

# *La Capra Associates*

## Hull Offshore Financial Analysis Update



**Presented by:**     **Alvaro E. Pereira, Ph.D.**  
*La Capra Associates, Inc.*

**Presented to:**    **Town of Hull**

October 13, 2012

## ***Project Overview***

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- **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 2006**
- **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**

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- ❖ **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**

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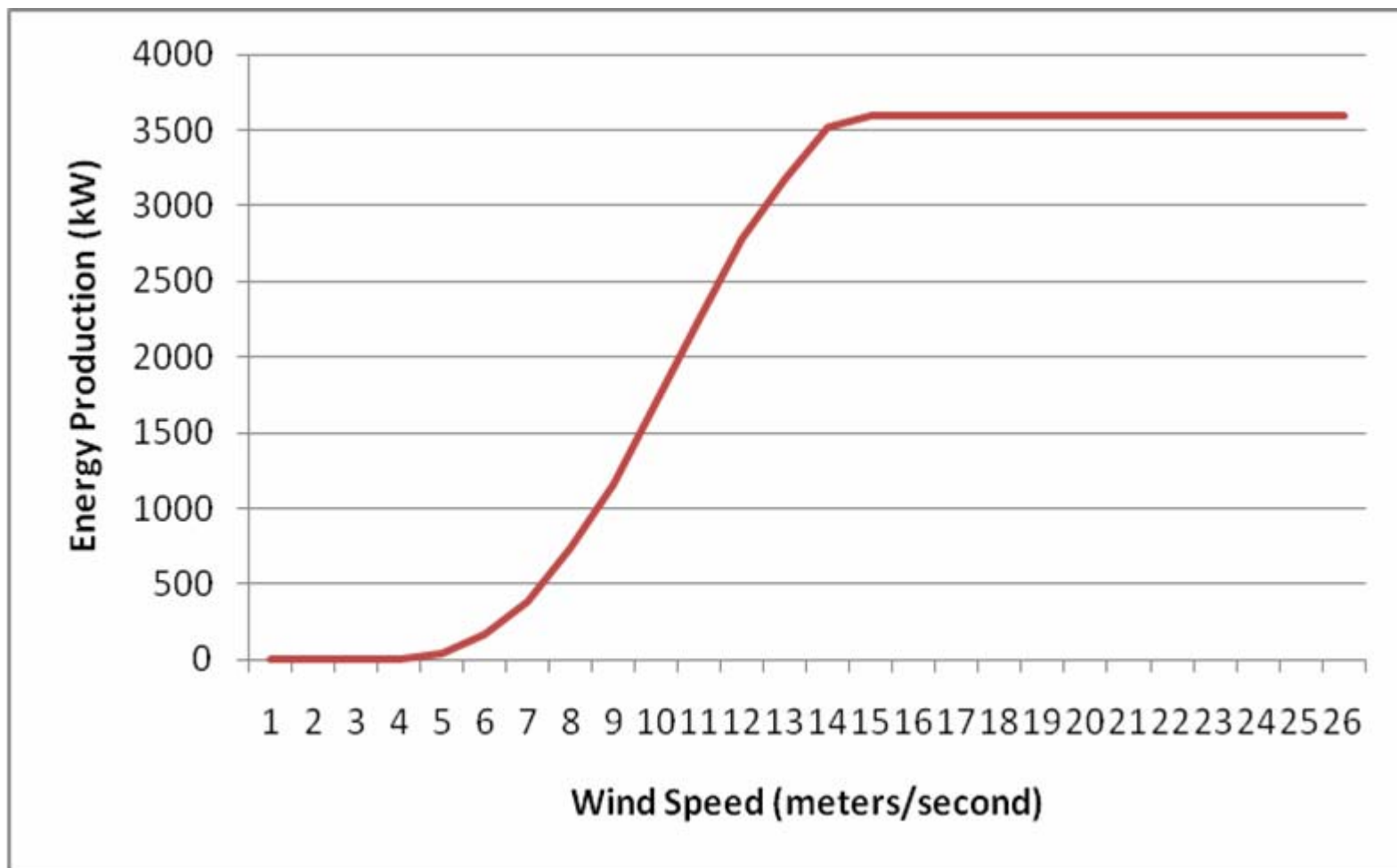
- **Determine future cost**
  - Should not be used for a prospectus or offtake contract
  - Additional Input from EPC firms needed
- **Calculate revenues to Project**
  - Energy
  - REC
  - Capacity
  - Did not included avoided cost (Hull is municipal light district)
- **Examine revenues/costs under different capacity factors**
- **Study Period is 2016-2035**

## **Project Configuration**

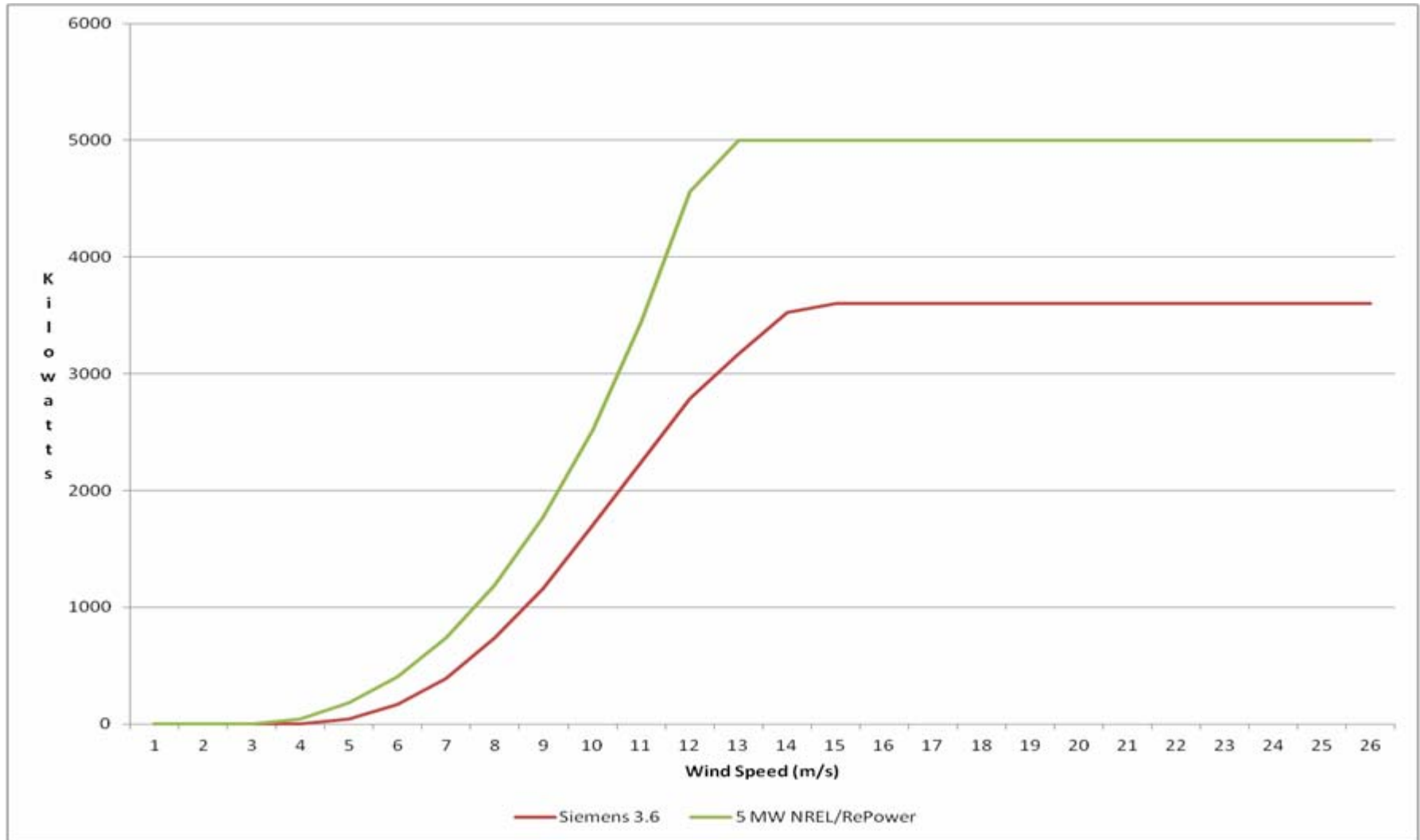
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- **Assume 3 or 5 x 5 MW (RePower) = 15 or 25 MW; 2009 Analysis used smaller turbines (3.6 MW); Larger turbine provides higher production**
- **Relatively close to shore (1-3 nautical miles from shore)**
- **Still strong winds (able to support 30%+ 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**

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### ■ **Capital**

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

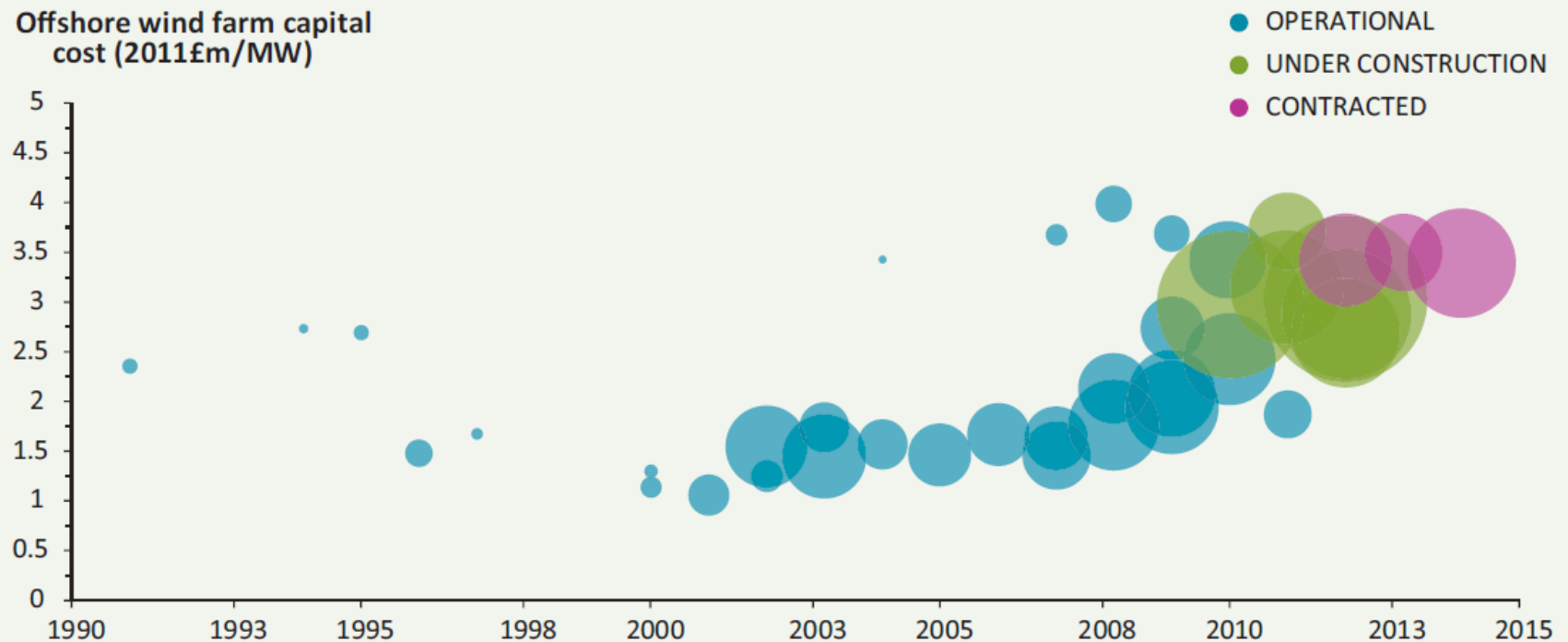
### ■ **Financing**

- 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**



Source: Offshore Wind Cost Reductions Pathway Study, The Crown Estate, May 2012

## Comparison of Major Cost and Financing Assumptions

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### ■ 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)

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	2009 Reference (\$/MWh)	2012 Reference (\$/MWh)
2012	62.65	n/a
2016	77.09	56.74
2020	107.23	66.22
2025	138.04	92.25
2035	176.09	140.81

## **REC Prices (Comparison, 2009 and 2012)**

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	<b>2009 Reference (\$/MWh)</b>	<b>2012 Reference (\$/MWh)</b>
<b>2012</b>	<b>34.20</b>	<b>n/a</b>
<b>2016</b>	<b>23.83</b>	<b>47.36</b>
<b>2020</b>	<b>13.55</b>	<b>74.79</b>
<b>2025</b>	<b>15.33</b>	<b>83.77</b>
<b>2035</b>	<b>17.35</b>	<b>81.09</b>

## Financial Model Results (assuming reference prices)

	2009		2012	
	Municipal Financing	Private Financing	Municipal Financing	Private Financing
<b>Revenue Requirements (LCOE)</b>	\$157.12	\$125.47	\$219.48	\$213.74
<b>Total Revenues</b>	\$129.86	\$125.86	\$170.40	\$170.40
<b>Difference</b>	(\$27.26)	\$0.39	(\$49.08)	(\$43.34)
<b>20 Year NPV (\$000) 3 Turbine</b>	(\$12,451)	\$177	(\$25,931)	(\$22,898)
<b>20 Year NPV (\$000) 5 Turbine</b>	n/a	n/a	(\$42,554)	(\$38,414)

## **What If The Wind Resource is Better?**

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- **Wind Data was from 80 Meters; 5 MW turbine may utilize wind resources at 100 Meters**
- **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**
- **Potential for Higher Capacity Factor Is Possible**

## Capacity Factor Sensitivity Analysis (assuming 3 Turbines and Muni Financing)

### Anticipated Capital Costs

Capacity Factor	NPV (\$000)
34.7%	(\$25,931)
38%	(\$17,914)
42%	(\$8,196)
45%	(\$0.91)
48%	\$6,380

### Historical 2011 Capital Costs

Capacity Factor	NPV (\$000)
34.7%	(\$3,199)
38%	\$4,817
42%	\$14,535
45%	\$21,823
48%	\$29,112

## Summary

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- **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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