The Reliability Pricing Model: Ensuring Adequate Supplies of Electricity

Tom Welch
Springfield, Illinois
December 1, 2005

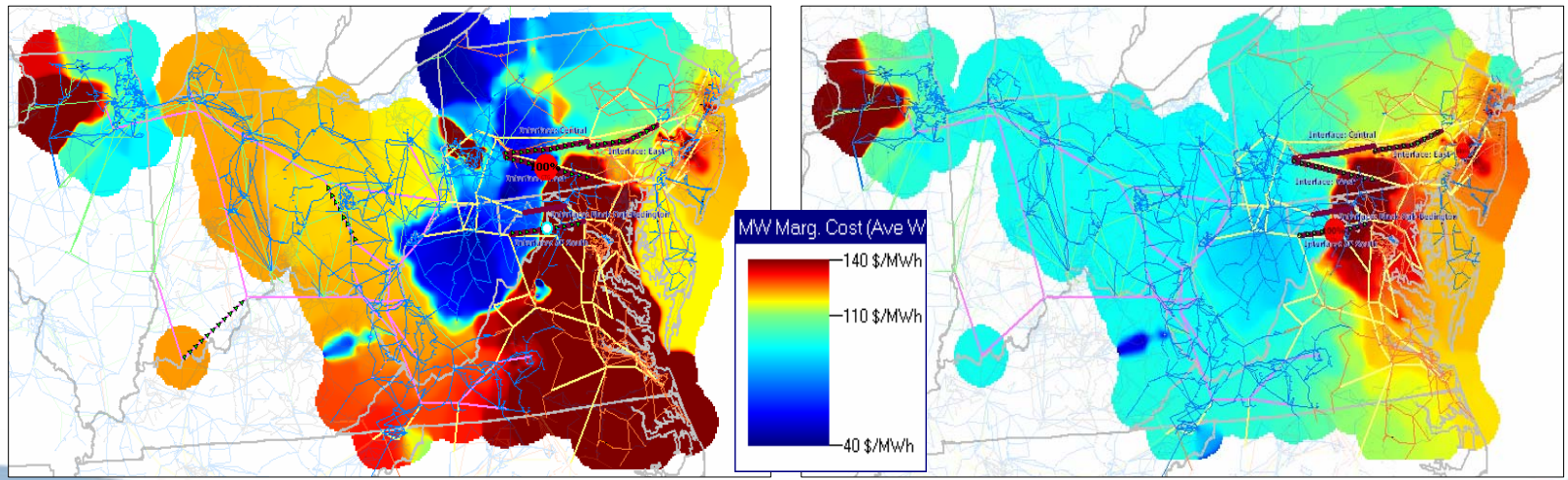
- The Value of Markets
- The Problem to Solve
- The Reliability Pricing Model

©2004 PJM

- Lower energy prices across the expanded PJM region
  - ESAI's technical study: region-wide energy price without integration would be $0.78/MWh higher in 2005 than with integration.
  - Spreading these savings over the total PJM RTO's energy demand of 700 terawatt-hours (TWh) per year yields aggregate savings of over **$500 million per year**.

Pre-Integration Price Pattern

Post-integration Energy Price Pattern

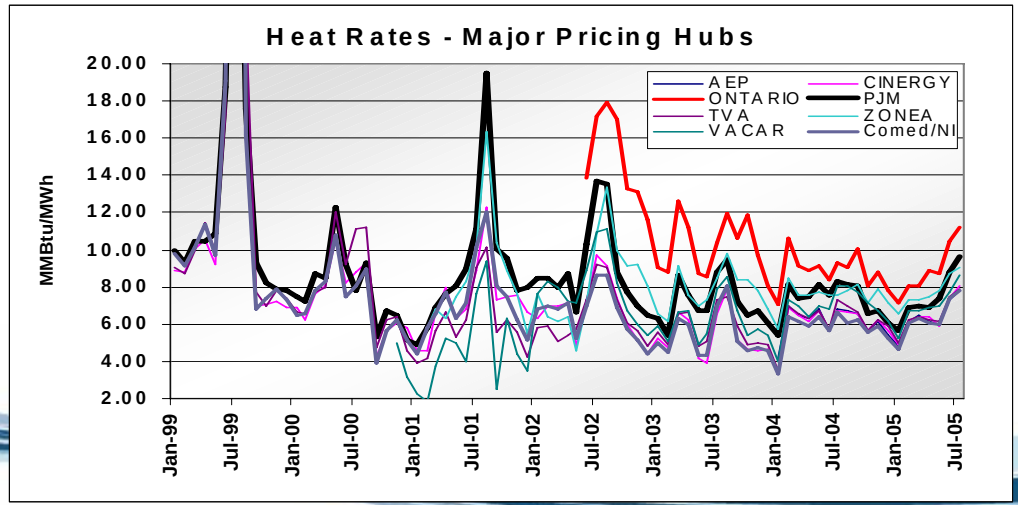


©2004 PJM

- Heat rates decline
  - Provides fuel adjusted measure of efficiency
  - Equivalent heat rate at Western Hub reduced

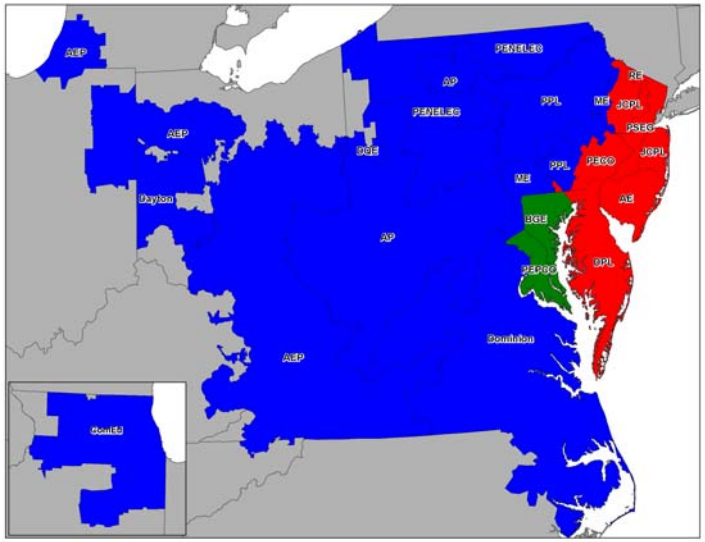
    from 11 MMBTU/ MWh in 1999

    to 7.3 MMBTU/MWh in 2004

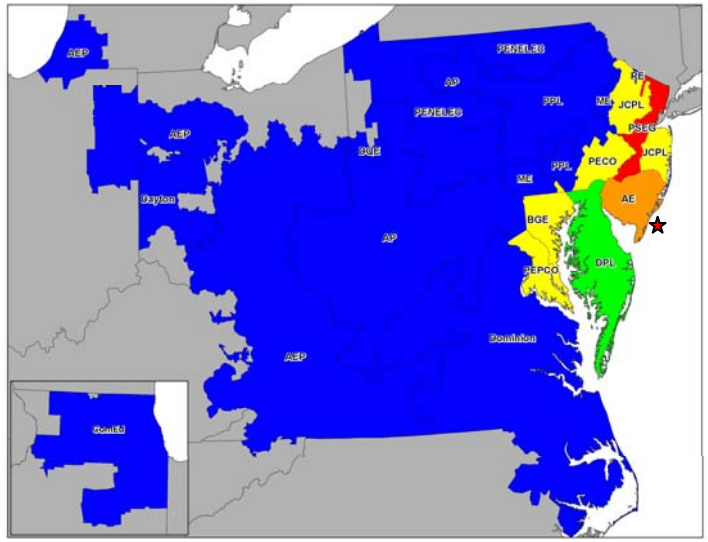


RPM Simulation results

May 2007 – June 2008



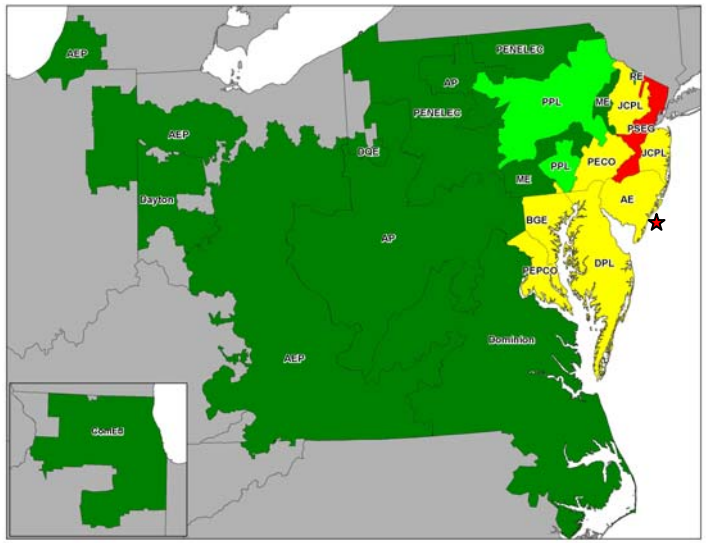
May 2008 – June 2009



Value of Capacity ($/MW-day)

- $20 - $39 =
- $40 - $59 =
- $60 - $79 =
- $80 - $99 =
- $100 - $119 =
- $120 - $139 =
- $140 - $159 =

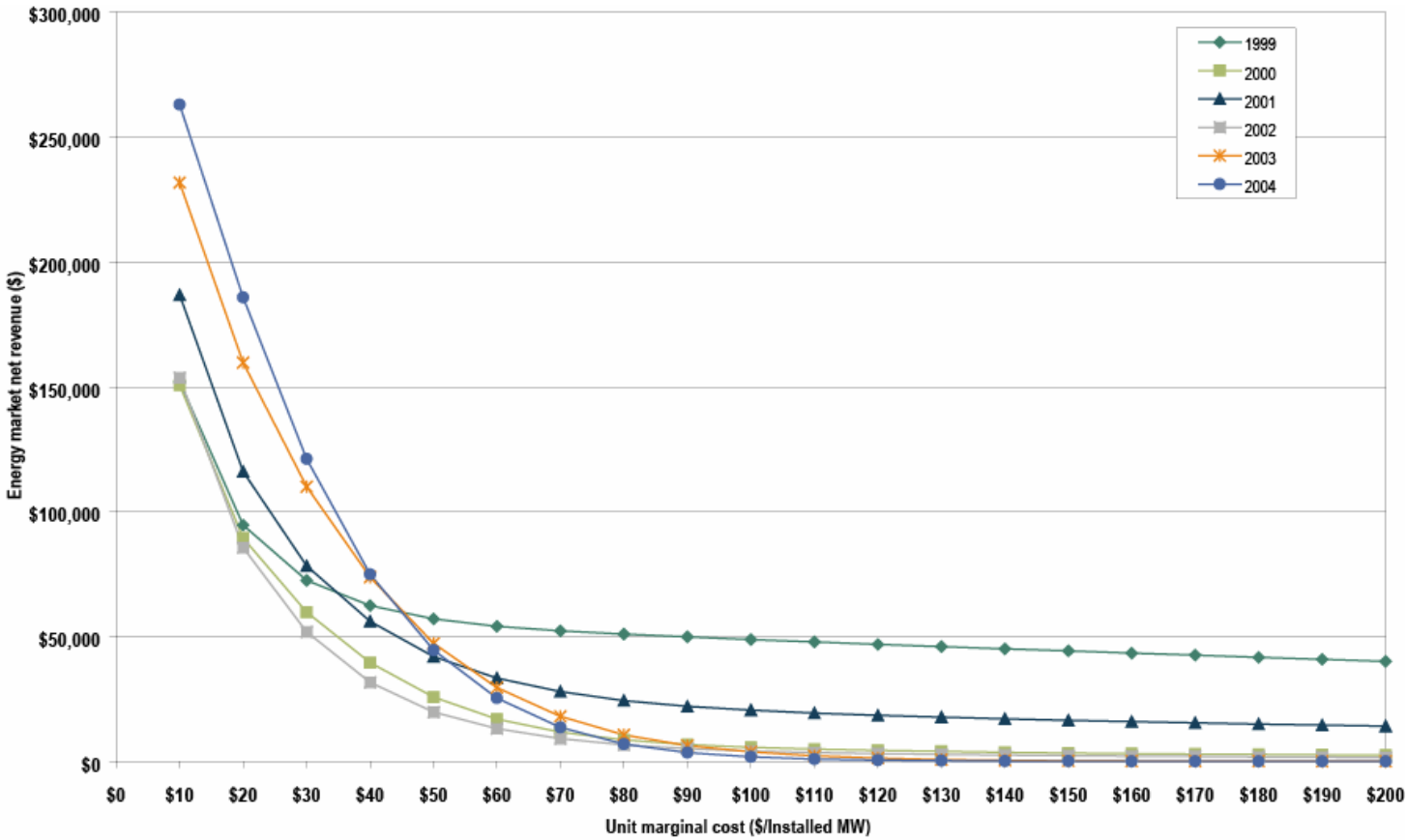
May 2009 – June 2010



★The increase Capacity Import Capability into Southern NJ is due to Transmission upgrades effective May 2009

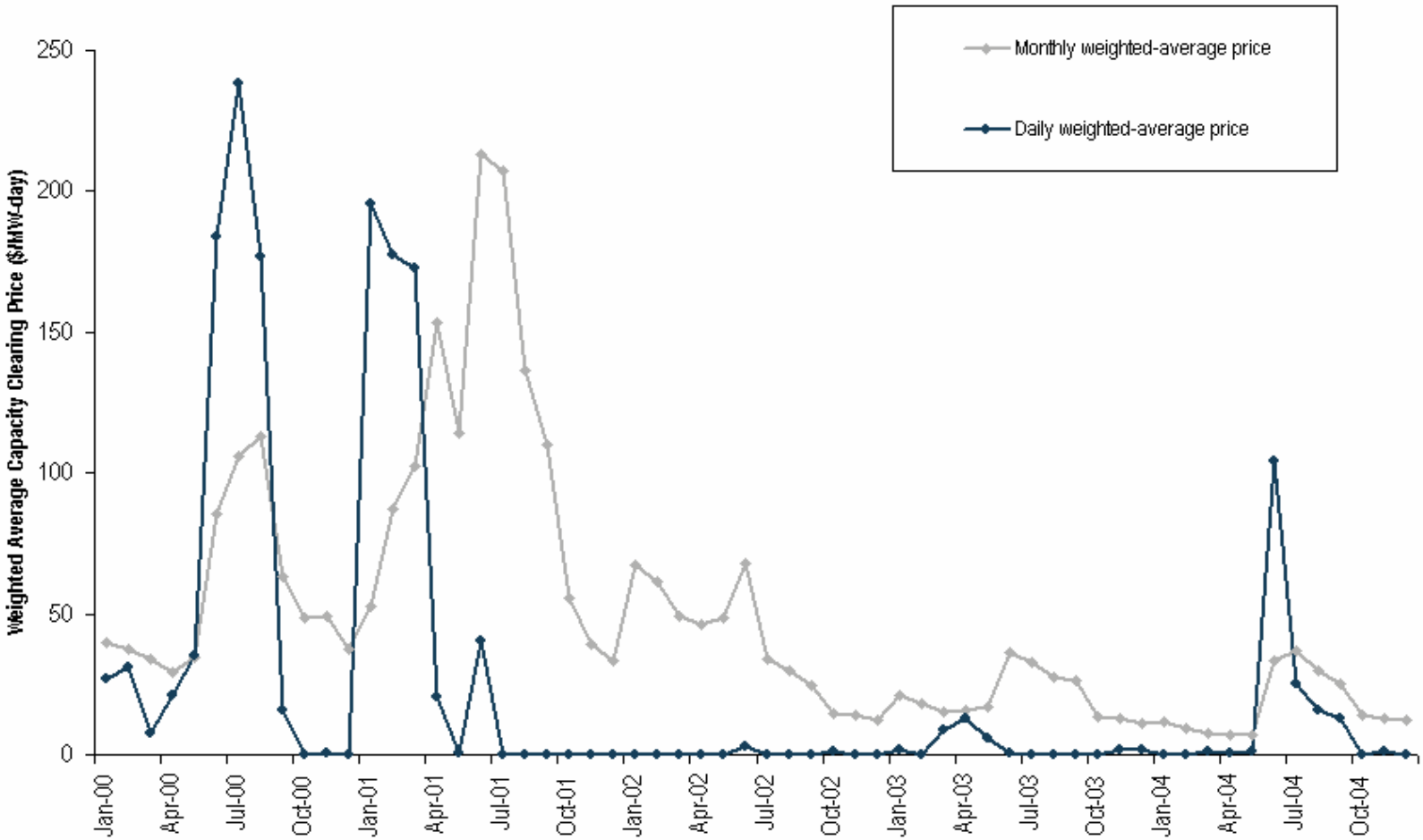
©2004 PJM

PJM energy market net revenue by unit marginal cost: Calendar years 1999 to 2004
Source: PJM MMU 2004 State of the Market



©2004 PJM

PJM Daily and Monthly Capacity Credit Market (CCM) performance: Calendar years 2000 to 2004
Source: PJM MMU 2004 State of the Market

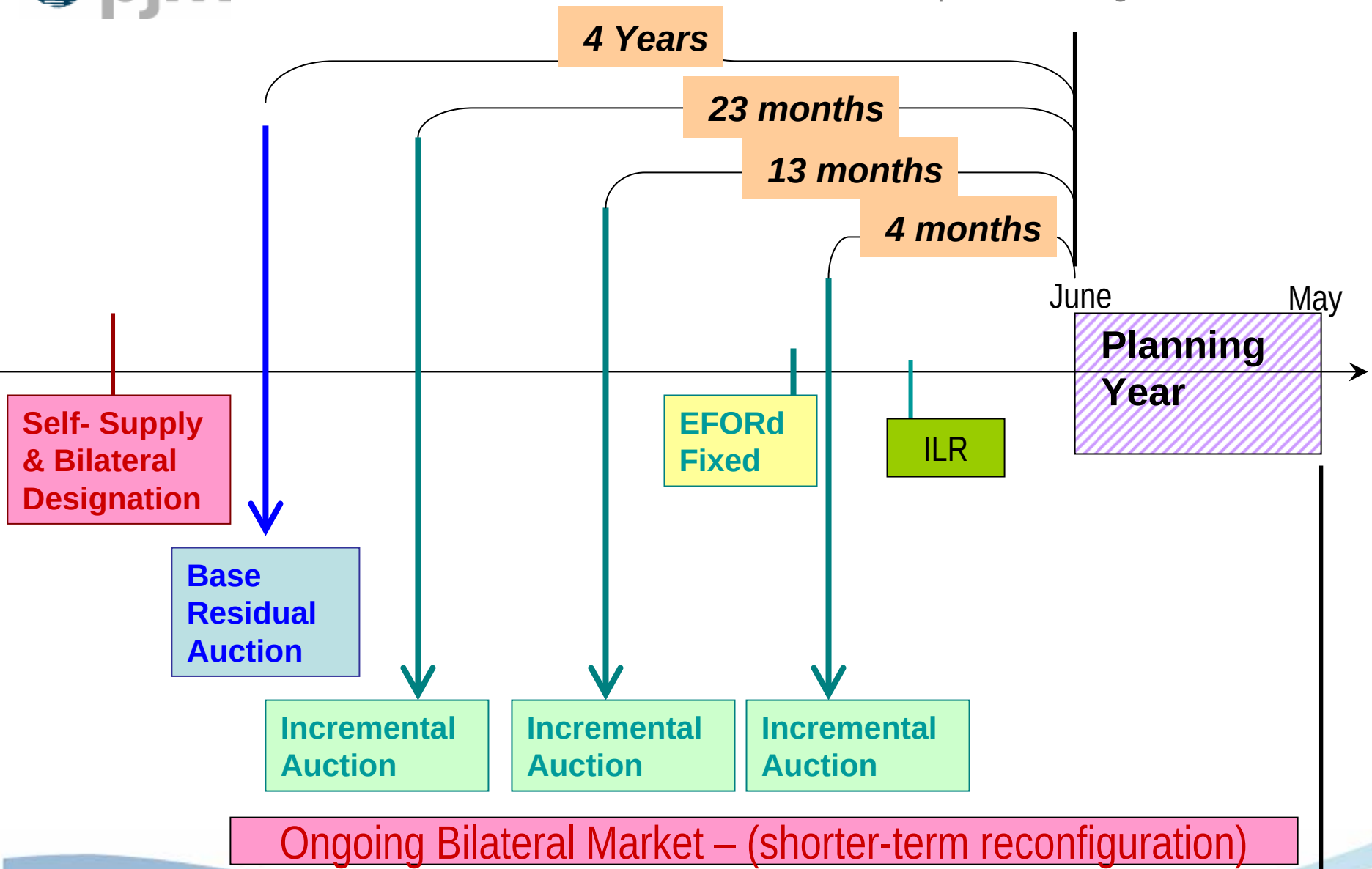


©2004 PJM

PJM Net Revenue

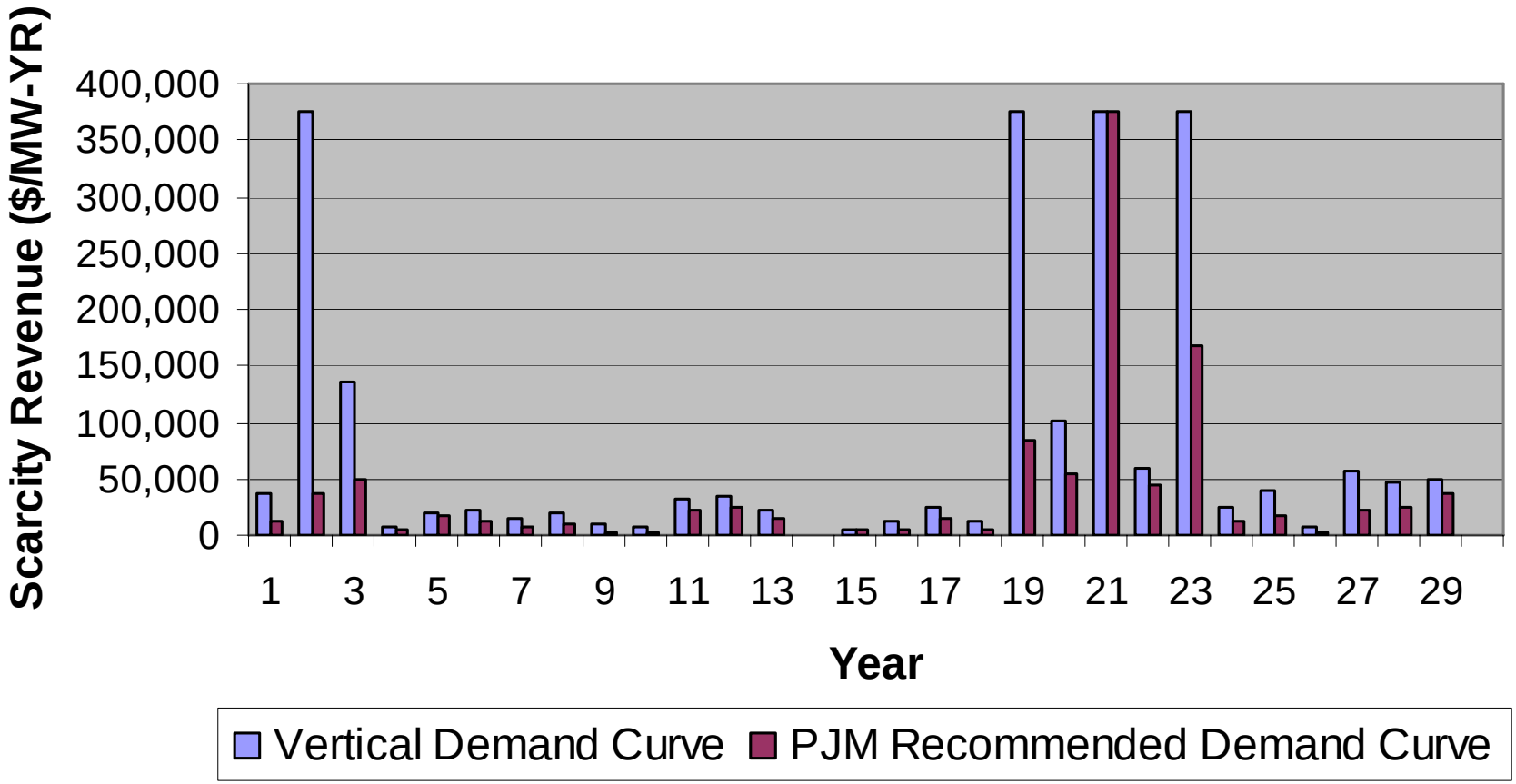
Unit Type	20 Year Levelized Fixed Cost	Realistic Dispatch Average Net Revenue 1999 to 2004
Combustion Turbine (CT)	$72,207	$36,195
Combined Cycle (CC)	$93,549	$52,243
Pulverized Coal (CP)	$208,247	$137,015

Proposed Timing of RPM Auctions



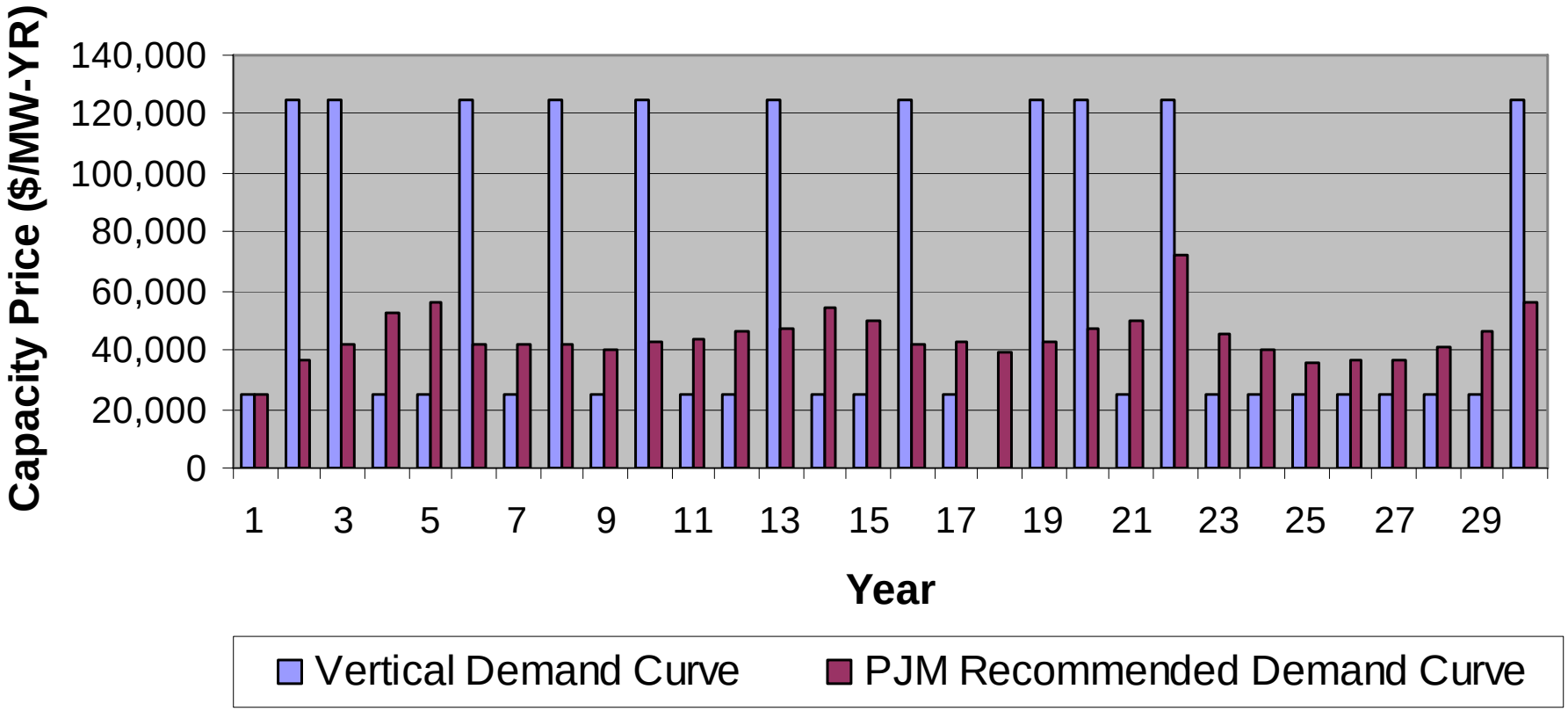
©2004 PJM

Scarcity Prices: PJM Recommended Demand Curve vs. Vertical Demand Curve at Target Reserve



©2004 PJM

Capacity Prices: PJM Recommended Demand Curve vs. Vertical Demand Curve at Target Reserve



©2004 PJM