BLOCK ISLAND WIND FARM
America’s First Offshore Wind Farm
Block Island

40% of Land In Conservation
State of the Art Water and Sewer Plants
No Discharge Harbor and Pump Out Program
Protection of Sole Source Aquifer
Historic District Commission
Environmental Education Programs
Offshore Wind Delivers Energy Where it’s Needed
Block Island Power Company
Five Diesel Generators

Block Island Wind Farm
Five Haliade 150 Wind Turbines
### Block Island Wind Farm Introduction

**Location**
- 3 nm southeast of Block Island
- 16 nm south of mainland Rhode Island
- In State Renewable Energy Zone

**Components**
- Five 6 MW direct drive offshore wind turbines, 30 mw nameplate capacity
- Jacket foundations in 75-90' of water
- Power delivered to Block Island via submarine AC export cable (shown in picture as green line)

### Block Island Transmission System (BITS)

- Bi-directional AC cable connecting Block Island to the mainland (shown in picture as yellow line)
- National Grid will build, own and operate BITS
- Cost of BITS will be recovered by National Grid under existing tariff
Alstom Haliade 150 on Jacket Structure
With the Corps’ permit, the Block Island Wind Farm has now been completely reviewed, and approved, by nine state and federal agencies.
BIWF Studies

- Terrestrial Wetland Assessment
- Underwater Acoustic Modeling
- Air Emissions Analysis
- Navigational Safety Assessment
- Terrestrial Cultural Resources Assessment
- Fish & Lobster Assessment - Trawl Surveys
- Visual Impact Assessment including nighttime simulation
- Marine Benthic and Biological Survey
- Site Selection and Routing Assessment
- Visual Simulations
- 3 years of avian and bat surveys
- Reconnaissance level geophysical investigation
- Geotechnical surveys in wind turbine area
- Eelgrass survey
- Marine Geophysical Survey
- Marine Geotechnical Survey of cable route
- Marine Cultural Resources Assessment
- Marine Benthic and Biological Survey
Early and Meaningful Stakeholder Engagement

Historic Lighthouse Hosts Block Island Wind Farm Radar Equipment

Native American Tribal Leaders Participating in Archaeological Surveys for Block Island Wind Farm

Local Commercial Fishermen Performing Fishing Surveys for Block Island Wind Farm
Town of New Shoreham
Town Council and Energy Utility Task Group
Regulatory Agency Public Hearings On BI Included the RIPUC, RIDEM, RICRMC w/USACOE
Construction Schedule

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**Foundations**
- Fabrication
- Installation

**Transmission (Submarine)**
- Fabrication
- Installation

**Transmission (Terrestrial, Substation)**
- Installation

**WTG**
- Fab and Delivery
- Marshalling
- Transport to Installation Vessel
- Installation
- Commissioning
Completed Foundation Design (2014)

- Steel jacket foundations specifically designed for project site
- Each jacket weighs over 1,500 tons
- Designed by leading offshore design firm Keystone Engineering (Houston)
- Designed to withstand 1,000-year storm
- Design and construction verified by third party verification agent hired by CRMC
Jacket & Deck Section on Feeder Barge
Installation of Jacket #1
July 2015
Lift Boat Robert Piling Driving
Setting Deck On Jacket
Submarine Cable Installation: Jet Plow

- Submarine cable installed via jet plow

Submarine cable:

- 6 foot target burial depth based on burial risk assessment
- Sediment redeposits over buried cable
- Temporarily liquidizes soil
- Submarine cable installed via jet plow
Submarine Cable Installation
Blade Manufacturing Complete
In 2013, Deepwater signed a contract with the Fred.Olsen Windcarrier WTG Installation Vessel.

- Jack-up vessel with a 800 tonnes crane
- Installed Alstom Haliade WTG off the coast of Belgium
- Turbines to be installed in Q3, 2016
- 5 days per turbine
Currently no U.S. vessel can install 6MW turbines

- A new U.S. vessel would require sustained offshore wind demand (~40 WTGs/for 10 yrs)

Until we have this demand:

- Lock in purpose built European vessel
- Utilize U.S. feeder barges
Preliminary Policy Question

Should BIPCo be required to transfer ownership of generation facilities into a separate affiliate of the electric distribution company?

- Rhode Island law allows the PUC to exempt BIPCo from the requirement to transfer ownership of generation to an affiliated company and from the prohibition against selling electricity at retail within its service territory (i.e., the island).
- BIPCo has advised the PUC that it plans to file for such waiver on or about January 1, 2016 so that it can have a decision from the PUC prior to the expected filing of its restructuring plan.
- The standard of review (basis) for a PUC decision is whether the PUC determines that such exemptions are in the public interest.
  - Every public utility is required to furnish safe, reasonable, and adequate services and facilities.
  - The rates, tolls and charges must be reasonable.
  - Economic considerations – cost of maintaining versus stranded cost
  - Reliability considerations – outage on the mainland – goes with economic considerations
  - Public policy considerations – if BIPCo is required to transfer generation to an affiliate, that would be a nonregulated power producer, allowed to sell electricity
What are all of these charges?

- **Customer Charge** - The cost of providing customer related services such as metering, meter reading and billing.
- **Distribution** - The cost to deliver the electricity from the beginning of BIPCo’s system to customers.
- **Energy Efficiency** - The cost of energy efficiency programs offered by the Company.
- **Transmission** - Cost of transmitting the electricity from the generators over the “highway” system of lines to the start of the distribution system. These will be comprised of mainland charges and the new undersea cable.
- **Energy Charge** - The charge to provide electricity and other services to the customer by the supplier.
- **Transition** - When the utility is required to transfer or sell assets by a date certain, unrecovered costs are payable by ratepayers.
- **Reserve Generation** - If BIPCo is allowed to retain generation, the fixed costs associated with maintaining and paying off the generator and variable costs incurred if needed.
Where does a restructured utility earn its profit?

General Answer: In the customer charge and distribution charge, which are set in a base rate case.

Caveats:
- National Grid earns a shareholder incentive on energy efficiency programs.
- If retaining ownership of generation, it is possible that BIPCo may be allowed to earn a return on reserve generation because if it had to divest, the affiliate would be a nonregulated power producer and would be entitled to sell electricity and earn a return outside of the regulatory environment.

Pass-through rates with no profit allowed:
- Energy charge
- Transmission charge
- Transition charge (if a waiver is not granted)
- The affiliate would be a nonregulated power producer and likely try to earn a profit.
How does the PUC set base rates?

Base rate case
- Customer charge and distribution charge
- Revenue Requirement = Rate of Return x Rate Base + Operating Expenses
- Rate of Return = Return on Equity (ROE) + Cost of Debt
- Cost of debt is usually not controversial (cost of taking out a loan at bank)
- ROE is how much the shareholder expects to earn on his/her investment.

The United States Supreme Court has held that a utility’s ROE should be comparable with returns on investments in other enterprises having corresponding risks and sufficient to maintain its credit and attract capital (FPC v. Hope Natural Gas 320 U.S. 591, 603 (1944)).

Compare the requested return to that which a group of similarly situated companies are earning.

If allowed a waiver, PUC would consider the reserve generation in a base rate case as well.
How does the PUC set base rates, cont.

After approving the revenue requirement, the PUC rules on how costs are allocated to each type of service and each type of customer. Then, do the customers pay on the basis of demand (kW) or usage (kWh)?

The rates need to be designed so as to allow BIPCo the ability to meet the expenses and the opportunity to earn a reasonable rate of return.

Meter, meter reading, and billing = customer charge

- Cost of serving customer class (ex. Residential, commercial, municipal) = revenue requirement for the class/number of customers in customer class

The cost to deliver the electricity from the beginning of BIPCo's system to customers = distribution charge

- Cost of serving customer class can be allocated to demand charges (fixed) or usage charges (variable) or some combination of both.
BLOCK ISLAND WIND FARM

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