Growth of Offshore Wind Globally

- 11,000 megawatts in operation
- 3,230 turbines spinning
- 40% growth in 2015
Rapid Advances in Offshore Turbine Technology

Typical Onshore Turbine

Block Island Wind Farm Turbine

Boeing 747: 250'
BIWF Blades: 240'
The Potential
Offshore wind delivers energy when and where it's needed most.
The Replacement Cycle is Accelerating in New England
The Best US Offshore Wind Site

- Outstanding wind resource (9.5 m/s)
- Buildable water depths (100 - 150 ft)
- 1500 MW capacity
5 turbines.
17,000 homes.
300+ construction jobs.
1st in the nation.
<table>
<thead>
<tr>
<th>Year</th>
<th>Milestone</th>
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</thead>
<tbody>
<tr>
<td>2008</td>
<td>Project proposed</td>
</tr>
<tr>
<td>2010</td>
<td>Power purchase agreement approved</td>
</tr>
<tr>
<td>2014</td>
<td>Final permits approved</td>
</tr>
<tr>
<td>2015</td>
<td>$297 million debt financing</td>
</tr>
<tr>
<td>2015</td>
<td>Offshore installation begins</td>
</tr>
<tr>
<td>2016</td>
<td>Commercial operations</td>
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</tbody>
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Key Siting Issues

• Marine mammals
• Fishing
• Cultural resources
• Avian and bat
• Visual
• Bottom habitat
• Other ocean uses (DOD, etc)
Permitting
All Federal, State and Local Permits for Block Island Wind Farm are Final.
Environmental Studies

Example Field Surveys:
• Archeological (Marine and Terrestrial)
• Visual Impact Assessment (including historic properties)
• Wetland Delineation
• Sensitive Habitat Surveys
• Avian and Bat Surveys
• Benthic Surveys
• Fishing Surveys
• Marine Mammal and Sea Turtle Surveys

Example Desktop Studies:
• EMF modeling
• EFH Analysis
• Navigational Risk Assessment
• Air Emissions Analysis
• Underwater and In-Air Acoustic Modeling
• Marine Mammal Risk Assessment
• Sediment Transport Modeling
• Other analysis to support...
Geophysical and Geotechnical Surveys

Multibeam depth sounder to determine water depths and general bottom topography

Seafloor imaging (side scan sonar survey) to identify natural and man-made acoustic targets

Magnetic intensity measurements for detecting ferrous objects

Sub-bottom profiler to map the near surface (chirp) and deeper (boomer) stratigraphy

Vibracores to collect sediment samples to ground-truth geophysical information and assess technical properties (e.g. thermal resistivity)

Deep geotechnical cores to sample sediment at certain foundation locations
Widespread Community And NGO Support

From Environmental Business, Labor, Community, and Political Organizations
Setting High Standards
Voluntary Species Protection Program

Deepwater Wind
“Going Above and Beyond”
Being a Good Neighbor
Working with Local Fishermen to Measure Impacts
Local Contractors

AECOM
AIS Observers
Aladdin Electric
Badd Brothers
Bay Crane
Blount Boats
Challenge Electronics
Communication Systems Inc.
DiPrete Engineering
Duffy & Shanley
Eagle Elevator
ESS Group
Essex & Newbury
EW Audet
GZA
Hart Engineering
Hinckley Allen
Keough & Sweeney
Inspire Environmental
Mayforth Group
Mott MacDonald
National Grid
RI Fast Ferry
Specialty Diving Services
WF Shea
VHB
Waterson Terminal Services

300 Local Workers
U.S. Vessels and Workers Completed Installation

1. Lift and set jacket on sea bed
2. Insert and drive piles into foundation legs
3. Lift and set transition deck on jacket and weld the two pieces together
Foundation Installation Complete

Summer 2015
Cable Installation Vessel

- “Big Max” arrived in RI in February
- Final outfitting work in Quonset
- Offshore installation began in April 2016
Spooling of Finished Cable
Cofferdam on Block Island
Horizontal Directional Drill Rig
Cable Installation Complete
Summer 2016

Float in of cable on Crescent Beach on Block Island
Heavy Lift Vessels for Turbine Installation

Brave Tern
Turbine installation vessel from Norway

Liftboats Caitlin & Paul
Shuttled components from ProvPort
Wind Turbine Installation

Set Towers

Lift Nacelle

Install Blades
Turbine Installation Complete
Summer 2016
Offshore Service Vessel Built in RI

- Deepwater contracted with Rhode Island Fast Ferry (Quonset, Rhode Island) to build a state of the art crew transfer vessel
- Rhode Island Fast Ferry contracted with Blount Boats (Warren, Rhode Island) to build the vessel
- The crew transfer vessel is a 70’ catamaran with a tier 3 engine and custom bow to safety and efficiently transport workers from the Quonset to the Block Island Wind Farm
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