

A WAKE-UP CALL FOR UK OFFSHORE WIND

21 September 2023

The absence of offshore wind from the results of the UK's latest auction for renewable generation under the contracts for difference (CfD) support scheme is a wake-up call for policy-makers. A combination of UK-specific challenges and macro-economic factors meant that no bids were received for offshore wind, putting the UK's renewable power ambitions for 2030 in doubt. We consider some of the challenges facing the UK offshore wind industry, and the path ahead to get the UK back on track.

Introduction

In early summer 2022, the UK government announced the successful results of CfD allocation round 4, with contracts awarded for almost 7GW of offshore wind at a record low price of £37.35/MWh^{1,2}. However, since then, the success of the round has been somewhat tarnished by Vattenfall's announcement in July of this year that it would halt the development of the Boreas offshore wind farm, which had been slated to provide almost 1.4GW to the UK's renewable capacity. The company's chief executive, Anna Borg, described the move as "prudent" given the rapid rise in input costs.³ While payments under the CfD are linked to CPI, Vattenfall reported that rising gas prices in 2022 fed through to an inflation-busting 40% growth in turbine manufacturing and construction costs.⁴ Others in the industry have echoed this message, with the Chief Executive of RWE's offshore wind business, Sven Utermöhlen, suggesting an increase of 20-40% in costs.⁵

In the run up to this year's CfD allocation round 5 (AR5), industry had for some months been warning government that it had set the CfD auction technology-specific ceiling prices, the administrative strike prices (ASPs), for offshore wind too low to attract the hoped-for number of bids.⁶ But few would have predicted that the ASPs of £44/MWh for bottom-fixed offshore wind and £116/MWh for floating projects would fail to attract any interest from offshore wind developers.

The contrast is clear with solar PV and onshore wind, both of which were offered a higher ASP than bottom-

fixed offshore wind. For onshore and remote-island wind, for example, the government proposed a maximum ASP of £53/MWh, which translated into final contracts awarded at £52.29/MWh for almost 1.5GW of electricity.⁷

The response from the offshore wind industry and commentators has been scathing, with fingers pointed at the failure to reconsider the price offered despite a number of warnings.⁸ With the government aiming for 50GW of offshore wind by 2030 (up from around 14GW today), the timeline for delivery is narrowing. Tom Glover, the chair of RWE, has stated that "serious government intervention" will be required for there to be any chance of meeting the target.⁹

The drivers behind the absence of offshore wind in the CfD AR5 results are multiple, ranging from supply chain issues, and grid and port upgrade requirements, to international competition and the rising cost of debt.

Supply chain issues and port infrastructure requirements

Compared to other sources of generation, the cost per MW for offshore wind is uniquely dependant on the cost of steel and, given the huge amount of energy required to produce steel, it is hardly surprising that the cost of offshore turbines has increased dramatically over the last two years during the global energy crisis. In April, Energy Monitor estimated this price increase at 38% with some key turbine components increasing by as much as 285% in

¹ All prices quoted in this article are in 2012 prices unless otherwise stated.

² Biggest renewables auction accelerates move away from fossil fuels | GOV.UK

³ Giant windfarm off Norfolk coast halted due to spiralling costs | Energy industry | The Guardian

⁴ Giant windfarm off Norfolk coast halted due to spiralling costs | Energy industry | The Guardian

⁵ Ørsted warns about rising costs of UK wind development | Financial Times

⁶ Ørsted warns about rising costs of UK wind development | Financial Times

⁷ Contracts for Difference Allocation Round 5 results | GOV.UK

⁸ 'Biggest clean energy disaster in years': UK auction secures no offshore windfarms | Wind power | The Guardian

⁹ UK subsidy auction fails to attract any offshore wind bids in blow to net zero plans | Financial Times

the period from January 2020 to March 2023¹⁰. These price increases are starting to cause real pain for turbine manufacturers, with GE Renewable Energy, a US turbine manufacturer, reporting a \$359 million loss in its second quarter this year, following a \$2.2 billion loss in 2022.¹¹

Aside from the turbines themselves, difficulties in securing supplies of high voltage cables is compounding the headache for developers. With supplies concentrated among a few companies and new entrants facing high barriers to entry, the current difficulty in securing the raw materials and skilled labour is hampering availability and extending lead times.¹²

Offshore wind developers may, in their drive for economies of scale based on ever increasing turbine sizes (from 6MW in 2015 to models at 18MW being developed now), have inadvertently created further cost pressures. An acceleration of development cycles for new turbine models has, over the last few years, stretched supply chains, increased logistical complexity, and put further pressure on costs. This has led to some developers calling for a period of standardisation in turbine design while suppliers catch up.¹³

The development of floating offshore turbines is likely to compound these issues. Concerns have been raised about the feasibility of meeting the UK's floating offshore wind target of 5GW by 2030 given the extensive infrastructure upgrades that would be required to existing ports and the requirements for more installation vessels. A report by the Floating Offshore Wind Taskforce, sponsored by RenewableUK, Scottish Renewables, The Crown Estate and The Crown Estate Scotland, suggests that £4bn of investment would be required to create the integrated manufacturing and installation ports needed.¹⁴ The report also notes that there are currently no national or regional ports in the UK capable of satisfying the infrastructure requirements for industrial scale floating offshore wind deployment and that locating landside areas suitable for production of the turbine components, is challenging. Whilst the UK government has committed £160m to floating offshore wind port upgrades¹⁵, the general view is that it is clear more is needed.

Grid connections and the need for strategic planning

¹⁰ Wind turbine cost: Up by 38% in two years | Energy Monitor

¹¹ GE Renewable Energy posts heavy loss but expects 'significantly better' profits | Windpower Monthly

From GE to Siemens, wind energy hopes its crisis is about to end | CNBC

¹² Will there be enough cables for the clean energy transition? | Financial Times

¹³ Wind power industry faces size problem as blades get longer than football pitches | Financial Times

¹⁴ Upgrading our ports is essential to kickstart UK floating offshore wind industry | RenewableUK

¹⁵ Floating Offshore Wind Manufacturing Investment Scheme | GOV.UK

¹⁶ Octopus Energy struggles to invest £28 billion amid 'challenging' National Grid delays | The Telegraph

Delays associated with grid connection are another factor holding back certain projects, including offshore wind. Developers and other network customers are receiving connection offers for the 2030s, slowing the energy transition. Octopus Energy has said it is struggling to invest £28 billion into renewable energy projects because of grid connection delays.¹⁶ RenewableUK has suggested that delays associated with grid connection "are holding back £15 billion of investment in offshore wind alone over the course of this decade".¹⁷

National Grid, as the Electricity System Operator (ESO), has been looking at ways to reduce grid connection delays. Initial reforms include removing so-called "zombie" projects from the connection-queue, thereby reducing grid connection delays for renewable projects which are ready to go.¹⁸ The ESO has also launched a Connections Reform consultation, seeking feedback on a number of grid connection options. Their preferred proposal (TMO4) involves a two-gate process. It is only following submission of planning consents that developers will reach the second gate and be granted positions in the connection-queue to receive connection dates aligned with their delivery plans. This will be subject to certain priority projects that will receive connection dates at an earlier stage of the process.¹⁹ A large number of respondents to the consultation gave support to TMO4.

In addition to these process related reforms, the ESO has been planning a pathway to a centrally co-ordinated transmission network. The ESO's pathway to 2030 Holistic Network Design (HND) promises a shift from the radial model of offshore wind farms to a co-ordinated network that will knit together 18 offshore wind farms with a total capacity of 23GW. With the phase 1 assessment completed, phase 2 will require £7.6 billion more in offshore investment, but it is intended to deliver wind power where it is needed and save £13.1 billion by smoothing out the flow of power.²⁰ In addition, phase 3 will expand the project further, folding in additional offshore wind farms in Scotland and the Celtic Sea.²¹

In July 2023, the government published its response and recommendations for the Offshore Transmission Network Review: Future Framework, mapping out a path to a Centralised Strategic Network Plan (CSNP) for the transmission network.²² The ESO has been instructed to work on delivering the CSNP, including consideration of

¹⁷ National Grid reforms will help to break the log jam of clean energy projects awaiting connections | RenewableUK

¹⁸ ESO introduces targeted support to speed up grid connections | Current News // Grid connection delays for low-carbon projects 'unacceptable', says Ofgem | Energy industry | The Guardian // ESO GB Connections Reform June 2023 | ESO

¹⁹ PowerPoint Presentation | ESO

²⁰ The Pathway to 2030 Holistic Network Design | ESO

²¹ ESO Offshore Coordination Update | ESO

²² Offshore Transmission Network Review: Future Framework, Government Response and Recommendations | Department for Energy Security & Net Zero

the role that multi-purpose interconnectors (**MPIs**) could play (i.e. electricity cables acting as both interconnectors between countries and connecting offshore wind farms). To facilitate this, the Department for Energy Security and Net Zero (**DESNZ**) and Ofgem are considering market arrangements for MPIs and how this impacts UK offshore wind project revenues²³. Meanwhile several stakeholders, including the ESO and The Crown Estate, have been tasked with taking a more strategic approach to seabed licensing and aligning it with the HND.²⁴

This would involve a shift from the current offshore transmission regime, under which dedicated offshore transmission assets are constructed for each wind farm and Ofgem runs a competitive tender process to sell the offshore transmission asset to a qualifying offshore transmission owner (**OFTO**). This approach produces efficient transmission owners, but fails to take account of the needs of the wider transmission network and potential efficiencies.²⁵ A more centralised approach to offshore transmission assets would be expected to bring benefits in terms of overall efficiency and balancing, particularly as wind projects are developed further offshore.²⁶

In practice it takes years to navigate planning and consent requirements and build new transmission lines. In a report published on 4 August 2023, the Electricity Networks Commissioner recommended a number of measures to tackle delays including a recommendation that the Future System Operator (itself the subject of a second policy consultation)²⁷ be established with responsibility for creating a Strategic Spatial Energy Plan to forecast and plan for future electricity supply and demand. This, together with an urgent update to the National Policy Statements setting out the government's policy for the delivery of energy infrastructure and providing the legal framework for planning decisions, is aimed at supporting transmission projects to pass through a fast-track process for grid connection.²⁸

International competition for capital and cost of funds

The UK market is increasingly benchmarked against other markets, as development capital looks for the most attractive opportunities for investment.

The clearest contrast with the UK experience on AR5 perhaps comes from Germany, where an oversubscribed

round ended in July 2023 with a number of “zero cent” bids for bottom-fixed offshore wind projects requiring no government subsidy. The result under the German model was an auction testing bidders' willingness to pay for concessions. 7GW of potential capacity was awarded and the process netted €12.8bn for the German government. A number of developers did, however, decline to participate here too²⁹ amidst concerns of low returns and a potential 'race to the bottom'.

Whilst it is difficult to draw clear conclusions from the recent results seen in Germany, it is clear that confidence in certain quarters is strong, with Vattenfall's announcement in July that it would halt development on Boreas followed quickly by an announcement in September that it would exercise a right to develop the Nordlicht 2 farm, providing up to 630MW of capacity in Germany. In press releases, Vattenfall struck an optimistic note on offshore projects in Germany generally, confirming that it was “flying the flag for offshore wind energy in Germany”. Of course, decisions on individual projects turn on more than subsidies. On Nordlicht 2, project-specific factors seemed to play a role as well, with Vattenfall noting “possible synergies at two neighbouring wind farms, which could have a cost-dampening effect”. Another significant difference compared to the UK is perhaps that German offshore wind developers do not take on development activities for the offshore grid connection works, which have to date been developer-led in the UK under the OFTO regime, adding to costs.

Certainly higher prices than the ASPs offered in AR5 are available in less mature offshore wind markets. Notably, AR5's maximum ASP of £44/MWh for bottom-fixed offshore wind (or approximately £60/MWh in 2023 terms) compares unfavourably to the first offshore bidding round concluded in Ireland in May 2023. There a maximum bid price of €150/MWh led to an oversubscribed auction with an average award price of €86/MWh in 2023 prices, approximately 20% higher than the AR5 cap.

Analysis by FTI suggests that even projects bidding at the maximum allowed ASP in AR5 could expect less than a 7% after-tax equity return. In part, of course, this is because of increasing costs of capital, which have directly driven down returns; interest rate benchmarks and the cost of debt have risen sharply with central bank base rates in the last 18 months³⁰.

²³ Consultation on the Regulatory Framework including Market Arrangements, for Offshore Hybrid Assets | Ofgem

²⁴ Offshore Transmission Network Review: Future Framework, Government Response and Recommendations | Department for Energy Security & Net Zero

²⁵ Offshore Electricity Transmission (OFTO) | Ofgem

²⁶ This centralised approach will also take account of the future role of MPIs, which serve a dual role of connecting countries' national grids to each other and to offshore wind farms located between the countries. Ofgem

has closed its consultation on the regulatory framework for MPIs and other offshore hybrid assets but has not yet announced its decision.

²⁷ Future System Operator: second policy consultation and project update | GOV.UK

²⁸ Electricity Networks Commissioner letter to Secretary of State for Energy Security and Net Zero | Electricity Network Commissioner

²⁹ RWE and Orsted urge government action if oil giants keep fuelling 'unsustainable' offshore wind auctions | Recharge News

³⁰ Bidding Considerations for AR5: Headwinds for Offshore Wind Projects | FTI Consulting

In the short and medium term, developers and investors seeking higher returns may be increasingly driven towards achieving synergies in markets where they already have a presence or by innovating with respect to the technology or structure used. Alternatively, higher returns may be available in jurisdictions where there is a pricing benefit due to the “first-in-country” nature of the project. In July, the Colombian government announced an acceleration of its own offshore ambitions³¹; and, only days after the announcement of AR5, Petrobras set out plans to develop projects with a potential capacity of 23 GW in Brazil.³²

In the longer term, the UK market may also see competition from the potential construction of renewable projects in other countries with a view to exporting renewable power to the UK. For example, discussions are underway in the European Economic Area to develop meshed offshore electricity grids, connecting offshore generation to interconnectors, and ensuring that power flows to the market with the highest demand. Looking further afield, the Xlinks Morocco-UK Power Project is looking to deliver up to 10.5GW of electricity from solar and wind farms located in Morocco via a dedicated interconnector link to the UK.³³ Structuring these projects requires consideration of the rules and support regimes applicable both in the wind farm’s home market and in the relevant connected market(s). However, as offshore transmission assets multiply, it is clear that there is an opportunity to develop integrated offshore grids, similar to onshore networks, providing a route for other large-scale renewable projects to deliver electricity to the UK.

What next for UK offshore wind?

Following a series of offshore leasing rounds in the UK over the last few years³⁴, there is a healthy pipeline of projects under development. 2024 is expected to expand the pipeline further with the launch of The Crown Estate’s Celtic Sea Leasing Round 5 which aims to deliver up to 4GW of floating offshore wind projects. Given the challenges in relation to port access for floating projects, as part of the tendering process, The Crown Estate will ask bidders to evidence contractual commitments for the port(s) infrastructure they plan to use and to provide a time-based plan to ensure access to their preferred port. Perhaps more controversially, the process is also expected include a new social value question which will require bidders to make commitments around jobs and skills.³⁵ Full details will be released in the Information

Memorandum in due course, but it remains to be seen how meaningful commitments might be made at such an early stage in a project’s development.

All eyes however will be on CfD allocation round 6 (AR6) which is expected to launch in the Spring of 2024 - and getting AR6 right will be important for investor confidence in the UK renewables market.

There are some signs that the UK government is already listening to industry concerns. For example, in its consultation opened in May 2023 on introducing non-price factors into the CfD scheme³⁶, the government sought views on how to value other benefits as part of the CfD allocation rounds. Examples of non-price factors proposed included incentivising sustainability in supply chains and minimising grid bottlenecks. Industry and bodies such as Regen³⁷ robustly highlighted the difficulties in incorporating non-price factors into CfD allocation and emphasised instead that greater levels of coordination between projects is needed to deliver the UK’s offshore wind ambitions, rather than increased risk to investment resulting from another layer of competition. In particular, Regen highlighted the co-dependency of the Celtic Sea projects in order to secure the port and supply chain investment needed in South Wales and the Southwest. Following analysis of responses, the government’s response, published in September, acknowledged the complexity involved in including non-price factors and undertook to reassess proposals in light of the responses received (although it fell short of dropping all the proposals). With a fresh consultation on the Review of Electricity Market Arrangements expected this autumn and integration of offshore wind with MPis likely in CfD allocation rounds beyond AR6, the future design of the CfD is expected to be a high priority for government.

Conclusion

With 2024 an election year in the UK, both the governing Conservative and opposition Labour parties have committed to ambitious offshore wind capacity targets. Approaches to achieving this differ, for example, with Labour pledging to provide £1.8bn in investment in ports via a National Wealth Fund³⁸ contrasting with a Conservative pledge for £160m of investment. More generally, the Chancellor has warned that the UK will not seek to compete with US and EU subsidy regimes.³⁹ It will be interesting to see how the political landscape affects the approach to AR6.

³¹ Colombia’s offshore wind power plans spark hope and caution | Diálogo Chino

³² Petrobras Unveils 23 GW Wind Power Play Offshore Brazil | Offshore Wind

³³ The Morocco- UK Power Project | Xlinks

³⁴ Including The Crown Estate Leasing Round 4, The Crown Estate Scotland ScotWind leasing round and the INTOG leasing round

³⁵ Celtic Sea Floating Wind: July 2023 update | The Crown Estate

³⁶ Introducing non-price factors into the Contracts for Difference scheme: call for evidence | GOV.UK

³⁷ Introducing non-price factors into the CfD: reviewing the proposed reforms | Regen

³⁸ Making Britain a Clean Energy Superpower | LABOUR.ORG

³⁹ UK’s Hunt says Britain will not go ‘toe-to toe’ with US, EU in green subsidies | Reuters

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