Project Overview

- Hull currently owns two on-shore facilities:
  - Hull I – 660 KW online in 2001
  - Hull II – 1.8 MW online in 2006
- Hull I and II currently produce ~ 12% of current town consumption
- Town has investigated possibility of offshore facilities since 2004
- Provide an objective, market-based, review of the financial assessment of building offshore facilities of 15 or 25 MW.
- Update and compare results to 2009 analysis
Off-Shore is much different than on-shore

- End of 2011: Of 237 GW (121 GW in 2008) installed wind capacity in world, only 3.6 GW (1.5 GW in 2008) is offshore (No U.S. installations).
- Higher Capacity Factors, generally; Don’t Need Land
- Higher Capital, Operating, and Interconnection Costs
- Insurance and Ability to Finance Concerns
- Specialty Construction Firms
- Fewer transport and access issues
Financial Assessment but not full Pro Forma

- **Determine future cost**
  - Should not be used for a prospectus or offtake contract
  - Additional Input from EPC firms needed

- **Calculate revenues to Project**
  - Energy
  - REC
  - Capacity
  - Did not include avoided cost (Hull is municipal light district)

- **Examine revenues/costs under different capacity factors**

- **Study Period is 2016-2035**
Project Configuration

- Assume 3 or 5 x 5 MW (RePower) = 15 or 25 MW; 2009 Analysis used smaller turbines (3.6 MW); Larger turbine provides higher production
- Relatively close to shore (1-3 nautical miles from shore)
- Still strong winds (able to support 30%+ capacity factors)
  - Umass Wind Data Leads to 34.7% CF with 5 MW Turbine
  - Compare to 31.1% CF with 3.6 MW Turbine
  - Analysis assumes 100% Availability
  - Examine Additional CFs for Sensitivity
- Environmental impacts not examined!
Siemens 3.6 MW Power Curve Data
RePower 5MW Power Curve Data Compared to 3.6
Cost Categories

- **Capital**
  - Turbine, Foundation and Substructures, Interconnection
  - $90 Million for 3 – 5 MW Turbine Project; $105 Million with Contingency (Size of Bond offering).

- **Financing**
  - Town-only
    - 100% Municipal Bonds at 4.75%
  - Private Financing
    - Mix of Debt and Equity, Assume PTC!

- **O&M, Insurance, G&A**
Cost Trends Show Increasing Costs

Exhibit 3.2 European offshore wind farm capital costs by year

Comparison of Major Cost and Financing Assumptions

- **2009**
  - Capital Cost: $3160-$3650/kW
  - Debt Financing @ 6% for Muni
  - Cash Grant available for Private Developer
  - REPI and CREBS available to Muni

- **2012**
  - Capital Cost: Close to $6000/kW
  - Debt Financing @ 4.75% for Muni
  - No Cash Grant, but PTC assumed available for Private Developer
  - REPI and CREBS not available to Muni
## Energy Revenues (Comparison, 2009 and 2012)

<table>
<thead>
<tr>
<th>Year</th>
<th>2009 Reference ($/MWh)</th>
<th>2012 Reference ($/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>62.65</td>
<td>n/a</td>
</tr>
<tr>
<td>2016</td>
<td>77.09</td>
<td>56.74</td>
</tr>
<tr>
<td>2020</td>
<td>107.23</td>
<td>66.22</td>
</tr>
<tr>
<td>2025</td>
<td>138.04</td>
<td>92.25</td>
</tr>
<tr>
<td>2035</td>
<td>176.09</td>
<td>140.81</td>
</tr>
</tbody>
</table>
## REC Prices (Comparison, 2009 and 2012)

<table>
<thead>
<tr>
<th>Year</th>
<th>2009 Reference ($/MWh)</th>
<th>2012 Reference ($/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>34.20</td>
<td>n/a</td>
</tr>
<tr>
<td>2016</td>
<td>23.83</td>
<td>47.36</td>
</tr>
<tr>
<td>2020</td>
<td>13.55</td>
<td>74.79</td>
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<tr>
<td>2025</td>
<td>15.33</td>
<td>83.77</td>
</tr>
<tr>
<td>2035</td>
<td>17.35</td>
<td>81.09</td>
</tr>
</tbody>
</table>
## Financial Model Results (assuming reference prices)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue Requirements (LCOE)</td>
<td>$157.12</td>
<td>$125.47</td>
<td>$219.48</td>
<td>$213.74</td>
</tr>
<tr>
<td>Total Revenues</td>
<td>$129.86</td>
<td>$125.86</td>
<td>$170.40</td>
<td>$170.40</td>
</tr>
<tr>
<td>Difference</td>
<td>($27.26)</td>
<td>$0.39</td>
<td>($49.08)</td>
<td>($43.34)</td>
</tr>
<tr>
<td>20 Year NPV ($000) 3 Turbine</td>
<td>($12,451)</td>
<td>$177</td>
<td>($25,931)</td>
<td>($22,898)</td>
</tr>
<tr>
<td>20 Year NPV ($000) 5 Turbine</td>
<td>n/a</td>
<td>n/a</td>
<td>($42,554)</td>
<td>($38,414)</td>
</tr>
</tbody>
</table>
What If The Wind Resource is Better?

- Wind Data was from 80 MW; 5 MW turbine likely would utilize resources at 100 MW
- Potential for Higher Capacity Factor Is Possible
- Offshore Wind Capacity Factors Have Increased over time and can be as high as 40-50%+ for some projects; (Cape Wind assumes 39% CF)
- Uncertainties over Project Location; Used 2006 Wind Data from comparable location
## Capacity Factor Sensitivity Analysis (assuming 3 Turbines and Muni Financing)

<table>
<thead>
<tr>
<th></th>
<th>Assumed Capital Costs</th>
<th>2011 Capital Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity Factor</td>
<td>NPV ($000)</td>
<td>Capacity Factor</td>
</tr>
<tr>
<td>34.7%</td>
<td>($25,931)</td>
<td>34.7%</td>
</tr>
<tr>
<td>38%</td>
<td>($17,914)</td>
<td>38%</td>
</tr>
<tr>
<td>42%</td>
<td>($8,196)</td>
<td>42%</td>
</tr>
<tr>
<td>45%</td>
<td>($0.91)</td>
<td>45%</td>
</tr>
<tr>
<td>48%</td>
<td>$6,380</td>
<td>48%</td>
</tr>
</tbody>
</table>
Summary

- Increase in offshore wind costs coupled with reduced energy market revenues leads to challenging development environment
- MA RPS provides valuable revenue support but still not enough to support profitable investment
- Capital costs assumptions are key
- Lower capital costs coupled with higher wind resources are necessary to justify project development
- Other barriers not considered: availability of financing and environmental impacts
End of Presentation

Thanks!

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