ISSUES CONFRONTING THE VERMONT PUBLIC SERVICE BOARD AND THE REGIONAL INDEPENDENT SYSTEM OPERATOR

NARUC Energy Regulatory Partnership Program

The Energy Regulatory Commission of the Republic of Macedonia
and
The Vermont Public Service Board

by

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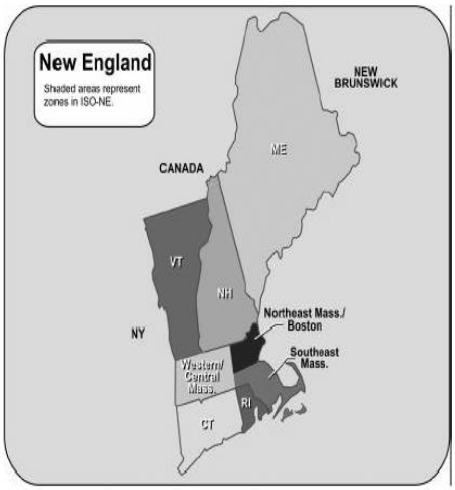
Regional Market Facts

- 6.5 million electricity customers
- 8 Zones
- 230 market participants
  - 7 transmission owners
  - 74 capacity owners
- 2003 annual peak load of 24,762 MW
- 31,000 MW of total supply
  - 30% gas-fired
  - 26% nuclear
  - 30% fossil fuel (coal or oil)
  - Hydro, wood, refuse, wind, imports (4.2%)
- 8,000+ miles of high-voltage transmission lines
  - 12 interconnections with systems in New York and Canada
- $4.5 billion total market value



The Regional Electricity Market

- Foundation of healthy markets
  - Single, region-wide reliability and economic dispatch since 1971
  - Open-Access Transmission Tariff in place: 1997
  - Foundation built by NEPOOL beginning 1971
- Regional regulatory infrastructure
  - VT,CT, NH, ME, CT, RI
  - 5 out of 6 states with restructured retail markets (Vermont still traditional scheme)
  - Highest level of utility divestiture in U.S.
  - Highly diverse marketplace with many competing interests
- Wholesale market opened: May 1999

The Regional Electric Market

- 75 percent of the electricity trading in New England is covered under bilateral contracts
- 25 percent is traded in the real-time spot market
  - This is a balancing market
  - Like any commodity market, the wholesale electricity market establishes a price for its commodity—electricity—by matching supply and demand
  - Demand or load submits bids it is willing to pay to purchase energy; suppliers submit offers for sales of energy at a given price
  - The interaction of these offers and bids ensures that the right amount of power is produced and consumed at an economically efficient price

Role of ISO-NE

- To reliably operate the electric grid
  - ISO has complete authority for reliability
- To act as the market operator for the New England electric market
  - ISO develops market rules
  - ISO performs least-cost security constrained dispatch of generation units to match load with supply
  - ISO is the settlement agent for all transactions
- ISO also performs regional planning and coordination
  - For expansion of the transmission system
  - For ensuring resource adequacy in the region

Relation of ISO to Market Players

- The ISO is functionally independent from all market participants including transmission owners and producers
- The ISO must provide open access over all transmission facilities to all wholesale customers
- The ISO has applied to FERC to become an RTO which will increase its independence even more
  - The ISO has been operating under an agreement with the market participants wherein they have certain rights
  - If the RTO is approved the ISO will be funded via its own tariff
  - RTO also improves the ability of the ISO to file market rules

Trading in the Wholesale Market

- There are three levels of trading in the wholesale regional market:
  - Bilateral transactions
  - Short-term forward market trading in the form of a day-ahead market, and
  - A spot market called the real-time market.
- Market participants can choose:
  - to participate in any combination of these markets
  - allows market participants to manage their portfolios as efficiently as possible.

Essential Standard Market Design Components

- Locational Marginal Pricing (LMP)
  - LMP is designed to reveal the price of producing power in 8 pricing zones
- Enhanced risk management tools
  - Bilateral contracts
  - Day-Ahead Market (DAM)
  - Financial Transmission Rights (FTRs)
  - Auction Revenue Rights (ARRs)
- Market Monitoring and Mitigation

Pricing in the Wholesale Market

- Since April 2003, the NE ISO operates a locational-based marginal pricing system for energy
- Prices are calculated for each of a number of nodes within the region
  - In the past, prices used to clear at a region-wide price
  - Now prices clear at each location; load pays a zonal price while generators receive a nodal price
  - The goal is to give precise price signals to both sellers and buyers
- Energy prices clear at those nodes in two markets
  - The Day-Ahead market which is financially binding
  - A Real-Time market which is the balancing market
- The ISO also operates markets for installed capacity, reserves, and other ancillary services

Issues Confronting the New England ISO and Vermont

#1 Ensure Resource Adequacy

#2 Diversify energy supply

#3 Foster development of the demand side of the market

#4 Plan for future system expansion

#5 Improve environmental quality

#6 Rate Design

Issue #1: Resource Adequacy

- Currently, New England has sufficient overall capacity to maintain adequate reserve margins
- But during peak periods some locations experience reliability problems and high zonal prices
  - Peaking capacity is needed in certain locations
- And as load grows, new resources must be built in the region
  - New generation will need to be built within 5 years
  - Question: Who has the responsibility for building new generation?
  - This is a difficult question to answer when utilities are no longer vertically integrated

Issue #2: Portfolio Diversification

- Promote diversification of the energy supply
- Develop good resource planning models that can evaluate alternative approaches
- Avoid further reliance on gas-fired generation
  - 35% of New England's generation is gas-fired
  - All new units being built are gas-fired
  - The marginal unit on the New England market is a gas-fired unit
  - Thus gas fuel prices drive the increase in electricity prices
  - Gas prices are predicted to increase over the next five years
- Promote use of renewable technologies such as wind

Issue #3: Demand-Side Development

- The ISO and market participants tend to focus on supply-side solutions to problems in the market
- Demand-side programs must be promoted
  - Market-based load response programs are now available
  - At peak hours they keep prices lower
  - Customer conservation and energy efficiency can also lower demand
  - Ensuring equal treatment of transmission, generation, and demand-side resources is very important

Issue #4: Grid Expansion

- The region must plan for future expansion of the transmission grid
  - As supply increases and load increases new transmission will have to be built
- The ISO is responsible for determining future system needs
  - The ISO does regional planning studies
  - The ISO has final responsibility for system reliability
- But individual states have jurisdiction over siting of new facilities
  - Siting of new transmission and generation facilities is legally the responsibility of the states – not the ISO or the Federal Government
- This can create conflicts

Issue #5: Environmental Quality

- Improving environmental quality in the power sector is critical
- Emissions from power plants that burn fossil fuels are harming our air and water
- Replacing fossil-fuel units with cleaner technologies is a goal
  - Costs to retrofit existing units are high
  - Emissions trading credits may be one solution
- We are actively trying to promote development of new clean renewable resources
  - A renewable portfolio standards (RPS) is in place in some states
  - Vermont's Legislature is considering whether to adopt an RPS

Issue #6: Rate Design

- New cost of service studies required
- Attribute costs to the appropriate class of customers
  - Residential
  - Commercial
  - Industrial
- Goal is to reflect costs accurately for each customer class