



Offshore wind workshop – Finance & insurance

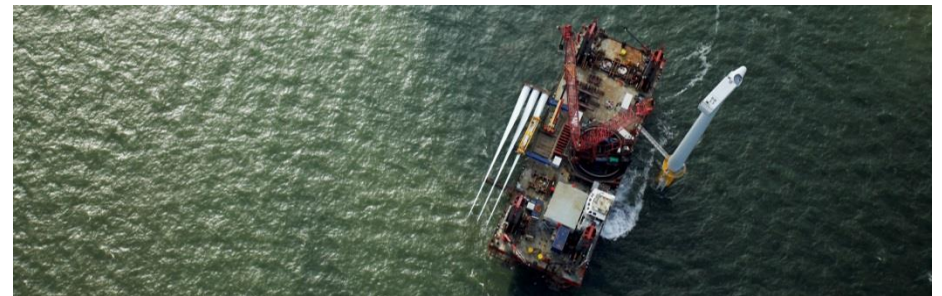
Visit of the Brazilian offshore wind delegation

Hamburg – 23 May 2019

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1. Green Giraffe – The renewable energy finance specialist

We get deals done

Deep roots in renewable energy finance

- Launched in 2010 by experienced finance specialists with a **strong and proven track record** in renewable energy
- 85+ professionals with offices in Boston (USA), Cape Town (South Africa), Hamburg (Germany), London (UK), Paris (France), and Utrecht (the Netherlands)
- Multi-disciplinary skillset including **project & corporate finance, M&A, tendering, contracting, and legal expertise**



Close to **EUR 25 billion** funding raised for renewable energy projects in **9 years**



85+ professionals in **6 countries** on 3 continents

High-quality, specialised advisory services

- Focus on projects where we can actually add value
- We can provide a holistic approach and are able to include sector-specific tasks in addition to traditional debt or M&A advisory (such as contracting, tender advice, strategic advisory, and development services)
- Widening geographical reach beyond Europe, with a growing presence in the Americas, Africa, and Asia
- Priority given to **getting the deal done!**

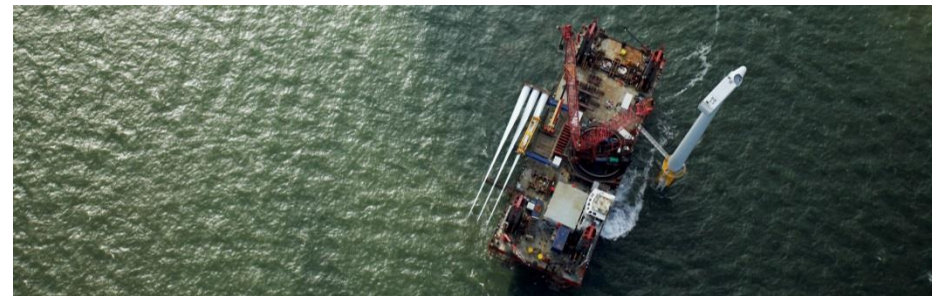


Involved in over **150 renewable energy transactions** or **projects** with a total capacity of circa **35 GW**

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2. Offshore wind in Brazil

Offshore wind developments to date

Public debate on offshore wind for several years, limited tangible development

- 2015 preliminary studies into offshore wind development commissioned by energy minister; political debate continued last year
- Memorandum of Understanding to evaluate joint offshore wind developments in Brazil signed between Petrobras and Equinor in September 2018
- World Bank & IFC have announced a programme to fast-track the adoption of offshore wind in emerging countries like Brazil in March 2019
- Offshore wind roadmap is currently under development by energy planning authority EPE and to be published in 2019; regulatory changes required to enable offshore wind development will also be analysed

Only limited offshore wind project developments

- Asa Branca recently submitted an updated 720 MW design based on GE Haliade-X turbines to national power regulator Aneel
- 5 MW pilot project developed by Petrobras with anticipated completion in 2022

Huge offshore wind potential



Long coastline, with shallow water depths stretching several kilometres from shore

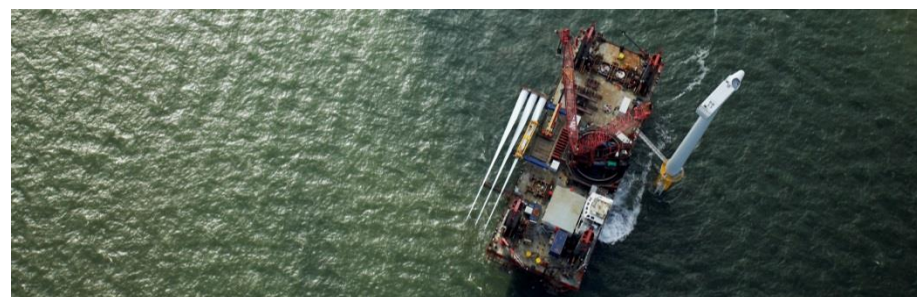
Reliable and strong winds

Many large cities are close to the shore which could help offshore wind's viability

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3. How offshore wind is financed

“Balance sheet” (equity) vs. “non-recourse” (debt)

Large projects are typically developed through a standalone project company

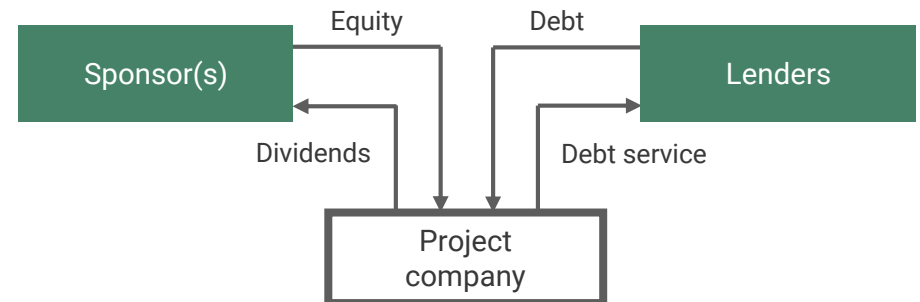
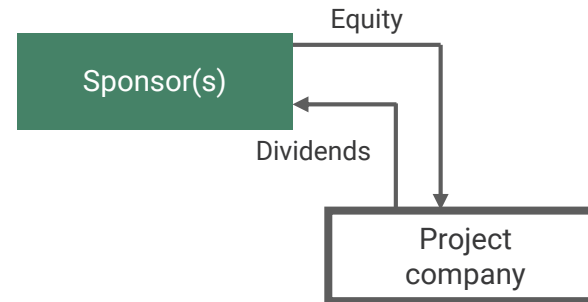
- Owned by the project investors
- With its own revenues & balance sheet and thus the ability to raise debt on its own merits

There are only two discrete sources of funding

- By the owners (directly via equity or shareholder loans, or indirectly via guarantees)
- By banks without recourse to the equity investors – this is “project finance”

The way a project is funded will have a material impact on how it deals with contractors

- In a project finance deal, you need to deal with the senior lenders' requirements!
- Tax, accounting, consolidation and rating issues



All parties have a direct incentive to understand who will be funding the project

3. How offshore wind is financed

A quick reminder about project finance

No recourse	No upside
Recourse to investors is contractually limited	Lenders receive a fixed remuneration
Lenders rely on project revenues only	Lenders do not benefit from better performance
Capital intensive projects requiring long term financing	Low single-digit margins vs high leverage
Lenders need long term operational performance	Risks to be commensurate with remuneration

- Lenders need to make sure that the project works on a standalone basis, with no third party commitments than those made at financial close. Such commitments must be realistic, credible and durable, both from a contractual and an economic standpoint
- This typically entails very detailed contractual frameworks and extensive due diligence

- Lenders need risks to be measurable and to have probabilities of occurring in the low single digits for investment to make sense. Risks which are (seen as) well understood are thus easier to bear
- Project finance lenders will usually have priority access to cash-flows and security on all assets, contracts and equity of the project

3. How offshore wind is financed

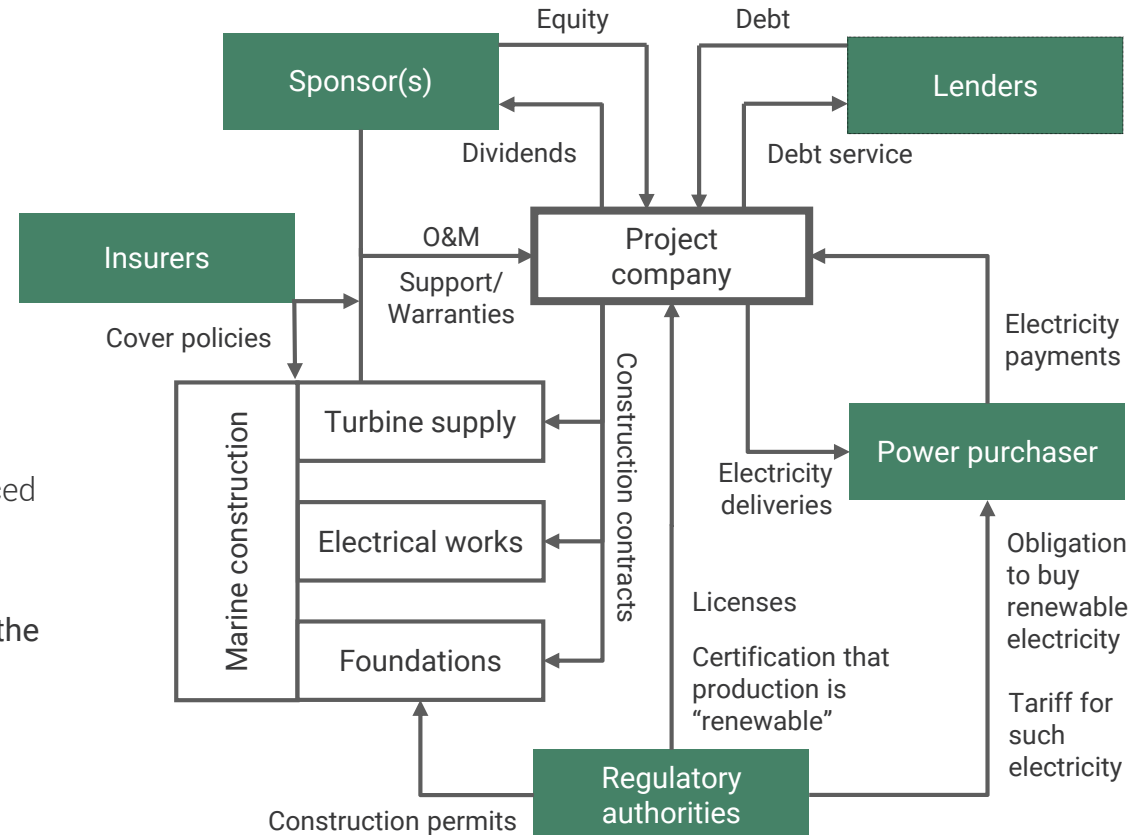
Offshore wind transactions are always heavily contracted

Major contracts include

- Permits, licenses, authorisations, etc.
- Construction/supply contracts
- Electricity sales contracts (and, if applicable, green certificates/RO contracts)
- O&M contracts
- Insurance
- Financing documents
- Direct agreements with key contractors, enforced by lenders in case of project default

Parties with a stake in the financing and a say on the overall project structure may include

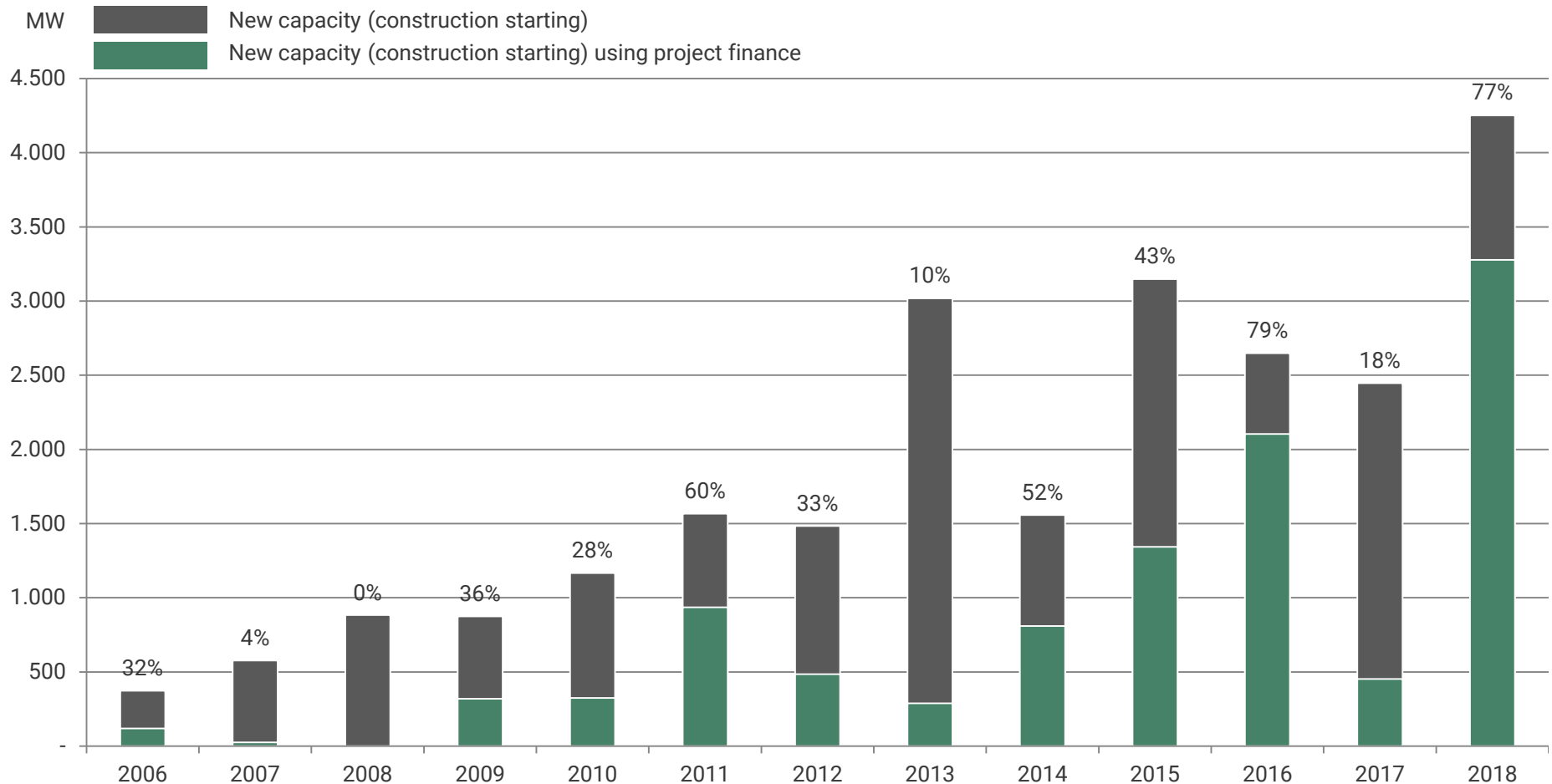
- Sponsors/investors
- Lenders (and their advisors)
- Contractors
- Insurers (and their advisors)



Offshore wind is a quintessential example of a comprehensive contractual structure

3. How offshore wind is financed

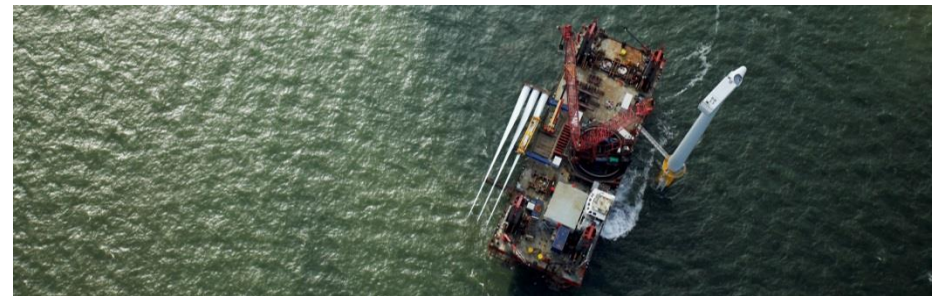
Project finance already finances a significant fraction of overall new capacity



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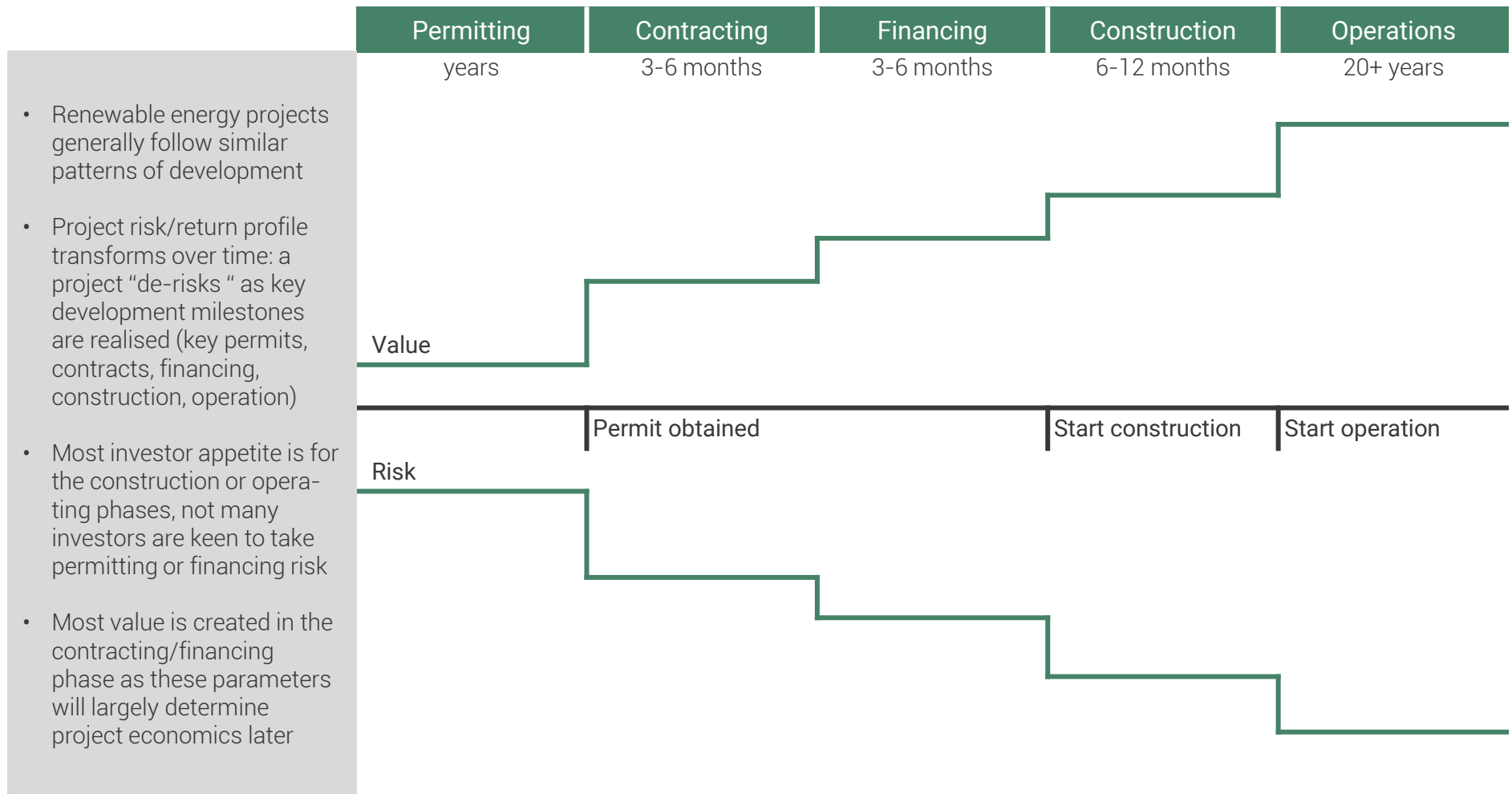
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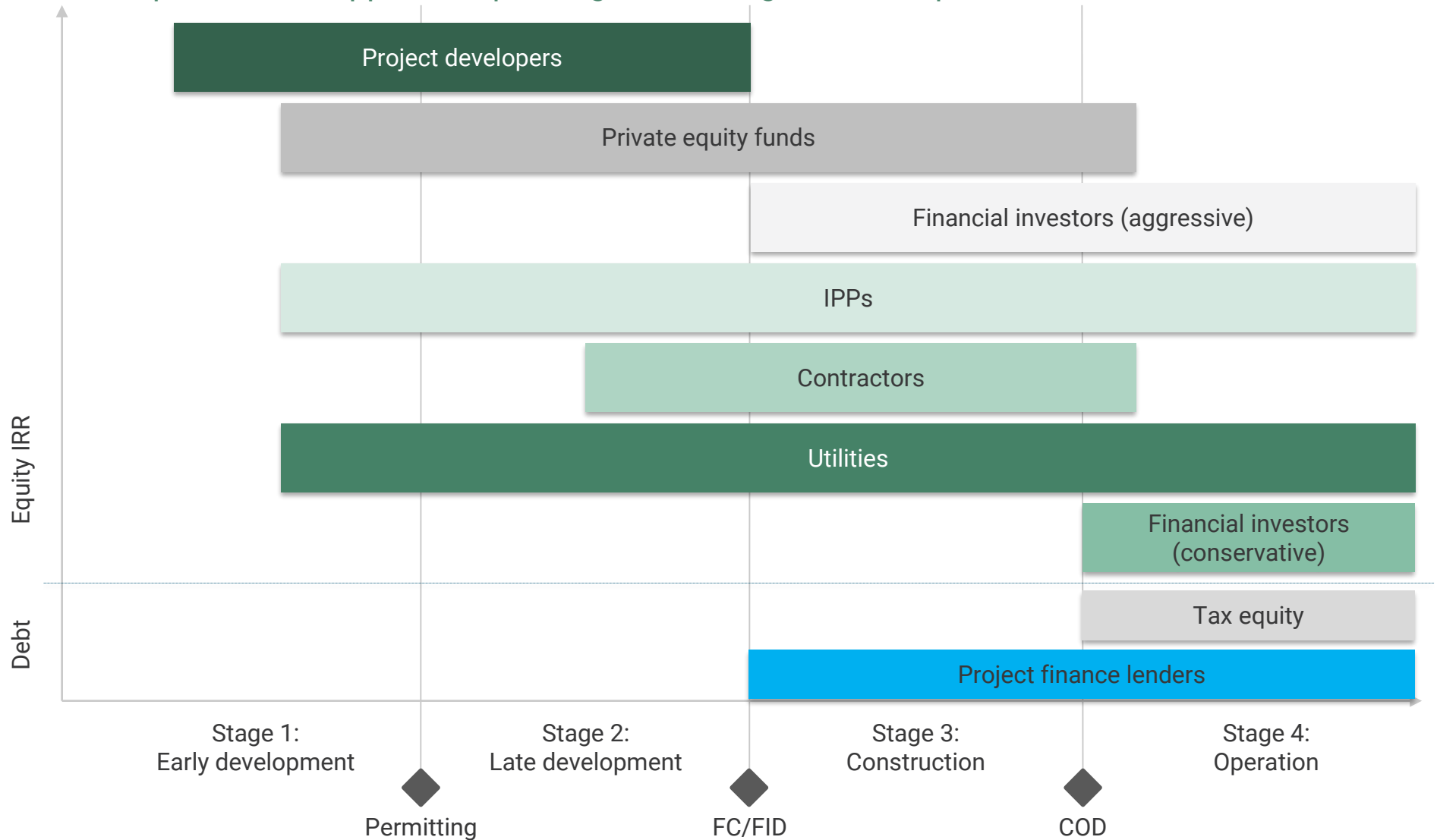
4. Investor strategies

Most value is created during the development & contracting phases



4. Investor strategies

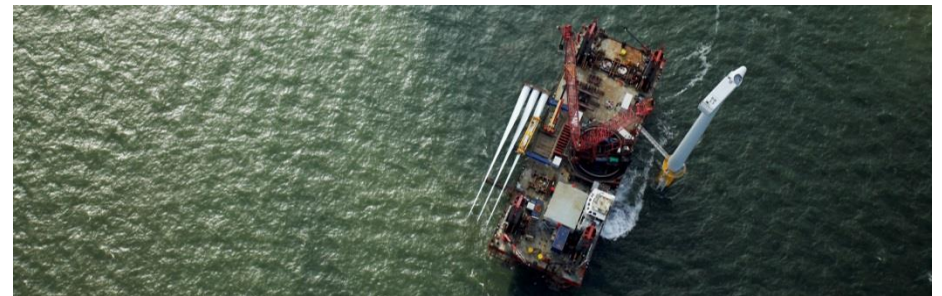
Investor profiles and appetite depending on the stage of development



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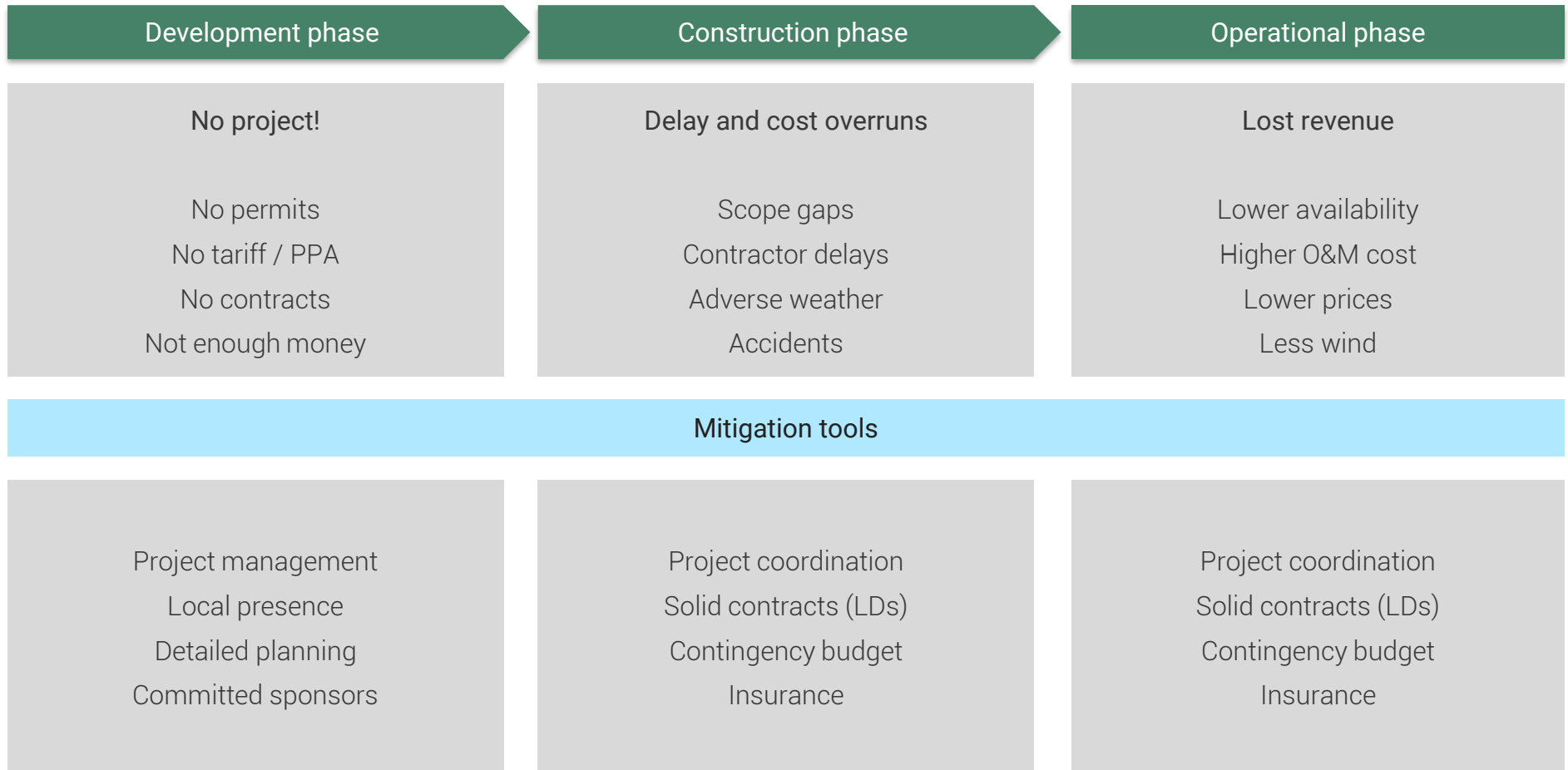
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5. Debt finance

Risks are different in each project phase



5. Debt finance

Construction risk – banks focus on interfaces between key tasks as well as between contracts

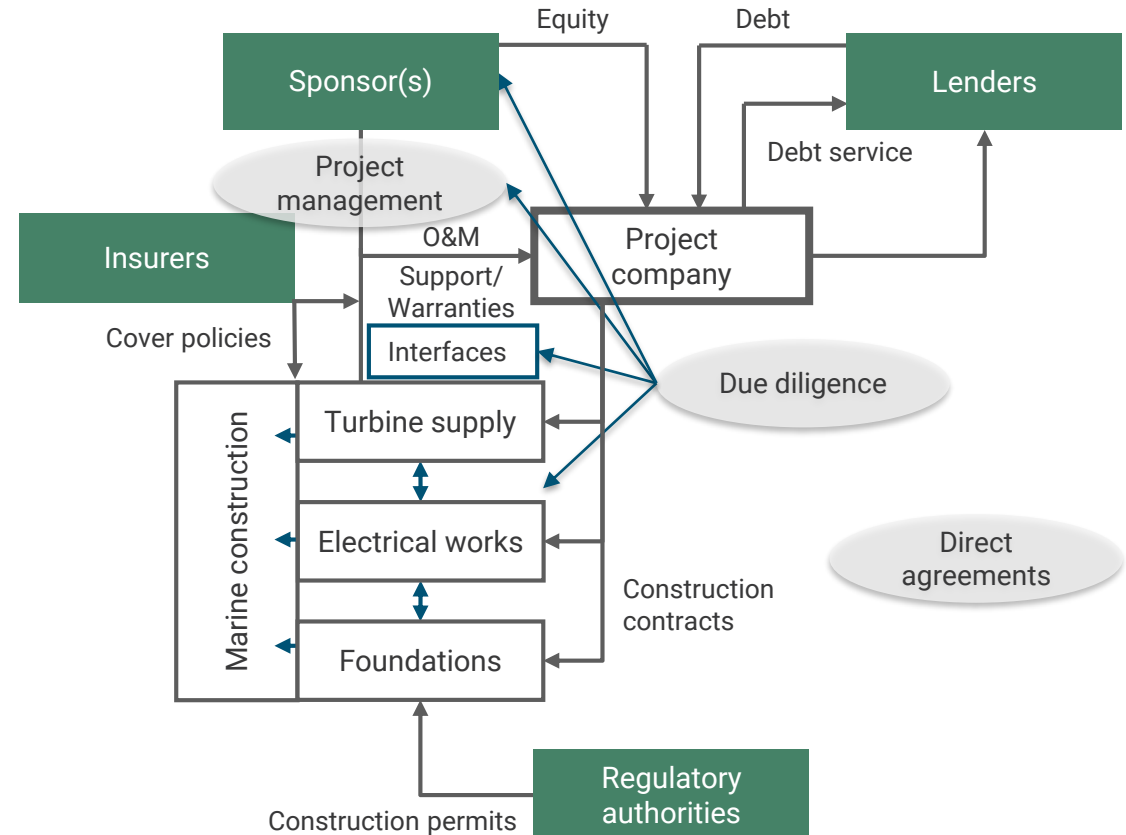
Several completely different industries

- Turbine manufacture
- Foundation/steelwork supplies
- Electricals
- Cabling
- Marine construction work

No obvious general contractor!

And yet banks do take construction risk

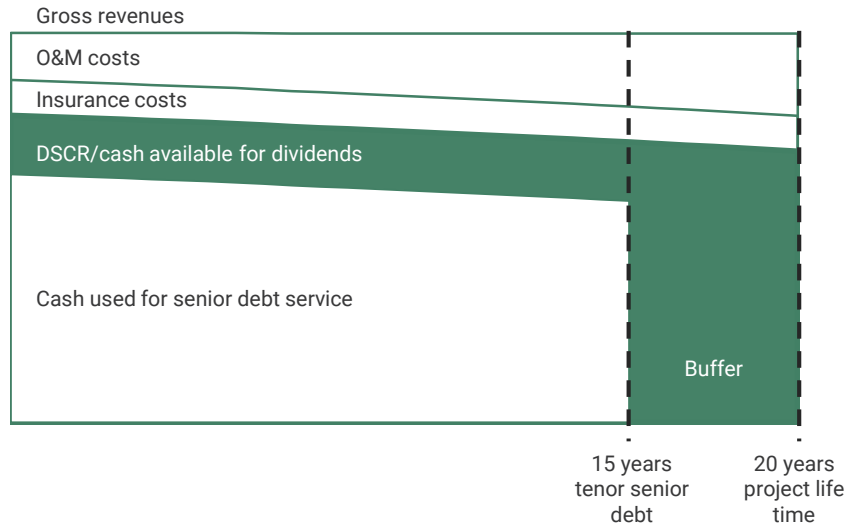
- Focus on project management
- Focus on key interfaces
- Understanding of critical path items
- Heavy involvement in contract negotiation



The higher risks borne by the banks impose different development and contractual approaches

5. Debt finance

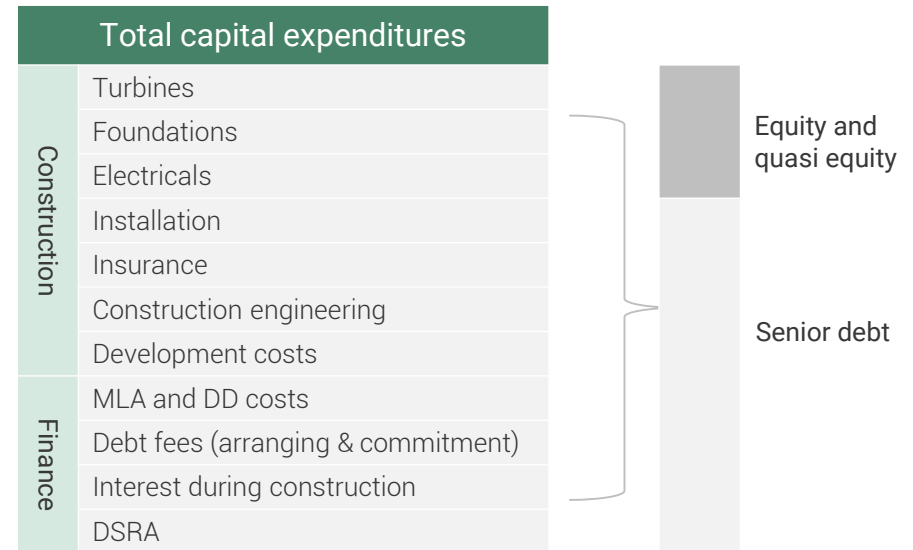
Revenue side constraint



Offshore DSCR constraint: 1.20-1.25 with P90

- No or very limited price risk on revenue side
- Net availability number in the 95-97% range
- Contracted O&M cost assumptions
- Full insurance package included

Capital expenditure constraint



Debt : Equity < 75:25

- No tolerance for junior debt mechanisms
- Some tolerance for pre-completion revenues
- General preference for equity to be paid upfront

5. Debt finance

Offshore wind has now become mainstream

Since the crisis, banks have refocused on known clients, core countries and strategic sectors of activity

- The good news is that offshore wind is unambiguously "strategic" for many banks today
- Countries where offshore wind is developing are seen as "safe" (Northern Europe) and core for most banks

There is more funding available than there are bankable deals

- Fewer deals brought to the market than banks were ready for, leading to frustration and pent-up demand
- Increased capacity does not translate into lower standards, so weak projects will not be financed
- Excellent liquidity for good projects

Increased diversity of structures

- Multiple post-construction refinancings, including refinancings done pre-COD with completion guarantees
- Bond market tapped, albeit not for construction risk
- Construction risk capacity available in all jurisdictions (including the US and Taiwan)

Record number of projects funded last year

- Several large greenfield projects
- Largest transaction ever with Hornsea 1, which includes several tranches tapping several markets

5. Debt finance

Market trends (for greenfield projects)

Typical project finance conditions - offshore	Leverage	Maturity post-completion	Pricing	Maximum underwriting
2006-2007	60:40	10-15 years	150-200 bps	EUR 50-100 M
2009-2013	65:35	10-15 years	300-350 bps	EUR 30-75 M
2014-2015	70:30	10-15 years	200-250 bps	EUR 100-200 M
2016-2017	75:25	15-17 years	150-225 bps	EUR 100-150 M
2018	75:25	15-18 years	120-175 bps	EUR 100-150 M

Debt is currently extremely cheap

- Margins rose after the crisis (reflecting higher bank cost of funding), but have been trending down since 2014
- With low underlying rates, the overall cost of >15-year debt is now well below 3%

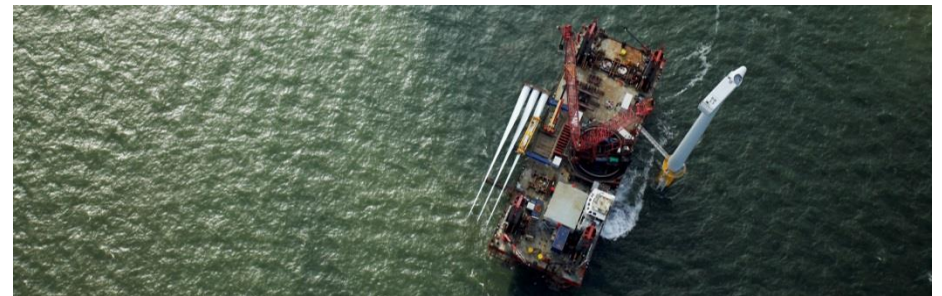
Structures (ratios, maturity, covenants) have actually been quite stable since 2007

- Debt terms fundamentally driven by regulatory framework (duration, merchant risk, public financing opportunities)
- Commercial fights are rarely about debt sizing or pricing
- General improvement in commercial terms over the past few years

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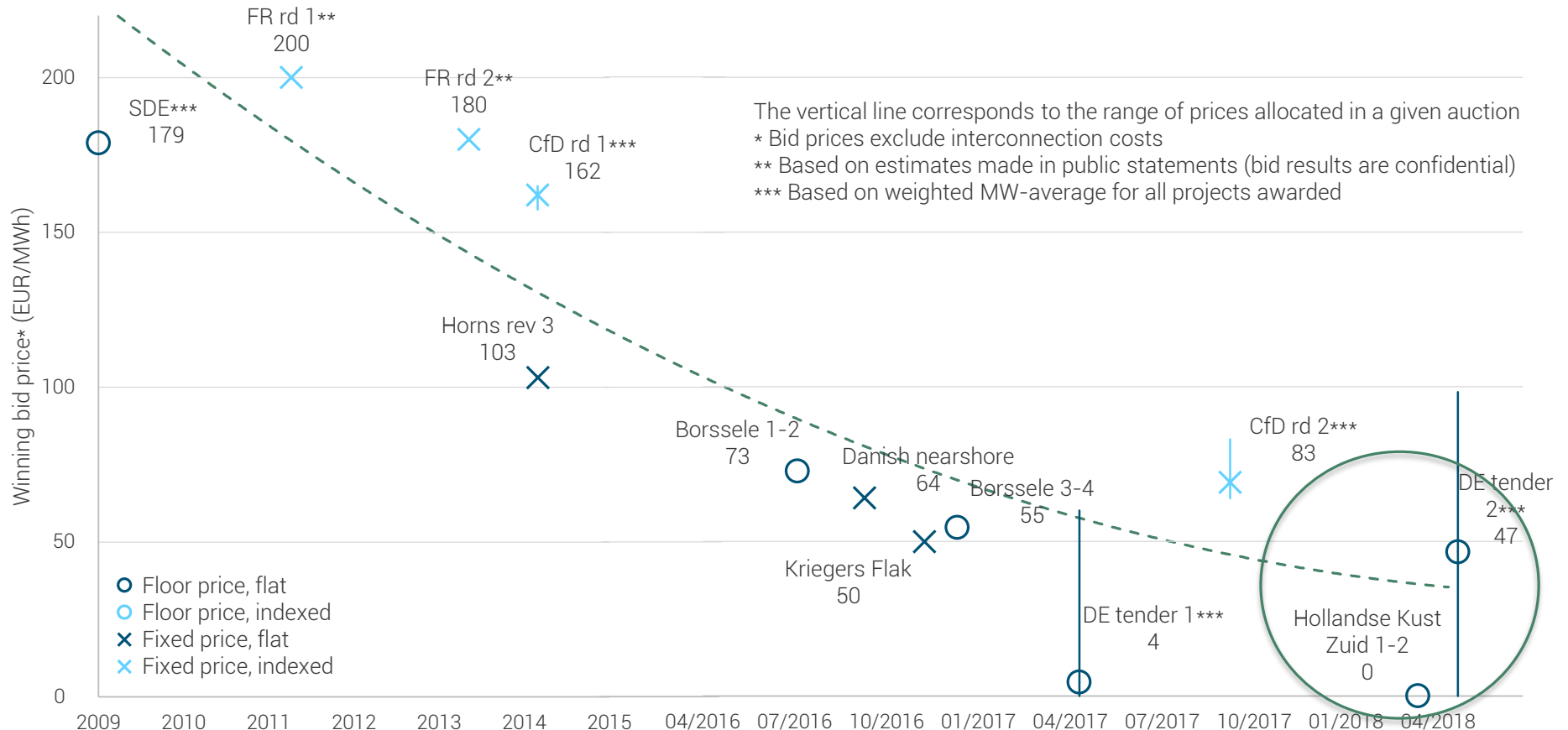
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6. Recent trends in offshore wind

Consistent policy has resulted in falling power prices for OW projects



Recent tenders in continental Europe have shown that some investors are willing to build OW projects with 40 EUR/MWh tariffs (2018 prices), excluding grid connection

6. Recent trends in offshore wind

What made the price drops possible: financial optimisation was essential

The financial context is favourable (but that is the only factor the industry does not control)

- Record low cost of money
- Investors seeking higher returns and finding the long term stable revenue flows of the industry very attractive

But the background context is only a small part of the story, and the other factors will not go away

- Perception of OW risk is improving as experience and track record builds up
- Downward movement on returns has been steady but reasonably slow – nobody has done anything stupid
- Industry has built up a solid, highly professional track record of solving issues and avoiding losses – there's still a premium as marine construction will always be risky, but risk is managed transparently and effectively

Financial optimisation has become sophisticated

- Increasing experience in selling (stakes of) operating projects to long term financial investors at high valuations
- Such equity refinancings can be incorporated from the start in assumptions, lowering the long term cost of capital and bid prices (but of course reducing the opportunities for capital gains that existed under the old price regimes)
- In parallel, the debt market has shown it was ready to take construction risk on attractive terms (leverage, pricing, covenants) and to offer even more attractive terms once projects are completed (and such refinancing terms can also be anticipated)

The lower pricing of OW risk is not going away

6. Recent trends in offshore wind

Several successful equity strategies

There are buyers for almost every profile of risk

- There is appetite for every kind of risk (development, construction, operations, merchant, etc.)
- There is appetite for every size of ticket (minority, majority, levered, unlevered)
- Returns are consistent with the risks taken

Current European equity strategies are based on aggressive assumptions

- Lower capital expenditure thanks to competitive supply chain
- Assumptions that projects will be refinanced with cheaper capital (whether debt or equity) once operational
- Limited premium for construction risk

Recent new auction results (Massachusetts, Taiwan) suggest there will be a minimal premium for “new market” risk

- Major European contractors expected to follow investors in new markets and build the local supply chain
- Aggressive financial structuring from the get-go, on the assumption that refinancings will indeed take place
- Experienced players involved in the projects



Debt



M&A



Strategic



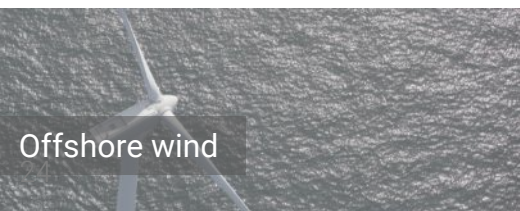
Contracting



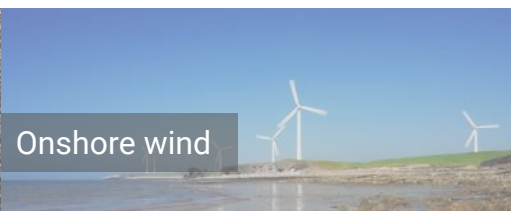
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Offshore wind



Onshore wind



Solar power



Other renewables

Appendix – Auction regimes are not the same

Comparison of the main existing regimes – DE, FR, NL, UK

	DE	FR	NL	UK
Allocation	Tender	Tender	Tender	Accreditation
Tenor (years)	20	20	15	15
Price regime	Floor	Fixed	Floor	Fixed
Inflated / indexed	No	Yes, for 60% of the tariff	No	Yes
Negative prices	No support for periods of > 6 consecutive hours	No risk	No support for periods of > 6 consecutive hours	Support cap = strike price
Grid connection	TSO	TSO (via separate tariff)	TSO	Project
Permits	With tariff	No	With tariff	Condition to auction
Devex support	Pre-development by BSH	No	Soil studies & EIA	No

Appendix – Auction regimes are not the same

Key parameter 1 – permits and early studies

	DE	FR	NL	UK
Allocation	Tender	Tender	Tender	Accreditation
Tenor (years)	20	20	15	15
Price regime	Floor	Fixed	Floor	Fixed
Inflated / indexed	No	Yes, for 60% of the tariff	No	Yes
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Permits	With tariff	No	With tariff	Condition to auction
Devex support	Pre-development by BSH	No	Soil studies & EIA	No

Including the permit in the tender makes a huge difference

- French round 1 & 2 are still waiting for their final permits today
- Development equity is the most expensive and has a direct material impact on final LCOE

Appendix – Auction regimes are not the same

Key parameter 2 – tariff regime

	DE	FR	NL	UK
Allocation	Tender	Tender	Tender	Accreditation
Tenor (years)	20	20	15	15
Price regime	Floor	Fixed	Floor	Fixed
Inflated / indexed	No	Yes, for 60% of the tariff	No	Yes
Negative prices	No support for periods of > 6 consecutive hours	No risk	No support for periods of > 6 consecutive hours	Support cap = strike price
Grid connection	TSO	TSO (via separate tariff)	TSO	Project
Permits	With tariff	No	With tariff	Condition to auction
Devex support	Pre-development by BSH	No	Soil studies & EIA	No

The price formula creates wildly different incentives

- Floor regimes encourage zero-bids, with as-of-today unpredictable consequences
- Long tenors are more attractive to long term investors with cheap capital
- Lack of indexation increases the headline tariff while unnecessarily pushing macro-economic risk on the project