

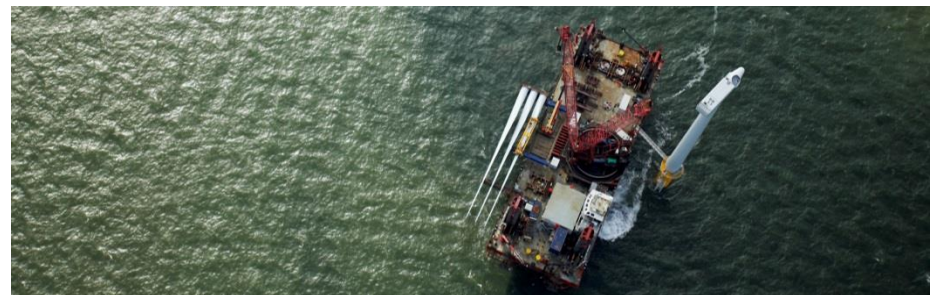
Offshore wind – Auction designs and why PPAs are only second best

August 2020

Auction designs and why PPAs are only second best

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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
- 100+ 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 30 billion** funding raised for renewable energy projects in **10 years**



100+ 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 **~200 renewable energy transactions** or **projects** with a total capacity of **~60 GW**

1. Green Giraffe – Now a 50:50 joint venture with Daiwa

A complementary partnership strengthening our advisory practice and international network



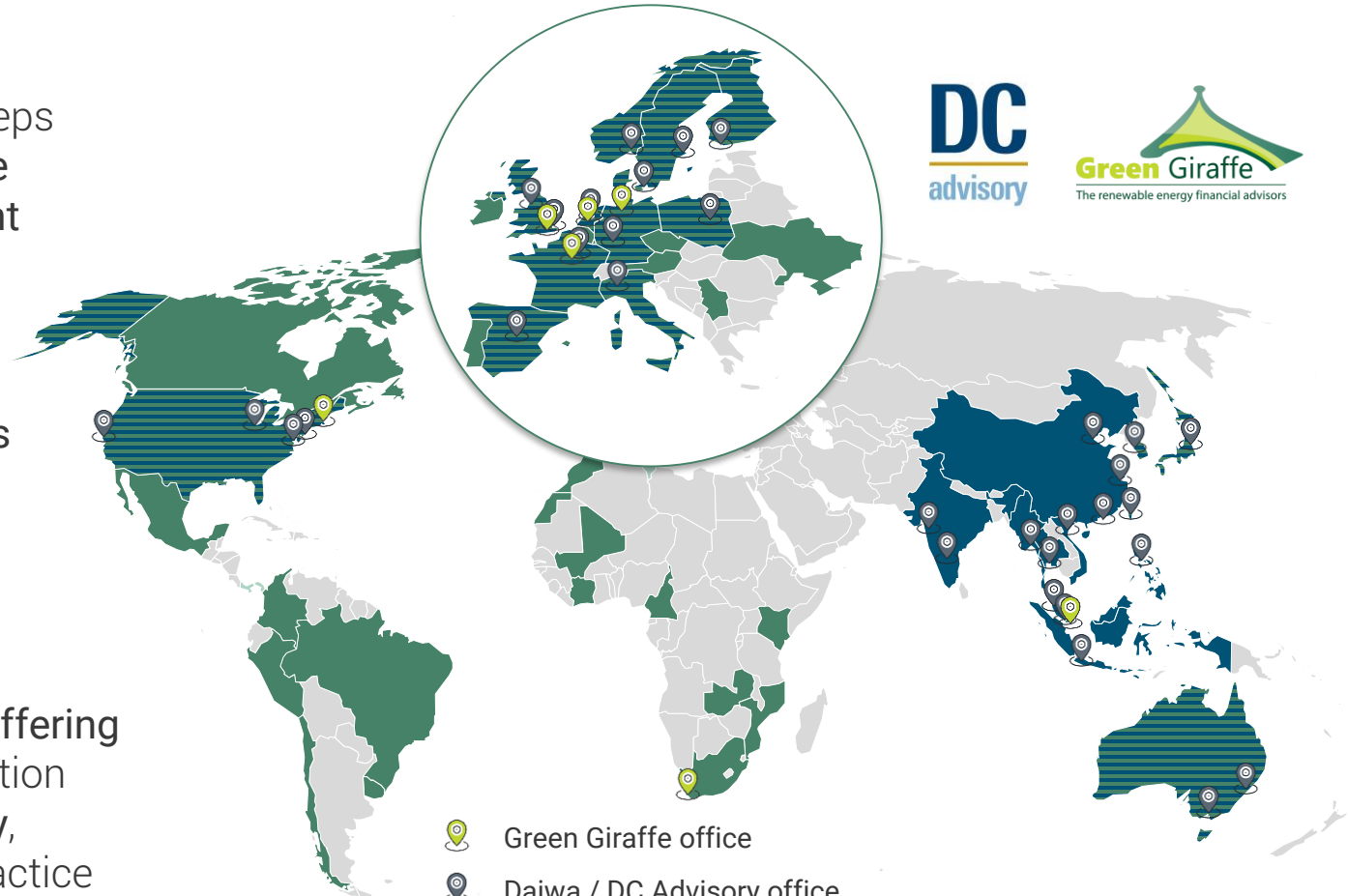
Green Giraffe keeps its independence and management







Improved access to international investors



Stronger client offering through cooperation with DC Advisory, Daiwa's M&A practice

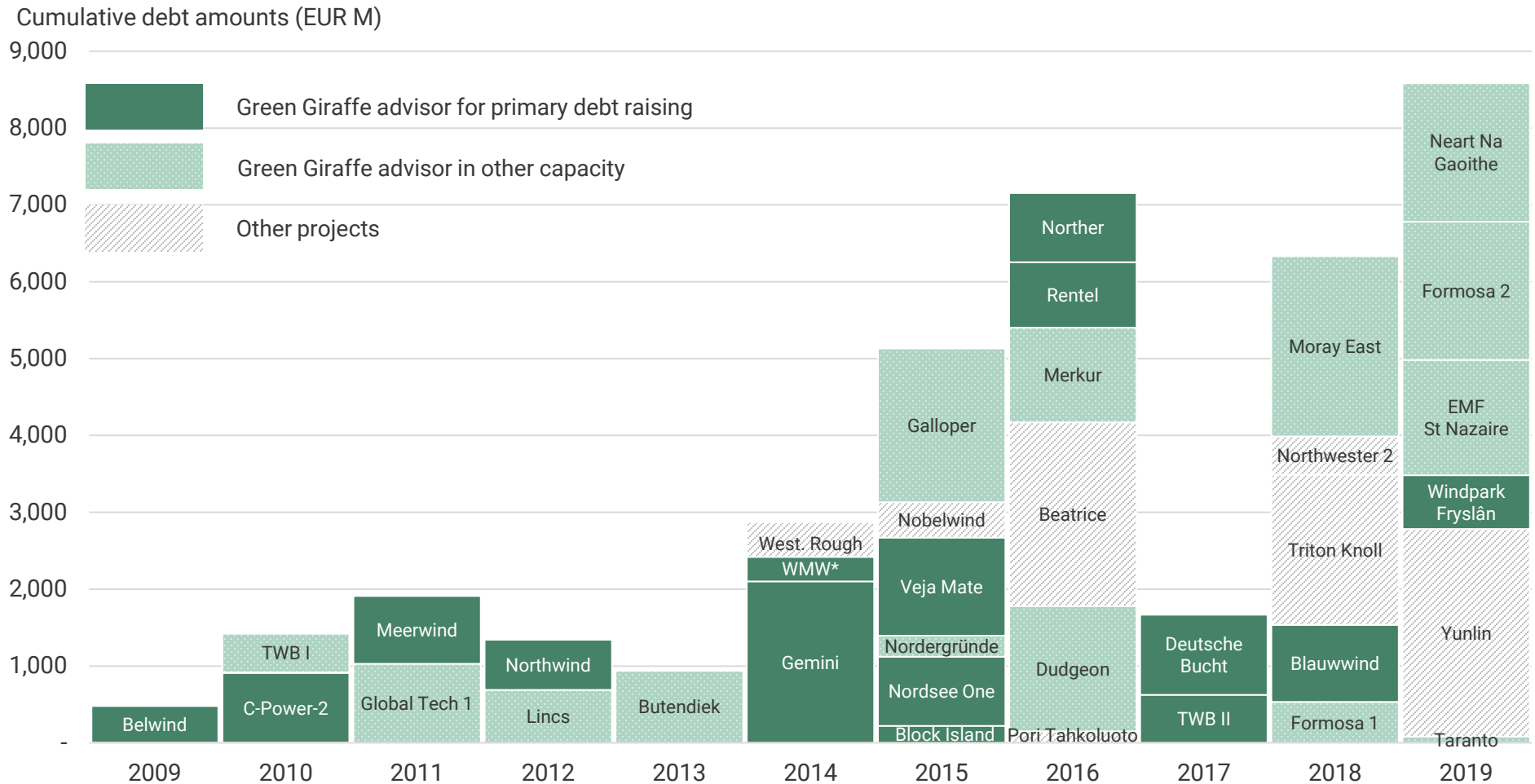


-  Green Giraffe office
-  Daiwa / DC Advisory office
-  Country in which Green Giraffe is active
-  Country in which Daiwa / DC Advisory is represented



1. Green Giraffe – The renewable energy finance specialist

We have been involved in most offshore wind debt transactions with construction risk to date

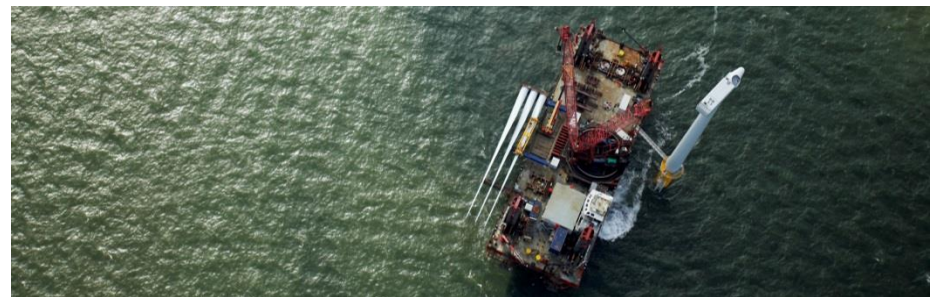


* WMW: Westermeerwind

Auction designs and why PPAs are only second best

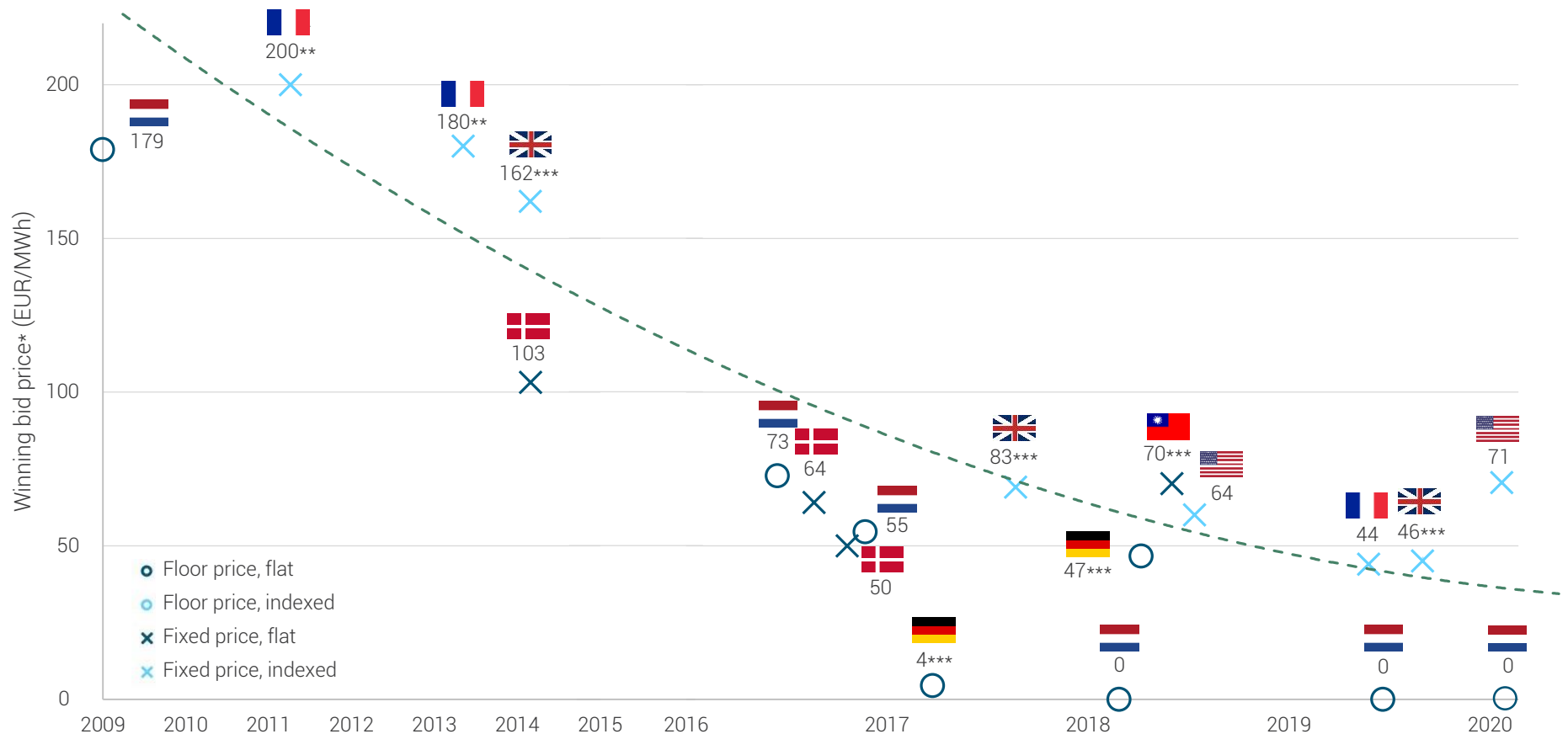
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2. Offshore wind financing update

Prices for OW projects have fallen consistently



The vertical line corresponds to the range of prices allocated in a given auction

* Bid prices exclude interconnection costs

** Based on estimates made in public statements (bid results are confidential)

*** Based on weighted MW-average for all projects awarded

2. Offshore wind financing update

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 offshore wind risk is not going away

2. Offshore wind financing update

Decreasing cost of capital in a relatively liquid market

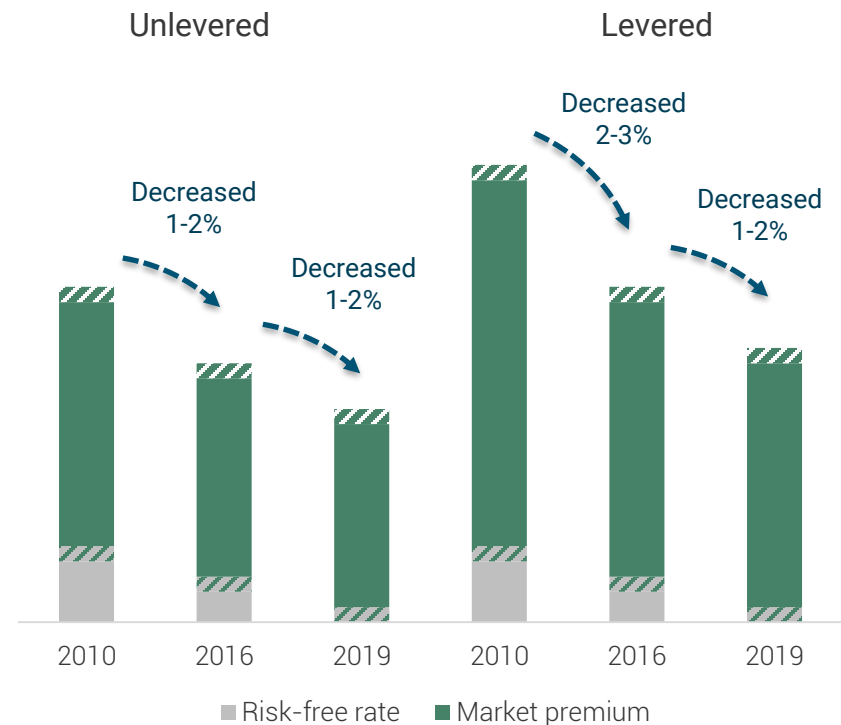
An active equity market

- Renewable energy assets are trading at high prices as investors competitively chase yield, pushing down IRRs
- Continued high transaction volume in OW (both for projects and companies like GIB, A2Sea, SHL, Reetec, MPI)
- Transactions for assets under development (LEM), at FC (NNG, Triton Knoll) or operating (GW2, Merkur)
- Emergence of Chinese buyers (CTG, SDIC) and continued active presence of Japanese and Canadian investors, in addition to traditional European players

Prices have been consistent

- There was a clear differentiation between development stages all the way to operating projects
- Early & mid development priced as a devex or MW multiple has been stable over the years, and relatively insensitive to technology or tariff and regulatory regime. As of late stage development, prices are fully determined by tariff
- Construction premium has been shrinking over time

Evolution of investor return expectations (2010-2019)



2. Offshore wind financing update

Market pricing 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
2018-2019	75:25	15-18 years	120-175 bps	EUR 100-150 M

Debt is currently extremely cheap

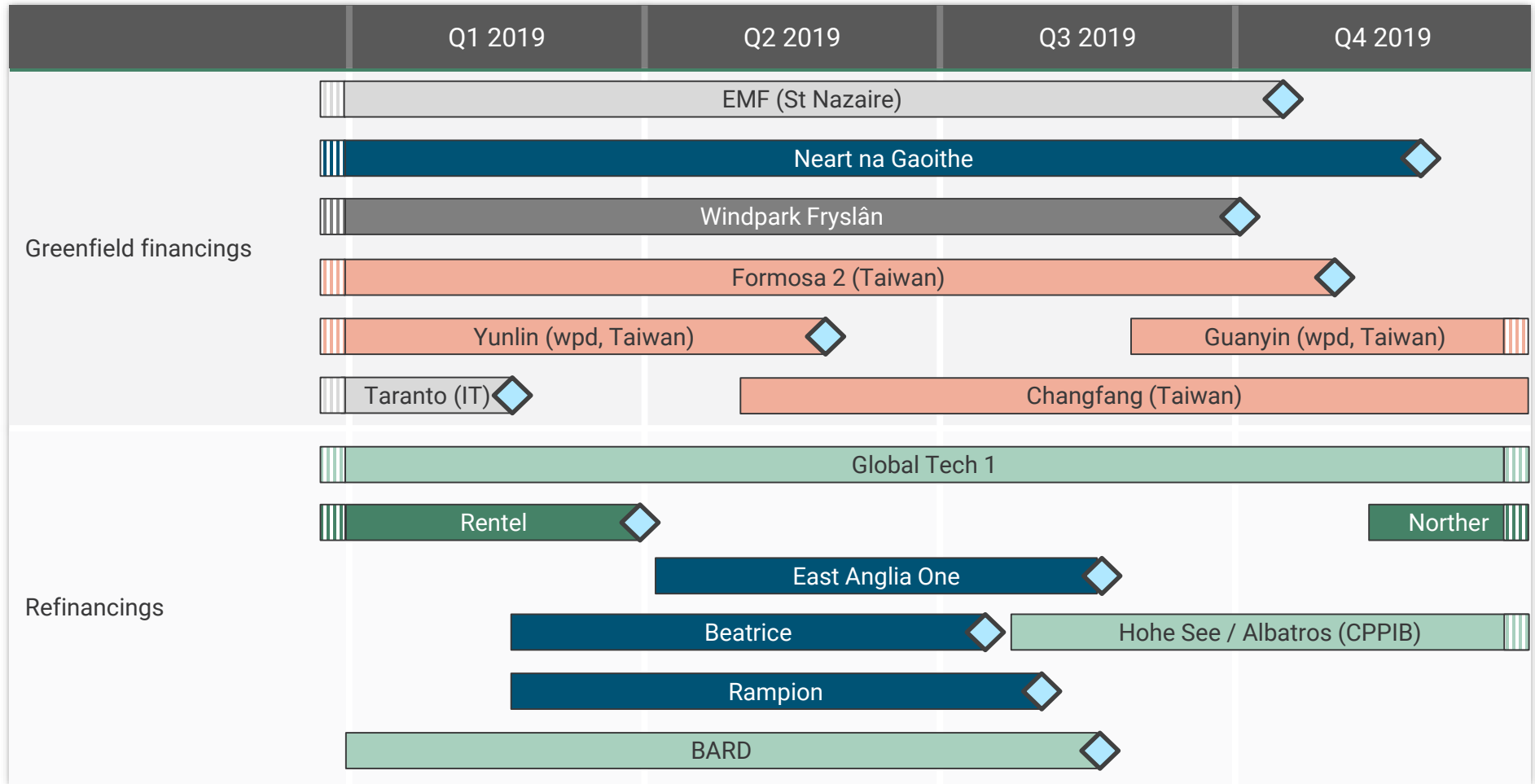
- Margins rose after the crisis (reflecting higher bank cost of funding), but have been trending down since 2014
- With low underlying rates, the overall cost of >15-year debt is now well below 2%

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

2. Offshore wind financing update

2019 was a busy year for offshore wind, with strong activity in new markets (TW, FR)

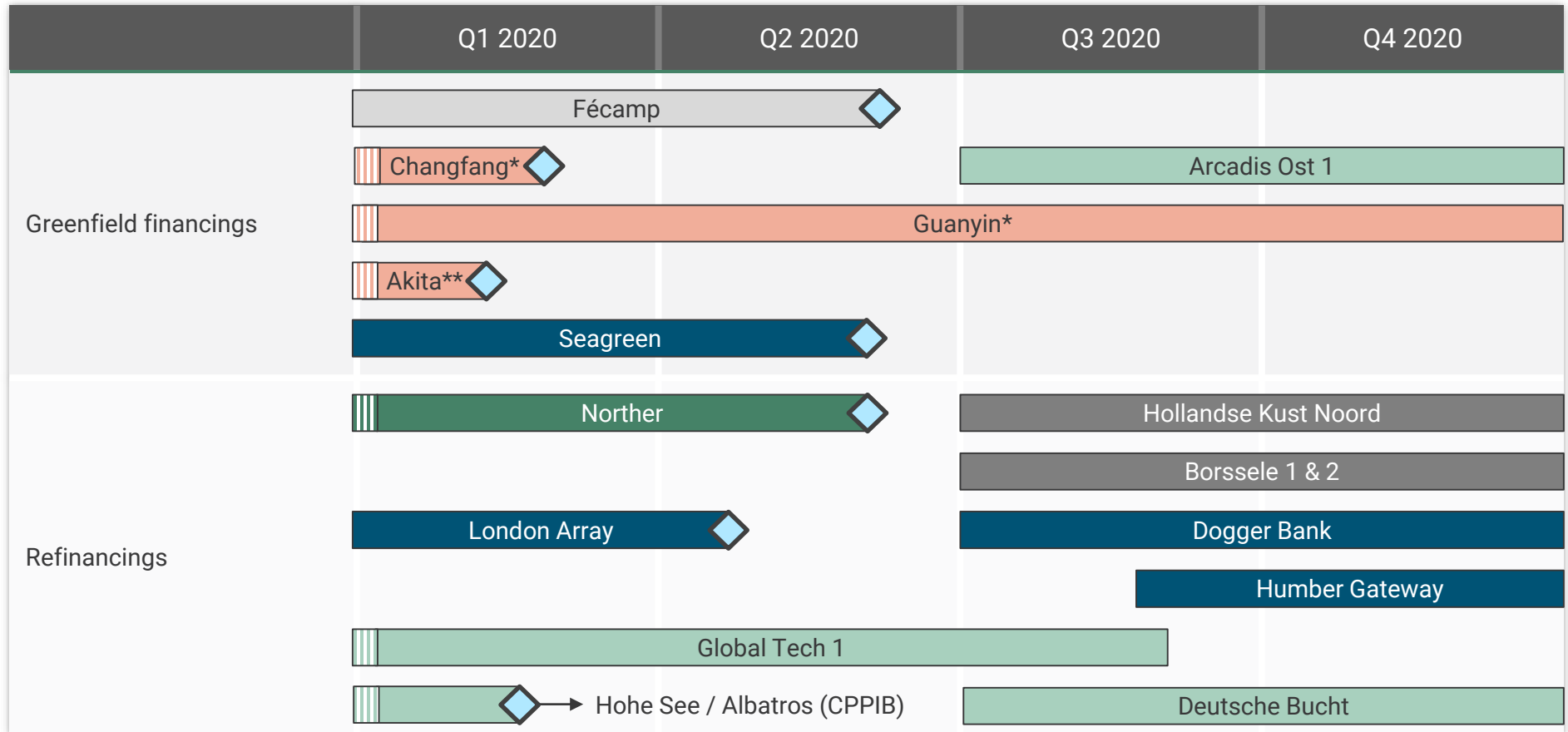


Legend



2. Offshore wind financing update

2020 is looking to be a relatively busy year for offshore wind debt



*Taiwan **Japan

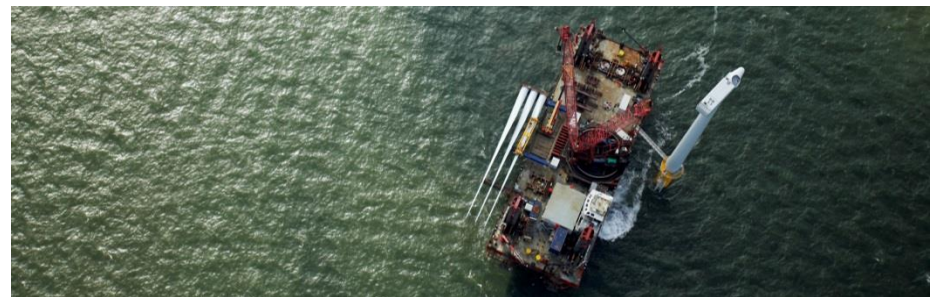
Legend



Auction designs and why PPAs are only second best

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3. Auction regime comparison

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

3. Auction regime comparison

Key parameter 1 – permits and early studies

	DE	FR	NL	UK
Allocation	Tender	Tender	Tender	Accreditation
Tenor (years)	20	20	15	15
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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

3. Auction regime comparison

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
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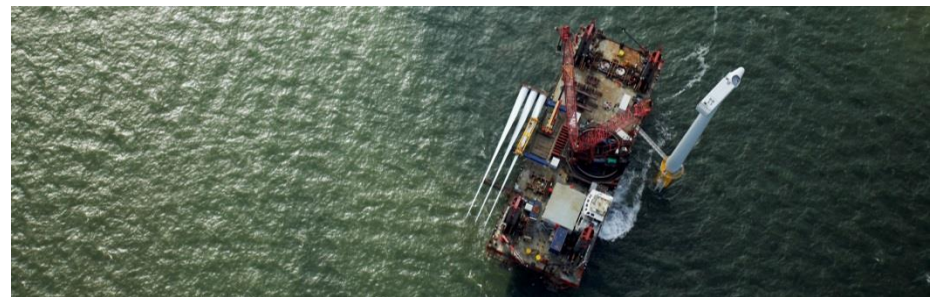
The price formula creates wildly different incentives

- 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

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4. German market context

Recap: Transitional auctions 2017 and 2018

Ten successful projects with COD by the end of 2025

- Total of 3.1 GW awarded, 7x North Sea & 3x Baltic Sea
- Utility players dominating as winners, incl. Ørsted, Iberdrola, EnBW, RWE (Arcadis Ost 1 as only exception)
- Financing for most projects on balance sheet, only very few expected to tap project finance debt

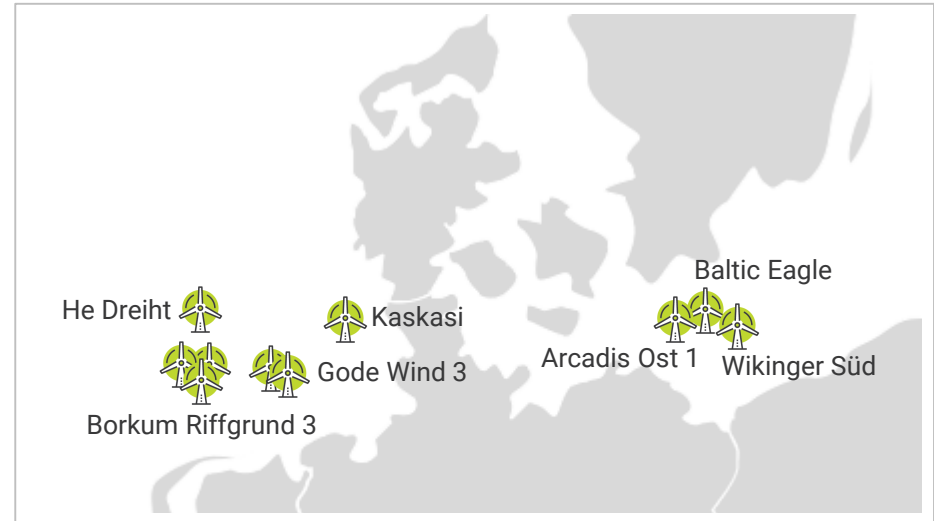
Emergence of “zero bids” in both auctions

- COD dates of zero bids projects in 2024 and 2025
- Inherent significant uncertainty regarding electricity price, technology and capex development

Covid impact on electricity markets

- Slump in electricity prices and slowdown of corporate PPA developments in Germany
- FID for zero bids projects will require solid business case economics and view on revenue expectations

Awarded projects 2017/2018 auctions



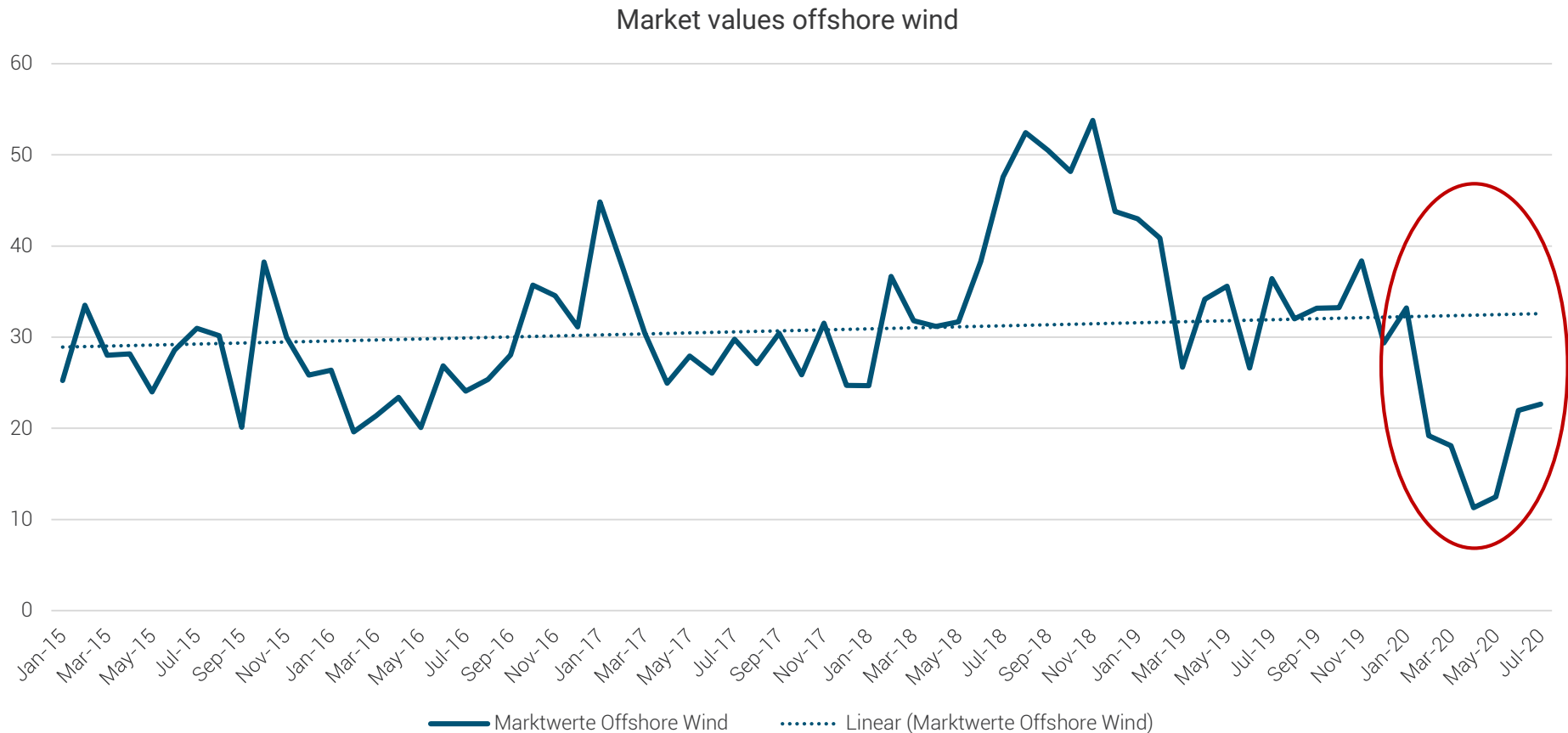
Awarded tariffs in both auctions

- 2017: Three projects with zero bids (2x Ørsted, 1x EnBW), one other Ørsted project with 60.00 EUR/MWh tariff
- 2018: Ørsted with another zero bid, Iberdrola for one small project, avg tariff of 46.60 EUR/MWh in auction

Realisation risk for zero bid project given current market development?

4. German market context

Market electricity price development 2015-today



So how will you make money? Will corporate PPAs save the day?

4. German market context

Offshore wind corporate PPAs signed to date

Only very few corporate PPA transactions have been signed for offshore wind projects

- All contracts announced are covering only for a fraction of the total project capacity and they come at a discount
- They are moreover in conjunction with FiT/CfD support regimes, reducing commercial pressure on the corporate PPA
- All OW corporate PPAs have been signed in the last two years, illustrating the emerging nature of this market
- There is no offshore wind financing that would purely rely on corporate or utility PPA-backed revenues

Project	Offtaker	Developer	Country	COD	PPA signed	Project (MW)	PPA (MW)	Tenor (years)
Norther	Google	Engie	Belgium	2020	2019	370	92	5
Race Bank	Nestlé	Ørsted	UK	2018	2020	573	31	15
Borkum Riffgrund 3	Covestro	Ørsted	Germany	2025	2019	900	100	10
Race Bank	NW	Ørsted	UK	2018	2019	573	23	10
Borssele III & IV	Microsoft	Eneco, Shell	Netherlands	2021	2019	731	90	15
Nordsee Ost	Deutsche Bahn	Innogy, RWE	Germany	2015	2019	295	25	5

NW = Northumbrian Water

There are only very few offshore wind corporate PPAs for only limited offtake capacity to date

4. German market context

German context – WindSeeG reform under discussion – What happened to date

Jul
19

Evaluation report calling for adjustment to WindSeeG

Mar
20

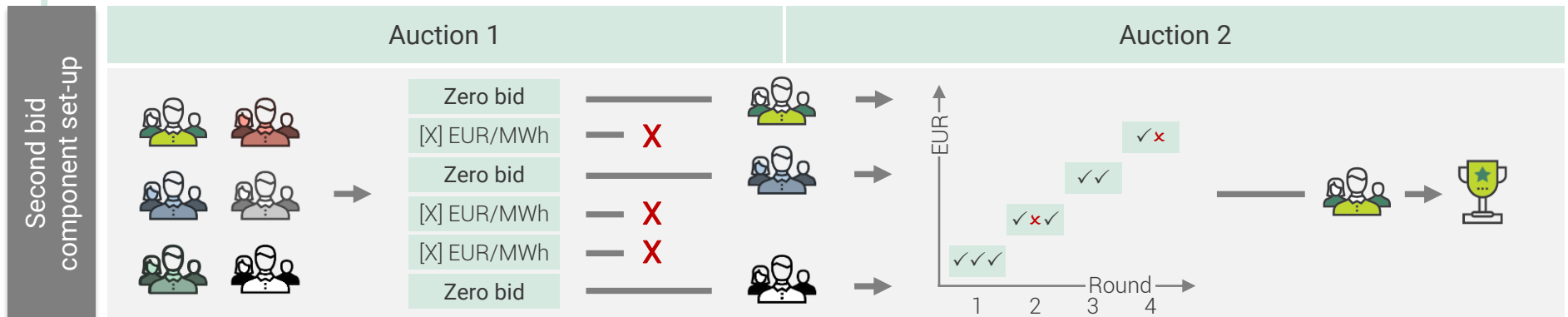
Evaluation by consortium of expert advisors suggesting second bid component set-up

-

Strong opposition from industry stakeholders which is continuing until today

Jun
20

Draft law including second bid component enacted by the government



July 2020: Bundesrat dismisses the proposal and argues in favour of two-sided CfD regime

4. German market context

German context – WindSeeG reform under discussion

Quote from short paper as of March 2020 – EEG evaluation (Fraunhofer ISI, Navigant, Consentec, Takon)

“Option 1, in der Variante als “jährliche Gebühr” ist unser präferiertes Modell. Der zentrale Vorteil dieses Modells ist der Anreiz des Bieters, **sich gegen langfristige Marktpreisrisiken (z.B. mit PPAs) abzusichern** und damit einerseits die “bankability” zu gewährleisten und andererseits die langfristige Marktintegration der Offshore Windenergie voranzutreiben. Damit könnte der bereits bestehende Trend im Markt weiter fortgeführt werden. Zudem **senkt das Modell vermutlich die Förderkosten** (ausschlaggebend ist hier das Verhältnis zwischen höheren Finanzierungskosten und **möglicher Abschöpfung**). In der Umsetzung ist das Modell weniger komplex als die anderen vorgeschlagenen Optionen.”

...and a few thoughts on it

PPAs are not the silver bullet as which they are presented

- The PPA market in Germany is not mature enough to support significant offshore wind capacity
- Timing issue: auction in 2021 for COD in 2026 is an issue for structuring a business case including a PPA route
- Banks require creditworthy offtakers and solid PPA and financing structures, significant merchant risk is an issue
- Rating and regulatory requirements don't allow pensions funds to invest in offshore with market risk

Financing costs in proposed system will be much higher

- They are the most important driver of LCOE and crucial for securing cheap green power in a sustainable way
- Overall system costs will be higher than in a fixed CfD regime that also allows for “skimming” to the benefit of the government/electricity consumers
- Recent experience from NL shows that diversity of players suffers significantly and becomes a process risk
- PPAs means value leakage as fix prices come at a discount

4. German market context

Allocation of market risk in infrastructure projects – Lessons for offshore wind?

Transfer of market risk when bidding for infrastructure projects has been heavily debated



Bundesnetzagentur auctions for mobile phone licences

- UMTS, 4G and 5G auctions yielded billions of EUR payments from network operators
- But such substantial upfront payments are a strain on the business case sustainability
- Consequently the infrastructure expansion and built out after the auctions has been slow, especially in rural areas



Road infrastructure

- Since 2005 some German Autobahnen were tendered as PPPs by the Federal Ministry of Transport ("A-Model")
- Initially the first projects were awarded based on the lost toll price per truck, so based on bidder's traffic forecasts
- Projects went insolvent, pushing the ministry to change in the tender design to fix price availability payments

Textbook: "(Risk) cost are being reduced efficiently if a risk is being allocated to the party best able to manage it"

- Arguably the party best able to manage electricity price risk are utilities – however – prices are largely driven by the regulators and external factors outside of the control (e-vehicle subsidies, carbon pricing, Covid-19, etc)
- IPPs will be systematically disadvantaged in such a regime as their ability to manage the risk is even lower

Lessons learnt should show that a second bid component will only increase risk exposure

4. German market context

Why a two-sided CfD is the preferable option from a policy perspective

Offshore wind power plants are price-takers – on merchant markets, their electricity is sold at the high marginal cost

- Offshore wind produces electricity at (close to) zero marginal cost and bids at zero into the electricity market
- The electricity price is set by high marginal cost producers which are, most of the time, gas-fired power plants
- This means that the price for electricity from offshore wind and other technologies is driven by the cost of natural gas imported from e.g. Qatar, Russia and the United States

A two-sided CfD offers an option to society to lock in long-term reliable electricity prices

- The long-term price for electricity would be the CfD price (public entity would get difference between wholesale price and CfD and protect consumers/taxpayers from potentially higher power price)
- Projects do sell on the wholesale market and are sensitive to market conditions (in particular below-zero prices - the CfD should not apply when that happens)

Offshore wind levelized cost of electricity (LCOE) will be significantly lower with a two-sided CfD

- The fixed price is a lot more attractive to lenders and investors and promises a much lower cost of capital; for renewable energy projects, cost of capital is a key driver for LCOE
- Auction regime will be more attractive to international developers and allow project finance players to participate – diversity of players will be higher than in second bid component set-up (see also recent experience in NL)

Two-sided CfDs are a valuable policy tool to ensure cheap electricity prices for society long-term



Debt



M&A



Strategic



Contracting

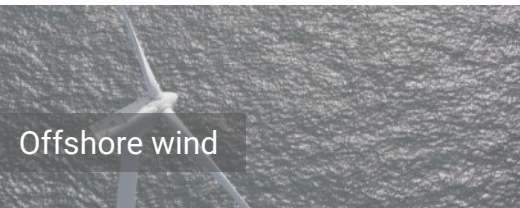


Green Giraffe

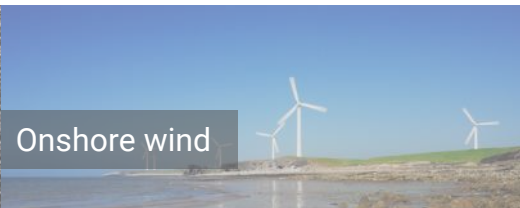
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Offshore wind



Onshore wind



Solar power



Other renewables