EBA Brown Bag/Teleconference
The Finance and Transactions Committee, the Renewable Energy Committee, and the International Energy Law and Transactions Committee of the Energy Bar Association present:
Financing Offshore Wind Projects in the United States

October 25, 2012
12:00 noon – 1:30 p.m. (EDT)
Two Locations: Washington, DC: Jones Day, 51 Louisiana Ave
New York, NY: Jones Day, 222 East 41st Street
Teleconference Participation will be available.

Proponents of offshore wind generation developments in the United States promise a source of clean, domestic, inexhaustible energy with which to meet fast-growing electricity demand, in close proximity to population centers. To build the currently proposed projects will require billions of dollars. This program will explore how projects are addressing financing needs in the face of the unique risks that face the nascent US offshore wind industry, including a comparison of how the environment for offshore wind in the US compares with that of the EU. The program is presented by the EBA Finance and Transactions Committee, the Renewable Energy Committee, and the International Energy Law and Transactions Committee. The speaker panel includes: David Hang, CFO of Deepwater Wind and Senior Vice President of D.E. Shaw, Mary Doswell, Senior Vice President-Alternative Energy Solutions for Dominion Resources, Dickson Chin, an attorney with Jones Day, and Joan Bondareff, an attorney with Blank Rome who served on Virginia’s Offshore Wind Development Authority.
Energy Bar Association: Financing Offshore Wind Projects in the United States

October 25, 2012
Wind Resources and Transmission Lines

The remaining states use data from the 1987 "Wind Energy Atlas of the United States".

Wind Power Classification

<table>
<thead>
<tr>
<th>Wind Power Class</th>
<th>Resource Potential</th>
<th>Wind Power Density at 50 m W/m²</th>
<th>Wind Speed at 50 m m/s</th>
<th>Wind Speed * at 50 m mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Marginal</td>
<td>200 - 300</td>
<td>5.6 - 6.4</td>
<td>12.5 - 14.2</td>
</tr>
<tr>
<td>2</td>
<td>Fair</td>
<td>300 - 400</td>
<td>6.4 - 7.0</td>
<td>14.3 - 15.7</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
<td>400 - 500</td>
<td>7.0 - 7.5</td>
<td>15.7 - 16.8</td>
</tr>
<tr>
<td>4</td>
<td>Excellent</td>
<td>500 - 600</td>
<td>7.5 - 8.0</td>
<td>16.6 - 17.9</td>
</tr>
<tr>
<td>5</td>
<td>Outstanding</td>
<td>600 - 800</td>
<td>8.0 - 8.9</td>
<td>17.9 - 19.7</td>
</tr>
<tr>
<td>6</td>
<td>Superb</td>
<td>800 - 1600</td>
<td>8.8 - 11.1</td>
<td>19.7 - 24.8</td>
</tr>
</tbody>
</table>

* Wind speeds are based on a Weibull k value of 2.0
Weekly natural gas rig count and average spot Henry Hub

Source: Baker Hughes
Cape Wind Associates, LLC

Map courtesy of Cape Cod Times
Deepwater Wind Block Island, LLC

Map courtesy of Deepwater Wind
Bluewater Wind Delaware, LLC

Map courtesy of NRG
Bluewater Wind
Hywind Maine

Source: Statoil North America Inc.

STAFF GRAPHIC | MICHAEL FISHER
Three Focus Areas – New England, New York, New Jersey
A Combined **Offshore Wind** and **Transmission System**

**Project Overview**

- **New England - Long Island (NELI)**: 600 MW transmission line connecting Long Island to New England
- **Greenport**
- **Montauk**
- **Shoreham Substation (LIPA)**

**Deepwater Wind Energy Center (DWEC)**: 800 MW offshore wind farm located 30 miles east of Montauk

**Key Benefits**:
- Lower cost energy market
- Cost competitive renewable energy

**Map Details**:
- Connecticut
- Rhode Island
- Massachusetts
- Martha's Vineyard

**Location Highlights**:
- New Haven
- Lower cost energy market
- Cost competitive renewable energy
Offshore Wind Technology has Matured Significantly

<table>
<thead>
<tr>
<th></th>
<th>First Generation Offshore Wind (2005)</th>
<th>Deepwater’s Proposed Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbines</td>
<td>2.0 – 3.6 MW</td>
<td>5 – 7+ MW</td>
</tr>
<tr>
<td>Foundations</td>
<td>5-7 miles offshore</td>
<td>15+ miles offshore</td>
</tr>
<tr>
<td>Capacity Factor (Wind)</td>
<td>Wind: 35%</td>
<td>Wind: 45%+</td>
</tr>
<tr>
<td>Transmission</td>
<td>Radial</td>
<td>HVDC Network</td>
</tr>
<tr>
<td>Capacity Factor (Transmission)</td>
<td>35%</td>
<td>~100%</td>
</tr>
<tr>
<td>Net Cost of Energy</td>
<td>~$200/MWh</td>
<td>~$100 / MWh</td>
</tr>
</tbody>
</table>
Price Suppression Explained

Before Offshore Wind

Market Clearing Price

Demand

Before Offshore Wind

Single-Cycle Gas

Oil / Gas Peaking

High Efficiency

CCGT

Medium Efficiency

CCGT

Nuclear

System-Wide Energy Demand

Unit Cost of Production

After Offshore Wind

Market Price

Suppression

Old Market Clearing Price

New Market Clearing Price

Wind

Nuclear

High Efficiency

CCGT

Medium Efficiency

CCGT

System-Wide Energy Demand

Unit Cost of Production

Demand
Measuring the Wind Offshore

- New Jersey Offshore Research Device (NJORD)
  - Floating LIDAR technology
Block Island Project Overview

- **Block Island Wind Farm**
  - Five turbines, each 6 MW, total 30 MW
  - 3 miles S.E. of Block Island
  - PPA with N. Grid; delivery point on Block Island
  - Permits expected Q1 ‘13

- **Block Island Transmission System**
  - 34.5 kV bi-directional transmission line connecting Block Island to N. Grid distribution system on the RI Mainland
~28,200 MW of electric generation
6,200 miles of electric transmission
11,000 miles of natural gas transmission, gathering and storage pipeline
947 billion cubic feet of natural gas storage operated
Cove Point LNG Facility
2.4 million electric customers in VA and NC
1.3 million natural gas customers in OH & WV
2.2 million non-regulated retail customers in 15 states
East Coast Regulatory Landscape

### RPS Policies
- **Renewable portfolio standard**
- **Renewable portfolio goal**

### Electricity Regulation
- **Deregulated**
- **Re-regulated**
- **Regulated**

### Residential Rates

<table>
<thead>
<tr>
<th>State</th>
<th>Cents/Kwh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connecticut</td>
<td>19.25</td>
</tr>
<tr>
<td>New York</td>
<td>18.74</td>
</tr>
<tr>
<td>New Jersey</td>
<td>16.57</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>16.32</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>15.92</td>
</tr>
<tr>
<td>Maine</td>
<td>15.71</td>
</tr>
<tr>
<td>Vermont</td>
<td>15.57</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>14.59</td>
</tr>
<tr>
<td>Maryland</td>
<td>14.32</td>
</tr>
<tr>
<td>Delaware</td>
<td>13.80</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>12.70</td>
</tr>
<tr>
<td>Florida</td>
<td>11.44</td>
</tr>
<tr>
<td>South Carolina</td>
<td>10.50</td>
</tr>
<tr>
<td><strong>Virginia</strong></td>
<td><strong>10.45</strong></td>
</tr>
<tr>
<td>North Carolina</td>
<td>10.12</td>
</tr>
<tr>
<td>Georgia</td>
<td>10.07</td>
</tr>
<tr>
<td>West Virginia</td>
<td>8.79</td>
</tr>
</tbody>
</table>
Levelized Cost of New Generation: 2016
Commercial Operations

<table>
<thead>
<tr>
<th>Fossil</th>
<th>CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind (Onshore)</td>
<td></td>
</tr>
<tr>
<td>Hydro</td>
<td></td>
</tr>
<tr>
<td>Biomass (dedicated)</td>
<td></td>
</tr>
<tr>
<td>Solar PV</td>
<td></td>
</tr>
<tr>
<td>Wind (Offshore)</td>
<td></td>
</tr>
</tbody>
</table>

Total System Levelized Cost (¢/kwh)

Costs do not reflect incentive mechanisms (tax credits, RECs...)

Source: U.S. Energy Information Administration, report on the Annual Energy Outlook, April 2011
CC = Combined Cycle; CT = Combustion Turbine; CCS = Carbon Capture & Sequestration; PV = Photovoltaic
• All major generating units require SCC approval (Certificate of Public Convenience and Necessity – CPCN).

• Requirement applies both to utilities and independent generators.

• SCC must consider effect of the generating facility, including associated transmission lines, on environment.

• Regardless of the type of supply-side resource, the SCC must determine costs to be reasonable and prudent in order to approve the project for cost recovery.
Utility Cost Recovery for Generation

• Generation facility construction costs may be recovered through “riders” - rate adjustment clauses (Section 56-585.1.A.6 of Re-Regulation Act).

• Riders allow for recovery of work in progress; rates rise gradually as work progresses, avoiding rate shock phenomenon.

• As incentive, Act provides enhanced returns on many generation investments.

• Allowed returns on utility renewable energy investments enhanced by 200 basis points.

• “Riders” require annual update and true-up.
Eight companies showed interest.


Entire lease area up to 2,000 MW.
Submitted nomination to Bureau of Ocean Energy Management for entire Virginia wind area:

- Indicating potential interest in future leasing of ocean blocks

Actively participating in policy development:

- Virginia Offshore Wind Development Authority
- Virginia Offshore Wind Coalition
- Transmission studies
- Department of Energy Grant – Alstom, Moffatt Nichol, Virginia Tech and National Renewable Energy Lab
- Submitted comments to BOEM
Dominion leading DOE grant team to identify offshore wind innovations to reduce cost 25 percent.

- Alstom, Moffatt & Nichol, Virginia Tech, & National Renewable Energy Laboratory

Beginning detailed design phase evaluating cost reduction methods

- Larger turbines
- Increased capacity factors
- Innovative foundation/installation methods
Virginia’s Advantage: Onshore Interconnection

- Study completed in November 2010.
- Landstown substation onshore interconnection point.
- Ability to connect up to 1,500MW of capacity.
- As the actual output of wind farms increase above 1500MW, relatively minor transmission upgrades would be required.
  - 2700MW - $30M
  - 4500MW - $70M

*Study based on known system conditions at that time and subject to change, based on actual detailed engineering analysis and onshore right of way.

Virginia’s Offshore Transmission

• Study completed in 2012 on offshore transmission options.

• Analysis divided the Wind Energy Area into four zones, 650 MW per zone.
  – Minimize potential stranded cost impacts.
  – Two cables per platform, two platforms per onshore interconnect (at 230 kV).

• Distance to shore for Virginia does not justify higher HVDC cost.

• Need an integrated approach to transmission interconnection.

Key Takeaways

- Virginia’s regulatory structure supports new generation development within the state

- Utility role anticipated as both a developer of generation and transmission

- Dominion is committed to developing leases if awarded lease rights

- Regulated utility has ability to balance sheet finance offshore wind projects

- Cost of offshore wind currently presents challenges, but efforts underway to reduce cost

- Need an integrated approach to transmission interconnection
Creating the Best Environment for Offshore Wind – Why Can’t the U.S. Be More Like Europe?

By Joan M. Bondareff, Of Counsel, Blank Rome LLP
Introduction and Summary

• The European Union (EU) is far ahead of the U.S. on Renewable Energy and Offshore Wind (OSW).
• The EU has a mandate on Renewable Energy that all member nations must follow.
• The U.S. lacks a coherent strategy and mandate for Renewable Energy.
• The U.S. is slowly catching up to Europe but needs consistent policies and financial incentives until OSW can compete with traditional energy sources.
Introduction and Summary

• No wind turbines are currently located in offshore waters or connected to the U.S. power grid.
• European public acceptance for Renewable Energy and OSW is greater than in the U.S.
• Europe has better access to a supply chain including turbine manufacturers.
• Even U.S. turbine manufacturers are going to Europe or China for work.
European Statistics on Offshore Wind

• 150 GW of OSW projects in the planning stage.
• 1247 turbines installed and grid connected.
• Anticipated annual market in 2011 of 1,000 MW of OSW.
European Statistics on Offshore Wind

- Creation of a new pan-European electricity super-highway to connect all offshore wind farms.
- Expected employment of more than 462,000 workers by 2020.
- UK boat builders are increasing production to meet the demand for support vessels.
U.S. Statistics

• 10 GW of OSW projects in planning by 2020.
• No wind turbines installed and connected to the grid to date.
• Proposed 54 GW of OSW by 2030.
U.S. Statistics

• Atlantic Wind Connection – U.S. super-highway to connect all OSW farms – undergoing permitting and environmental review.

• Predicted to have 500,000 jobs in the total onshore and offshore wind industry by 2030.

• BOEM decision on No Competitive Interest.
• U.S. boat builders are waiting for clear signals to start production of offshore supply vessels but some have entered into licensing agreements with European boat builders.
U.S. “Smart from the Start” Program

- Begun by Interior Secretary Ken Salazar in 2010 to expedite leasing off the Atlantic Seaboard.

- To date, the Dept. of the Interior has completed the following:
  - Final Environmental Assessment (EA) for offshore NJ, DE, MD, and VA (Feb. 2012).
U.S. Smart from the Start Program

- Draft EA for offshore RI and MA (July 2012).
- Final Lease Form (Feb. 2012).
- Initial Steps to Leasing and Creation of Federal-State Task Forces.
– Notice of no competitive interest and intent to proceed with an EA for the Atlantic Wind Connection (May 2012).
– Interior plans to award leases by the end of 2012 for offshore VA, DE and MA.
EU Directives and Policies

• 2009 EU mandate for renewable energy – 20% by 2020.
• Each member nation has mandatory targets to meet.
• Each member nation submits a National Renewable Energy Action Plan to meet targets.
• Each member nation can adopt financial incentives, e.g., feed-in tariffs or green certificates.
EU Directives and Policies

• The EU expects to exceed its target of 14% from wind energy (includes 4% from OSW).
  – Ireland expects to get 36% of its energy from wind.
  – Denmark expects to get 31% of its energy from wind.
EU Directives and Policies

• EU directive to streamline administrative procedures and transmission operators must provide priority access to the power grid for renewable energy.
Comparison of EU and U.S. Incentives

• U.S. developers depend on tax credits such as the Production Tax Credit (PTC) which allows a tax credit of 2.2 cents per Kw-hour for qualified wind facilities.

• The PTC expires at the end of 2012 and its extension remains uncertain.

• EU has encouraged the use of feed-in tariffs and green certificates but has increasingly turned to private and bank financing.
Comparison of EU and U.S. Incentives

• EU just issued €230 M ($285M) in bonds to attract private investment in energy, transportation, and IT network projects.

• The European Investment Bank and government-owned banks in France, Germany, Italy, Spain and Poland have each contributed €100M ($122M) to invest in renewable energy.

• Total investment of €80 billion is expected over the decade with increasing reliance on project financing.
Comparison of EU and U.S. Incentives

• U.S. loan guarantees in doubt post-Solyndra bankruptcy.

• No major U.S. bank has stepped up to the table so far to invest in OSW farms.
Policy Differences and Political Climate

• U.S. now has an abundance of natural gas which is cheaper than wind.

• U.S. is reaching energy independence as a result of new oil and gas drilling in the Arctic and new shale gas finds.

• Fuel prices are higher still in Europe and no other suitable fuel alternatives.

• EU has policies on reducing greenhouse gas emissions which the U.S. lacks.
Policy Differences and Political Climate

• EU has policies on marine spatial planning to resolve conflicts which the U.S. is yet to put in place.
• EU is promoting an interconnected offshore grid while the U.S. debates what to do.
• EU can direct member nations what to do while the U.S. Government cannot dictate to states.
Policy Differences and Political Climate

• U.S. cannot preempt state laws and/or direct states or regional entities to accept OSW into their power grids.

• EU has ready access to turbine manufacturers and a ready supply chain which the U.S. lacks.

• In a slow economy, it’s all about the cost.
Conclusions

• U.S. can only catch up to Europe if it:
  – Adopts a renewable energy standard;
  – Extends the Production Tax Credit for a certain number of years to provide certainty to developers;
  – Promotes the development of an offshore electric super-highway to connect all OSW farms to the grid;
Conclusions

– Expedites marine spatial planning to resolve offshore use conflicts;

– Develops a unified system of federal and state laws and policies to promote OSW; and

– Creates a predictable playing field for OSW developers.
Conclusions

• The U.S. can learn from the EU example of establishing commitments, resolving use conflicts, and supporting renewable energy and offshore wind. This will create green manufacturing jobs, promote the offshore supply and boat building industry, protect the environment, and promote energy independence.
Conclusions

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