Forward Capacity Market
Accounting for Increasing Risk in Contracts

Abigail Krich
President, Boreas Renewables LLC
NECA Conference on Renewable Energy
March 28, 2013
Presentation Outline

• Forward Capacity Market background
• Impending market changes
  – FCM Redesign
  – Performance Incentives
• Implications for long-term contracting
FCM, A Timeline


• FCA 7 held February 2013 for capacity delivery in 2016-2017

• FCA 8 to be held February 2014
  – Minimum Offer Price Rule, no price floor

• FCA 9 to be held February 2015
  – New performance incentives proposed

FCM Market Rules: Market Rule 1 Section 13
Renewables in the FCM
Qualification by Type

• Biomass and hydro with pondage are conventional generators. Qualified capacity is maximum unit capability.

• Wind, solar, run-of-river hydro are intermittent generators. Qualified capacity is median output from 1-6pm summer, 5-7pm winter.

• Distributed generation not considered here
Renewables in the FCM
Historical Qualification of Intermittents

- 13 wind farms have on average qualified at 22.7% of nameplate in summer, 40.8% winter
- 8 community wind projects have averaged 5.2% summer, 15.5% winter
- 13 PV generation projects have averaged about 30% summer, 0% winter
- 199 RoR hydro projects totaled 201 MW summer, 335 MW winter qualified capacity

Renewables in the FCM

Availability Penalties

• Intermittents already docked for performance, not subject to additional availability penalties.

• Other generation subject to penalty if not “available” during system shortage events.
  – No shortage events have occurred since start of market in June 2010.
  – Penalty capped at FCM revenue.

• Little to no risk of participating today.
Renewables in the FCM
Past Revenue Potential

• FCA 1 to 7 all cleared at the administrative auction floor price with excess capacity
• Payment rates ranged from 4.254 to 2.336 $/kW-month
• An average 50 MW wind farm would have earned between $487k and $887k per year over that period
“FCM Redesign” – FCA 8
No Floor Price

• FCA 8 will be the first auction without a floor price.

• Widespread speculation that auction will clear under $1.00/kW-month
  – Avg 50 MW wind farm revenue < $170k

• Many renewables may be shut out of the FCA
  – Unless an individual new renewable project is approved to offer below $1.00/kW-month, it will not clear.
“FCM Redesign” – FCA 8 Minimum Offer Price Rule

- FERC ordered buyer-side market power mitigation known as the Minimum Offer Price Rule (MOPR)
- Prevents buyers from subsidizing uneconomic entry in order to suppress auction clearing price

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Offer Review Trigger Price ($/kW-month)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combustion Turbine</td>
<td>$10.00</td>
</tr>
<tr>
<td>Combined Cycle Gas Turbine</td>
<td>$11.00</td>
</tr>
<tr>
<td>Biomass</td>
<td>$24.00</td>
</tr>
<tr>
<td>On-Shore Wind</td>
<td>$14.00</td>
</tr>
<tr>
<td>Real-Time Demand Response</td>
<td>$1.00</td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td>$0.00</td>
</tr>
<tr>
<td>All Other Resource Types</td>
<td>Forward Capacity Auction Starting Price</td>
</tr>
</tbody>
</table>
“FCM Redesign” – FCA 8

• MOPR does not apply to reconfiguration auctions or bilateral transactions, leaving some room for trading into the market if shut out of the FCA.

• FERC encouraged ISO to develop a renewable resource exemption from the MOPR given the large number of stakeholders that supported this concept.
  – Won’t be in time for FCA 8
  – Will likely have to include a sloped demand curve
Performance Incentives – FCA 9

- ISO is proposing to implement strong incentives for capacity resource performance during times of system stress (scarcity events).
- Resources over-performing their capacity obligation during event would be paid an extra $5,000/MWh.
- Resources under-performing would be penalized $5,000/MWh.
- Initially no penalty cap, but ISO is now developing a stop-loss provision.

Performance Incentives – FCA 9
The Concept

• Conceptually, the strong incentive allows existing resources to justify spending money on upgrades, fuel supply, and staffing to improve performance.

• Conceptually, the incentive structure encourages development of new capacity that is efficient (likely to be dispatched) and flexible (can respond when event occurs).
Performance Incentives – FCA 9

The Concern

• Intermittents cannot pay any amount to increase the wind/sun/water when events occur.
• All they can do is price the risk of under-performance into auction bid prices.
• Very uncertain, variable risk makes it hard to price.
• If MOPR didn’t drive all wind and solar out of the market, this may finish the job.
Performance Incentives – FCA 9
The Silver Lining

• Generators with no capacity obligation that produce power during events will receive incentive payments.
• Resources that exit the market will still get paid something.
• Resources that were never able to get into the FCM in the first place due to transmission bottlenecks will finally have revenue opportunity.
How This Impacts Long Term Contracts

• Block Island Wind amended PPA
  – Reduces energy payment rate by amount seller receives from FCM.
  – If not qualified or cleared, reduced by amount seller would have received had it cleared.
  – How do performance incentives fit into this construct? Can amount be negative if seller loses money or would have lost money in the FCM?

• Orbit Energy PPA (biogas)
  – COD, and obligation to purchase Products under the PPA, does not occur until unit clears in an FCA.
  – What if MOPR prevents unit from clearing?
How This Impacts Long Term Contracts

MA

• 2010 MA RFP - NSTAR purchased capacity from Bull Hill Wind contingent on project
  – qualifying for FCM (which it hasn’t yet) and
  – bidding in (is there a clearing requirement?).

• 2013 MA RFP - Capacity not an eligible product
  – Threshold requirement for project to commit its capacity to New England market exclusively.
  – Draft PPA not released yet.
How This Impacts Long Term Contracts

ME

• 2008 ME RFP purchased capacity from Rollins Wind.
  – Rollins must pay market value of its capacity until it qualifies at which time it must pass capacity revenue on.
  – What is market value under performance incentives?
• 2010 ME RFP purchased capacity from Verso Bucksport (biomass) in financial transaction.
  – Verso pays 10% of capacity clearing price for 30 of 60 months of initial term, 5% for all of second term.
  – Must use commercially reasonable efforts to qualify capacity in FCM.
• 2012 ME RFP says resource should be likely to be recognized as capacity within FCM or else provide significant benefit if not so recognized.
MA Class I RPS
225 CMR 14.00

• If capacity factor is >50%, unit must attempt to qualify and must clear in the first FCA for which it has qualified

• Problematic under both MOPR and Performance Incentive market rules
Questions?

Abigail Krich
Boreas Renewables
Krich@BoreasRenewables.com
www.BoreasRenewables.com