOs – PJM Concentration - Select Constraints

- Supplier HHI "behind" constraint – local market power

Region or Interface	Constraint	HHI
PSEG	Roseland-Cedar Grove	8198
	Branchburg transformer	2998
Eastern interface	-	1575
AECO	Laurel-Woodstown	9012
PENELEC	Erie West transformer	3306
PECO	Chichester-Linwwood	2988
AEP	Cloverdale-Lexington	1078
	Kanawha R-Matt Funk	1066
	Mahans Lane-Tidd	10000
AP	Mitchell-Shepler Hill	10000
	Mt. Storm-Pruntytown	1048
	Bedington-Black Oak	1083
Western interface	-	1130

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Competitiveness and Market Power in LMP RTOs – PJM Conduct / Performance

- Conduct: Offer prices above marginal cost

Lerner Index			
Year	**PJM Raw**	**PJM Adjusted**	**ISO NE**
2002	2.0 %	11.0 %	
2003	3.0 %	12.0 %	9 %
2004	3.4 %	8.4 %	3 %
2005	0.3 %	3.9 %	6 %

Sources: PJM State of the Market Reports for 2005, 2004, 2003 and 2002; ISO NE 2005 Annual Markets Report

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Competitiveness and Market Power in LMP RTOs – PJM Monitoring / Mitigation

- Monitoring
  - Spot markets monitoring
  - Bilateral market: no public data akin to analysis in State of the Market reports
- Mitigation
  - $1,000/MWh Offer Cap (unconstrained system)
  - Marginal cost + 10%, local market power (constrained system)
  - Local market power: three pivotal supplier test used
  - Exemptions from offer cap

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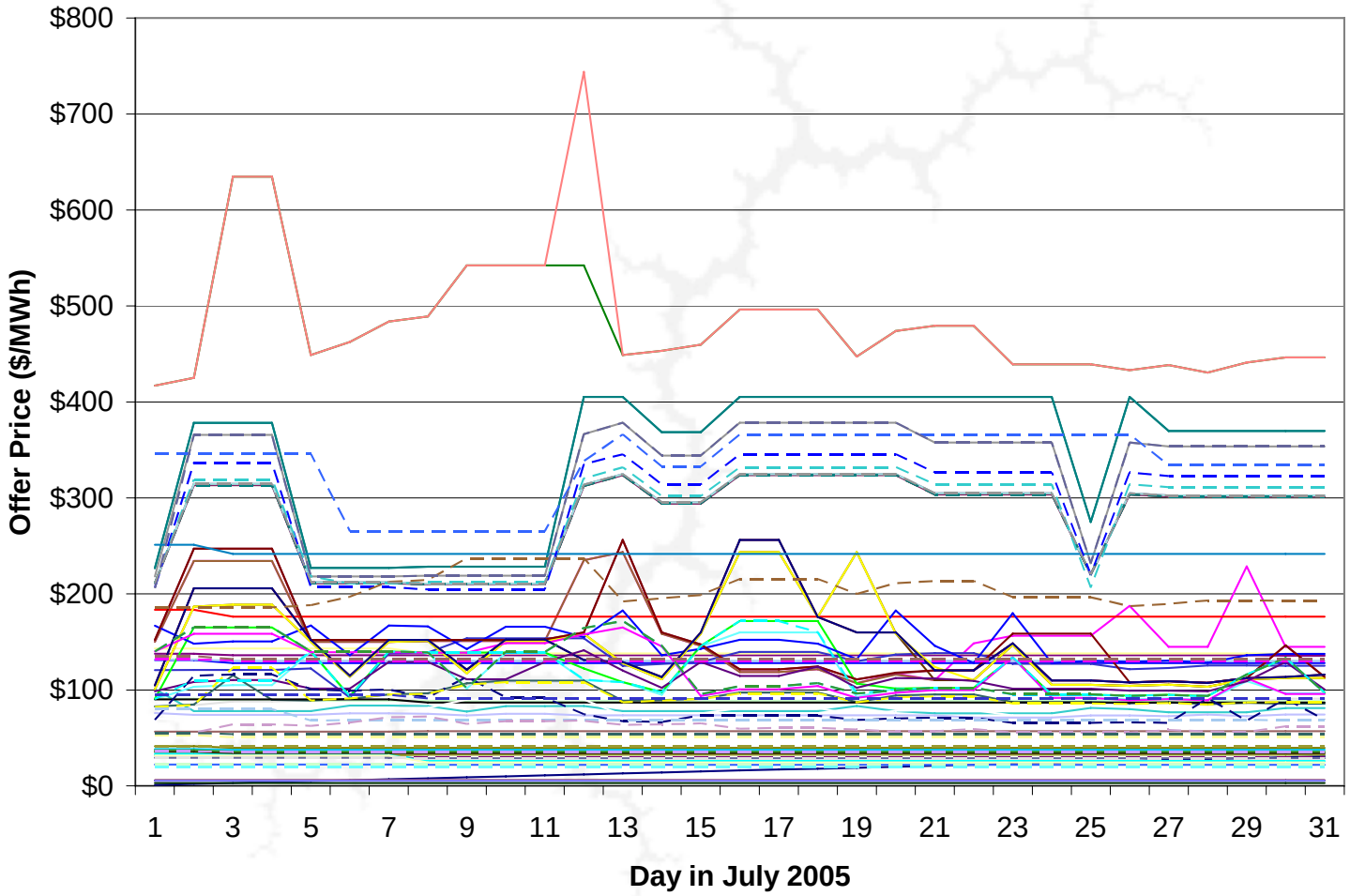
Single Company "E1" Offer Data – PJM – by day, July 2005



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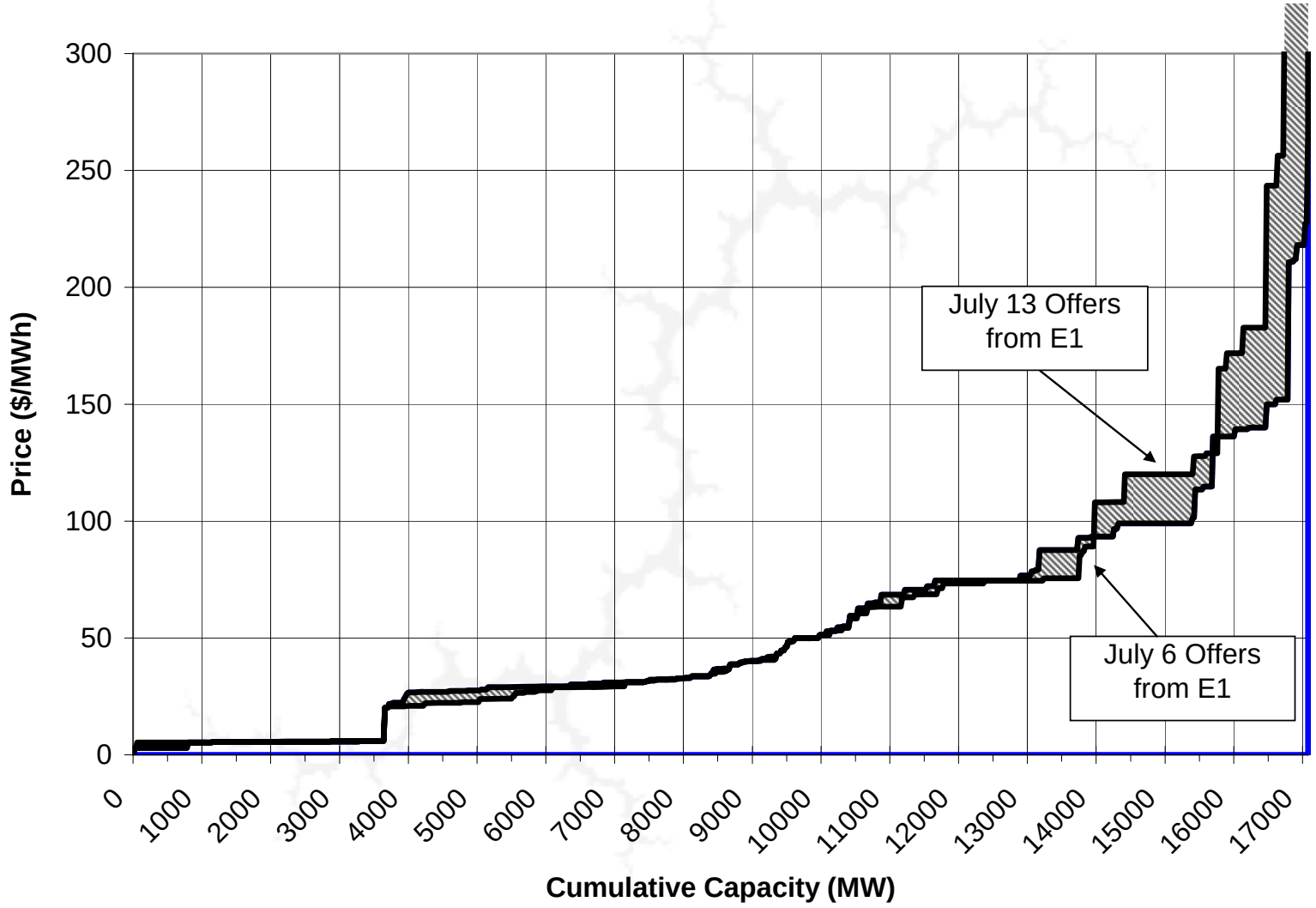
Single Company "E1" Portfolio – Offer Curve Comparison



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Concluding Thoughts

What elements will impact consumers?

- RGGI, other state policy
  - Considerably increased energy efficiency
- State level procurement changes
  - Greater use of long-term contracting
- Transmission Improvements
  - RTEP, Economic
  - Reduced congestion
- Locational capacity markets
  - Will the incentives work? Lessons from LMP

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Thank you…

Invaluable assistance from Synapse staff:

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Elise Caplan and John Kelly

THANK YOU!

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