5 April 2022

DELIVERING NET ZERO

Floating offshore wind: buoyant times ahead

Floating offshore wind is predicted to play a critical role in long-term global decarbonisation efforts in the next decade. Globally, there is extensive competition as market participants move to take up strategic positions and seek to capture market share and know-how. The award of almost 15 GW of floating offshore wind project leases as part of the UK's ScotWind leasing round is a timely reminder of the appetite for investment in the floating offshore wind market globally.

There are of course, as with most new technologies and relatively nascent markets, going to be some challenges along the way in delivering the level of investment in floating offshore wind required to meet international decarbonisation objectives. In this publication, we take stock of the developments since our 2020 publication and consider what is in store for investors in this market.

What have we learned from the ScotWind auction?

The ScotWind auction, managed by the Crown Estate Scotland, can be seen as a significant endorsement by the market of floating offshore wind technology and recognition of its future global market potential. It is particularly noteworthy for the floating offshore wind market because of its scale, pricing and participants.

Size matters

For the first time, the majority of sites awarded leases as part of the auction (c. 60%) are suitable for floating technology. The round saw rights awarded to develop sites with the potential for almost 15 GW of floating offshore wind capacity. To put this into perspective, the world's largest currently operating floating offshore wind farm is the 50 MW Kincardine project, which reached full commercial operations in 2021, having first commissioned a single turbine in 2018. And, according to a report on Scaling up floating offshore wind by WindEurope[1], only 113 MWs of floating offshore wind were operational globally at the end of 2021. Whilst the ScotWind sites will take time to develop and may not deliver on their current capacity estimates in full, the round clearly represents a step change in the ambition for floating offshore wind.

Supply vs demand

The prices that the ScotWind sites commanded are also noteworthy. The high prices seen in the English Round 4 seabed leasing round in 2021 led to a review of pricing for the Scottish round, with an increase to the cap on the option bid prices from £10,000 per km^2 to £100,000 km^2. As a result, bidders again paid significant option fees for rights to offshore wind sites, totalling £699.2 million (an average £26,932/MW) for all lease options awarded. Of this, floating projects (excluding mixed sites) paid option fees totalling £384.2 million (averaging £23,302/MW)[2].

The prices achieved were in part thanks to significant competition, with 74 bids reportedly put forward in total and only 17 leases awarded overall. It will be interesting to see if this level of investment can be sustained and whether investor demand will continue to outstrip the projects available as we enter into a period of high inflation and tighter supply chains. Pricing will again be tested in the UK's Celtic Sea leasing round in 2023, which plans to include 1 GW of floating wind sites (although this figure may yet increase given demand) and in the ScotWind Clearing process later

[1] WindEurope, Scaling up floating offshore wind towards competitiveness, November 2021
[2] The Crown Estate Scotland, ScotWind offshore wind leasing delivers major boost to Scotland's net zero aspirations, 17 January 2022

this year[3]. A number of European countries such as France and Norway are also holding auctions in the coming year.

New entrants

Historically the offshore wind sector has been dominated by major electricity utilities and, in recent years, new entrant oil and gas companies have made inroads thanks to their ability to shoulder the significant devex investment required and leveraging their operational experience in deep water offshore developments. However, the ScotWind auction results reveal a potentially more diverse and more competitive market. Whilst utilities and energy majors such as Shell, Vattenfall, SSE Renewables and Scottish Power Renewables were successful, other big names were displaced by joint ventures involving onshore renewable developers such as Falck Renewables and BayWa r.e.. The round also saw co-investment by significant supply chain companies such as Ideol and DEME, the latter fronting a consortium better known in the Belgian offshore wind market. Full details of successful project partners can be found on the Crown Estate Scotland's website.

Growing confidence in floating technology

The round gives a clear indication of continuing and growing confidence in floating offshore wind technology. Although designs are moving from pilot to early commercial deployment, WindEurope estimate that 7 GW will need to be deployed by the end of the decade in order to capture technology learning and to drive down costs. The ScotWind results demonstrate the confidence of market participants that floating offshore wind technology will deliver on promised cost reductions and reach maturity within this decade. As a result, the leasing round saw sponsors, some with limited previous experience of floating offshore wind, secure sites appropriate for floating technology, in anticipation of the rapid commercialisation of floating wind technology.

Early investment may bring greater rewards

There is a highly competitive market for bottom-fixed offshore wind projects and over recent years the returns available have reduced commensurately with increasing confidence in project delivery and risk management. In less than a decade, experience and scale has seen this market move from equity only investment during construction, to one where debt investors are confident taking construction risk. Floating offshore wind therefore represents an opportunity for early investors to capture higher returns or at least important market share.

These benefits do not come risk free, particularly in the UK market where, as things stand, the award of an option for lease does not guarantee that a project will be successful in securing support under the Contracts for Difference (**CfD**) regime. As a result, projects will have deployed significant development expenditure by the time they are sufficiently progressed to be eligible to participate in a CfD allocation round. It is worth noting that the Department for Business, Energy and Industrial Strategy (**BEIS**) has already highlighted that closer alignment between the award of seabed leases and CfD allocation may need to be considered as one of the options to enable anticipatory grid investment, as part of the Consultation on the enduring regime under the Offshore transmission network review.[4]

To secure a CfD in a competitive auction where there are more projects than budget available, floating offshore wind projects currently compete in a 'less established technology' (or pot 2) auction, separate to bottom-fixed offshore wind (which has its own, pot 3 auction). In general, in an auction scenario, CfDs are awarded to the lowest bidder first, but all successful projects are awarded the strike price of the highest bidder accepted within the budget envelope, capped at their technology specific administrative strike price[5]. However, in CfD Allocation Round 4 which is currently underway, floating offshore wind has been allocated a £24 million minimum budget. Whilst this funding is therefore ring-fenced for floating technology, meaning that at least one project is likely to be successful within the budget, where the value of floating projects exceeds the £24 million budget cap, these projects will compete in a separate "minimum auction" first and, if successful, secure a different clearing price compared to the overall pot 2 clearing price. Participants will be considering their bidding strategy carefully. A key question is

[3] The Crown Estate Scotland, ScotWind Clearing Process Procedural Update, 4 March 2022
[4] BEIS, Offshore transmission network review: enduring regime and multi-purpose interconnectors consultation, 2021
[5] Floating offshore wind's administrative strike price is £122/MWh (in 2012 prices), compared with £46/MWh for bottom-fixed projects in AR4

likely to be how to factor in forecast technology cost reductions to maximise competitiveness.

Local content

Important to the delivery of floating offshore wind is the infrastructure required for the construction, operation and power offtake from projects. The importance of policy to address issues such as anticipatory investment in, and co-ordination of, offshore grid infrastructure, as well as port upgrades for the deployment of floating offshore wind was highlighted by WindEurope[6]. However, to justify this level of public investment, governments will expect to see commitments to local jobs and supply chains by floating offshore wind developers.

An example of this trend can be seen in the UK. The UK Government has pledged £160 million to fund the construction of port and supply chain infrastructure and factories for floating offshore wind. This investment comes following commitments by industry to jobs and supply chain investment as part of the UK's Offshore wind sector deal signed in 2019[7] to have 60% of UK content in domestic projects over the lifetime of each project. Indeed, as part of the ScotWind auction, the Scottish Government, working with the Crown Estate Scotland, took the opportunity to strengthen this commitment, with the inclusion of a Supply Chain Development Statement in the leasing process, with penalties for failure to achieve the commitments made[8]. The multi-billion of supply chain investment that this is expected to generate is obviously a big win for the Scottish economy but will also provide a strong foundation for the sector, helping to reduce costs and attract investment into manufacturing and infrastructure.

Delivery on floating offshore wind supply chain promises in the UK is also likely to be more closely monitored under the CfD regime. Plans are under consultation[9] in relation to CfD Allocation Round 5 to require supply chain plans to be submitted by floating offshore wind projects for the first time (these projects were previously exempt due to the immaturity of the technology). Further, a call for evidence on supply chain commitments has also been launched to seek evidence on changes to the penalty regime for failure to implement supply chain plans where termination of the CfD is not justified. Any changes would be implemented in future CfD allocation rounds subject to the outcome of consultations[10]. However, with the linking of support under the CfD and local supply chain commitments being challenged by the European Commission under World Trade Organisation rules[11], it remains to be seen what requirements might apply to the ScotWind projects.

Understanding operating risks

Whilst confidence is growing regarding the nature and management of construction risks relating to floating offshore wind, experience of operating floating offshore wind projects remains scarce. To date, turbine performance has been good, with capacity factors for Hywind and Floatgen reportedly exceeding 57%, thanks to the higher wind speeds these floating projects are able to capture further offshore. However, as highlighted by the Carbon Trust's Floating Wind Joint Industry Project[12], experience of the full operation and maintenance (**O&M**) cycle is still relatively limited. Unlike bottom-fixed turbines, O&M of floating offshore wind turbines may take place both in situ (for reactive or routine maintenance) or be towed to a port-side O&M base. The technical feasibility and cost of turbine reinstallation over the life of the project following major shore-side maintenance will be a new line-item, with towing activities likely to increase opex relative to capex for floating offshore wind.

The use of dynamic electrical cables may also increase O&M complexity. Experience of claims under the UK's Offshore Transmission Owner regime in relation to cable failures for connections to bottom-fixed projects has shown the cost of rectifying issues can be high. How cabling between turbines and substations in a floating project withstands the additional fatigue of constant movement is an open question. Disconnection and re-connection of a floating turbine from its electrical connection to facilitate onshore maintenance will require both that the electrical connection is maintained during this period and the operation of the rest of the turbines comprising the project are not disrupted[13], potentially adding cost and complexity. Investors in floating offshore wind projects will need to understand, provide for and apportion responsibility for unexpected costs relating to O&M to the extent these cannot be passed to contractors.

[6] WindEurope, Scaling up floating offshore wind towards competitiveness, November 2021
[7] Department for Business, Energy and Industrial Strategy, UK Offshore wind sector deal, 2019
[8] The Crown Estate Scotland, Supply Chain Development Statement summary, 4 May 2021
[9] Department for Business, Energy and Industrial Strategy (BEIS), Consultation on changes to Supply Chain Plans and CfD delivery, February 2022
[10] BEIS, Call for evidence on proposed amendments to Supply Chain Plans, February 2022 (closes 29 April 2022)
[11] European Commission, EU challenges discriminatory practices of UK's green energy subsidy scheme at WTO, 28 March 2022
[12] Carbon Trust, Floating Wind Joint Industry Project website, visited 1 March 2022
[13] Blackfish, Floating offshore wind: installation, operation and maintenance challenges, July 2020

Successful joint ventures

As we have seen, the scale of investment required means that significant joint ventures are being established to deliver floating offshore wind projects in the UK market. Structuring, documenting and manging these joint ventures raises issues familiar in the context of bottom-fixed offshore wind projects.

For example, budgets and related contingency allowances, and certainty around these, are a key discussion point in many offshore wind joint venture arrangements. Floating offshore wind raises challenges in providing that certainty. Project construction phases, which are particularly capital intensive in all offshore wind projects, involve greater novelty - and potentially scope for greater overrun - in combining both onshore and offshore assembly and commissioning. Equally, operating phases have scope for unexpected risks and costs not present in bottom-fixed projects (whether around cabling, moorings or disconnection and reconnection).

To the extent these risks may or do give rise to funding needs at the project level, joint venture agreements will need to allocate commitments equitably between shareholders, being clear about the circumstances in which shareholders may or must fund (and the consequences if they fail to do so). Funding caps may require greater headroom and contingency amounts and unilateral funding discussions are likely to be more challenging given potential impact on returns.

Conclusion

Sponsor confidence in floating offshore wind is growing. The ScotWind auction has demonstrated the appetite for investment in this relatively new technology. However, as experience of constructing and operating projects is still limited we would expect transactions to be heavily scrutinised. To date, there are only a few examples of debt financings for floating offshore wind projects but with significant players entering the market, experienced in managing risks associated with new technologies and offshore installations, we expect a competitive market for debt finance to emerge, fuelling further development by freeing up equity capital.

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