Evolution of a Regional Electricity Market: The PJM Experience

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Historic Context of North American Electricity Market

- Decentralized Regulatory Authority (U.S. States)
- Retail Regulation is Jurisdiction of States
- Wholesale Regulation is Jurisdiction of Federal Government
- Transmission Jurisdiction Divided by States and Federal Government
- Note On Canada:
  All Authority is with Provinces
  Only Federal Authority is Approval of Sales to U.S.
Market Structure

- Vertically Integrated Monopolies
- Contract Transmission Access
  (Voluntary for Transmission Owners)
- Public Utility Policy Act of 1978
Market Structure (continued)


- Actual and/or Functional Vertical Disaggregation

- Cost-Based Wholesale Tariffs Replaced by Market-Based Rates Residual Power to Regulate when Market Power Exists
Historic Context of PJM

1927: Three Utilities (in Pennsylvania, New Jersey, and Maryland Power Pool)

- To Capture Efficiencies in Joint Least Cost Dispatch and Transmission Services
- Original Operations Managed by Designated Member
- Membership Grows Over the Years

1962: EMS IT System Makes Transmission Operations Transparent to Members

- Real Time Information
1993-1997 PJM Transition to Independent System Operator
(First in North America)

- Not For Profit
- Disinterested in Market Outcome
- Functions as Market Operator
- Operates System But Does Not Own Transmission Assets
- Operates Under Transparent Protocols
Organized Markets in North America / Independent System Operators
Emergence of PJM Market Model

• Cost Based Dispatch Replaced by Bid Based Dispatch
  Day Ahead Prices

• Generators paid Market Clearing Price, not Prices Bid

• Socialized Prices Replaced by Locational Marginal Cost Pricing of Transmission

• Competitive Ancillary Services Market
Emergence of PJM Market Model

- Demand Response

- Energy Price Cap and Capacity Market

- Hedging/Trading Enabled (for Energy, Capacity, and Transmission (FTR))
Governance

• Independent Board of Directors with Regulatory Oversight

• Extensive Stakeholder Involvement

• Participatory Planning Process

• Efforts to Synthesize Policies of Diverse Political Jurisdictions (e.g. Carbon Emissions)
Conclusions

• Transition from Reliability Backup and Asset Sharing to Fully Competitive market

• Focus on Competitive Energy Market

• Reduction of Re-dispatch Through Use of Locational Price Signals

• Diversification of Resource Options (e.g. Demand Response, Storage, Smart Technology)
Thank You!

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