

The Brattle Group

Cross-RTO Survey of Capacity Markets What is Working and What is Not

Presented at

EUCI Conference on 'Smart' Capacity Markets

Attila Hajos and Sam Newell

November 9, 2009



Copyright © 2009 *The Brattle Group, Inc.*

Antitrust/Competition Commercial Damages Environmental Litigation and Regulation Forensic Economics Intellectual Property International Arbitration
International Trade Product Liability Regulatory Finance and Accounting Risk Management Securities Tax Utility Regulatory Policy and Ratemaking Valuation
Electric Power Financial Institutions Natural Gas Petroleum Pharmaceuticals, Medical Devices, and Biotechnology Telecommunications and Media Transportation

The Brattle Group's Expertise in Capacity Markets

The Brattle Group has worked on a number of highly visible engagements in capacity market design for RTOs. Our recent work in these areas includes:

- ◆ “Review of PJM’s Reliability Pricing Model (RPM)” (June, 2008)
- ◆ “Review of the Forward Capacity Market Auction Results and Design Elements” in ISO New England (co-authored with ISO-NE Internal Market Monitoring Unit, June, 2009)
- ◆ “Cost-Benefit Analysis of Replacing the NYISO’s Existing ICAP Market with a Forward Capacity Market” (June, 2009)
- ◆ “A Comparison of PJM’s RPM with Alternative Energy and Capacity Market Designs” (October, 2009)
- ◆ Assessment of the Midwest ISO’s Resource Adequacy Construct (2009, in progress)

Capacity Market Design

	No Resource Adequacy Requirement	Short-Term Resource Adequacy Requirement	Forward Resource Adequacy Requirement
No RTO Capacity Market	ERCOT AESO Ontario	SPP	CAISO
“Voluntary” RTO Capacity Market		MISO	
“Mandatory” RTO Capacity Market		NYISO	PJM (RPM) ISO-NE (FCM)

This presentation focuses on key market design challenges in mandatory capacity markets*

*Based on *The Brattle Group's* work evaluating capacity market designs for PJM, ISO-NE, and NYISO

Forward Capacity Market Structure

Observations

- ◆ Existing forward capacity markets (PJM, ISO-NE) appear to attract sufficient new capacity to meet future needs.
- ◆ NYISO (a short-term capacity market) currently has surplus capacity; the incremental benefits of forward procurement would not be available until new capacity is needed.

Challenges

- ◆ Aligning auction timing with capacity development lead-times
- ◆ Buyers' risk of over-procurement due to peak load over-forecasting
- ◆ Suppliers' risk of deficiency penalties if projects are not completed on time
- ◆ Still provides only one-year certainty

Approaches

- ◆ Three-year forward commitment period (PJM, ISO-NE) with provisions for DR and other short lead-time resources
- ◆ Hold back some demand until the incremental auctions; some supply (DR and new generation/uprates) is also likely to hold off
- ◆ Allow suppliers to relieve themselves of their supply obligation in incremental auctions
- ◆ Forward commitment helps price stability; commit to mitigate buyer market power; consider multi-year commitment, but this creates inefficiencies

DR Participation in RTO Capacity Markets

Observations

- ◆ RTO forward capacity markets have attracted a lot of new demand response (PJM, ISO-NE).
- ◆ Robust DR growth even at low capacity prices (ISO-NE).
- ◆ Penalties and incentives for DR have been uneven – some penalties have been asymmetric across resource types.

Challenges

- ◆ Deficiency risk with DR resources (like *potential* generation, no steel in the ground)
- ◆ Performance risk of DR resources (“fatigue”)
- ◆ Some DR capacity is available only on a shorter-term basis than 3+ year forward commitment

Approaches

- ◆ Qualification requirements and monitoring of project development milestones; deficiency penalties
- ◆ Performance penalties comparable to generation; energy payments provide incentives
- ◆ Allow new DR to participate in incremental or reconfiguration auctions (requires increasing liquidity of these auctions)

Locational Resource Adequacy

Observations

- ◆ All three RTO market designs (PJM, ISO-NE, NYISO) aim to ensure that prices accurately signal where new capacity is needed.
- ◆ NYISO has consistent price separation and high prices in constrained NYC zones.
- ◆ ISO-NE has not yet price-separated, in PJM price separation varies from year to year.

Challenges

- ◆ Ensuring local price signals
- ◆ Uncertainty of planned transmission upgrades
- ◆ Market power mitigation in constrained areas

Approaches

- ◆ Careful definition and explicit modeling of capacity zones (PJM) and local sourcing requirements (ISO-NE, NYISO)
- ◆ Count only if certain milestones have been achieved
- ◆ See next slide

Market Power Mitigation

Observations

- ◆ Supplier market power can be high, especially in small, constrained areas.
- ◆ Buyer market power is a concern, especially in smaller markets or markets with moderate load growth. Threat is that buyers depress the market price paid to existing resources by contracting for surplus new capacity out of market.
- ◆ NYISO: heavy buyer & seller mitigation in constrained areas; PJM: extensive supply offer mitigation; ISO-NE: rely on non-market solutions, light mitigation reflects skepticism about the ability to mitigate accurately.

Challenges

- ◆ Supplier market power
- ◆ Buyer market power

Approaches

- ◆ Allow planned resources to make a forward commitment to compete with existing (PJM, ISO-NE); Sloped demand curves (PJM, NYISO); Mitigate offers
- ◆ Offer floors (PJM, ISO-NE, NYISO); APR in ISO-NE

Administrative Capacity Demand Curves and Net CONE

Observations

- ◆ Capacity demand curves and Net CONE values are the largest source of contention.
- ◆ Sloped capacity demand curves – PROS: reduce the incentive to exercise market power and dampen price volatility.
- ◆ Sloped capacity demand curves – CONS: clearing prices are determined partly by administratively-determined parameters.
- ◆ Even if Net CONE were accurate the RA requirement and/or scarcity prices are still administratively-determined.

Challenges

- ◆ Shape of administrative demand curve
- ◆ Administrative determination of CONE
- ◆ Adjustments to Net CONE over time

Approaches

- ◆ Ranges from different sloped curves (PJM, NYISO) to vertical (ISO-NE)
- ◆ Depends on choice of reference technology, cost estimates, financing assumptions, and Energy + A/S offset
- ◆ Administrative and empirical market-based adjustments

What is Working and What is Not (quite yet)

Working

- ◆ Several markets have attracted and retained large amounts of capacity, even at market prices lower than CONE
 - **PJM:** RPM attracted/retained a net of 7,210 MW of capacity sixth auction alone, after a net capacity addition of more than 14,000 MW in the first five auctions
 - **ISO-NE:** FCM attracted 900 MW capacity in the 1st auction, and 3,134 MW of new capacity in the 2nd auction
- ◆ These market have also attracted large amounts of low-cost demand response

Continuing Challenges

- ◆ Buyer market power
- ◆ Contentious administrative determinations (load forecasting, reliability targets, Net CONE)
- ◆ Local reliability; continued reliance on RMRs in some markets
- ◆ Treatment of planned transmission
- ◆ Tension in accommodating short lead-time resources (mostly DR) and long lead-time projects (baseload generation, transmission)
- ◆ Perceptions (“not yet reliable”) and transition issues (“rate shock”)

About *The Brattle Group*

The Brattle Group provides consulting and expert testimony in economics, finance, and regulation to corporations, law firms, and governments around the world.

We combine in-depth industry experience, rigorous analyses, and principled techniques to help clients answer complex economic and financial questions in litigation and regulation, develop strategies for changing markets, and make critical business decisions.

Climate Change Policy and Planning
Cost of Capital
Demand Forecasting and Weather Normalization
Demand Response and Energy Efficiency
Electricity Market Modeling
Energy Asset Valuation
Energy Contract Litigation
Environmental Compliance
Fuel and Power Procurement
Incentive Regulation

Rate Design, Cost Allocation, and Rate Structure
Regulatory Strategy and Litigation Support
Renewables
Resource Planning
Retail Access and Restructuring
Risk Management
Market-Based Rates
Market Design and Competitive Analysis
Mergers and Acquisitions
Transmission

**Contact *Sam Newell* – Principal or *Attila Hajos* – Associate
at sam.newell@brattle.com or attila.hajos@brattle.com
44 Brattle Street, Cambridge, MA 02138
617-864-7900**