New England’s Forward Capacity Market

David LaPlante
Harvard Electricity Policy Group
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A Brief History

- **2003**
  - April - FERC order April to File Locational Capacity Market on March 1, 2004
- **2004**
  - March - ISO-NE filed Locational Installed Capacity Market
  - June FERC accepted design, set details for litigation
  - September ISO-NE filed updated LICAP proposal for litigation
- **2005**
  - June - ALJ accepts most of the proposal
  - Summer - ALL New England Senators and US Representatives send FERC letter opposing LICAP
  - September 20 – FERC holds hearing and authorizes settlement
A Brief History (Continued)

• 2006
  – January – Settlement reached
  – June – FERC accepts Settlement
  – Fall/Winter - Rules developed
  – December – Transition Payments Begin

• 2007
  – Rules filed and accepted by Commission

• 2008
  – First Auction scheduled for February for delivery of capacity in June, 2010
Transition Costs: Bridge to FCM

- Effective December 2006 through May 2010
- Fixed capacity payments to all resources
  - Existing
  - New
  - Imports
- Ensures Reliability
- Payments adjusted for historical availability

<table>
<thead>
<tr>
<th>Date</th>
<th>Payment ($/KW-month)</th>
<th>Estimated Total Payment ($Billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/01/2006 – 05/31/2007</td>
<td>$3.05</td>
<td>0.6</td>
</tr>
<tr>
<td>06/01/2007 – 05/31/2008</td>
<td>$3.05</td>
<td>1.2</td>
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<td>06/01/2008 – 05/31/2009</td>
<td>$3.75</td>
<td>1.4</td>
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<td>06/01/2009 – 05/31/2010</td>
<td>$4.10</td>
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Objectives

• Procure enough capacity to meet New England’s forecasted Installed Capacity Requirements three years in the future.

• Select a portfolio of Supply and Demand Resources through a competitive *Forward Capacity Auction (FCA)* process. The selected Supply and Demand Resources are paid the market-clearing price.

• Provide a long-term (up to five year) commitment to Supply and Demand Resources to encourage investment.
Key Elements

• Qualification
  – Existing and New Resources
  – Assures Projects are Viable
• Forward Capacity Auction ("FCA")
  – Descending Clock Auction
  – Capacity resources procured three years in advance of need
• Reconfiguration Auctions
• Exchange Capacity Obligations
• Resource Performance Incentives
  – Energy Option
  – Performance during “Shortage Hours”
The Capacity Product

- Physical Capacity (planned or existing) in a location with a summer and winter rating

- Bid in day ahead and real time market

- Must follow dispatch instructions
  - Penalties depend on harm caused

- Energy call option at cost of expensive peaker (about $200 indexed to gas price)

- Quantity of option follows load
Qualification

• Qualification required for All Resources:
  – New Resources (including Intermittent and Demand Resources)
    • Project Viability and Rating
      – Review process tailored for each type of resource
    • Ability to Interconnect
  – Existing Capacity Resources
    • Verify ratings for resources remaining in the auction
    • For Resources that wish to leave the market
      – Review prices at which they wish to leave the market
      – Screen for Reliability Issues
Forward Capacity Auction

- Descending Clock Auction
  - Includes both Demand and Supply Resources
  - Starting price is twice the cost of new entry (CONE)
  - Bidders respond by offering resources into the market

- If more resources bid than are required, price is lowered.
  - Successive price reductions continue until supply equals demand.

- Payments about three years after auction year
  - Sooner for first few auctions
  - Five year term for new resources

- Market determined price important
Reconfiguration Auctions

• Permits Participants to adjust positions
• Annual Reconfiguration Auctions:
  – Full year commitment
  – After the primary FCA
  – Held approximately two years, one year and just before the FCA Commitment period
• Monthly and Seasonal Reconfiguration Auctions:
  – Adjust annual commitments during the commitment period
  – Begins the first month of the first commitment period
Key Design Elements -- Location

- Design provides for different Capacity Zones
- Possible Export Constrained Zones:
  - Constraints modeled in Auction.
  - If Constraint binds, price will be lower in the Auction.
- Possible Import Constrained Zones:
  - Projected need for capacity estimated before the auction.
  - If capacity needed, constraint modeled in the auction.
- Can result in a year lag for import constrained zone
Key Design Elements – Demand Resources

• Demand is treated as a Resource:
  – Demand receiving same payment as supply resources
    • Includes adjustments for reserves and losses
    • Load Forecast has to be “corrected” for demand resources

• Resources must reduce demand in enough hours to reduce capacity requirement:
  – Design requires performance like a peaking unit
    • Reduce load at high demand and in system shortage conditions.
    • Amount of demand depends upon load shape

• Different Types of Demand Resources
  – Active Demand Reduction
  – Energy Efficiency
Key Design Elements - Performance Incentives

- **Purpose:**
  - To preserve incentives of an uncapped energy market in the capacity design

- **Send Price Signals to obtain:**
  - correct quantity of resources
  - correct mix of resource
  - correct operating incentives
FCM Components – Performance Incentives

• Capacity Payments Reduced for Resources Unavailable in capacity shortages

• Energy Option
  – Capacity resources must provide energy or operating reserve when prices exceed the cost of a peaking unit with a 22,000 heat rate
    • This corresponds to hours of scarcity pricing
  – Capacity Payment to all resources is reduced by this amount
FCM Performance Incentive – Energy Option

- Capacity Market provides Energy Price Hedge
  - Load exposure to energy price is capped at strike price
  - High scarcity prices for those selling capacity

- A supplier that wins 10% of ICR in auction has sold call options to cover 10% of load
  - Load = energy + required reserves
  - It must hedge 10% of load at all times against prices over $200
FCM Performance Incentive – Energy Option

• The hedge is priced properly
  – Based on Suppliers’ Bid in competitive Auction

• Capacity Market Design hedges weather risk:
  – Most scarcity conditions are driven by extreme weather.
  – In an energy only market, the weather uncertainty would drive up energy prices.
  – The Capacity Market hedges this weather risk. If there are three years with no high prices, resources receive full capacity payment, reducing risk and lowering capacity costs.
    • Summer of 2007 in New England is an example
FCM Performance Incentive – Energy Option

• Reduces Incentives to Exercise Market Power in energy market.
  – If a supplier withholds from the market, its capacity payment is reduced and it doesn’t earn the energy market revenues.

• Rewards those who perform when needed.

• Over time, should reduce need for capacity.
FCM Performance Incentive – Shortage Hours

• In Addition to Energy Option
• Resources unavailable in shortage events get reduced capacity payments.
  – Penalty = 5% of annual FCA Payment per event
  – Capped at 10% per day
  – Monthly penalty cannot exceed 2.5 times FCA Payment in that month
  – Annual penalties cannot exceed total FCA Payment less PER adjustments
  – FCA Payment = FCA cleared MW x Clearing Price
## Projected Capacity Needs

<table>
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<tr>
<th>Year</th>
<th>Forecast 50/50 Peak</th>
<th>Representative Future ICAP Requirement</th>
<th>Assumed Existing ICAP&lt;sup&gt;(a)&lt;/sup&gt;</th>
<th>Additional ICAP Needed&lt;sup&gt;(b)&lt;/sup&gt;</th>
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<tbody>
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<td>2008</td>
<td>27,885</td>
<td>31,848</td>
<td>33,199</td>
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<td>2009</td>
<td>28,495</td>
<td>32,657</td>
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<td>35,103</td>
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<td>2013</td>
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<td>35,716</td>
<td>33,644</td>
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<td>2014</td>
<td>31,100</td>
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<td>2015</td>
<td>31,510</td>
<td>36,755</td>
<td>33,644</td>
<td>3,111</td>
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<td>2016</td>
<td>31,885</td>
<td>37,187</td>
<td>33,644</td>
<td>3,543</td>
</tr>
</tbody>
</table>

<sup>(a)</sup> Assumed Existing ICAP<br>
<sup>(b)</sup> Additional ICAP Needed
Demand Response Capacity
Show of Interest - FCM #1

Energy Efficiency
839 MW - 28%

Active Demand Response
2,184 MW - 72%

Total - 3,023 MW
Supply Show of Interest Breakdown by State (10,051 MW)

- MA (4,588 MW)
- CT (4,764 MW)
- ME (200 MW)
- NH (#2 MW)
- VT (105 MW)
- RI (352 MW)
Questions and Discussion