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**ENERGY TRANSITION
– OPPORTUNITIES
AND CHALLENGES
FOR OFFSHORE WIND**



– THOUGHT LEADERSHIP

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ENERGY TRANSITION – OPPORTUNITIES AND CHALLENGES FOR OFFSHORE WIND

With increasing global demand for offshore wind to power the clean energy transition, the opportunities and risks are multiplying. Offshore wind has long been seen as a great tool to tackle energy transition needs and to achieve energy sovereignty objectives while boosting economic growth, and more governments are committing to more ambitious targets. However, the industry faces a number of challenges as inflation and high interest rates have hit the sector particularly hard. In this extract from a recent webinar, Clifford Chance surveys the issues arising from new technology, new markets, new deals and regulatory changes.

The global outlook

"There has never been so much installed capacity in the offshore wind market and so many projects being planned", says Gauthier Martin, a Clifford Chance Partner based in Paris. "Over the course of the past 10 to 15 years, the industry, which was initially focused on a limited number of northern European countries, has become much more global and is spreading significantly across Europe and Asia. While the US started later, a significant number of projects are now contemplated there. The trend is not about maintaining, but about significantly expediting the pace of development."

In late 2021, the EU had a combined offshore wind capacity of 15 GW. Last year, nine European countries committed to build 300 GW in the North Sea by 2050. In the meantime, southern European countries including Greece, Italy and Spain are considering rolling out significant offshore capacities in the deep waters of the Mediterranean Sea, thanks to the development of floating technology. The picture is similar in the Asia Pacific region. Japan, for example, announced plans to become a significant offshore wind producer last year.

Despite the growth trend in the sector, recently we have seen several major operators withdrawing from projects that they had been granted, in Europe and the US, or else depreciating their assets. One leading operator decided to cancel two major projects of around 1 GW each in the US.

In September 2023, the UK failed to attract any developers in its latest renewable energy auction. And this all comes after various contractors have accumulated significant losses since 2022 – notably turbine manufacturers, due to the increase in raw material prices, a race for innovation and the building of bigger and bigger turbines, which offers limited time to amortize investments.

How can these opposing trends be explained? They are two sides of the same coin.

The growth in offshore wind, coupled with inflation and high interest rates has created great tension in the supply chain – there are not enough resources for all projects, and, without huge investment, this issue could become even more acute. This has led to an estimated 40% increase in prices over the past year.

The sector is not well equipped to handle such price increases: public tenders for contracts for difference (CfDs) are mainly tariff-driven, and the typical contractual risk allocation is designed for a sector in which costs were seen as following an ever-decreasing trend – estimated to be around 60% over the past decade – before last year's dramatic increase. This typically means, for example, that not many CfDs worldwide incorporate inflation provisions.

Against this backdrop, what is the outlook? Offshore wind will likely remain central to achieve the decarbonization of the electricity mix, but this is a wake-up call for stakeholders to revisit the way in which these assets have been developed so far.

"Governments will need to reconsider the importance of tariffs as an award criterion, and look at how bids are evaluated, ensuring that pricing assumptions are documented and justified so that reliable prices can be assessed and compared," says Martin. "Aside from improving permitting process, governments also have a responsibility to set a favourable framework for greater investment in the supply chain. This is necessary to tackle increasing bottlenecks, but it's also an energy security issue if they aim to develop offshore wind at a controlled pace and cost."

Sponsors also have a role to play. This starts with not engaging in unsuitable public tenders. While this can be a difficult business decision, it is also the best way for governments to get the right message from the market. Addressing risk allocation in an efficient and balanced way is also an important common objective for sponsors and their contractors. Lenders and financial investors also remain key stakeholders given the capital expenditure that will need to be financed in the future.

Focus on APAC

"Excluding China, there are currently three 'live offshore wind markets' in APAC, albeit each at quite different stages of relative maturity," says Matt Buchanan, a Clifford Chance Partner and leader of the APAC construction practice. "A number of other countries are seeking to achieve more traction. Australia is at the front of that list and, to a lesser degree, Vietnam."

Taiwan

Taiwan is the most mature offshore wind market in APAC. It has evolved at a tremendous rate, from the initial pure feed-in tariff-based 128 MW Formosa 1 project (which achieved financial close in 2018 and is now operational), to the 1,044 MW mixed feed-in tariff/corporate PPA-based Hai Long which achieved financial close earlier in 2023. All the projects in Taiwan to date have been fixed-bottom, given the relatively shallow water depths, although there is a push for floating options through the subsequent rounds. "It has to be said that Taiwan's journey was accelerated and has certainly not been without difficulty," says Buchanan. "All of the round two projects in particular have been buffeted by a range of factors and have seen pretty significant cost and delay issues in most instances."

Taiwan's allocation rounds

Capacity has been allocated by the Taiwanese government on the west coast of the island through three phases. There was an initial demonstration round where all the projects received 20-year power purchase agreements (PPAs) with the state utility Taipower on a heavily subsidised fixed feed-in tariff.

There was a subsequent round two in 2018 where 36 zones were released for development, some on a fixed feed-in tariff basis with the balance awarded through a competitive auction process, with Taipower as the offtaker, or substituted as in the case of Hai Long with a corporate offtaker under a corporate PPA (CPPA).

Currently, in round three, five projects have been allocated with a total capacity of 2.3 GW. All of these are on a zero-subsidy basis, meaning that the entirety of the offtake will go to corporate purchasers under CPPAs. A subsequent 3 GW round ("**Round 3-2**") is expected to commence in March 2024, with the results expected to be announced in May 2024.

Japan

Until 2019, Japan had seen limited development, focused in near-shore port areas and limited in scale. In 2019, the Offshore Wind Promotion Act was introduced which sought to accelerate offshore projects through a public auction scheme. The first of these public auction schemes concluded in 2021, with Mitsubishi picking up all three of the projects, on a fixed-bottom basis, with a combined capacity of 1.7 GW. These are expected to come online between 2028 and 2030.

The second round of the auction scheme was concluded in June 2023 and the winners of three of the four areas were announced in December 2023, and consisted of three different consortia, notably including at least one foreign investor among the consortia (being RWE). The winner of a fourth site is expected to be announced in March 2024.

Buchanan says, "Interestingly, the assessment criteria for this second round were adjusted and shifted to attach more weighting in favour of non-price elements, such as capacity, experience and capability."

Floating offshore wind is anticipated in Japan, which has some of the best wind resource locations in deep waters.

South Korea

"There has been an enormous amount of energy and excitement from developers directed into the South Korean offshore wind market," says Buchanan, "but progress has been mixed. Much of that is because of the extremely prolonged, and sometimes uncertain, permitting path that projects need to navigate."

The first commercial scale project in South Korea, the 99 MW Jeonnam 1, is expected to reach commercial operation in 2024, having achieved financial close in 2023.

Revenue contracts in South Korea are awarded, like other jurisdictions, through an annual auction process where projects can bid for 20-year PPAs covering both power generation as well as associated renewable energy certificates (RECs). In the first round, which occurred in 2022, there was only one bidder – CIP/SK for Jeonnam 1 – and the second round closed in December 2023 with an allocation of 1.4 GW across 5 projects. Despite the difficulties that bidders faced to obtain an approved environmental impact assessment (EIA), the auction was oversubscribed by 600 MW which is a positive sign for the industry in South Korea when it is facing headwinds elsewhere. However, it was notable that the only non-domestic sponsor to bid (Singapore-headquartered Equis Development) was unsuccessful. Most of the projects so far have been focused on fixed-bottom solutions; however, like Japan, given the location of the wind resource in deep water, there has already been a significant shift in focus towards floating options at a relatively early stage.

Australia

While the Australian market is relatively new, the rise in offshore wind projects in Australia has resulted in significant public and private interest and the size and complexity of these projects typically require (and attract) significant amounts of private capital. "The recent developments in Australia regarding offshore wind have led to a significant uptick in investment activity in 2023 and we expect this momentum to continue into 2024" says Nadia Kalic, a Clifford Chance Partner based in Sydney.

Following Australia's national regulatory framework for offshore energy coming into effect in June 2022, the Australian Government has earmarked a number of potential offshore wind zones. The Bass Strait off Gippsland in the state of Victoria was declared Australia's first offshore wind zone in December 2022 and an additional area off the Hunter region in the state of New South Wales was declared suitable for offshore wind development in

July 2023. Feedback is currently being sought for Southern Ocean (Vic), Illawarra (NSW) and Bass Straight (TAS).

The allocation process for offshore wind in Australia:

- Phase 1 (Area Declaration): Area identification and preliminary assessment (including assessment of risks to environment, shipping, aviation and defence), followed by public consultation (minimum 60 days) and then area declaration.
- Phase 2 (Feasibility Licence): Applicants, often a consortium of investors, apply for a feasibility licence (2-7 years) and are assessed against merit criteria including financial and technical.
- Phase 3 (Commercial Licence): Applicants can apply for commercial licences (up to 40 years) which are only granted once the Minister considers that all of the required criteria have been met; following issuance of the licence, development of the project can commence.

In December 2023, the Victorian government announced that it would be launching a competitive auction process for CfDs to deliver Australia's first tranche of projects. The auction process will start with an Expression of Interest (EOI) phase that is intended to commence in the fourth quarter of 2024. Award of contracts is expected in late-2026. A minimum requirement to submit a proposal will include holding a feasibility licence for the declared development zone off Gippsland. There are 6 proposed projects, which received preliminary decisions to grant a feasibility licence on 22 December 2023 (with a further 6 being invited to resubmit applications to resolve overlapping issues).

The United States

"While there will continue to be market headwinds that plague US offshore wind projects in 2024, we're seeing an amelioration of those headwinds to help move projects along" says Alexander Leff, a Clifford Chance Partner based in Houston.

The US offshore wind sector was particularly challenging in 2023. Despite there being a fundamental need for projects to be built, and favourable locations identified, interest rates, supply chain issues and permitting challenges have combined to push up costs. This proved especially difficult for developers who had agreed fixed prices with state regulators and utilities, leading to a number of cancelled contracts. However, the macroeconomic outlook is now more positive and there are signs that the market is beginning to settle. "Given the size of offshore wind projects, government support is vital, and states that are committed to their climate targets will need to look for ways to make projects viable for developers," continues Leff, "Inflation Reduction Act incentives are a critical source of support, providing certainty, and states that are able to make adjustments will provide further stability." However, supply chain issues are likely to remain, given the international demand.

Revenue support mechanisms and corporate PPAs

"The Dutch offshore wind market is more mature than some other markets, especially regarding subsidy-free wind tenders, where the Netherlands was one of the first movers," says Liesbeth Buiters, a Clifford Chance Partner based in Amsterdam. "Although it's not completely subsidy-free, as the entire offshore high voltage station is still funded by the Dutch government."

"We see a lot of emphasis on revenue support mechanisms, which serve a number of critical purposes" she says, "in particular that of risk mitigation – to minimise financial risk for investors and lenders by ensuring a steady return on investment, especially given the long-term nature of the offshore wind sector."

Market attractiveness is a key consideration to make offshore wind more appealing to developers and investors, spurring growth and innovation in the sector. Over the past few years, revenue support mechanisms have been critical to help governments and industries to meet their renewable energy targets by incentivising investment.

Companies that have set targets to reduce their carbon emissions can achieve this through the use of corporate PPAs (CPPAs). Some even want their own dedicated wind farm.

CPPAs offer an attractive alternative to a traditional CfD. CPPAs have become more sophisticated, and provide flexible hedge arrangements for rising electricity costs. Typically, they have a tenure of 8-12 years but, depending on the financing structure of the project, this may be insufficient – especially if you have a debt tenor that is longer. There are mechanisms such as cash reserves and sponsor credit support that can be put in place to reduce uncertainty during the final phases of the project.

"CPPAs are also more popular as corporates have come under increased pressure to reduce their CO2 emissions whilst hedging against price volatility. Hence, a CPPA is an attractive way for sponsors to hedge their revenues during the life of the project," says Buiters. "As general corporate ESG targets and incentives increase, we anticipate that the depth and range of CPPAs will also expand."

Kalic adds, "The bankability of offshore wind projects in Australia are going to be contingent on demonstrating certainty of underlying cashflows. It will be interesting to see whether Australia will have a similar mix to that which we have seen in other jurisdictions of reverse auction programmes; feed-in tariffs, power purchase agreements and increasingly, CPPAs. From a CPPA perspective, the market in Australia is quite sophisticated and established, particularly when it comes to onshore renewable projects, and we expect that CPPAs will feature for offshore wind."

The challenges are market dependent

Buchanan says, "In APAC each market is quite distinct and there is limited scope for interconnectivity or interoperability across those markets. Each market has its own different regulatory environment, and this flows through to issues like vessel flagging and cabotage, constraining vessel movements within the region."

There are very robust local content requirements in certain jurisdictions, such as Taiwan, and the diversity in geophysical environments has an impact on the type and nature of solutions available. There is variance in procurement norms – some markets such as Taiwan have a high degree of disaggregation, whereas Japan and Korea tend towards one- or two-contract solutions. Finally, there are national restrictions, with the best example being the prohibition on bringing Chinese content into Taiwan.

"There's concern around revenue and project viability and one fairly unique aspect of that, given the relative immaturity of the market, has been the rapid reduction in state subsidy support," says Buchanan. "Governments – and Taiwan is a good example of this – have been very quick to move away from a heavy subsidy environment and shift into the CPPA space to allow projects to take advantage of the reduction in the levelised cost of energy (LCOE). However, this has not panned out in the way that everyone had hoped, given the spiralling costs of construction and operation, due to both global and regional factors in APAC."

The strong push towards CPPAs also raises questions about the viable pool of bankable customers in these markets at this stage and their capacity, whether they will provide suitable protections, indexation and inflation protections through the revenue stream.

"Developers need to see project scale and pipeline. There's been a lot of frustration around caps on megawatt size in auction rounds, not justifying long-term supply chain establishment and investment, and a lack of clarity in various auction rounds on future size and scale, again limiting that long term ability to plan" continues Buchanan.

Risk mitigation

"There are three main reasons for disputes that come up during projects – delay issues, cost overruns and defects," says Jan Conrady, a Clifford Chance litigation Partner based in Düsseldorf. "Projects are under huge time pressure." Scheduling is usually very ambitious,

which puts a lot of pressure both on owners and contractors and, with a growing market, contractors are very keen to move quickly from one project to another. With offshore projects, contractors tend to schedule their projects back-to-back in order to increase the utilisation of vessels, and this can create problems if there's adverse weather or permits are delayed, or a contractor faces technical issues.

Projects are under huge time constraints and sometimes the engineering has not been finalised when the contractor commences its work, so there need to be adjustments during the execution of a project leading to additional costs. "We also see disputes around defects and non-fulfilment of performance parameters. For example, if there is an issue with a defective turbine, it will not only affect the Turbine Supply Agreement, but it will also have an impact on reliability and the overall economics of the entire windfarm," adds Conrady.

There are three main criteria when it comes to risk assessment: the maturity of the technology, the environmental conditions and the legal environment. In offshore wind there are a lot of new developments; for example, floating technology and larger turbines. Environmental factors include the availability of vessels, weather and ocean floor soil conditions. The permitting process has a significant impact on the timeline and needs to be reliable.

Grid access and transmission creates another source of risk. "Under German law, the grid operator has to indemnify the wind farm operator if a grid connection is not available, and the wind farm operator will receive 90% of the regular tariff even if the wind farm isn't commissioned," says Conrady. "This regulation was introduced to provide a framework for risk sharing between the grid operator and wind farm operators."

What's next?

There are many reasons to remain optimistic for the future of the offshore wind sector. Developers continue to push forward with projects and further innovations are on the horizon. The increasing demand for clean hydrogen will provide opportunities to combine offshore wind with hydrogen production, bringing efficiencies by reducing the need for multiple power conversions and transmission, and advantages for transportation of hydrogen via pipeline and of products, such as methanol and ammonia, by ship. Stakeholders will need to consider the shifting landscape and the way to best navigate it, combining industry knowledge and strategic vision.



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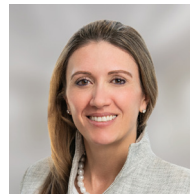
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