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Offshore Wind Finance:

Overview

OSW Webinar: The Role and Needs of Private Investors in Offshore Wind Finance

Presented by Andy Wickless

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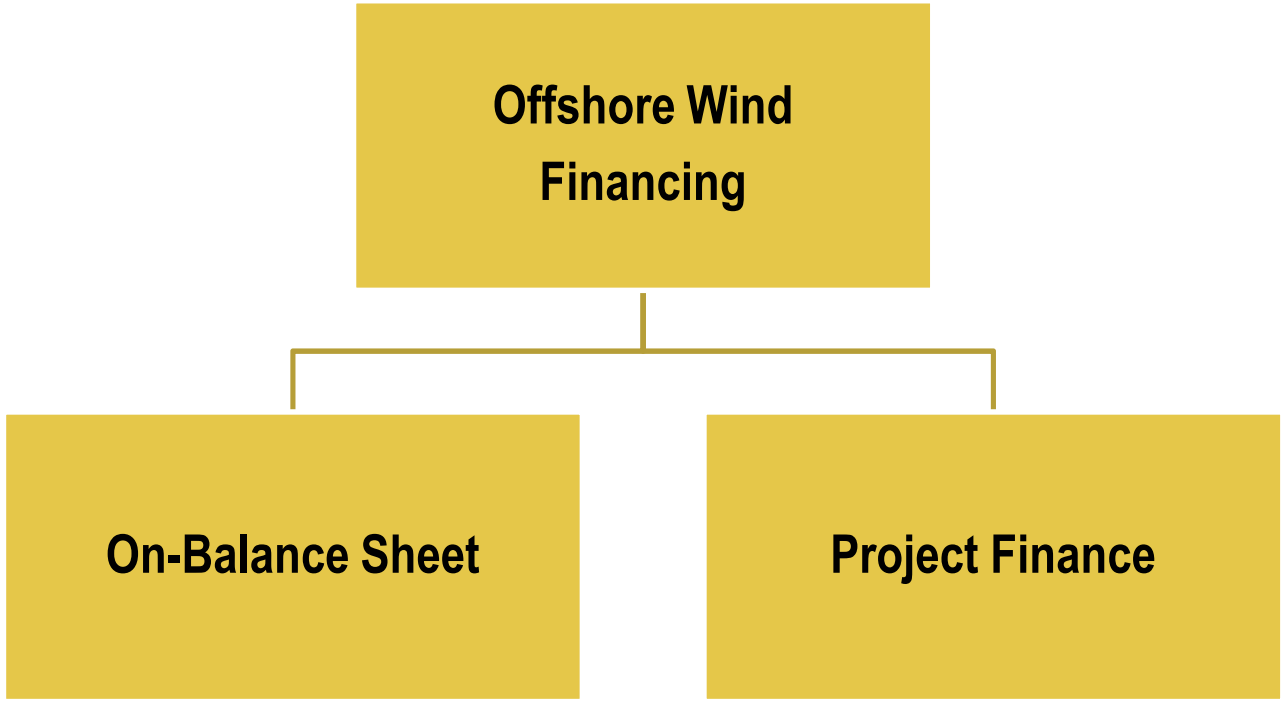
- Offshore wind is a young industry
- Growing quickly in Europe
- Trying to take off in U.S.
- Lots of projects proposed; None have started construction nor reached financial close
- Projects are big – billions of dollars
- Technology and methods are relatively new
- **How are offshore wind farms going to be financed in the U.S.?**

At a high-level, there are two primary methods with which to finance offshore wind projects.



With balance sheet financing, a company uses its own cash and/or debt secured against the assets of the company as a whole.

Balance Sheet Financing: Pros vs. Cons	
Pros	**Cons**
• Debt raised with balance sheet financing is cheaper as the overall risk of the company is less than that of the specific offshore project. • Involves fewer parties, thus saving time, and allows the developer to maintain greater control over the project.	• Capital intensive; reduces the company's financial flexibility • Utilities have other projects to finance such as gas or nuclear plants. • Exposes company to the full risk of the project • Increased exposure to offshore wind on balance sheet could affect corporate credit rating.

With project finance, the company typically establishes a stand-alone entity and secures financing based solely on the cash flows of the project.

Project Finance: Pros vs. Cons	
Pros	**Cons**
• Project finance reduces the amount of capital needed from the project sponsor • Insulates the sponsor from the project's failure	• Typically more expensive • More difficult to arrange given the number of parties involved and the amount of due diligence required

Balance sheet financing has been the predominant financing method in Europe but is unsustainable over the long run and unlikely in the U.S.

Lack of Project Finance

- Project finance is often the preferred method.
- Due to the credit crisis and the perceived risks of offshore by many in the market, access to project financing has been largely unavailable.

Utility-Driven

DONG energy, centrica, RWE The energy to lead, VATTENFALL, e·on, SSE

- In recent years, most European offshore wind farms have been financed on the balance sheets of major European utilities.

Partnership to Share Risk

Source: Vattenfall

- The pursuit of economies of scale offshore drives up project sizes.
- Multiple utilities typically partner to share risk and expertise as project costs can exceed $1 B.

Unsustainable

STANDARD &POOR'S

MOODY'S

- As European utilities increase their capital expenditures to fund the multi-billion dollar offshore market, as well as other infrastructure projects, their corporate ratings could come under pressure.

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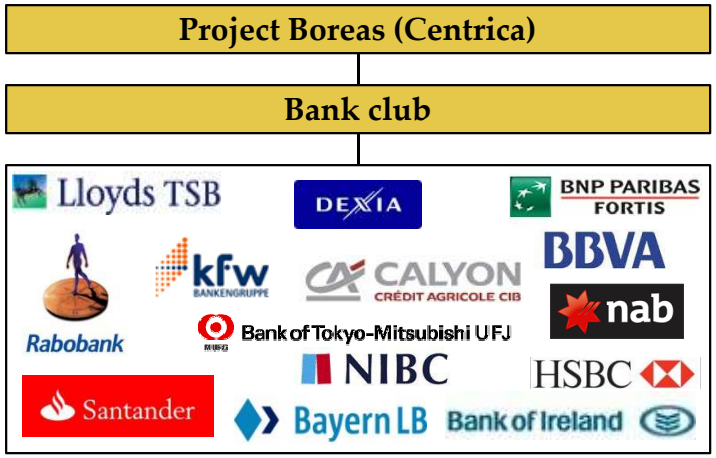
While few projects in Europe were project financed at the beginning, this is beginning to change as the industry matures.

Rabobank/ Dexia Leading

- Rabobank and Dexia have led the project financing effort in the European offshore wind market.

Bank Clubs



- As each commercial bank is only willing to lend ~$50M per project, bank clubs are formed.
- Centrica's Project Boreas obtained £340 million in project finance from a "club" of 14 commercial banks (refinancing).

Project Finance Increasing

Project Financed Offshore Projects (Selected)			
Developer	**Turbines**	**Size**	**Year**
Princess Amalia	Vestas	120 MW	2007
Project Boreas	Siemens	220 MW	2009
Global Tech I	Areva	400 MW	2013

- The size of projects lenders are willing to finance is growing.
- Lenders are also financing projects with turbines other than Vestas and Siemens.

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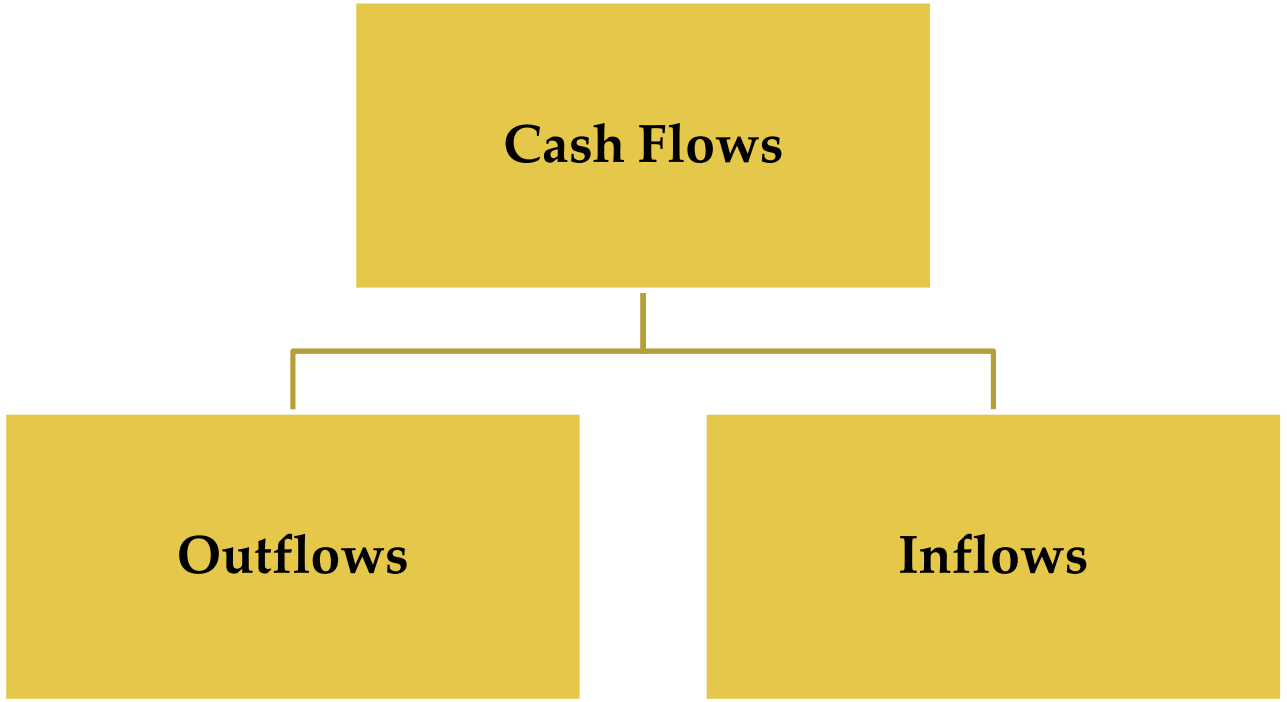
In non-recourse project finance, lenders base their decisions on the expected cash flows of the individual project.



Lenders will need confidence in the assumptions about the cash outflows and inflows.

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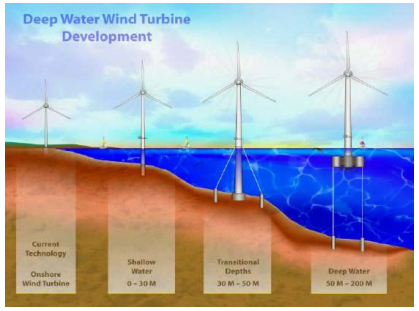
On the cash outflow side, the principal risk is related to delays and cost overruns during construction and operation.

Risks: Construction, Operation



Source: NREL

- Coordination issues with multiple construction contractors (no wrap)
- New foundation types in deeper waters
- Supply chain constraints (e.g. vessels, cranes, HVDC cable, spare parts) can adversely impact construction and O&M.
- Inclement weather can impact all phases of a project.

Mitigation Efforts

Source: Thanet Offshore Wind Ltd.

- Increased project coordination and documented interfaces are critical.
- Vertical integration can ease supply chain bottlenecks (e.g. DONG/ Siemens – A2SEA).
- Pre-assembly of some components onshore mitigates weather risk, enabling quicker installation offshore, which is more costly.

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The most significant cash inflows for offshore wind farms are those for power sales. Signing a PPA is critical for financing.

Securing PPAs

Signed Offshore PPAs – U.S. (Selected)				
Developer	**Utility**	**State**	**Size**	**Year**
NRG Bluewater Wind	Delmarva	DE	Up to 200 MW	2008
Deepwater Wind	National Grid	RI	28.8 MW	2009
Cape Wind	National Grid	MA	234 MW (50%)	2010

- Without a long-term power purchase agreement (PPA), offshore wind farms in the U.S. are unlikely to obtain financing.
- Some U.S.-based projects have signed PPAs.
- PPAs have come under tremendous scrutiny for the increased rates electricity customers would pay.

States Take Action

New Jersey RPS Carve-Out for Offshore Wind

- Nation's first offshore wind carve-out
- Bill passed by NJ state senate (S.B. 2036)
- Directed Board of Public Utilities (BPU) to develop percentage-based standard to support 1,100 MW

- As the cost of energy from offshore wind farms is uneconomic without government subsidy, some states are forcing the hand of utilities to sign PPAs.

Another key aspect for financiers, in terms of cash inflows, is ensuring the uptime of the wind turbines.

Risks: Technology, Weather, Operations

Technology risk

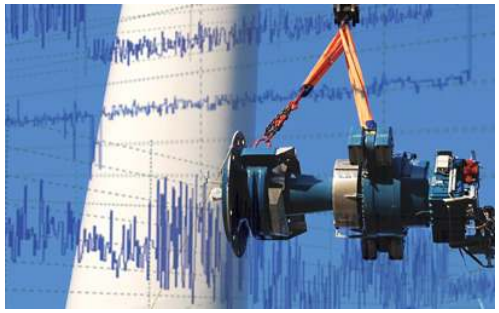
Source: AMSC

Weather risk

Source: NASA

- Multiple factors could lead to the loss of power sales.
- Larger turbines are being developed but do not yet have sufficient operating history.
- Severe weather can put turbines out of service and also inhibit access to maintain and repair turbines.

Mitigation Efforts



Source: Wind Systems Magazine

- Using turbine models with a history of strong operating performance will ease access to financing.
- Remote condition monitoring and predictive maintenance can enable repairs to be made in periods of low wind and good weather.
- Most turbine availability warranties include stiff penalties.

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For larger projects, the support of public financial institutions (PFI) will likely be critical either in terms of loans or loan guarantees.

Europe

European Investment Bank

kfw

EKF EKSPORT KREDIT FONDEN

EULER HERMES

- Project financed wind farms in Europe typically receive support from state-owned banks and/or export credit agencies.
- PFIs can provide about as much funding as commercial banks for a project.
- The export credit agencies could facilitate the financing of U.S.-based projects by supporting turbine manufacturers such as Vestas, Siemens, and REpower.

DOE Loan Guarantee

"The abrupt reduction of DOE loan-guarantee authority has injected considerable uncertainty into the financing for and viability of all U.S. offshore wind projects."
-NRG Bluewater Wind Spokeswoman (May 2011)

- The DOE loan guarantee program once appeared to be a major potential source of financial support in the U.S.
- The current outlook, however, is quite bleak due to lack of funding.
- In mid-May, the DOE notified Cape Wind that its application was "on hold".
- In late May, NRG Bluewater put a project on hold.

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Vendor Financing may be used opportunistically when other sources are unavailable.

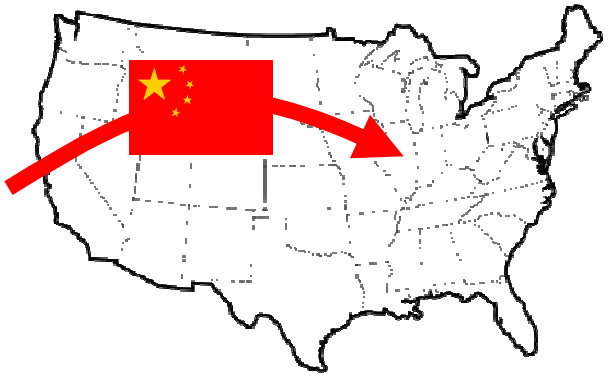
Siemens – Cape Wind

Cape Wind Energy for Life. SIEMENS

"We've always made it clear that we are not only willing but also capable of helping to support the whole project."
-Josef Kaeser, CFO, Siemens
June 2011

- Vendor financing is not new.
- Siemens has stepped forward and offered debt and equity financing for the Cape Wind project.

Vendor Financing Likely to be Opportunistic



- The OEM-financed paradigm is unlikely to be a typical financing model over the long-term.
- Some OEMs may finance select projects as a stop-gap measure to ensure the sale of their turbines.
- Example: Chinese OEMs entering U.S. onshore market may use vendor financing.

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Conclusions

- At a high-level, there are two primary methods with which to finance offshore wind projects.
- Debt raised with balance sheet financing is cheaper, easier to arrange, and provides greater control but is capital intensive, taking available capital away from other projects.
- Project finance reduces the amount of capital needed from the project sponsor and insulates the sponsor from the project's failure but is typically more expensive and more difficult to arrange.
- Balance sheet financing has been the predominant financing method in Europe but is unsustainable over the long run.
- While few projects in Europe were project financed at the beginning, this is beginning to change as the industry matures.
- For larger projects, the support of public financial institutions will likely be critical either in terms of loans or loan guarantees.
- Vendor Financing may be used opportunistically when other sources are unavailable.

Key CONTACTS

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