Lessons from Wholesale Markets

NASEO Annual Meeting

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Synapse Energy Economics

• Founded in 1996 by CEO Bruce Biewald

• Leader for public interest and government clients in providing rigorous analysis of the electric power sector

• Staff of 30 includes experts in energy and environmental economics and environmental compliance

• Smaller team providing wholesale market design and participation since 2004
Doug Hurley bio

• Participating in stakeholder discussions around wholesale market design since 2004 in New England, PJM and MISO
• Led NEPOOL’s Alternative Resources sector from 2010 – 2015 and again since 2017
• Provides ongoing advice on daily participation of more than 300 MW of EE, CHP, and solar PV resources in the New England capacity market since 2006. Key clients include:
  • *The Cape Light Compact (Cape Cod)*
  • *Efficiency Maine*
  • *Efficiency Vermont*
  • *Independent providers of distributed and demand resources*
Caveats

• These comments are my own, and do not necessarily represent the views of any of our clients (past, present, or future)

• This represents my experience. It is not meant as either praise or condemnation of the markets, specific designs, or any of the stakeholders and their positions.
Mandate – Balance Supply with Load

System Load Graph
Date: 08/29/2018

[Graph showing system load over time, with peaks and troughs indicating actual and cleared energy levels.]
Timing of Markets to Operate Grid

- Milliseconds
  - Regulation
  - Real Time Energy
  - Reserves

- Minutes
  - Day Ahead Energy

- Hours/Day
  - Capacity
  - Other Ancillary Services
    - Black start
    - Reactive Power Capability
    - Etc.

- Months/Season

- Years

Timeframe
Flow of Power and Money

Original Goal: Shift risk of long-term capital investment from customers to investors.
## RTO Mission Statement

<table>
<thead>
<tr>
<th><strong>Operate the Grid</strong></th>
<th>Reliable operation of the grid in real time. Balance supply and demand.</th>
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<tbody>
<tr>
<td><strong>Administer the Markets</strong></td>
<td>Run efficient wholesale markets in accordance with the FERC-approved tariff (caveat: ERCOT not under FERC) for a reliable system.</td>
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<tr>
<td><strong>System Planning</strong></td>
<td>Plan for a reliable transmission system in the 10-15 year timeframe. Uses forecasts for load and supply resources that are mostly procured in the markets.</td>
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*All of your priorities are NOT in their mission statement. (But they could be)*
Some Lessons

• There is no “invisible hand” of the markets! Dispel this myth.
  • Markets are designed by *people*, to achieve a particular outcome. If you are one of these people, you can influence the design, and the outcome.
  • Power plant owners are a small group with very large revenues who will show up for the marathon.
  • Electricity is NOT oranges. It is not, nor should it ever be, a free market. Some amount of regulation is imperative for such an important public service.

• The markets will change. Every year. Forever.
  • You are joining *a* market, not *this* market.
  • Market participants (load and supply) are *very* savvy financial entities

• Summary: Markets are not bad or good. They achieve the end for which they were designed (and constantly re-designed). Be involved in that design.
Anecdotes

• 3-year forward capacity market is not “technology neutral”. Serious impediment to clean energy and causes of a multitude of timing problems.

• Summer-focused market with seasonal-only audits for energy efficiency and renewable energy

• Energy and reserves for storage resources

• Renewable capacity based upon “fuel”, but not so for gas units

• Demand-side resources and load forecasts that use 20-year data

• Ramping issue to manage the “problem” of solar
Anecdote – Myth of the Scary Duck

Is the afternoon ramp a concern?
Anecdote - Lesson

Is truncating the Y-axis misleading?

Percent of the time

98.0
98.5
99.0
99.5
100.0

NO

YES

98.0
98.5
99.0
99.5
100.0
Anecdote – Reality

ISO-NE System-wide demand for electricity.
Saturday, April 21, 2018

Deep pond of resources available to manage afternoon ramp. Plus, increasing battery storage.
Thank you!

Questions?