

# New England's Forward Capacity Market

David LaPlante  
Harvard Electricity Policy Group  
October 5, 2007

# 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

Date	Payment (\$/KW-month)	Estimated Total Payment (\$Billion)
12/01/2006 – 05/31/2007	\$3.05	0.6
06/01/2007 – 05/31/2008	\$3.05	1.2
06/01/2008 – 05/31/2009	\$3.75	1.4
06/01/2009 – 05/31/2010	\$4.10	1.6

# 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.

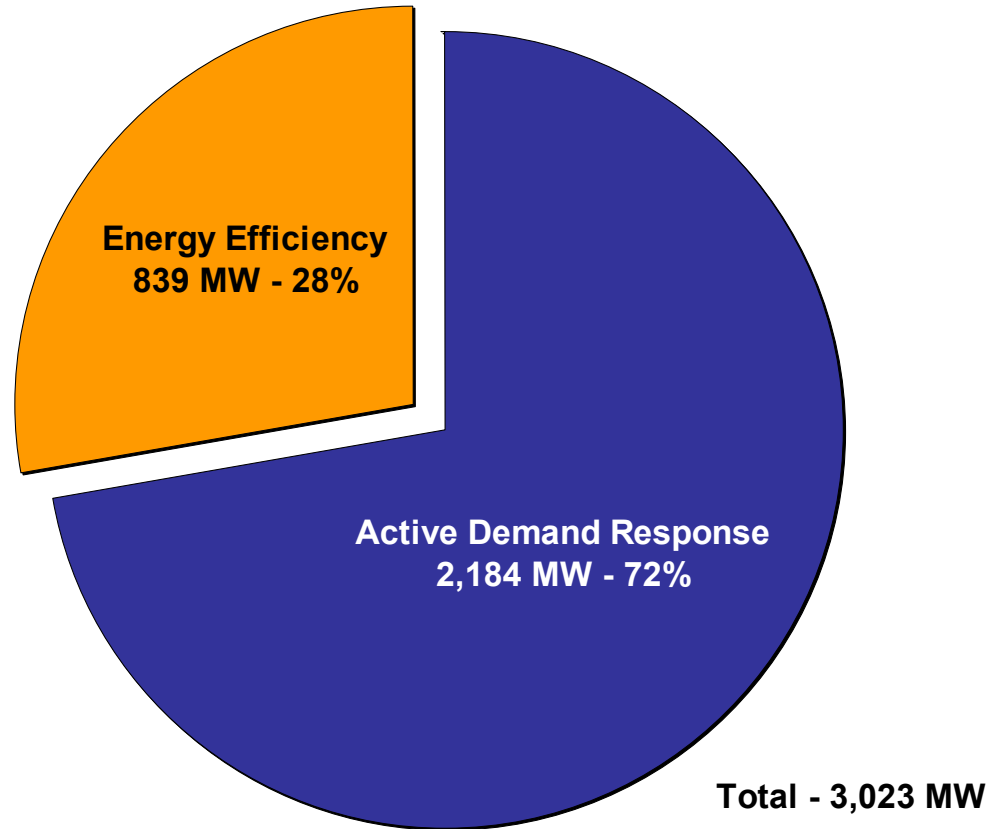
# FCM Performance Incentive – Shortage Hours

- 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
  - $\text{FCA Payment} = \text{FCA cleared MW} \times \text{Clearing Price}$

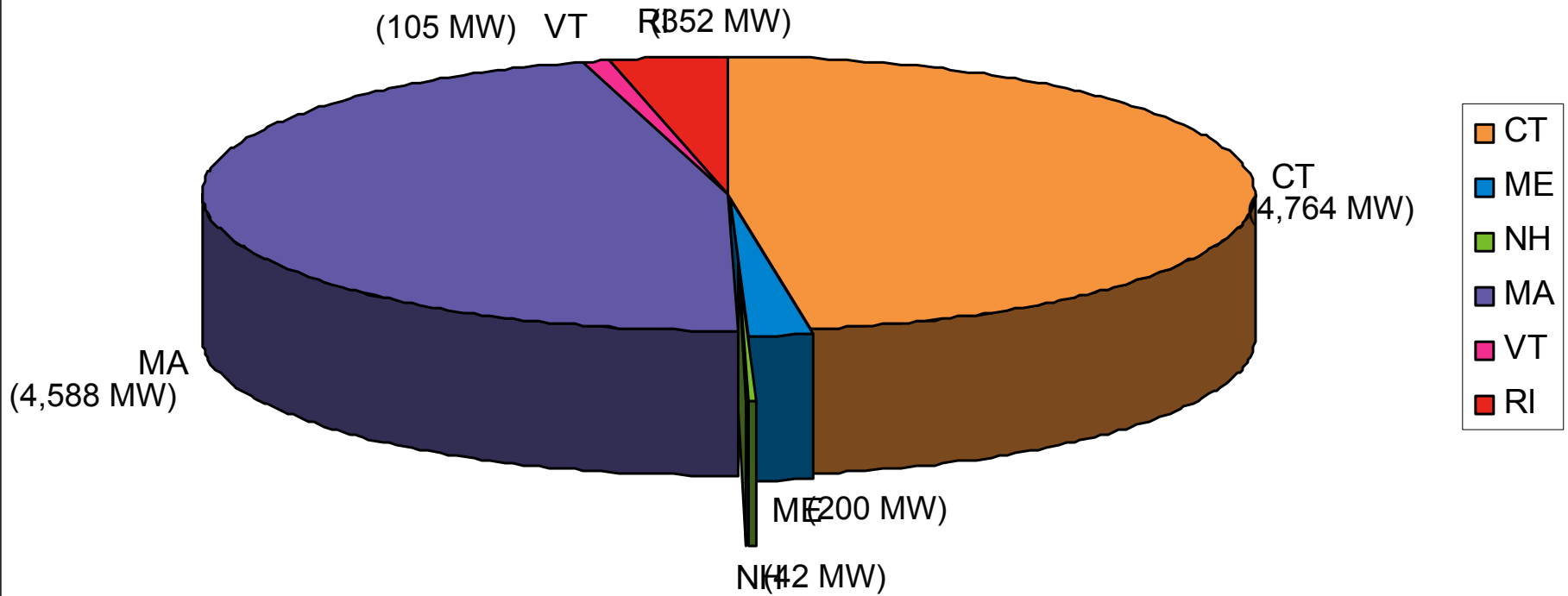
# Projected Capacity Needs

Year	Forecast 50/50 Peak	Representative Future ICAP Requirement	Assumed Existing ICAP <sup>(a)</sup>	Additional ICAP Needed <sup>(b)</sup>
2008	27,885	31,848	33,199	
2009	28,495	32,657	33,199	
2010	29,035	33,705	33,644	61
2011	29,635	34,449	33,644	805
2012	30,175	35,103	33,644	1,459
2013	30,660	35,716	33,644	2,072
2014	31,100	36,250	33,644	2,606
2015	31,510	36,755	33,644	3,111
2016	31,885	37,187	33,644	3,543

# Demand Response Capacity Show of Interest - FCM #1



# Supply Show of Interest Breakdown by State (10,051 MW)



# Questions and Discussion

