FCM Pay For Performance

Enhancing Capacity Markets to Improve Resource Performance and Investment

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New Challenges Require Enhancements to New England’s Forward Capacity Market

1. **New England faces** significant reliability, investment, and resource performance challenges over the coming decade

2. **Capacity market improvements** can address these challenges: *FCM Pay For Performance Incentives*

3. **Expected benefits:** Cost-effective solutions to region’s investment requirements; improved system reliability; and a simpler, resource-neutral capacity market design
Agenda: Reforms, Rationales, Results

1. Performance and investment challenges facing New England

2. Solutions: Pay for Performance FCM design

3. Expected Outcomes and Benefits

4. Process and Schedule: FERC Order Pending
NEW ENGLAND’S INVESTMENT AND RELIABILITY CHALLENGES

Escalating Performance Problems, Looming Investment Needs
Investments Needed for New England’s Future

- Up to 8,300 MW at risk for retirement by 2020 (28 older oil & coal units)
- If all retire: ISO estimates a need for nearly **6,300 MW** of new or repowered units
- Existing and planned transmission projects provide significant flexibility for locating these new resources
- Details: *ISO-NE Retirements Study*
Investment and Reliability Are Closely Linked

- **Reliability risks** of growing gas dependence
  - Increasingly reliant on resources with uncertain performance
  - No catastrophes, yet. Why?
  - ISO manages risks, *when anticipated*, using oil-steam and coal units

- **Two pressing concerns**
  - These are 50+ year old units, and may not perform as needed
  - These units are ‘at risk’ for retirement (2018+/- timeframe)

- **What then?**  *Without new incentives:*
  - Little confidence that remaining and new capacity will perform better than they do today, putting system reliability at increasing risk

- **Incentives must be addressed now** for 2018/19 investment
Existing Market Incentives are Insufficient

• No single, least-cost technology solution
  – For gas: dual-fuel, non-interruptible transport, backup LNG supply
  – Best options vary by unit, its costs, location in gas network
  – Other possible investments: Fast-responding DR, greater liquid fuel storage and re-supply chains at non-gas units, and so on

• Concern: Current FCM provides insufficient incentive for resources to undertake these capital investments
  – Useful for limited hours per year; energy market revenues are insufficient for a supplier to justify the capital investment
  – FCM exemptions: Capacity revenue largely insensitive to performance

• Implication: Markets can motivate suppliers to pursue cost-effective solutions, but this requires changes to FCM
Investing in the Future

• **Plummeting fuel prices** have reduced total wholesale costs to load dramatically, falling over $6 B (40%) from 2008 peak.

• **With the shift to a ‘just in time’** fuel delivery system and aging oil/coal units, we have new reliability risks.
  – Region must acquire ‘insurance’ against fuel non-availability risks, performance uncertainties, etc., that are more likely than in the past.

• **Ensuring long-term reliability through good market design.** This ‘insurance’ cost is a necessary step to sustain the savings from cheaper, cleaner sources in a reliable power system.
FCM PAY-FOR-PERFORMANCE DESIGN

Cost-Effective Solutions for Resource Performance and Investment
A Simple Conceptual Approach

- **Theory.** In tight conditions, price rises to the value consumers place on reliable service. *Could be very high.*

- **Reality.** LMPs reflect short-run marginal costs and administrative reserve prices. *Much lower.*

- **Concept.** The “missing money” that a capacity market provides *should depend on performance during scarcity conditions*
Sound Principles for Capacity Market Reforms

1. Reward outputs (power delivered), not specify inputs
   - Let suppliers identify least-cost solutions, bearing risks and rewards

2. Re-define performance measures for capacity resources
   - Delivery of energy and reserves during (reserve) scarcity conditions
   - Not peak period ‘availability,’ or EFOR-based measures

3. Better align resources’ financial incentives with the value of reliable service during tight system conditions
   - Mimic the performance incentives of an efficient energy market, with the reduced volatility that a forward market provides
Pay-for-Performance: Four Major Elements

• **Capacity Obligations: A Standard Incentive Contract**
  – Base payment set in forward auction, and a performance payment

• **Performance Payment:**
  – Delivery of energy & reserves during (reserve) shortage conditions
  – May be positive or negative (on top of base payment)
  – Not based on “availability,” or EFOR-type measures

• **Resource Neutral, No Exemptions**
  – **All** resources have same base and performance payment rate

• **Who pays what?**
  – **Loads** pay the base payment set by the forward clearing price
  – **Performance payments** are transfers among suppliers
Design Insights: The Product Definition

• Current FCM capacity ‘product definition’ is... *hard to define*
  – *Common view:* Payment (subsidy) for “steel in the ground”

• **PFP establishes a new, simple, economic product definition, and changes sellers’ financial obligations from current FCM**

• **With PFP, the FCM employs a standard forward contract structure.** It is based on two key concepts:
  – **Two-settlement system** in forward markets (e.g., like the DA market)
  – Using a **scarcity pricing premium** as RT incentive in scarcity conditions
ISO New England’s Reforms: Make Capacity a Proper Forward-Sold Good

Forward-Sold Goods

- Initial revenue on fwd sale
- Specifies a forward financial commitment (‘position’)
- 2\textsuperscript{nd} Settlement based on deviations at delivery ...
- ... at a contract rate, or at replacement (floating) price

ISO’s Capacity Reforms

- Auction-based fwd sale (FCA)
- \textit{Pro-rata share} of system demand (load + reserves) during RT reserve shortages
- 2\textsuperscript{nd} Settle, for delivery (energy + reserves) delta from share
- At (high) tariff-specified rate (analogous to scarcity pricing)
Practical Consequences for the Supply Side

• **Every supplier faces both new risks and new rewards:**
  
  – ‘**Upside’ reward** for performance above (a share of) its CSO
  
  – ‘**Downside’ risk:** Many resources will miss some scarcity conditions
  
  – A supplier must **price these risks** into its FCA auction bid
  
  – **Key:** Reliable resources will clear; unreliable ones will not

• **Exemption-free Design.** A supplier that delivers *less* than its pro-rata share *buys* (through the pool) to cover its obligation
  
  – This covers the payment to resource(s) that deliver *more* than their pro-rata obligation, and helped end the reserve deficiency
  
  – **ISO enhancing ability to trade out** in offline maintenance periods
Contrast: Adverse Consequences of the Current Capacity “Product Definition”

• What capacity sellers do, in simple terms:
  – Build something, and operationally test it
  – Be “available” during the capacity commitment period

• “Available” is ill-specified and fraught with problems
  – Lead time? E.g.: Available on 2 hours or 20 hours notice?
  – Exemptions! For intermittent resources, transm. problems, and so on

• Adverse consequences:
  – Adverse retention/selection of poor-performing resources
  – System not resilient to fuel-supply (or other) disruptions
  – Incentives for resources to offer inflexibly (long lead times)
FCM PAY-FOR-PERFORMANCE: EXPECTED BENEFITS AND COSTS

Market Solutions that Promote Reliability and Investment
Expected Benefits of Improved Capacity Design

• **Efficient resource evolution.** Strong incentives for investment in new capacity that is either:
  (1) Low-cost and highly reliable (nearly always operating); or
  (2) Highly flexible and highly reliable (gets online quickly and reliably)

• **Greater operational-related investments** at existing resources to improve resource performance
  – Esp.: Fuel arrangements and/or secondary fuel supplies

• **A more reliable power system, using market incentives**
  – PFP rewards suppliers who make cost-effective investments that enable them to perform during tight system conditions
Expected Operational-Related Investments

• **PFP provides strong incentives** for suppliers to improve their resources’ performance and availability:
  – Dual-fuel capability to protect against fuel shortages
  – LNG, transport arrangements yielding ‘less’ interruptible fuel supply
  – Faster unit startup capability to supply energy during deficiency hours
  – More rapid price-responsive demand, with more times available
  – Staffing improvements at many facilities
  – And so on.
  – See *White Paper, Section 3*

• **Expectations**: Suppliers will resolve availability and ongoing performance issues in the most cost-effective ways possible
LOGISTICS AND PROCESS / SCHEDULE

With Links to Additional Supporting Materials at iso-ne.com
Logistics and Timing

• **Timeframes:**
  - Jan-Dec 2013: NEPOOL Stakeholder process
  - January 2014: FERC Filing (ER14-1050)

• **FERC order pending** *(as of 14 May 2014).*

• **Proposed**
  - For FCA 9 -- held 2015, CCP of 2018/19
  - Implementation: *(FCA 9 Qualification deadline is June 2014)*

• **Major initiative:** Extensive market impact analysis for stakeholders on FCA prices, etc.
For More Information

- White Paper: *FCM Performance Incentives*
- Impact Analysis: *Results and Market Impact*
- PFP Strategy: *FCA Bids and Offer Analysis*
- Incentive Price Analysis: *Performance Payment Rate*
- Liability Limit Provisions: *Stop-Loss Design*