



ORRICK OFFSHORE WIND ENERGY UPDATE AND OUTLOOK

2021

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INTRODUCTION

Despite the impact of the COVID-19 pandemic, 2020 was another record-breaking year for the global offshore wind sector:

- additional installed capacity increased by 5.2 GW, with total global installed capacity hitting 32.5 GW;
- global investment in the sector reached US\$30 billion;
- 15 new projects went into operation, bringing the total number of operational offshore wind projects to 162 (globally);
- the average size of newly operational projects was 347 MW (compared to 325 MW in 2019); and
- full-time jobs in the sector reached an estimated 297,000.

This trajectory will not change as a result of the pandemic. If anything, the pandemic has served to reinforce the attractiveness of the sector. Investors searching for a secure revenue stream during uncertain times have found a safe haven in existing projects (typically benefiting from stabilising revenue support), while governments seeking to “build back better” and reach “net zero” have put offshore wind at the center of the global energy transition, driving forward new projects. This is demonstrated by some themes identified in this report, including:

- **Widening geographies.** Although the expansion of offshore wind in Europe, particularly among the North Sea nations, is accelerating, the rise of offshore wind in Asia is remarkable. Taiwan leads in this respect, with the past year seeing some major projects reach financial close and others pursue construction, while South Korea and Japan are advancing following a number of regulatory initiatives to improve the investment environment. Adding to this are developments in the United States where major permitting and financing hurdles have been cleared, thousands of MWs are being contracted on an annual basis, and a number of large utility scale projects are moving quickly towards start of construction.

- **Sustained and expanding interest in the sector.** The past year has seen continued investment in the sector, both in regard to projects reaching FID and financial close and in respect of M&A activity – in 2020 there were 36 M&A deals in the offshore wind sector valued at approximately US\$7.7 billion in aggregate. The appetite for offshore wind as an asset class is strong given the scale of the investment opportunities and the stable returns on offer.
- **‘Big oil’ embracing energy transition with vigour.** As a sign of the times, a number of O&G majors have set ambitious targets to hold significant renewable portfolios, with offshore wind playing a principal role. The past year has seen these majors participate in regulatory processes to develop, or simply acquire stakes in, projects in Europe, Asia and the US – with plenty more in the pipeline. This is creating significant competitive tension, both in auction processes at development stage and in the M&A market, potentially pushing out smaller players (but also giving them cause to be more creative with their investment strategies).

- **Emerging technologies.** The momentum behind floating offshore wind continues to build, with major developers announcing a number of projects in the past year, including in certain Asian countries where deeper sea waters make some fixed bottom projects unviable and local industry is well placed to provide floating platforms. We expect to see a much faster progression from demonstration size floating projects to commercial size (300 MW+) than we saw in the fixed bottom evolution. In addition, the combination of offshore wind and electrolysis to produce green hydrogen has caught the imagination of the industry and a number of pilot projects are now in train. There is real hope that power-to-X based on offshore wind is a leading solution to the intermittency of renewables. This will be the subject of a separate Orrick report due out later this year.

In the pages that follow, these trends and various legal/regulatory points and general market updates are considered in the context of the world's principal offshore wind markets, building on our 2020 report ([Orrick Offshore Wind Energy Update and Outlook](#)) and drawing on our experts' direct experiences over the past year. If you have any questions, please get in touch with us or the authors of the respective country reports.

This report is accurate as of June 2021.

Orrick's Global Offshore Wind Practice

On a personal note, 2020 was an important year for Orrick's offshore wind practice, with the arrival of a six-strong partner team in London and Asia who have nearly two decades of European and Asian offshore wind experience. Combined with our market-leading renewables practice in the United States, our team is collaborating on a range of mandates in all of the key countries. Some of our credentials are included on the pages that follow.

We are proud to be active participants in the offshore wind sector and look forward to working with our clients and others to move the sector forward in the decade to come.



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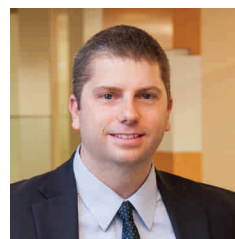


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BELGIUM

authored in collaboration with **LOYENS & LOEFF**



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Belgium remains one of the most active European countries in the offshore wind sector. The total installed capacity of offshore wind in Belgium increased in 2020 to approximately 2.3 GW and all Belgian offshore wind farms together injected 6.7 TWh of electricity into the transmission grid, representing 8.4% of total electricity consumption in Belgium. There are currently nine operational wind farms in the Belgian North Sea, operated by eight different entities, with the upcoming “second offshore wind phase” aiming to add another 2 GW of capacity.

The First Offshore Wind Phase

Belgium’s first offshore wind zone (the “**East-ern zone**”) has now been completed. [Map 1](#) sets out Belgium’s operational wind farms in use as of 1 January 2021, each of which are in Phase 1.

Whilst C-Power, Belwind, Northwind, Nobelwind and Norther are connected directly to the transmission grid onshore (either with their own or with a jointly used export cable), Northwester 2, Rentel and the two SeaMade wind farms (Seastar and SeaMade) are connected to the Belgian Transmission System Operator’s Modular Offshore Grid (“**MOG**”).

The Second Offshore Wind Phase

The Belgian government’s maritime spatial plan for the period of 2020-2026 establishes an additional offshore wind zone (the “Princess Elisabeth Wind Farm Zone”) which promises an additional capacity of up to 2 GW. The new concessions to develop, construct and operate offshore wind projects within this additional zone will have

a maximum term of 30 years (which must include the construction phase, operational phase and decommissioning phase), and will be awarded to the winning bidder following a competitive tender round.

Legislation containing the detailed rules on the new tender process is still to be adopted and discussions on how it will be structured are ongoing. The process may become similar to the procedure in [The Netherlands](#) (see page 19) but may just as well take a form similar to the procedure in the [United Kingdom](#) (see page 29). It will in any event be based on the following principles:

(i) concessions will be awarded to the winning bidder at the same time as key permits and authorisations, and on the basis of objective, non-discriminatory and transparent criteria; (ii) bidders will be subject to technical, organisational, financial and professional criteria; (iii) the Belgian state will enter into an agreement with the winning bidder; and (iv) the chosen bidder will be able to utilise the subsidy schemes, if any, for a maximum of 15 years.

In addition, the Belgian Transmission System Operator (TSO), Elia, is working on a second offshore grid extension. Elia also plans to reinforce the existing onshore high-voltage grid to ensure that increasing volumes of electricity generated offshore can be transported efficiently.

In light of this, new offshore wind tenders are expected to be delayed until 2023 at the earliest.

Support Schemes

The existing Belgian renewable energy support schemes are still in place for the Phase I wind farms and consist essentially of a system of green certificates, as well as a cable subsidy. Offshore wind farm operators have three or four revenue streams, namely:

- revenue from the sale of electricity under a power purchase agreement;
- revenue from the green certificates. These are granted by the regulator at a rate of one certificate per MWh, and can be sold at a guaranteed price to Elia (which recovers the cost through a surcharge on its network tariffs). Note that there is currently no market for such certificates, and Elia is the only purchaser;
- revenue from the sale of guarantees of origin; and
- potential revenue from the provision of ancillary services to Elia.

The subsidy level is governed by the rules on the guaranteed certificate price.

For the first four projects (Belwind, Nobelwind, Northwind and C-Power), the certificate price is set directly by law, namely at EUR 107.00 per MWh for the electricity generated from the first 216 MW of the installed capacity, and EUR 90.00 per MWh for the electricity generated from additional installed capacity. The minimum price applies for a period of 20 years from the commissioning of each installation.

For more recent projects, the certificate price is set on the basis of a formula which approximates the logic of a Contract for Difference.

For Rentel and Norther, the price formula is: certificate price = LCOE (levelized cost of energy) minus a corrected electricity reference price. The electricity reference price is "corrected" by factoring in (i) the revenue from guarantees of origin, (ii) the effect of energy losses between production and injection into the transmission grid and (iii) a correction factor (which as a rule equals 0.10 but which *Commission for Electricity and Gas Regulation (CREG)* must periodically adapt for each concession, in principle in light of the PPA selling price). The LCOE for Rentel is EUR 129.80/MWh. For Norther it is EUR 124.00/MWh. However, during certain periods of negative imbalance or day-ahead prices, the certificates price is zero. The support term is 19 years from the commissioning of each installation.

For Northwester 2, Seastar and SeaMade, the LCOE is EUR 79.00/MWh. The key novelty for these three projects is a system of monthly prepayments and of ex post settlements, which should ensure a more stable revenue stream. The subsidy term expires on the earlier of: (i) 17 years after the date of commissioning of each installation; and (ii) 31 December 2037. The support is also limited to 63,000 full load hours of electricity production at wind farm level. The same rule on zero-pricing of certificates in case of negative imbalance and day-ahead prices applies as for Rentel and Norther.

In addition to the above, existing offshore wind projects have previously received a cable subsidy, whereby Elia funds part of the cable required to connect an offshore wind project to the transmission system. The cable subsidy has in the past either taken the form of a capital subsidy and/or an LCOE mark-up.

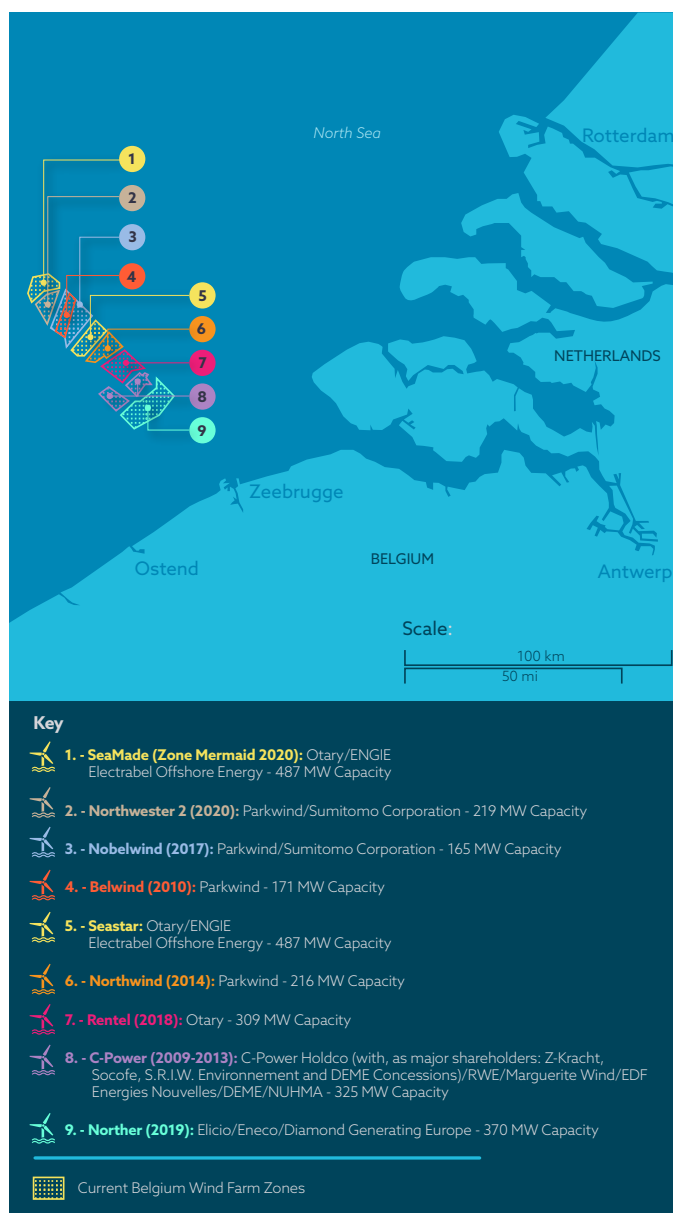
The Modular Offshore Grid

The MOG is an offshore platform which connects to the Belgian onshore grid through various undersea cables. It has been operational since 2019 and transports the generated energy from the Rentel, Northwester 2, SeaMade and Seastar projects to the mainland. The federal government is now preparing a second generation area for offshore wind power, which will be connected to the onshore transmission system via a second Modular Offshore Grid to be developed by Elia ("MOG II"). The second generation area and MOG II are expected to boost capacity by 2 GW (up to 4 GW offshore in total) by 2030. It is not yet clear if there will be a specific cable subsidy in relation to the new offshore wind projects' connection to MOG II.

Conclusion

Belgium is a country with long-standing energy production from offshore wind, as seen by its completion of the first offshore wind phase. The second phase promises continued levels of power generation but will take a different approach given the new tender process. However, the federal government still has to decide on the design of the new tender process, and Elia still faces several hurdles, particularly to reinforce the onshore grid.

MAP 1: BELGIUM'S OFFSHORE WIND PROJECTS





DENMARK

authored in collaboration with **Bech·Bruun**



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A True Pioneer

Denmark was the first country in the world to complete an offshore wind project in 1991. The Vindeby offshore wind project totalled 5 MW at a time when offshore wind was still very much an unfamiliar concept. True to its pioneering form, the Danish government announced in June 2020 a new climate package which includes the creation of two offshore energy islands that will act as hubs to connect several offshore wind projects.

The two energy islands will consist of the natural island of Bornholm in the Baltic Sea and an artificial island to be created in the North Sea. The islands are expected to host electrical capacity equal to 5 GW in total, with the potential to increase this to 12 GW in the future.

North Sea Island

The Danish government approved plans to construct the North Sea island in February 2021, which will be 80 km off Denmark's west coast. The government will take a 51% stake in the project, and a legal framework will be developed to tender the remaining 49% stake, which will provide an exciting opportunity for wind farm developers and investors. The official tender will be launched in February 2022, with a preferred bidder announced the following year. The Danish Energy Agency ("DEA") and the Transmission System Operator ("TSO"), Energinet, will also conduct environmental studies, focusing on the impact of the islands and offshore wind turbines on the seabed, to be completed by 2024. Construction of the island is expected to start in 2026. The island is expected to be operable by 2033. The first phase (of 3 GW) is expected to cost around 210 billion Danish

crowns (approximately EUR 28 billion). The North Sea island will have the potential to increase its capacity from 3 GW to 10 GW.

The North Sea island may also connect to various European countries. Belgium, the Netherlands and Germany could all benefit from the project.

Baltic Sea Island

The energy island in the Baltic Sea will be Bornholm. Technical facilities on the island will serve as a hub for offshore wind farms off the coast, supplying 2 GW of energy. The wind farms will be constructed approximately 20 kilometres to the south and southwest of Bornholm and will be connected to the island via submarine cables. The Danish parliament has set a target of 2030 to carry out these activities.

Similar to the North Sea island, neighbouring European countries could benefit from the Bornholm connection. A direct connection to Poland has been earmarked. In addition, in January 2021, the German TSO 50Hertz and Danish TSO Energinet agreed to collaborate on the project. The German and Danish grids would therefore be connected by way of an interconnector. The two TSOs will carry out studies throughout 2021 to confirm if the joint project is viable.

Three New Offshore Wind Projects

As well as the announcement of the new energy islands, there are several offshore wind projects which are currently in the pipeline. Pursuant to the Energy Agreement of 29 June 2018, the Danish government set a target of approximately 55% of

Danish energy consumption to be derived from renewable energy. This will partly be achieved through the establishment of three new offshore wind projects by 2030.

The first project, Thor, was announced by the DEA in February 2019 and will be located in the North Sea west of Nissum Fjord, 20 km from the shore of Jutland. It will have a capacity of up to 1 GW and will be connected to the grid between 2025 and 2027. In January 2021, the DEA received a total of 6 applications from consortia and companies that have qualified to participate in the tender process. Bidders include: Ørsted; Vattenfall; a consortium of Total and Iberdrola; Thor Wind Farm I/S (owned by RWE Wind Holding A/S and RWE Offshore Wind A/S); a joint venture of SSE Renewables Offshore Windfarm Holdings Limited and Thor OFW K/S, which is owned by Copenhagen Infrastructure IV Thor OFW ApS and Andel Holding A/S; and Swan Wind P/S (a joint venture between Eneco Wind B.V. and European Energy A/S). In August 2021 the DEA will call for final bids, with the winner expected to be announced in December 2021.

Offshore wind projects established via tender are entitled to subsidies pursuant to the "Contract for Difference" ("CfD") subsidy. The Thor project will follow the CfD model. The concession owner will receive a price premium calculated as the difference between the tendered bid price and the reference price (the spot price of electricity in the relevant area) during the years when the offered bid price is higher than the reference price, but will pay the Danish state during the years when the reference price is higher than the offered bid price. The subsidy will be granted for a period of 20 years.

In addition, it is worth noting that the winning bidder of the Thor project will also be responsible for developing and constructing access to the electricity grid. This is unlike previous projects whereby the TSO was responsible for offshore connection.

Hesselø Offshore Wind Farm is the second offshore wind farm announced pursuant to the Energy Agreement of 29 June 2018. The Hesselø project is scheduled to be fully commissioned by the end of 2027. The tendering process will start in Q3 2021, with the winning bidder announced at the end of 2022. Hesselø is expected to have a capacity of up to 1.2 GW and will follow a similar subsidy scheme as the Thor project, based on the CfD model.

The third project to be developed pursuant to the Energy Agreement of 29 June 2018 is yet to be announced but will be built as part of the energy island projects described above.

Permits and Licences

There are two procedures for obtaining permits to construct and operate offshore wind projects in Denmark: (i) tenders announced via the Danish government; and (ii) the 'open-door' procedure.

Tenders are run by the DEA for larger-scale offshore wind projects in a designated location with a specific capacity. Each of the projects established pursuant to the Energy Agreement of 29 June 2018 are being tendered.

The open-door procedure is for projects which have not already been reserved by the government's spatial plan for tenders. Current windfarms under the open-door procedure are:

1. Omø Syd 200 – 320 MW
2. Jammerland Bugt 120 – 240 MW
3. Mejl Flak 60 – 120 MW
4. Lillebælt Syd 160 MW
5. Frederikshavn Havvindmøllepark 21.6 – 72 MW
6. Aflandshage 250 MW
7. Nordre Flint 160 MW
8. Kadet Banke Havmøllepark 504 – 864 MW
9. Paludan Flak 154 – 228 MW
10. Treå Møllebugt 434 – 720 MW
11. Hesselø Havvindmøllepark 800 – 1200 MW

The DEA is responsible for assessing and issuing all licences (both in relation to the tender process and the open-door process). Four licences are required throughout the project lifecycle: a licence to carry out preliminary investigations; a licence for construction of the offshore wind project; a licence to produce electricity; and an electricity production authorisation (above 25 MW).

Conclusion

Denmark has a determined approach on climate change. It has pledged to be independent of oil and gas by 2050, and the promise of two new energy islands to harness offshore wind, on top of three new committed offshore wind projects, will be a promising step to cut greenhouse gas emissions by 70% by 2030. The development of the energy islands will provide a key opportunity for market players looking to capitalise in these innovative infrastructure projects, which will be the first of their kind globally.

MAP 2: DENMARK'S LARGEST OFFSHORE WIND FARMS





FRANCE



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The French offshore wind market has begun to pick up momentum, with a busy pipeline of projects and ambitious objectives set by the French government. These new projects will not only benefit from the experiences during the development of France's first generation of offshore wind projects, but also from new government reforms aimed at simplifying and speeding up the competitive bidding process.

A Challenging Start – Tender Rounds 1 and 2 and the FiT

Offshore wind projects have been developed in France since 2011, when the French government launched its first call for tenders up to a maximum capacity of 3 GW spread over five zones: (i) Le Tréport; (ii) Fécamp; (iii) Courseulles-sur-Mer; (iv) Saint-Brieuc; and (v) Saint-Nazaire. A second call for tenders was issued in March 2013. This call targeted two zones (Le Tréport and a zone between the islands of Yeu and Noirmoutier) for a total installed capacity of 1 GW.

The procedures for these tenders experienced various issues, including, in particular, challenges before the French administrative courts. These disputes led to significant delays in the construction of the projects to which they related. For instance, the final authorisations for the Fécamp and Courseulles-sur-Mer projects, the Saint-Nazaire project and the Saint-Brieuc project were only determined by France's highest Administrative Court, the Council of State (in French, the *Conseil d'État*), on 24 July 2019, 7 June 2019 and 3 December 2020, respectively.

In this context, the feed-in tariffs ("FiTs") resulting from these tenders were high when compared to the decreasing construction costs of offshore wind farms (the FiTs awarded ranged between €180.00 and €230.00/MWh). This discrepancy led the French government to consider whether it was advisable to carry on with these projects. However, the abandonment of the projects was avoided thanks to a renegotiation by the French government of the FiTs (leading to FiTs in the range of €131.00/MWh and €155.00/MWh). The newly agreed FiTs were validated by the European Commission on 26 July 2019, and the deployment of these projects was able to begin.

Consequently, the Saint-Nazaire project reached financial close in September 2019, the Fécamp project at the end of May 2020 and the Courseulles-sur-Mer project in February 2021.

Tender Round 3 – A Move to CfDs

The third call for tenders was launched on 15 December 2016 for the Dunkerque offshore wind project, which was awarded on 14 June 2019 to a consortium comprising EDF, Innogy and Enbridge for a capacity of 600 MW.

This call for tenders was the first one to be carried out through a competitive dialogue (*dialogue concurrentiel*), meaning that the government and the candidates discussed certain terms and conditions of the project before the government issued the final version of the specifications (*cahier des charges*) of the project. This includes the determination of a contract for difference ("CfD") rather than a FiT. A CfD grants the project a "premium" based on the spot electricity price, a reference electricity tariff (proposed by the winning developer during the competitive process) and the reference market price. In respect of the Dunkerque project, the CfD reference electricity tariff is €44.00/MWh.

Tender Rounds 4 and 5 – Confirmation of France’s Offshore Wind Momentum

An additional fixed-bottom offshore project was called to tender on 15 January 2021 near the coast of Normandy for a total installed capacity of 1 GW (round 4)¹.

Interested developers were required to submit their applications (“*candidatures*”) for pre-qualification by 12 March 2021. On the basis of these applications, a total of 6 developers were selected, which met the pre-qualification requirements or criteria provided for by the pre-qualification document (“*document de consultation*”). The selected developers are:

1. Eoliennes en Mer Manche Normandie (EMMN) – a consortium comprising EDF, Enbridge and CPPIB;
2. Iberdrola;
3. Ocean Winds – a joint-venture between EDPR and Engie;
4. Shell;
5. Total and RWE; and
6. Vattenfall, German Wpd and Banque des Territoires.

These 6 developers are now in a competitive dialogue with the government that will last several months, at the end of which they will have to submit their bid (“*offre*”).

Additionally, for the first time, a commercial floating wind farm with a total installed capacity of 250 MW has been launched near the coast of Brittany (round 5). Although floating wind turbines have been installed in France since 2018, these projects were pilot projects and only concerned a limited number of turbines.

The public debate regarding the Brittany floating offshore wind project ended on 22 December 2020, and the national public debate commission (*Commission nationale du débat public*) had two months to publish

the resulting assessment. The assessment was published on 21 February 2021. The next step, the publication of the decision of the energy minister as to whether the project can proceed to tender and, most importantly, the perimeter of the project, was published on 18 May 2021. In this decision, the energy minister decided to continue the project near the coast of Brittany and defined the perimeter of the project. Following this, a competitive dialogue with bidding developers will follow.

In both cases (rounds 4 and 5), the successful developer will be selected based on criteria such as the financial and economic offer proposed, consistent with round 3.

The Competitive Process

The delays and difficulties experienced in the first calls for tenders led the government to modify the regulatory framework in order to promote and simplify the development of future projects. The implementation of an offshore wind project in France still requires numerous authorisations, but many of them have been adapted to solve the difficulties experienced in the previous calls for tenders.

As noted above, the development of an offshore wind project in France requires the developer to win a call for tenders. The call for tenders is launched by the minister in charge of energy based on specifications drawn up with the Energy Regulatory Commission (*Commission de Régulation de l’Energie* or *CRE*). This procedure may take the form of a competitive dialogue. Since 2016 and the Dunkerque project, the competitive dialogue procedure has been chosen by the French government for all its competitive bidding procedures.

Permits

Winning a call for tenders allows the developer to be issued an operating permit (*autorisation d’exploiter*) as well as the right to conclude a CfD (as explained above). It should, however, be highlighted that an

operating permit is not required when the installed capacity of the project is 1 GW or less.

In addition to the operating permit, the operator must obtain two main authorisations (an environmental authorisation and a public domain authorisation) when the project is built on the public maritime domain². A single authorisation is instead required when the project is built in the French exclusive economic zone pursuant to the provisions of Ordinance No. 2016-1687 of 8 December 2016³.

These authorisations are obtained through application to the relevant authority (and not through a competitive process).

Reforms

Following the first three calls for tenders, several other amendments to the regulatory regime are worth noting.

A. GRID CONNECTION

First, the government decided to reform the regulations relating to the grid connection of electricity production facilities. Pursuant to Law No. 2017-1839 of 30 December 2017, the French operator of the public electricity transmission system, *Réseau de Transport d’Electricité* (RTE), carries out, at its own expense, the grid connection of the offshore wind project pursuant to a timetable set out in the specifications of the call for tenders of each project. The costs of the grid connection are thus no longer borne by the developers, which has led to a significant decrease in the reference electricity tariff proposed by the developers for the Dunkerque project.

B. INSURANCE

Second, offshore wind projects have been added to the “major risks” identified in Article L. 111-6 of the French Insurance Code to promote their insurability. This means that offshore wind projects are exempted from a mandatory requirement to insure for

¹ The public debate—the first stage of the public assessment process, determining the viability of the project and the area in which it is to be developed—started on 15 November 2019, and, while it was intended to last four months, it did not complete until 19 August 2020 due to delays caused by the COVID-19 pandemic.

² The public maritime domain (DPM) is essentially made up of land historically covered by the sea but from which it has retreated, as well as land still under water between the seashore and the limit of territorial waters. The DPM is subject to a special regulatory regime under French law.

³ As defined by the so-called Montego Bay Convention, the exclusive economic zone is “an area beyond and adjacent to the territorial sea, subject to the specific legal regime established in this part, under which the rights and jurisdiction of the coastal State and the rights and freedoms of other States are governed by the relevant provision of this Convention” (art. 55). French law provisions with respect to the use and occupation of the French exclusive economic zone are set forth in the abovementioned Ordinance no. 2016-1687.

terrorism and natural disasters. The exclusion of both requirements does not mean that these risks cannot be insured, but rather that the project and insurers are now free to insure these risks on their own terms (rather than being required to do so).

C. "ENVELOPE PERMIT"

Third, to enable the developer to benefit from the latest technological developments and construction techniques, Law No. 2018-727 of 10 August 2018 created the "envelope permit." This permit allows the developer to obtain an authorisation for a project with variable characteristics. Accordingly, the developer may modify certain characteristics of the project within the limits of the "envelope permit" to benefit from the latest technological developments, without modifying the authorisations granted. For example, the developer could modify the number of wind turbines or the installed capacity of each turbine subject to retaining the core characteristics upon which the project was awarded.

D. SIMPLIFYING THE PROCEDURE

Finally, in order to accelerate the development of offshore wind farms, two additional measures have recently been adopted by the so-called Law No. 2020-1525 of 7 December 2020 for speeding up and simplifying the public procedure.

With respect to the public consultation, which is required to be held for determining the viability of the project and fixing the area in which it is to be erected, Article L. 121-8-1 of the French Environmental Code was modified in order to (i) allow the minister in charge of energy to launch the call for tenders before the end of the public consultation, which was not previously possible (although we note that the competitive dialogue cannot start before the results of the public consultation are published), and (ii) launch a unique public consultation for determining several areas for offshore wind projects. As the implementation and duration of a public debate can be lengthy, the possibility to launch a one-off debate to determine several areas for the implementation of future projects is expected to accelerate the number of projects to be launched in the coming years.

With respect to challenges lodged against the authorisations of a project, France's highest Administrative Court (the *Conseil d'État*) is now in charge of "challenges against decisions relating to offshore renewable energy installations and their related works (...)". By reserving jurisdiction to the highest Administrative Court (which will make a final judgment on any legal challenge relating to a project's authorisations), the French government aims to reduce the challenges targeted against projects and therefore allow them to be more quickly developed (cf. Art. L 311-13 and R. 311-1-1 of the French Administrative Code).

Outlook

The multiannual energy programming (*Programmation pluriannuelle de l'énergie* or *PPE*) for the period 2019-2028 published by Decree No. 2020-456 of 21 April 2020 sets ambitious objectives of additional offshore wind capacity of 2.4 GW by 2023 and 5.6 GW to 6.2 GW by 2028. The projects to be launched will be both fixed-bottom and floating offshore wind farms.

France is reported to have the second-largest offshore wind resource in Europe, and it has been made clear that the ambition of the French government is to develop a strong offshore wind sector.

A. THE CONTINUATION OF THE DEVELOPMENT OF FIXED-BOTTOM OFFSHORE WIND FARMS

The development of additional fixed-bottom offshore wind farms is expected to continue. Indeed, preparation for an additional public debate is underway regarding the prospective implementation of another fixed-bottom offshore wind farm (for an installed capacity ranging between 500 MW to 1 GW) near the Island of Oléron. The commissioning of this wind farm is expected in 2028.



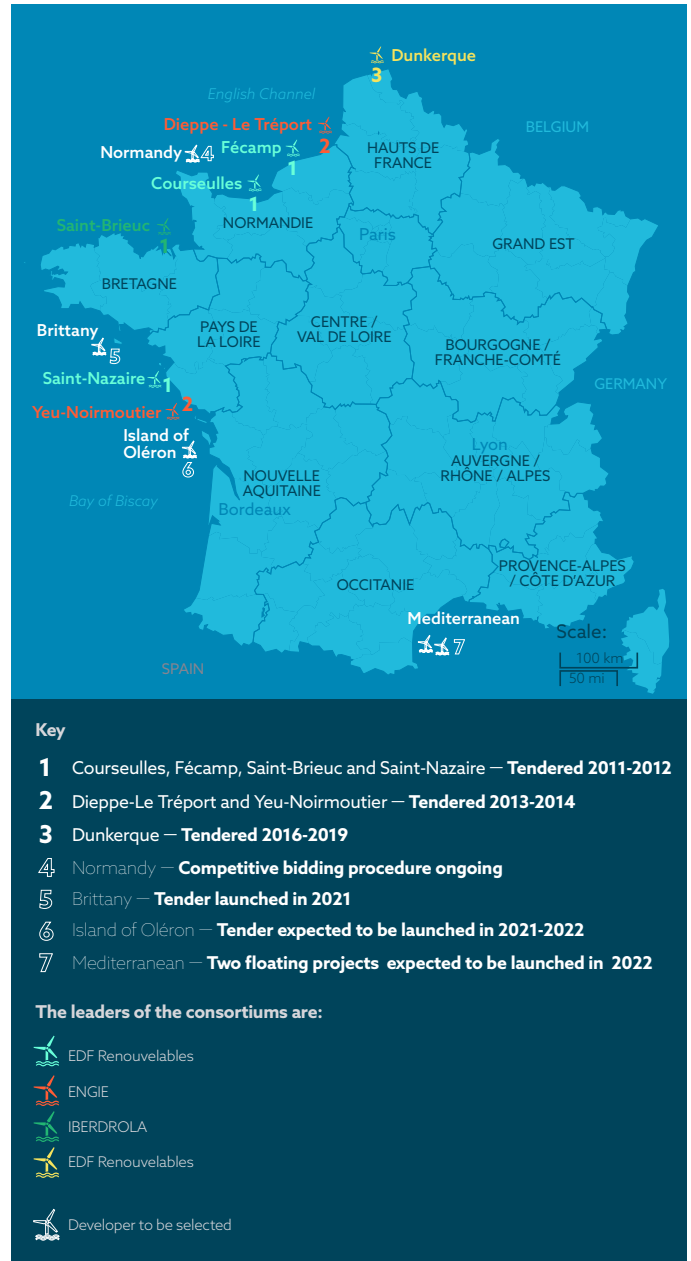
B. THE DEVELOPMENT OF COMMERCIAL OFFSHORE FLOATING WIND FARMS

Floating wind turbines can generate power in deep water, where the wind is stronger and more consistent. Furthermore, the installation of floating wind turbines does not require the developer to build solid foundations or use the special construction vessels needed for fixed-bottom offshore wind turbines. The French Environmental and Energy Management Agency (in French, ADEME) has already launched several calls for pilot projects. These projects benefited from grants authorised by the European Commission on 25 February 2019.

Given the promising nature of floating wind technology, the government showed its support for this technology by including floating offshore wind turbines in the *Programmation Pluriannuelle de l’Energie* for the period 2019 - 2028. As mentioned above, a call for tenders is expected to be launched in 2021 for the 250 MW Brittany floating offshore wind project. Two other floating offshore wind projects in the Mediterranean are also expected to be launched in 2022 with a capacity of 250 MW each.

Please see [Map 3](#) for further detail on France’s offshore wind projects.

MAP 3: FRANCE’S OFFSHORE WIND PROJECTS





GERMANY



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Germany achieved a cumulative installed capacity of approx. 7.7 GW of operational offshore wind farms in 2020, however no significant growth was seen from 2019 (when the figure stood at approximately 7.5 GW). As of January 2021, no offshore wind farms are under construction in Germany. To combat any suggested plateauing, the German Bundestag has amended its legislative framework for the development of offshore wind farms and set ambitious targets for the development of future offshore wind capacity. 2021 should see this play out.

An Amendment to WindSeeG

In November 2020, the German Bundestag officially approved an amendment to the Development and Promotion of Offshore Wind Energy Act (*Windenergie-auf-See-Gesetz*, 'WindSeeG'), the country's offshore wind act. The amendment to the WindSeeG is a legislative cornerstone for the achievement of the German government's 2030 climate protection programme. The key amendments are as follows:

- **Ambitious increase in capacity targets.** The amendment sets targets of 20 GW of offshore wind power by 2030 and 40 GW of offshore wind power by 2040. The abolition of a fixed annual target for installed capacity allows for more flexibility in the expansion of the industry over each decade. Following the amendment, installed capacity is expected to be approximately 1 GW per year for the years 2021-2023, 3 GW in 2024 and 4 GW in 2025.
- **Changes to the tendering system.** An additional assessment step has been introduced to ensure timely completion of necessary infrastructure. Prior to

announcing the invitation to tender for a site, the Federal Network Agency (*Bundesnetzagentur*, 'BNetzA') will check whether the grid capacity required for electricity feed-in, transmission and distribution is expected to be constructed and completed in time. Should certain conditions not be met, tendering can be postponed for the relevant year.

- **Tighter construction time frames.** Key development milestone deadlines have been shortened as follows: (i) *start of construction*: six instead of three months before the binding grid connection date; (ii) *operational readiness of at least one wind turbine*: by the binding grid connection date instead of six months after; and (iii) *operational readiness of all wind energy installations*: six instead of 18 months after the binding grid connection date.
- **Zero-cent bids.** Zero-cent bids (bids that require no subsidy) have been a feature of the auction rounds since 2017. In light of this, the Bundestag contemplated a second component to the tender process whereby zero-cent bidders would be able to offer a connection premium to the transmission operator. The intention was

that if there are multiple zero-cent bids, the bidder(s) with the highest premium would win. Following concerns raised by stakeholders, this proposal was rejected by the Bundestag (at least for now). Instead, in instances of multiple zero-cent bids, the winning bid will be determined by a lottery process (for example, if three zero-cent bids are competing for the same tender area, then one of these developers will be chosen at random).

- **Maximum bid value.** Previously, the maximum bid value for a tender was required to correspond to the lowest bid value which received an award in the most recent bidding round. This was intended to ensure that the subsidy would decrease over time. However, because the previous lowest bid (in the 2018 tender round) was zero, this mechanism would effectively render all future rounds zero-cent based (subsidy free). Consequently, given that some projects are not expected to be feasible on a zero-cent basis, the November amendment to the WindSeeG has increased the maximum bid value for the 2021 tendering round to 7.3 eurocents/kWh, which will then be reduced for the subsequent tendering rounds to 6.4 eurocents/kWh for 2022 and 6.2 eurocents/kWh from 2023 onwards.
- **Co-locating hydrogen production.** The amendment to the WindSeeG also contemplates certain offshore areas, separate from the wind farm location, to be used for other forms of offshore energy production, for example, the production of green hydrogen. According to the area development plan 2020 (*Flächenentwicklungsplan*), which is the main planning tool for offshore wind development in Germany, two areas have been designated, one in the Baltic Sea (7.6 km²) and one in the North Sea (27.5 km²). However, only the area in the Baltic Sea will benefit from a direct connection

to land via cable and pipelines. The North Sea area will not be connected to the grid, i.e., the green hydrogen would be produced using the excess electricity from offshore wind farms to feed into an offshore electrolyser, with any green hydrogen produced then needing to be shipped to market.

- **Other areas.** The amendment also includes welcome changes relating to: (i) the modification or reissuance of permits; (ii) the reimbursement of planning costs; and (iii) transitional provisions regarding certain changes (e.g., construction deadlines).

To ensure that the government's new target of 20 GW by 2030 is achieved, a total capacity of 10 GW will be tendered until 2025. Additionally, a further 22.3 GW would then be required to achieve the government's 40 GW target by 2040. Thus, a total of 32.3 GW still has to be added by 2040. Given the obvious challenges associated with setting such an ambitious target, it remains to be seen whether the targets will be met.

The first round of the new tenders commenced at the end of February, with the government announcing a tender for 958 MW of capacity across three sites (658 MW across two sites in the North Sea and a third site of 300 MW in the Baltic Sea). The respective offers have to be submitted by 1 September 2021 with the maximum bid price set at 7.3 eurocents/kWh. The commissioning year will be 2026.

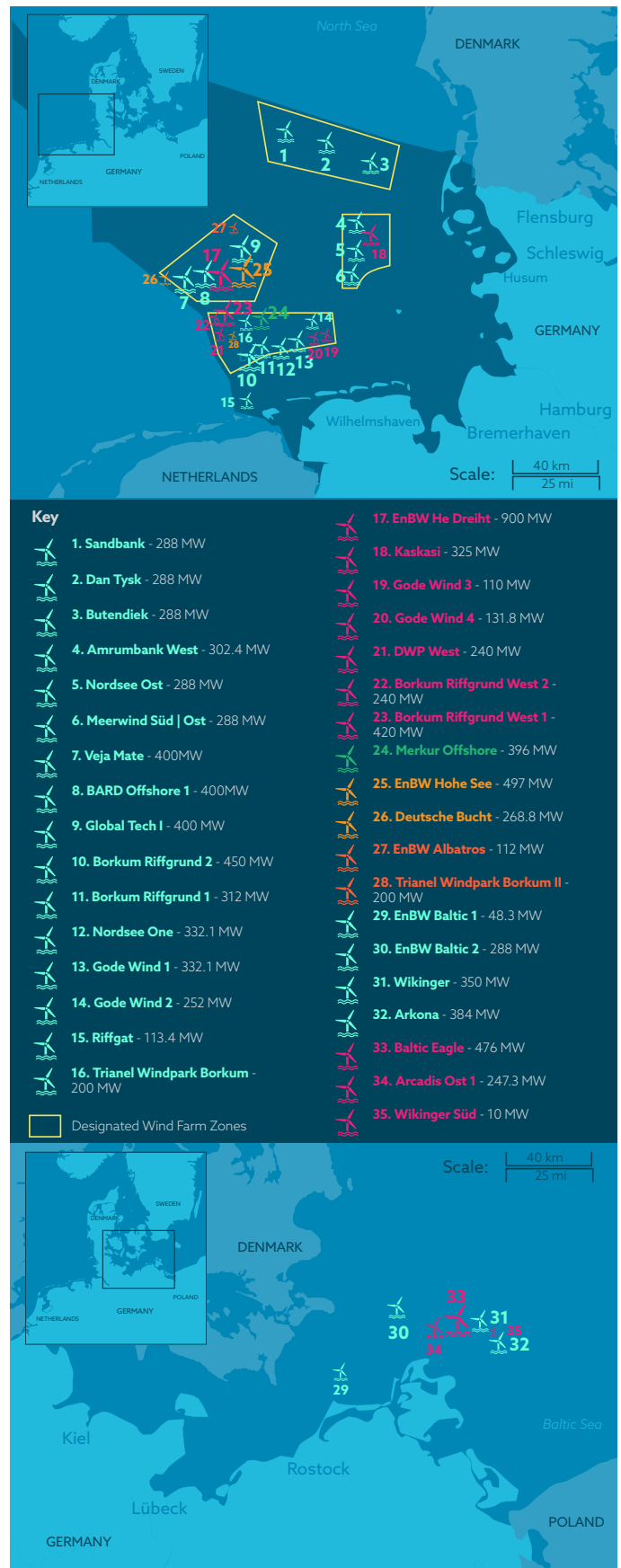
Subsidy Support: a CfD?

While the amended WindSeeG has crystallised a long-term vision for the expansion of Germany's offshore wind market, the offshore industry still harbours concerns about the apparent lack of financial support. In the second half of 2020, many key stakeholders in the German offshore wind sector began lobbying for the Bundestag to adopt a two-way market premium akin to the Contracts for Difference ('CfD') model known in other countries (e.g., the UK). Earlier this year, Chief Executive of WindEurope Giles Dickson said "negative pricing is likely to deter investors, push up financing costs and increase the pressure on the already struggling supply chain. No other country in Europe is seriously considering negative pricing. A number of countries, however, are moving towards CfD." However, while these sorts of sentiments appear to have been influential in the Bundestag's decision to move away from negative pricing, at least for now, the Bundestag has not yet been persuaded to establish a CfD model. It is expected that the discussions in the Bundestag will pick up again in 2022 after the general election in autumn 2021.

Technology

German companies are at the forefront of technological development regarding offshore floating wind projects. For instance, in December 2020, the energy giant EnBW successfully completed trials of its Nezy floating wind system in the Baltic Sea. The construction of the 1:1 scale model is expected to be finalised by the end of 2021/beginning of 2022. The feasibility of offshore floating wind projects will boost the growth of the global offshore market and Germany hopes to take a larger market share through its floating offshore wind expertise.

MAP 4: GERMANY'S OFFSHORE WIND FARMS





IRELAND



Authored by Adam Smith (Orrick) and Oliver Sikora (Orrick) – refer to page 44 for contact details.

Big Potential

The Irish government has outlined ambitious targets to install 5 GW of offshore wind projects by 2030. These will primarily be fixed-bottom wind farms located off Ireland's eastern and southern coasts, given the shallower seabed conditions and proximity to load centres. A number of projects are already in the pipeline. In addition, Ireland's west and south west coasts, which have deeper waters (not generally suitable for fixed-bottom turbines), provide significant opportunities for floating turbines, with some estimates suggesting a potential for up to 30 GW of floating offshore wind being possible. The potential is reflected in Simply Blue Energy and Shell establishing a partnership to develop the 1 GW Emerald floating offshore wind project off the southern coast of Ireland, which was announced in January 2021, and DP Energy and Iberdrola's joint venture to develop 2 GW of offshore wind projects, including floating, on the southwest and west coasts, announced in February 2021.

A Legislative Wave

The challenges which Ireland faces to meet this 5 GW target have been well documented, but there are promising signs ahead. 2021 will likely see the Irish government publish and enact its much-anticipated Marine Planning and Development Management Bill (which may be renamed as the Marine Area Planning Bill) (the "Bill"), which should streamline the consenting process into a single system. This will be welcome news to developers, as the existing legislative regime was viewed as not fit for that purpose. It is expected

that the Bill will provide for a multistage consenting process, similar to that of the system in the UK, which, if a developer is successful, should ultimately result in that developer acquiring a right to occupy a parcel of the marine area for the development of its proposed wind farm.

2021 is also likely to see the Irish government announce its plan on grid connection policy for offshore wind projects, which is currently being consulted upon.

Relevant Projects

That being said, there are a number of offshore wind projects which have already commenced development under the existing legislative framework. Under the Bill, these projects will benefit from a transitional protocol in the new marine planning process. These so-called 'Relevant Projects,' which have a combined capacity totalling approximately 3.5 GW, would be afforded a 'fast-track' into the consenting procedure and are permitted to engage with EirGrid for grid connection offers.

Time to Auction

Although the timelines have not yet been confirmed, 2021 or 2022 is expected to see the Irish government hold its first offshore wind auction under Ireland's new Renewable Electricity Support Scheme ("RESS"). The structure of the offshore wind auction (or "RESS-O") and the terms and conditions of the scheme have yet to be published but a number of potential features can be assumed from the design of the RESS 1 auction (held in 2020).

RESS-O will allow developers to bid for a two-way Feed-in-Premium ("FIP"), with the lowest bids necessary to meet the output requirements being successful. RESS 1 was structured as a 'pay-as-bid' auction. RESS operates similarly to the UK Contract-for-Difference regime, with the Public Service Obligation making up any shortfall in the price of electricity from the strike price under the FIP and the generator paying any excess monies received above the strike price to the Public Service Obligation.

Whilst the FIP under RESS 1 was not subject to indexation, it remains to be seen if that position will be maintained in RESS-O.

RESS 1 support has been granted for a period of up to 16.5 years commencing on the commercial operations date of the project, which is likely to be reflected in RESS-O, however this is yet to be confirmed.

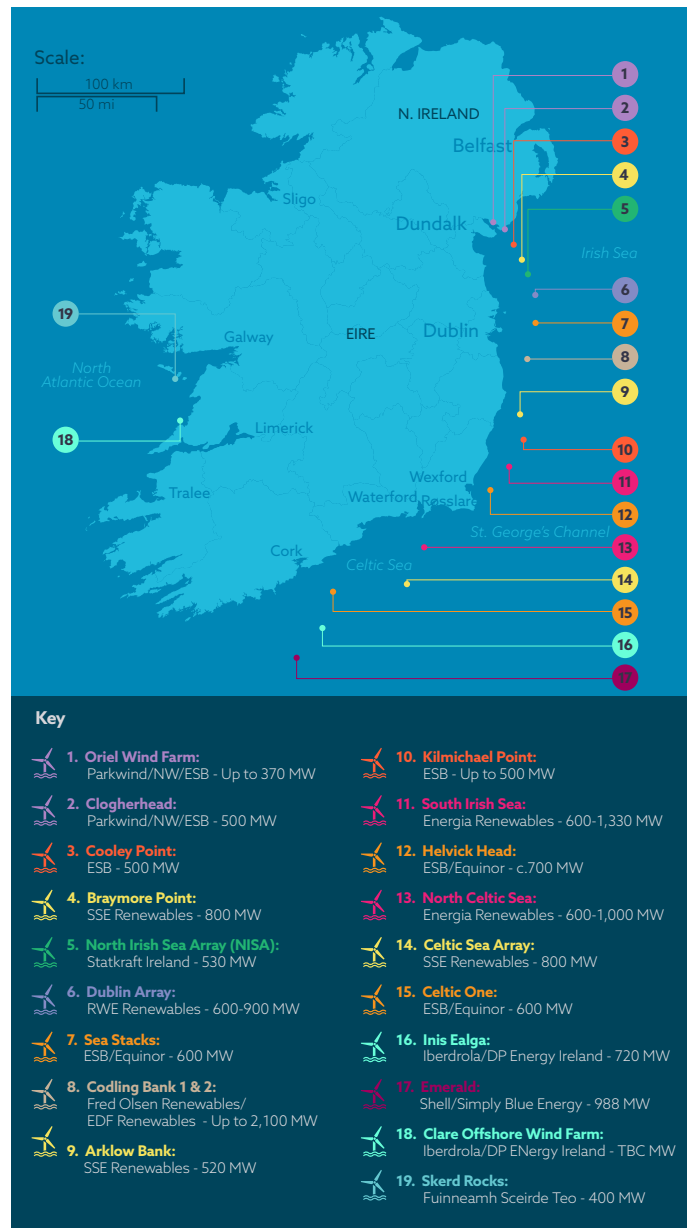
The conditions for the awarding of a FIP will be set out in the RESS-O terms and conditions and the contractual milestones for delivering the RESS-O project will be set out in an implementation agreement to be entered into between the developer and the Minister for Communications, Climate Action & Environment.

The Irish government has committed to hold a RESS-O auction in 2021/2022 (and subsequent auctions up to 2025) if there is sufficient competition to do so.

Conclusion

Given recent M&A activity in the Irish offshore wind sector (see Iberdrola's acquisition in February of a majority stake in DP Energy's 3 GW Irish offshore wind pipeline and Shell's acquisition of a majority stake in Simply Blue Energy's Emerald floating wind venture in January), as well as significant development activity by many well-known industry players, the pipeline for future offshore wind projects in Ireland is starting to look promising.

MAP 5: IRELAND'S OFFSHORE WIND FARMS





JAPAN



Authored by Minako Wakabayashi (Orrick) and Gohshun Kawamura (Orrick) – refer to page 44 for contact details.

Offshore Wind Promotion Act

Japan has installed approximately 4.4 GW of wind power as of June 2020, most of which consists of onshore wind. Offshore wind projects account for approximately only 20 MW. These projects are small, near-shore and operating for the purposes of research and testing conducted by the government. That said, developers and industry investors see great potential in Japanese offshore wind, a sentiment which has been reinforced by the government's promotion of offshore wind projects pursuant to the Act for Promoting Utilization of Sea Areas in Development of Power Generation Facilities Using Maritime Renewable Energy Resources (the "Offshore Wind Promotion Act"), which came into effect on 1 April 2019.

At present, the only offshore wind projects which are being constructed in Japan are located in port areas; however, developers and industry investors see further opportunity in outer sea areas, which should arise out of the Offshore Wind Promotion Act. The new law enables projects to exclusively utilise a designated outer sea area for up to 30 years (or more if extended). Under the new law, the Japanese government will designate "promotion areas" annually, which developers will bid for through a public bidding process, and those selected will obtain permission to use the awarded promotion area to develop and operate a wind farm and benefit from a FiT or, perhaps, a FiP (see below). The Japanese government designated the first promotion area in December 2019 and a further four other promotion areas in July 2020, together with four additional "prospective areas"

(please see [Map 6](#) for an overview of Japan's offshore wind promotion areas). In respect of the first promotion area, the application window for the bidding process was closed on 24 December 2020, and the result was announced on 11th June 2021. The bids for the other four promotion areas were closed on 27 May 2021, and the result is to be announced around October or November 2021, according to the government's guidelines.

FiT of FiP?

Japan has been promoting renewable energy under its feed-in tariff ("FiT") since July 2012 (indeed, the Orrick team advised the Japanese government on the structuring of the FiT). In addition to the FiT, the Japanese government has also introduced a Feed-in-Premium ("FiP") support regime, effective as of April 2022. The plan is for both schemes to coexist, with scheme eligibility depending on the type of generation technology and its capacity. The Japanese government has not yet revealed how it intends for offshore wind projects to utilise these support schemes under the Offshore Wind Promotion Act. In respect of ongoing bidding processes for designated promotion areas, the successful developers will be granted a FiT.

Getting to Net Zero

In October 2020, the new prime minister declared that Japan will achieve carbon neutrality by 2050. To achieve this ambitious goal, the Japanese government recognises that offshore wind will need to provide a significant percentage of Japan's energy mix. As such, in December 2020 the government announced at the Public-Private Council on

Enhancement of Industrial Competitiveness for Offshore Wind Power Generation that Japan should achieve 10 GW of offshore wind generation capacity by 2030 and 30 to 45 GW by 2040.

Opportunities, Floating and Hydrogen

Since the offshore market in Japan has no established players, opportunities for new investors abound, especially considering that numerous foreign companies have recently installed onshore renewable energy projects under Japan's FiT programme. European and American companies recognise this potential; some are opening offices in Japan to focus on the offshore wind market in Japan, and Asia more broadly, and to form joint ventures with other investors (both international and local partners).

Notably, given the deep water around the Japanese coastline, Japan is expected to be a core market for floating turbines with the first project under the Offshore Wind Promotion Act featuring a plan for floating foundations. Further, given Japan's long-held aspirations for hydrogen, there is also a potential for the production of green hydrogen.

Keeping Up to Date

Since the Offshore Wind Promotion Act introduces a completely new regime, uncertainty exists about its implementation. Moreover, Japan has seen multiple amendments to the FiT system from time to time, and further amendments are expected to take place in the years ahead. Developers and investors will need to be aware of potential amendments to these laws and regulations. Orrick produces a periodic update on Japanese law and regulation relating to renewables, prepared by our expert team in Tokyo. To subscribe, please email: TokyoRenewableAlert@orrick.com.

MAP 6: JAPAN'S OFFSHORE WIND PROMOTION AREAS



THE NETHERLANDS

authored in collaboration with **LOYENS & LOEFF**



Authored by Roland de Vlam (Loyens & Loeff) and Adam Smith (Orrick), Oliver Sikora (Orrick) and Sejal Patel (Orrick) – refer to page 44 for contact details.

Introduction

In 2013, a national Energy Covenant was entered into by over 40 Dutch organisations including central, regional and local government authorities, employers and unions, energy companies, environmental organisations and financial institutions. The Energy Covenant focused on making energy supply more sustainable by boosting renewable energy sources, energy conservation and job creation and set out certain renewable energy targets to be met by 2023, including 4.5 GW offshore wind energy by 2023.

This Energy Covenant has been followed-up by the Dutch Climate Agreement of June 2019. Part of the Dutch Climate Agreement is the objective for a minimum of 70% of all energy used in the Netherlands to come from renewable sources by 2030. To further this ambition, the Dutch government published the Offshore Wind Energy Road Map 2030, which adds 7 GW between 2024 and 2030 to the 4.5 GW that had been planned under the 2013 Energy Covenant.

The Dutch government therefore has a clear and determined plan for the promotion of offshore wind projects in the coming years. This is discussed further below.

The Offshore Wind Energy Road Map 2030

The Dutch offshore wind program currently outlines six development zones (wind areas), each consisting of multiple sites. Three of these development zones were part of the 2023 Road Map (Borssele, Hollandse Kust (Zuid) and Hollandse Kust (Noord)), and tenders for the sites for these zones were held between 2017 and 2020. The resulting offshore wind projects will be completed between 2021 and 2024.

The 2030 Road Map sets out the location and timing of three additional development zones (Hollandse Kust (West), Ten Noorden van de Waddenzee and Ijmuiden Ver), with seven sites in total for offshore wind energy with a total capacity of 7 GW.

[Map 8](#) shows an overview of existing and new locations of offshore wind farm zones in the Netherlands.

Subsidy vs. Subsidy Free

The Netherlands Enterprise Agency (“NEA”) conducts the offshore wind energy subsidy and permit tenders on behalf of the Ministry of Economic Affairs and Climate Policy.

The tender process is currently split into: (i) tenders with subsidy; and (ii) tenders without subsidy with a comparative assessment. A bill to amend the Offshore Wind Energy Act is currently pending in Parliament and upon enactment there will be four alternative tender processes available:

- a subsidy procedure (similar to the existing subsidy procedure);
- a procedure for a comparative assessment (similar to the current procedure without subsidy);
- a procedure for a comparative assessment with a financial bid; or
- an auction procedure.

The two Borssele tenders were held on 2016 and 2017 with a subsidy, referred to as the Sustainable Energy Production (“SDE+”). SDE+ is a form of feed-in-premium and operates by compensating electricity generation companies for the unprofitable component of renewable energy, compared to energy from fossil fuels. The compensation is equal to the difference between the cost price of renewable energy

(e.g., the production costs), and the market price of renewable energy, and is fixed for a period of 15 years.

The two subsequent tenders for Hollandse Kust Zuid (“HKZ”) were held using comparative assessment and were the first projects in the Netherlands without subsidy. Also the 759 MW Hollandse Kust North (“HKN”) project tendered in 2020 was subsidy-free and on the basis of a comparative assessment¹.

The Tender Scheme

The key factor of the Dutch offshore wind scheme is the pivotal role for the Dutch State in the planning and zoning of wind projects. The State not only designates development zones (wind areas) but also the sites within these zones. In a site-specific Offshore Wind Site Decision, the State determines the requirements for the wind farm (capacity, rotor size, axis height, delineation, cable crossings, safety areas, etc.) and with the Decision includes all zoning and environmental permitting requirements (EIA, etc.). Therefore, the winning applicant for the license in the tender will receive a complete package and no further licence requirements exist for the project. Furthermore, under the Electricity Act 1998, the Dutch TSO, TenneT, has been designated as the offshore TSO and has been charged with the construction of the OHVS and the exit cable to shore, resulting in a significant reduction of cost for the developer and significant efficiency gains for TenneT.

¹ HKZ is owned by Vattenfall and will be developed in an area subdivided into four parcels. It is expected to be commissioned by 2023. HKN was awarded to a consortium of Shell and Eneco and is expected to be commissioned by 2024.

Tenders had to comply with the following requirements to be eligible for a wind permit: (i) the applicant's equity capital must be equal to at least 10% (for subsidy tenders) or 20% (for subsidy-free tenders), of the total planned investment of the project and if such equity capital is less than 20% for subsidy tenders, confirmation must be provided by financiers in relation to financing the remaining part of the 20%; (ii) the applicant must submit an income statement specifying planned costs associated with the project; (iii) the applicant must submit a time schedule with specified milestones, and construction must start within four years of the wind permit becoming irrevocable; (iv) there must be technical feasibility and assurance that the project will be operational on time; and (v) the permit must comply with the relevant Wind Farm Site Decision².

The Minister of Economic Affairs typically decides on applications within 13 weeks of the tender period. A 13-week extension can be given once. In relation to subsidy tenders, the winning bidder must enter into: (i) an implementation agreement within two weeks of the award; and (ii) a bank guarantee in the amount of EUR10 million, granted by a bank established within the EU, within four weeks of the award, the form of which is contained within the implementation agreement. Wind permits are currently granted for 30 years which with the enactment of the current Bill will be extended to 40 years.

Assuming that the technical and other requirements set out above are satisfied, wind permits for subsidy bids are awarded to the lowest bidder. In contrast, wind permits for bids without a subsidy are awarded to the highest ranking based on a graded assessment of the technical and other requirements set out above, and also taking into account knowledge and experience of the parties involved, quality and design of the wind project, capacity, costs to the public, risk assessment and cost-effectiveness.

SDE++ Subsidy

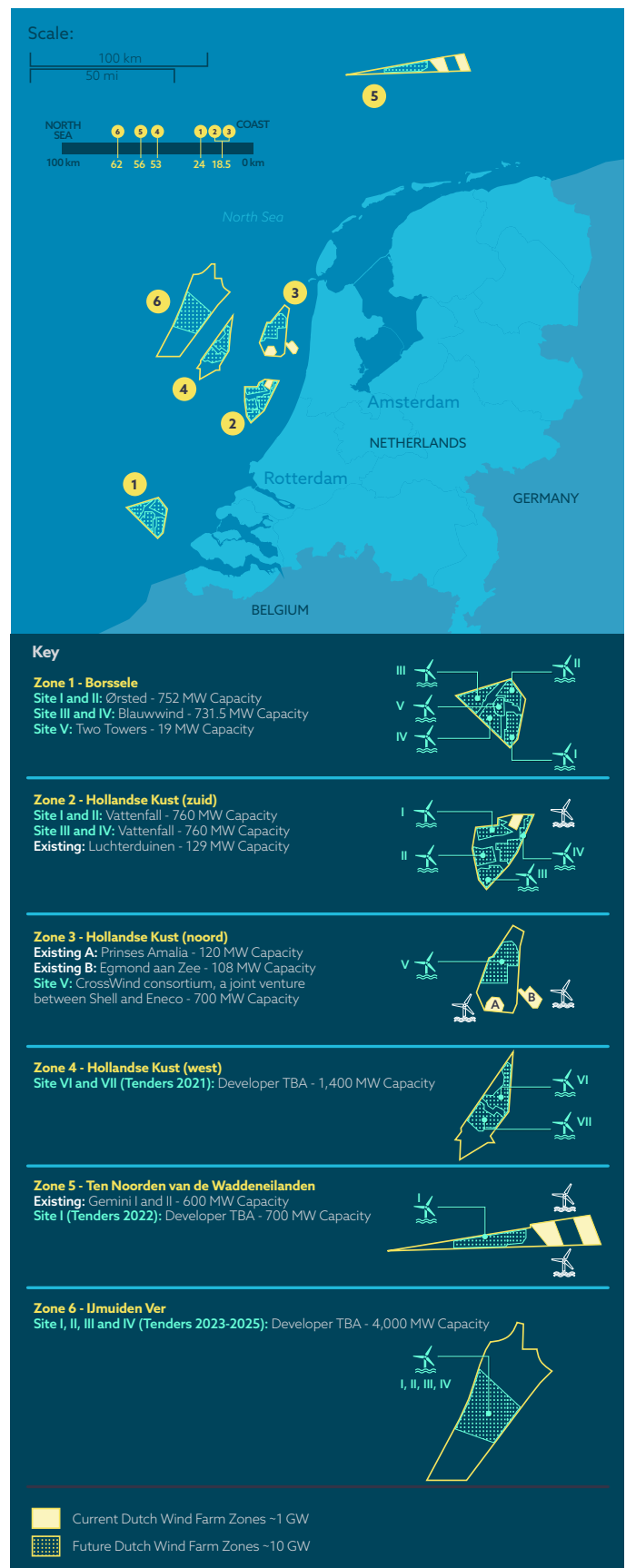
The SDE+ subsidy scheme has been extended by the Dutch government to encompass the Sustainable Energy Production and Climate Transition scheme ("SDE++"). SDE++ focuses on CO₂ reduction, meaning that projects applying for the subsidy will compete on the basis of how much CO₂ will be reduced, rather than the amount of renewable energy the project will generate. The new scheme is also broader in scope – it includes technologies that focus on reducing greenhouse gas emissions, such as carbon capture and storage, aqua thermal power and geothermal energy. SDE++ opened to applications other than offshore wind at the end of 2020, with a total budget of EUR5 billion available for 2021. If offshore wind is tendered with subsidy in the future, it is likely to be auctioned under a separate budget.

Conclusion

The Netherlands continues to focus on offshore wind as a key tool in tackling climate change. With the Offshore Wind Energy Road Map 2030 and wide availability of new development zones, as well as expansion of the subsidy scheme, there are clear opportunities in the Dutch offshore wind market.

² Pursuant to the Offshore Wind Energy Act that entered into effect on 1 July 2015, wind farms may only be developed on designated locations.

MAP 8: NETHERLANDS' OFFSHORE WIND FARM ZONES





POLAND

authored in collaboration with



Authored by Igor Muszyński (SSW Pragmatic Solutions), Dominik Strzałkowski (SSW Pragmatic Solutions) and Grzegorz Filipowicz (SSW Pragmatic Solutions), Adam Smith (Orrick) and Oliver Sikora (Orrick) – refer to page 44 for contact details.

Although Poland does not yet have any operational offshore wind farms, the country has big ambitions to move away from its dependency on coal to a renewable energy future, which, in part, will be achieved by targeting 3.8 GW of installed offshore wind generating capacity by 2030. Looking further ahead, Poland is positioning itself to be the largest producer of offshore wind energy in the Baltic Sea, with an estimated capacity of up to 28 GW of installed generation by 2050. 2021 will see the substantive start of this journey.

The Two-Phase Approach

In February 2021, the new Polish offshore wind bill became law (the “**Law**”). The Law contemplates that Poland’s offshore wind industry will be developed in two phases.

Phase 1 is targeted at those offshore wind projects whose development is most advanced and is for a total maximum capacity of 5.9 GW. Eligible projects will be able to apply until 31 March 2021 for a 25 year indexed Contract-for-Difference (“**CfD**”) from the President of the Energy Regulation Office (the “**ERO**”). The strike price of the CfD, which is set in Polish złoty per one MWh, has been determined by the Minister of Climate and Environment as PLN 319.60/MWh (equal to approximately 69 EUR/MWh). This is less than some industry participants had hoped for.

Phase 2 will allow projects to apply for a 25-year CfD from the President of the ERO, but, unlike phase 1, the strike price will be determined through a competitive auction. The first auction is scheduled to commence in 2025 for 2.5 GW of capacity, with the second round to commence in 2027 for 2.5 GW plus any excess capacity not awarded in the first round.

A Contract-for-Difference

A CfD will take the form of a two-sided support structure, similar to the UK regime, whereby: (i) if the price obtained by the project for the electricity generated by the offshore wind farm is less than the strike price under the CfD, then the project will be reimbursed for this negative balance; or (ii) if the settlement price obtained by the project for the electricity generated by the offshore wind farm is higher than the strike price under the CfD, then the project will be obliged to return this excess to the state. The maximum support which a project can receive under its CfD is capped under both phases. On 7 April 2021, the first 3 CfDs relating to Polish offshore wind farms were approved by the Energy Regulatory Office. The CfDs were awarded to the Baltica-2, Baltica-3 and the BTI-RWE projects. The Bałtyk II and Bałtyk III projects were subsequently awarded CfDs in early May followed by Baltic Power and B-Wind and C-Wind projects by Ocean Winds in June. Each of these CfDs have a maximum strike price of PLN 319.6/MWh (Approx. EUR 67/MWh). Please see [Map 7](#) for the location of these projects.

Transmission Assets

There are many aspects of the Law which developers will need to consider, and which are beyond the scope of this report, but, in particular, we note that the Law prescribes certain parameters relating to local content, equipment age and sell-downs. The Law also provides the transmission system operator with certain rights in respect of the project’s transmission assets, including an option to purchase those assets from the project. This includes that if the transmission assets are sold by the project to a third party, the transmission system operator has a pre-emptive purchase right over the third party.

The Grid

It also remains to be seen how the Polish government intends to modernise and strengthen the onshore transmission and distribution networks, including meeting the associated costs, in the north of the country (where Poland’s offshore wind farms will connect into the grid). If the grid is not strengthened in parallel with the development of Poland’s offshore wind farms, then developers may find that there are capacity limitations. Currently, the cost of such grid improvements is expected to be paid by the transmission system operator (i.e., not developers), and the Polish state wishes to obtain financial support from the *NextGenerationEU* stimulus package (the EU’s COVID-19 economic recovery fund) to help finance these costs.

Outlook

Given that there is now a strong, industry-backed, legislative framework for the development of Poland's offshore wind industry in the form of the Law, Poland's offshore wind market is set to be an exciting prospect for industry participants. Indeed, 2021 kicked off with the announcement of the formation of two notable joint ventures: (i) the Ørsted/PGE 50:50 joint venture to develop the Baltica 2 and Baltica 3 offshore wind projects; and (ii) the Northland/PKN Orlen joint venture to develop the 1.2 GW Baltic Power offshore wind project in the Baltic Sea. Please see [Map 7](#) outlining the offshore wind projects in Poland, which are currently in development and have exclusive permission to develop an offshore wind project in the illustrated area.

That said, note that the Polish government enacted in May its new maritime spatial management plan that will update the specific zones where the development of offshore wind farms is permitted. The consequence of this is that if a developer's existing permit covers (even partly) an area not included in the updated zones, that developer's existing permit will be cancelled. All the sites that are not covered by earlier issued permits and are included new maritime spatial plan as devoted to offshore wind farms will be reoffered by the government to the market via a competitive procedure. The competition will start as soon as the Polish government finalises the long awaited rules for competitive tenders.

MAP 7: PHASE 1 OFFSHORE WIND PROJECTS IN THE POLISH ZONE OF THE BALTIC SEA





SOUTH KOREA

authored in collaboration with **KIM & CHANG**



Authored by Ryan Russell (Kim & Chang), John Park (Kim & Chang) and Chang Sup Kwon (Kim & Chang), Adam Smith (Orrick) and Oliver Sikora (Orrick) – refer to page 44 for contact details.

Bold Ambitions

Although South Korea currently has only around 125 MW of installed offshore wind capacity, it has bold ambitions to become one of the world's leading offshore wind power producers, with plans for 12 GW of new capacity to be installed by 2030. This will result in a major shift away from South Korea's existing coal-fired and nuclear power generation. The new capacity is expected to be predominantly located within the South Jeolla Province (as part of the greater Sinan Offshore Wind complex), with additional major new builds planned for the North Jeolla Province (in the greater Jeonbuk Southwest Offshore Wind complex), off South Korea's southeast shores (the greater Southeast Floating Offshore Wind complex), near Jeju Island (the greater Jeju Offshore Wind complex), near Incheon (the greater Incheon Offshore Wind complex) and near Ulsan City (the greater Ulsan Floating Offshore Wind complex) (see [Map 9](#)), with developers eyeing potential synergies from the use of existing infrastructure at the nearby Donghae gas field as a means of reducing capital expenditures in the latter area.

While established fixed-bottom technologies will likely feature in initial projects, as expected from Ørsted's proposed development of an up to 1.6 GW offshore wind project in the shallow waters off the coast of Incheon City, given the deep and mountainous nature of much of South Korea's seafloors, the expectation is that floating offshore wind projects will eventually become the dominant technology. Indeed, in September 2020, Total and Macquarie's Green Investment Group announced a joint venture to develop a >2 GW portfolio of five floating offshore wind projects located off the coasts of the Jeolla Provinces and Ulsan City.

South Korea's offshore wind ambitions have their roots in 2017, when President Moon Jae-in's election campaign included a promise to place a moratorium on new coal-fired and nuclear power plants, with a switch to renewable energy sources. This commitment to decarbonisation was affirmed in July 2020 when the South Korean government announced its "Green New Deal," which promises over US\$7 billion of government investment in wind, solar, hydrogen and other renewables sectors by 2025 and aims to set South Korea on a path to net-zero by 2050.

The first step on this journey is evidenced recently through the South Korean government's announcement in February to support, with the assistance of a number of private power generation companies, what could be the world's largest offshore wind complex – the 8.2 GW greater Sinan Offshore Wind Complex to be developed over three phases and located off the coast of Sinan County in South Jeolla Province, which is equivalent to the power output of six contemporary nuclear reactors.

That said, some obstacles may temper these ambitions from being achieved in full as scheduled. These obstacles, however, are not unsurmountable.

Potential Challenges

Currently, South Korea has a complicated permitting process for the development of offshore wind projects, with multiple permits to be obtained from various government departments at both a national and local level, which are not always perfectly aligned. This could delay the development of offshore wind projects in South Korea. The government recognises that this is an issue

that needs to be resolved to promote greater interest and investment in the country's offshore wind industry and is planning legislative and regulatory changes to create a more transparent and streamlined permitting and development process.

In addition, as one would expect given its 2,413km coastline, South Korea's fishing industry is a major employer and generator of GDP (especially in regions where major offshore wind power developments are being considered). As such, the development of offshore wind projects in South Korea's coastal areas pose the possibility of tension with the fishing industry. As has been seen in other developing offshore wind markets where this is also a concern, such as Taiwan, developers will be expected to provide a level of compensation to relevant parties, such as fisherman, for losses suffered as a result of the development of an offshore wind project. Such compensation arrangements often involve lengthy and protracted negotiations, which any financiers will ideally want to see addressed before a project reaches financial close. As such, developers are encouraged to start engagement with the relevant parties at an early stage of a project's development.

Developers of offshore wind projects in South Korea also face the prospect of having competing interests with national security organisations, given that the majority of South Korea's naval bases are situated in the provinces identified for offshore wind project development. Such competing interests are not impossible to overcome and are seen in other key offshore wind jurisdictions, including the UK, with any such issues being addressed contractually (for example, via radar mitigation agreements). In our experience, early diligence on this issue, and confirmation that an agreement can be reached with the relevant authority, is essential to avoid later problems with permitting.

Renewable Energy Certificates

Currently, power generators must generally sell any power which they produce on the single cost-pool wholesale power market, the Korea Power Exchange (the "KPX"), at a spot rate and only the majority state-owned Korea Electric Power Corporation ("KEPCO") may purchase electricity from the KPX for resale to domestic electricity consumers. The inherent price uncertainty of the KPX spot rate will not support project financing on the scale required to fully develop large-scale offshore wind projects. However, this is mitigated through the issuance of renewable energy certificates ("RECs") which may be bought and sold through long-term fixed-price contracts for terms of up to 20 years.

An offshore wind power generator is awarded RECs based on the power it produces multiplied by a weighted value set by the South Korean government. These RECs have economic value (for the reasons explained below) and provide an additional revenue stream which, through long-term fixed-price contracts, can be projected with long-term certainty to support project financing.

Currently, six KEPCO wholly owned power generation subsidiaries and 16 other large generation companies must ensure that 9% (and as of 2022, 10%)⁴ or more of the electricity they supply is derived from new and renewable energy resources. If they fail to meet this requirement through self-generated sources, then they must either: (i) purchase RECs on the KPX-managed REC spot market; or (ii) enter into contractual arrangements to purchase RECs. Naturally, for offshore wind projects seeking debt finance, the preferred option is entering into a long-term contractual arrangement that mitigates revenue uncertainty.

⁴ New legislation passed March 24, 2021, raised the statutory ceiling on this requirement from 10% to 25%, signalling that this obligation may continue to gradually increase.

Domestic developers and sources of funding seem fairly comfortable with this long-term fixed-price contractual scheme. Some non-South Korean market newcomers, however, have expressed concern that this process may be too unfamiliar, complex or uncertain.

Another complicating factor of the REC regime is that the actual number of RECs that a project will receive will not be known with certainty until the project is commissioned. This uncertainty makes it difficult for developers to prepare financial models and banking cases demonstrating with certainty that the project will have sufficient RECs to generate enough net revenue to service and repay debt and provide an adequate return on investment for its shareholders. The South Korean government acknowledges that this is a complicating factor and has signalled that it will introduce a process that will notify offshore wind project developers of projected REC allotments well in advance of commissioning.

For the reasons stated above, some participants have suggested that a switch to a feed-in-tariff/premium model would be more attractive to developers, although this would involve a large shift in government policy and doesn't currently look likely.

Power Purchase Agreements

Although long-term fixed-price contracts have historically been the only available means to achieve revenue certainty, recently passed legislation will soon enable renewable power developers to enter into power purchase agreements ("PPAs") directly with electricity consumers.

On March 24, 2021, Korea's National Assembly passed an amendment to the Electric Utility Act signalling the end of KEPCO's monopoly on the resale of electricity by allowing large-scale renewable power producers to enter into PPAs with off-takers rather than selling generated power on the KPX. Official promulgation of this new law is expected soon. The change will be effective following a six-month promulgation period, meaning that South Korea's first large-scale corporate PPAs for renewable electricity may be executed as early as Q3 2021.

Although power sold under a direct PPA will not be eligible for issuance of RECs, the same agency that issues RECs (the Korea Energy Agency) plans to issue "renewable energy use certificates" with respect to such power. These use certificates will include the information currently included in RECs to enable easy tracking of the corresponding environmental attributes and to prevent double-counting for purposes of compliance with corporate sustainability goals such as the RE100 initiative.

Strong Local Contractors

One of the main attractions to South Korea for developers is the country's strong local supply chain, forged from its respected history in manufacturing, construction and shipbuilding. Indeed, the strong industrial capabilities of South Korea's contractors, such as Samkang, Hyundai, CS Wind, LS Cable and others, are already seen on offshore wind projects in the region, such as in Taiwan and Vietnam, which boosts the confidence of developers that a strong local supply chain could be easily established in South Korea. Domestic turbine suppliers, such as Doosan Heavy Industries and Unison, are also hoping to grow with the domestic offshore wind market, although substantial R&D is needed to upscale domestic turbines to the capacity and size manufactured by European players.

Crucially, use of the strong local supply chain would help foreign developers show the South Korean government that they are promoting local industry and supporting the creation of jobs, which is a key area of focus for the government. Although the government is not expected to impose formal localisation requirements as seen in Taiwan, drawing on a strong local supply chain may be critical to foreign developers as local government and government-backed enterprises play an increasing role in directly developing large-scale offshore wind projects.

Expected Market Developments

2021 is expected to see a partial liberalisation of the Korean power market, including as follows:

- i. permitting (x) direct PPAs to be entered into between renewable energy generators and electricity consumers and (y) indirect PPAs to be entered into between renewable energy generators and KEPCO, with KEPCO then entering into a back-to-back PPA with an electricity consumer to sleeve the renewable power supplied from the renewable energy generator. This is a major advancement in the South Korean power market, which, as noted above, has historically seen a monopolistic structure with all generated power being aggregated and sold through the KPX;
- ii. allowing renewable-sourced power to be certified as such and enabling end users to participate in “green pricing,” i.e., purchasing only green electricity in consideration of their payment of a “green premium” in addition to standard electric rates;
- iii. permitting the purchase and trading of RECs by RE100 companies through (x) a separate online REC trading platform designed for RE100 companies and (y) direct trading between renewable power generators and RE100 companies; and
- iv. the introduction of renewable energy use certificates that will enable consumers who self-generate or purchase renewable power (or corresponding RECs) to obtain credit for such usage.

These liberalisations, especially alternative offtake arrangements which could mitigate foreign consternation surrounding the REC issues noted above, will be welcome news for developers. Other expected regulatory changes, including the introduction of a one-stop-shop for offshore wind permitting and official guidance on appropriate levels of compensation for fishermen and other local stakeholders, should further stoke investor interest. More generally, these developments show that the winds of change are blowing in the right direction for South Korea to meet its ambition to become one of the world’s leading participants in the global offshore wind power sector.

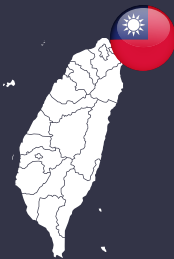
MAP 9: SOUTH KOREA'S OFFSHORE WIND PROJECTS





TAIWAN

authored in collaboration with



Authored by Robin Chang (Lee & Li), Odin Hsu (Lee & Li) and Julia K.F. Yung (Lee & Li), Evan Stergoulis (Orrick), Adam Smith (Orrick) and Oliver Sikora (Orrick) – refer to page 44 for contact details.

Taiwan: Asia's Offshore Wind Leader

Taiwan continues to lead the Asia Pacific region in offshore wind. This has its roots in the Taiwan government's "Thousand Wind Turbines Project" to generate 5.7 GW of electricity from offshore wind by 2025 (equal to approximately 20% of Taiwan's total electricity generation) and 15.5 GW by 2035. To date, eleven (11) offshore wind projects have been awarded grid capacity. One of them is in operation, being Formosa I, and the others are at some stage of development or construction. Each project site is located on the west coast of Taiwan, in the Taiwan Strait, as shown in [Map 10](#).

The Process to Date

To date, the Taiwanese government has split the development of its offshore wind sector into three phases, comprising:

1. **Round 1 (Demonstration)**, where three projects were awarded an aggregate capacity of approximately 360 MW;
2. **Round 2 (Transition)**, which saw 5.5 GW of capacity awarded across various projects; and
3. **Round 3 (Zonal Development)**, which is expected to release 15 GW of capacity between 2026-2035.

The Demonstration Round and the Transition Round resulted in more than 5 GW of capacity being awarded to developers. Now, all eyes are on the next phase of Taiwan's offshore wind story – Round 3 (Zonal Development).

Round 2 (Transition)

All Round 1 and 2 projects benefit from the right to a 20-year feed-in-tariff ("FiT") to be paid by Taipower ("TPC"), the state-owned grid operator and power producer (although, note that a project may opt to switch between the FiT and a corporate power purchase agreement, as provided for under the relevant laws and regulations and seen on Ørsted's Greater Changhua 2b and 4 projects – see [Corporate PPAs](#) below for more information). Once grid capacity and corresponding development rights are awarded through the allocation round, a FiT is secured.

Two separate allocation rounds were held for Round 2. In the first allocation round, developers were awarded grid capacity through an administrative selection process run by the Taiwanese government (the "Selection Process"). Under this process, a project had to satisfy a number of prescribed criteria based on a range of technical and financial metrics, as provided for in the Guidelines for Grid Allocation published by the Bureau of Energy on 18 January 2018. Applicants would then be ranked by score (out of 100, and determined on the basis of construction capability, engineering design capability, operations and maintenance capacity and financial capability), with the highest scoring applicants awarded the grid capacity, development rights and FiT until the allocated capacity for that allocation round had been fulfilled. The FiT for this allocation round was set by the government.

Projects that were successful in obtaining grid capacity and a FiT in the Selection Process are subject to local content requirements – as to which, see [Localisation](#) below.

Applicants which were unsuccessful in obtaining development rights and a FiT, but which still scored above 60/100 points in the Selection Process, were invited to participate in a competitive auction process for the remaining grid capacity, with the lowest bidders awarded a FiT based on the developer's auction bid price (rather than as set by the government). Notably, projects that were awarded a FiT in this auction process are not subject to any local content requirements – please see [Localisation](#) below for more information on the relevance of this.

Round 3 (Zonal Development)

In Round 3, it is expected that a form of the Selection Process will continue as seen in Round 2, with projects having to meet a minimum required threshold of points to be successful for being considered. However, unlike Round 2, it is expected that FiTs will be set pursuant to a competitive auction process only, such that the FiT will be determined by the developers, rather than the Taiwanese government. Pursuant to such process, subject to the points threshold being met, it is expected that the final determining factor for qualifying projects will be the FiT rate proposed by the developer in the auction (as seen in the second allocation of Round 2). In connection with this, it has been suggested that a potential price cap may be applied to FiT bids. However, the rules for Round 3 have not yet been formally announced by the Taiwanese government. They were due to be announced in 2020, with the first allocation round of Round 3 to be held in 2021, but this was delayed.

The Taiwanese government has now informed participants that the new allocation rules will be published as soon as possible in 2021, with the first allocation pursuant to the new rules expected in 2022. The delay is believed to be the result of consultation between developers and the Taiwanese government, with the government wishing to take further time to refine the new rules after developers expressed concern that the rules (as consulted on in draft form) would impede investment into the offshore wind sector – as to which, see [Localisation](#) below.

Subject to the details set out in the new rules, the next allocation round is expected to be heavily oversubscribed (as per the previous rounds) with the developers to compete for 1.5 GW of capacity for each year between 2026–2035 (inclusive).

In Round 3, developers are expected to be allowed to choose to submit applications to develop either 1 of the 36 government designated zones of opportunity, which remain undeveloped or a self-identified developer proposed zone, as was the case for certain projects which were successful in Round 2⁵. In choosing their sites and projects, developers should note that Round 3 is expected to limit project size to a maximum of 0.5 GW per project and 2 GW per developer, which, if this materialises into the rules, would suggest at least 30 projects being awarded capacity between 2026–2035.

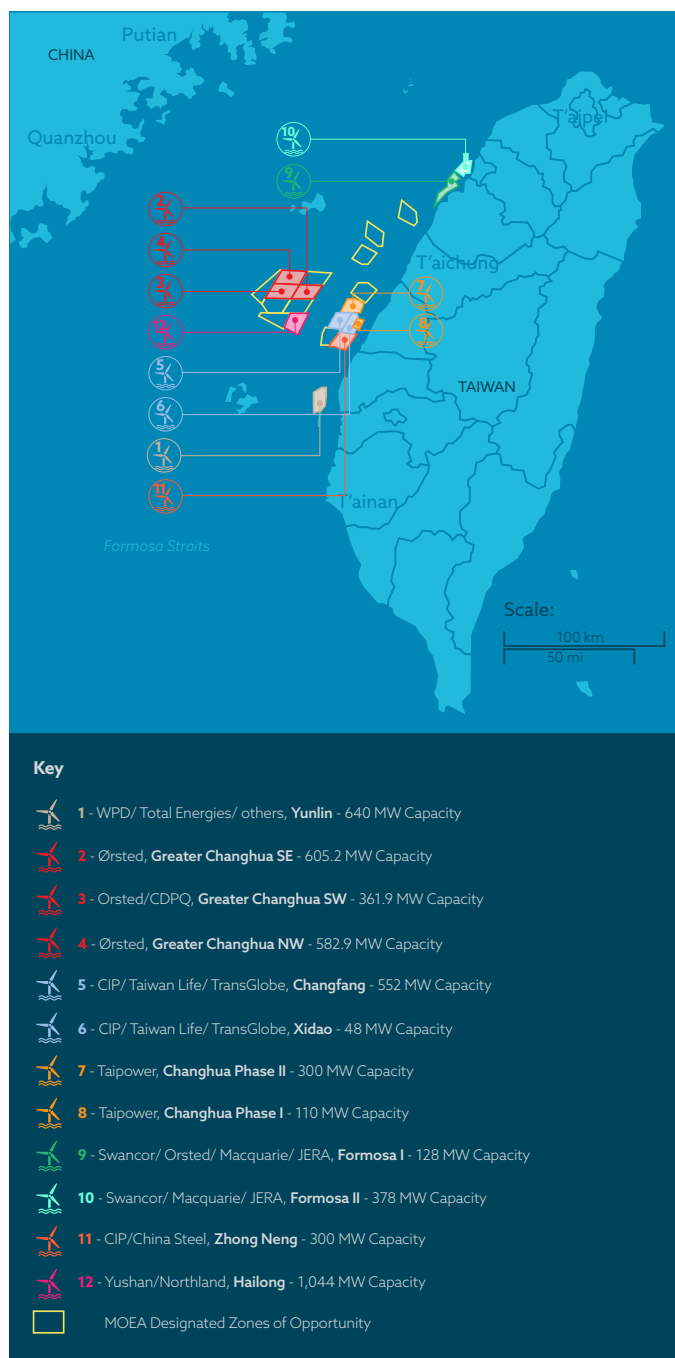
Localisation

As part of the Taiwanese government's push to develop the local supply chain, if a developer has been awarded a government-determined FiT, then that developer's offshore wind project will be subject to certain localisation requirements set by the Ministry of Economic Affairs (the "MOEA"). The MOEA prescribed in its "Framework of Offshore Wind Power Industry Relevant Implementation Programme" (published in January 2018) a detailed list of components used in the construction or operation of an offshore wind project that a developer is required to source within Taiwan. The exact parameters of a project's localisation requirements are dependent on what year it connects to the grid. In general, there has been a trend of ever-increasing localisation for offshore wind projects in Taiwan, with the list of components which are to be localised increasing in each allocation round.

The localisation requirements have caused some concern among developers. While developers are sympathetic to the government's desire to ensure the maximum economic and social return to Taiwan from subsidising the offshore wind industry (through the FiT), those developers are equally concerned that the drive to localise will have the effect of impeding development. There are various reasons for this, but, in short, developers are concerned that projects will be forced to use domestic suppliers who have not yet built up the capacity to deliver the relevant components on time and to the required specification and cost, leading to delay and added costs (and thereby reducing returns for developers). It remains to be seen whether the government will take these concerns into account

⁵ Yunlin Offshore Wind Project is located in an area which was identified by its developer, rather than through the government's designated zones of opportunity.

MAP 10: TAIWAN'S CONSENTED OFFSHORE WIND FARMS



when finalising the new allocation rules. In a bid to try to facilitate discussions between the Taiwanese government and developers (to discuss matters such as localisation), the Taiwan Offshore Wind Industry Association has been launched. The aim of this association is to create a forum for dialogue with the government on the development process for offshore wind projects in Taiwan.

Corporate PPAs

Given the competitive nature expected of future allocation rounds, it is anticipated that the FiT will be driven lower over time. For this reason, developers are known to be considering the possibility of a corporate power purchase agreement (“cPPA”) as an alternative to the FiT. This was seen in July 2020 when a cPPA was entered into for the entire output of Ørsted’s Greater Changhua 2b & 4 offshore wind farms. It was reported to be the world’s largest cPPA to date.

Note that, even if a project secures a cPPA, it must still be successful in the government allocation process/Selection Process in order to secure a right to develop an offshore wind farm. This means that projects with a cPPA will still have the right to the FiT awarded pursuant to the auction-based allocation process. This then poses the possibility of a project effectively using the FiT as a hedge against a failed cPPA, by switching from a cPPA to the FiT. This is provided for under the relevant laws and regulations.

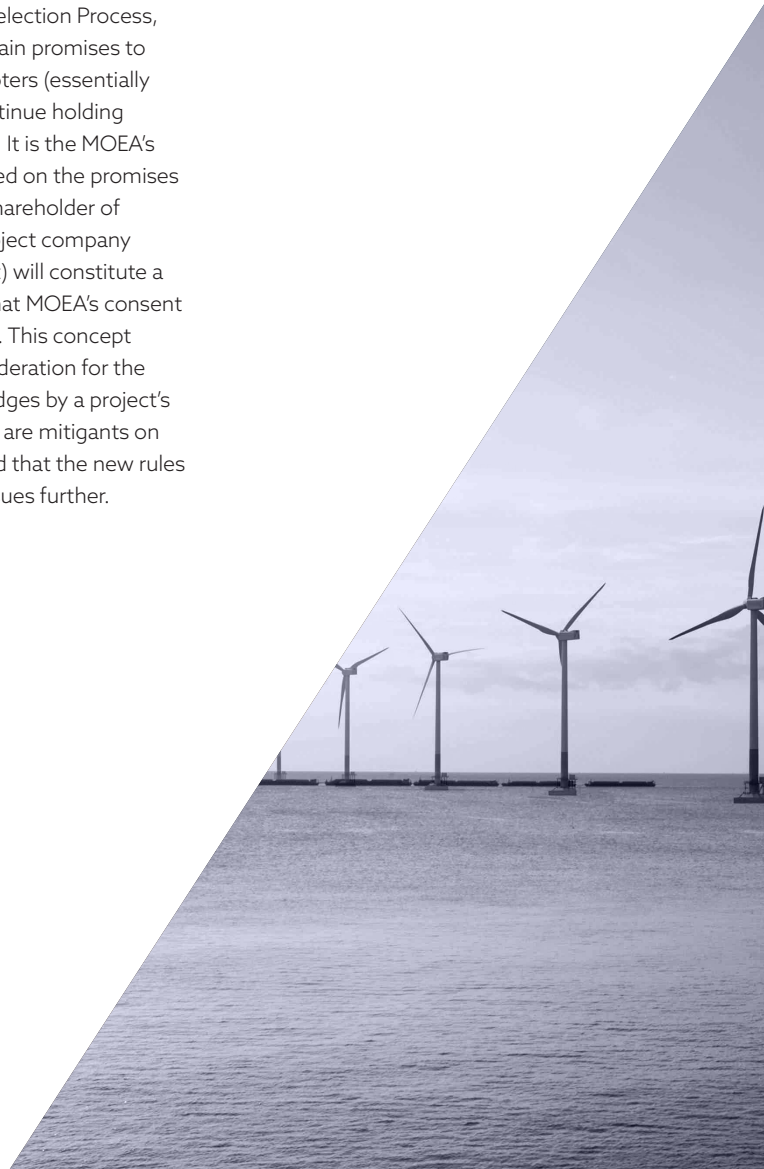
Sell-Downs

As in Europe, there has been notable M&A activity in the Taiwanese offshore wind market. For example, in December 2020, Ørsted agreed to sell a 50% stake in the 605 MW Greater Changhua 1 Offshore Wind Project to a consortium comprising of Caisse de dépôt et placement du Québec (CDPQ) and Cathay Private Equity. In addition, in April 2021, Total Energies agreed to acquire a 23% stake in the 708 MW Yunlin Offshore Wind Project from WpD. It is expected that this M&A activity will continue as more projects reach financial close or get closer to commissioning, with other sell-down processes being reported in the industry press.

Prior to any foreign investors acquiring a stake in an existing offshore wind project, such investor must first obtain foreign investment approval from the MOEA. This is generally a formality, unless the investor is from mainland China. In addition, sell-downs by existing sponsors typically require the consent of the MOEA. This is because, in the previous Round 2 Selection Process, the developers made certain promises to the MOEA that the promoters (essentially the shareholders) will continue holding their shares in the project. It is the MOEA’s current position that, based on the promises made, any transfer by a shareholder of its shareholding in the project company (whether direct or indirect) will constitute a “material change,” such that MOEA’s consent to that change is required. This concept is also an important consideration for the enforcement of share pledges by a project’s financiers (although there are mitigants on this point). We understand that the new rules will aim to clarify these issues further.

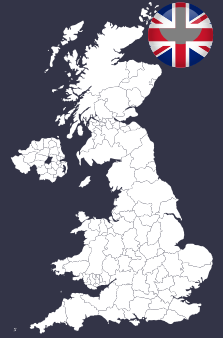
Conclusion

It is clear that Taiwan’s offshore wind industry is burgeoning and has a strong pipeline of projects to facilitate Taiwan meeting its renewable energy targets. Details of the new allocation rules are eagerly awaited and will provide the foundations for the next stage of rapid growth.





UNITED KINGDOM



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2020 saw continued high levels of activity. This is expected to continue through 2021 and beyond, with the UK intending to cement its position as a global offshore wind hub by delivering an installed capacity of 30 GW during this decade, taking the UK's total installed capacity to 40 GW by 2030. At least 1 GW of the new target is to come from floating offshore wind. These ambitions are being put into practice, as we shall explore.

Crown Estate Leasing Round 4 (applies to England, Northern Ireland and Wales)

The results of the Crown Estate's Leasing Round 4 ("**Leasing Round 4**"), which commenced in 2020, were announced in February this year. The successful applicants will be entitled to a 10-year agreement for lease with the Crown Estate (for the development phase), which can, at the option of the developer, be replaced with a 60-year lease (for the construction and operations phase). This therefore assumes a repowering at around year 30. Unlike previous rounds, bidders were required to pay an upfront deposit (equal to its estimated annual option fee) in order to take part in the auction.

Six proposed new offshore wind projects succeeded in the auction, representing just under 8 GW of potential capacity. Of particular note is that more than 50% of the aggregate capacity was awarded to bids from oil and gas ("**O&G**") majors or consortia that involved an O&G major; see [Map 11](#). This

reflects a trend of O&G majors seeking to diversify and adapt their business models by investing in renewables, including offshore wind.

This success, however, comes at a price. The winning bidders were those who offered to pay the highest option fee (an annual fee to be paid by the developer, payable from the entry into of an agreement to lease (expected to take place in 2022) and until a developer receives its final planning permission to build the new offshore wind project, up to a maximum of ten years), calculated by multiplying the bid price in (£/MW) by the proposed capacity of the offshore wind project, with the successful bids ranging from £82,552 - £154,000 (£/MW). The total fees payable by all of the developers (in respect of all of the projects) equate to £879,000,000 per year. This has raised concerns in some quarters that the magnitude of these figures will discourage smaller developers from participating in future rounds (thereby reducing competition in the sector) and increase the cost of electricity to consumers (on the basis that end users will ultimately bear the cost).

Once a project is ready to commence construction, a developer can exercise its option and enter into a 60-year lease with The Crown Estate. From this point, instead of paying the annual option fee, the developer pays an annual rent of: (i) during construction, approx. £0.90 per MWh of minimum expected production; and (ii) during operation, 2% of gross revenue.

Floating Offshore Wind Leasing Round (Celtic Sea)

Separate to Leasing Round 4, the Crown Estate recently announced that it is establishing a leasing round solely for early commercial-scale floating offshore wind projects up to 300 MW in size to be located in a yet-to-be-defined area of the Celtic Sea. The announcement is consistent with the UK government's ambition for 1 GW of commissioned floating offshore wind by 2030 and is in addition to the award in August 2020 of seabed rights to the 96 MW Erebus floating wind project, which is under development in the Celtic Sea by Total Energies and Simply Blue Energy. This signals the Crown Estate's acknowledgement that floating offshore wind merits a separate application process in order to prevent relatively more expensive floating offshore wind projects being squeezed out of the fixed-bottom leasing rounds, which, as seen in Leasing Round 4, can attract extremely competitive bids.

Extension Projects

In addition to Leasing Round 4, following its announcement in 2017 to allow existing offshore wind projects to apply for project extensions, the Crown Estate announced in September 2020 that certain existing projects would be permitted to extend (the “**Extension Projects**”).

These projects are shown in Table 1.

TABLE 1: EXTENSION PROJECTS

Original Project	Extension Name	Extension Capacity	Developer(s)
Sheringham Shoal	—	Up to 317 MW	Equinor ⁶
Dudgeon	—	Up to 402 MW	Equinor ⁷
Greater Gabbard	North Falls	Up to 504 MW	RWE SSE Renewables
Galloper	Five Estuaries	Up to 353 MW	Macquarie RWE Siemens Fin. Serv. ESB Sumitomo
Rampion	Rampion 2	Up to 1,200 MW	RWE Enbridge Macquarie
Gwynt y Mor	Awel y Mor	Up to 576 MW	RWE Stadtwerke München Siemens Fin. Serv.

ScotWind Leasing Round (applies to Scotland)

2021 has seen Crown Estate Scotland tender lease option rights for up to 10 GW of offshore wind capacity across 15 ‘Plan Option Areas’; refer to [Map 12](#). Each Plan Option Area has a development potential of 1-3 GW, and each proposed offshore wind project must have a minimum capacity of at least 100 MW. The deadline for applications has now closed, with Crown Estate Scotland confirming that 74 applications have been made by developers looking to build projects across the 15 Plan Option Areas. Crown Estate Scotland has confirmed that it expects to make initial offers for the first option agreements in January 2022, with successful applicants entitled to enter into a 10-year lease option agreement with Crown Estate Scotland (for the development stage) and, at the developer’s option, a subsequent 60-year lease (for construction and operations). The high option fee bids arising from Leasing Round 4 (as discussed above) led Crown Estate Scotland to review its option fee structure, with the maximum option fee which developers may submit rising tenfold from £10,000 per km² of seabed to £100,000 per km² of seabed. This increase aligns

⁶. The other Sponsors (Macquarie GIG, Equitix and TRIG) to the original project have reserved the right to enter the extension during the construction stage.

⁷. To be developed in parallel with Sheringham Shoal, given the proximity of the two projects.

MAP 11: CROWN ESTATE LEASING RD. 4 PREFERRED PROJECTS



Crown Estate Scotland’s potential revenue streams with those seen in Leasing Round 4 (although note that, unlike in Leasing Round 4, there is a cap on the maximum fee and it is based on development area and not output).

In addition to the option fee, developers must provide a Supply Chain Development Statement affirming their commitment to developing a strong local supply chain for the offshore wind industry in Scotland. The statement must outline a project’s anticipated supply chain, including detailed information in relation to the components which the developer anticipates to source locally, with Crown Estate Scotland giving preference to those projects which have made strong commitments to source their supply locally. The minimum local commitment required is 25% (increased from 10% following March 2021) of the total supply, which a developer must satisfy before they can apply for a lease. Any local supply chain commitments made by developers will then be formally incorporated into its lease agreement and compliance assessed during the lifecycle of the project.

A number of the 15 Plan Option Areas have water depths in excess of 60m, which would be more appropriate for floating offshore wind projects. It is therefore possible that the 2021 ScotWind Leasing Round will lead to the development of some of the first commercial-scale floating wind projects in the world, as recently indicated by the proposed 200 MW Salamander floating wind project to be developed between Simply Blue Energy and Subsea 7. These projects will complement the Crown Estate's floating offshore wind projects that are anticipated in the Celtic Sea (see above).

CfD Allocation Round 4 (applies to the whole UK)⁸

Developers of offshore wind farms in the UK can apply for revenue support through a 15-year indexed contract-for-difference ("CfD"). CfDs are awarded (in respect of various technologies; not just offshore wind) pursuant to a competitive reverse auction process, with the next round due in late 2021 ("Allocation Round 4"). Developers must submit their CfD auction bids per megawatt hour to National Grid ESO, with the lowest bids being successful. Successful bidders are awarded a CfD with a strike price which is equal to its auction bid. This effectively sets a guaranteed price that the project will receive for the electricity generated by the project. Once operational, if the project earns revenue in excess of the strike price, then the project must return the difference between the strike price and the revenue earned to the CfD provider, whereas if the wind farm earns revenue below the strike price, then the CfD provider must pay the project the difference between the price earned and the strike price.

Following an extensive consultation process, the UK government has confirmed that there will be a number of amendments to Allocation Round 4, including a specific pot of the CfD budget assigned to offshore wind farms only, reflecting the maturation of this industry compared to other less-established renewable technologies (the concern being that if offshore wind shared a pot with other technologies, the bidders in respect of other technologies would struggle to compete). The government has not yet determined the capacity caps between these pots. See Table 2.

TABLE 2: ALLOCATION ROUND 4 CfD POTS

Pot	Scope
1 – Established Technologies	Onshore wind (>5MW), Solar Photovoltaic (PV) (>5MW), Energy from Waste with CHP, Hydro (>5MW and <50MW), Landfill Gas and Sewage Gas.
2 – Less Established Technologies	ACT, AD (>5MW), dedicated biomass with CHP, floating offshore wind, geothermal, remote island wind (>5MW), tidal stream and wave.
3 – Offshore Wind	Offshore wind.

⁸ This means that projects that are successful in Crown Estate Leasing Round 4 or ScotWind may apply to CfD Allocation Round 4, as a UK-wide scheme.

⁹ See s.10F, Electricity Act (1989).

MAP 12: SCOTWIND PLAN OPTION AREAS



Extension Projects will also be permitted to bid for a CfD in Allocation Round 4.

Auction bids for offshore wind have shown a dramatic reduction over the course of the three allocation rounds held so far. Allocation Round 3 in 2019 delivered a CfD price of £39/MWh, and there is an expectation that the price will go lower in Allocation Round 4 in 2021.

OFTO Tender Round 7 and 8

Pursuant to the unbundling regime,⁹ an entity cannot be both a generator and a transmitter of power from an offshore wind farm. Governments of offshore wind states have adopted different models for how to deal with the transmission assets relating to offshore wind farms, and in the UK the preferred model is the "build and dispose" model, whereby the developer is responsible for the construction of both the transmission and generation assets and is then required to divest of the transmission assets within 18 months of first power. Ofgem (the regulator) runs a competitive tender process to select and license entities to acquire and operate these transmission assets. Such entities are known as "offshore transmission operators" (or simply "OFTOs").

2021 will see the continuation of consultation on Ofgem's Tender Round 7 ("TR7"), which is the next competitive tender to select and licence OFTOs. TR7 relates to two UK offshore wind farms, Triton Knoll and Moray East, which are due to be commissioned in March 2022 and April 2022, respectively. The TR7 process is now underway and the TR7 Enhanced Pre-Qualification Stage Shortlist Notice has been published. Tender round 8 is also expected to launch at the end of July 2021.

The practical implications of the consultation remain to be seen, but current discussion envisages a shorter tender process. For further information, please see the following article prepared by the Orrick team: [Ofgem Launches Consultation on Developments to Tender Process Under Current OFTO Regime](#).

Alongside consultation on the tender process itself, Ofgem has consulted on the end of tender revenue stream and the possibility of extending the regulatory revenue period and how any such process should be operated, and an outcome is expected shortly.

M&A Activity

2020 saw a hotbed of M&A activity in the offshore wind sector, which is already continuing into 2021 and likely beyond. Two key drivers of this are:

1. A predictable and secure revenue stream. Offshore wind projects, particularly those with subsidy support or otherwise creditworthy offtakers, provide predictable and secure revenue streams that institutional investors seek. This was highlighted in 2020 when comparing to other classes of infrastructure (such as airports) that are more susceptible to sudden economic shocks.

2. Encroachment of O&G majors. O&G majors have set themselves ambitious targets to hold significant portfolios of renewable assets, the consequence of which is that those majors have either started developing renewable assets themselves, as seen in Leasing Round 4, and/or have undertaken strategic acquisitions of assets around the world, including in the UK offshore wind sector. This is evidenced by Eni's acquisition of a 20% stake in Dogger Bank Wind Farm (expected to be the world's largest once complete) in December and Total's acquisition of a 51% stake in the Seagreen project last June, which marked the French major's first significant move into offshore wind.

So far, we have seen no sign of these trends changing during 2021. Indeed, in March we advised: (i) Copenhagen Infrastructure Partners on the sale of its 25% interest in the Beatrice offshore wind farm to Equitix and The Renewables Infrastructure Group; and (ii) a joint venture between Ørsted (50%) and Global Infrastructure Partners (50%) on the sale of the transmission assets of the Hornsea offshore wind farm to Diamond Transmission Partners Hornsea One Limited – the largest OFTO transaction to date. More information of these deals can be found on our offshore wind website: <https://www.orrick.com/en/Practices/Offshore-Wind>



UNITED STATES OF AMERICA



Authored by Sue Cowell (Orrick), Paul Zarnowiecki (Orrick), Cory Lankford (Orrick), Scott Cockerham (Orrick) and Wolf Pohl (Orrick) – refer to page 45 for contact details.

The U.S. offshore wind sector has been making rapid progress in 2020 and 2021 towards the construction of a number of large offshore wind projects and the continued development of numerous additional projects, as well as moving quickly to become a viable and important new contributor to U.S. energy renewable energy market. The Biden Administration provided a tremendous boost to the U.S. offshore wind industry when the administration announced on 29 March, 2021 a series of actions in support of offshore wind including deploying 30 GW of offshore wind projects by 2030, designating wind energy areas off of the coast of New York for projected lease sales at the end of 2021 or early 2022¹⁰ and announcing target auctions in mid-2022 for two areas off of the coast of California. The U.S. Bureau of Ocean Energy Management (BOEM) is also assessing the viability of offshore wind in the Gulf of Mexico and is anticipated to conduct an auction for areas off of the coast of New York in late 2021.

A number of funding opportunities were also made available. For example, the U.S. Department of Transportation's Maritime Administration encourages states and port authorities to apply for U.S.\$230 million in discretionary grant funding for port and intermodal infrastructure-related projects

through the Port Infrastructure Development Program.¹¹ Separately, the offshore wind sector may benefit from a variety of funding opportunities, including the U.S. Department of Energy (DOE) Loan Program Office (LPO) and its capacity to provide up to U.S.\$3 billion in loan guarantees for market-ready renewable energy and efficient energy technologies through its Title 17 Innovative Energy Loan Guarantee Program.¹²

These developments are examples of the U.S. offshore wind energy sector quickly evolving to a viable and important market sector. The 30 megawatt (MW) Block Island wind project off the coast of Rhode Island has completed its fourth full year of operation. Vineyard Wind, the first large-scale offshore wind project off the coast of Massachusetts, is in an advanced stage of project development and the small demonstration project owned by Dominion Energy in Virginia is operating. Numerous power purchase agreements (PPAs) and offshore wind renewable energy credit (OREC) contracts have been awarded with coastal states from Maine to California in various stages of offshore wind programme planning. Things are now moving extremely quickly and energy investors from North America, Europe and Asia are lining up to get involved.

¹⁰. See White House Fact Sheet: Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs dated March 29, 2021 (available at <https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/>).

¹¹. See <https://maritime.dot.gov/newsroom/press-releases/us-department-transportation-announces-funding-availability-port-0>.

¹². See https://www.energy.gov/sites/default/files/2021-03/DOE-LPO_Program%20Handout_T17-REEE-Offshore%20Wind_2021-03-26.pdf. Benefits of the LPO Loan Guarantee Program include access to debt capital that private lenders cannot or will not provide, customisable financing to meet the specific needs of individual borrowers, and technical support from the LPO team for the duration of the financing lifecycle. To be eligible for the program, projects must satisfy the following requirements: innovative technology, greenhouse gas benefits, located in the U.S. and reasonable prospect of repayment. The LPO is particularly interested in providing sector-wide financing to help build out the infrastructure required for the commercial offshore wind industry in the U.S. See *id.*

Structure of Energy Purchase Transactions (PPAs and OREC Transactions)

Two different transaction structures have been utilised for the purchase and sale of offshore wind energy and related products in the United States. Starting with the early power purchase agreements (PPAs) for the Cape Wind project off of the shore of Massachusetts and the Block Island project off the shore of Rhode Island, many offshore wind energy transactions have been agreed upon using traditional bilateral PPAs with the state utilities. These PPAs have been similar to utility PPAs for U.S. onshore wind and solar, but with customised and highly negotiated transaction terms related to offshore wind and project-specific considerations, including for pricing, project timeline, transmission, permitting and variations in project size and technology. Utility PPAs have been used for offshore power purchase transactions in Massachusetts, Connecticut, Rhode Island and in New York.

The second transaction structure is for the purchase and sale of offshore wind renewable energy certificates (ORECs), representing the environmental attributes associated with one megawatt-hour of electricity generated from offshore wind resources and consumed by retail customers. The OREC transaction structure has been utilised for procurements of offshore wind energy in Maryland, New Jersey and New York.

Both PPAs and OREC transaction structures are expected to be utilised in upcoming procurements of U.S. offshore wind. On 30 June, 2021, the State of New Jersey announced the award of a total of 2,658 MWs of ORECs to EDF/Shell's Atlantic Shores Offshore Wind project and to Ørsted's Ocean Wind II project.

Financing Outlook for U.S. Offshore Wind

The robust financing market for U.S. renewable energy projects appears ready to embrace offshore wind, as more than 50 major lenders and tax equity providers have now expressed interest in financing U.S. offshore wind projects. This includes numerous European lenders with offshore wind financing experience and who will likely be a driving force for offshore wind financing in the United States. Some of these European lenders will need to be educated on financing structures that are unique to the U.S. market, such as tax equity financings and the intercreditor arrangements between tax equity and debt. Many lenders (both foreign and domestic) also perceive offshore wind to have heightened construction risk. The industry believes this perception will change over time as the market is educated.

Offshore wind financing will not be limited to European lenders. U.S. onshore wind projects with strong economic foundations and sponsor backing have traditionally benefitted from widely available debt and tax equity. It is expected that many U.S. onshore wind financing providers will also participate in upcoming offshore wind project financings. Domestic lenders and tax equity investors are anxious to fund these projects in part because many of the planned U.S. offshore wind projects feature large project sizes, strong project sponsors, and even better offtake contracts than many recent onshore projects.

Recent legislation has added a new federal investment tax credit (ITC) category for offshore wind projects. The offshore wind ITC is worth 30% of a project's cost as long as the construction of the project begins before January 1, 2026. Offshore wind projects had previously only qualified for a production tax credit (PTC), or a less-valuable ITC that was subject to a haircut – and pending expiration date – corresponding to the statutory phase-out schedule for PTCs. The legislation was a significant win for the offshore wind industry. ITCs (based on cost) are generally viewed as more valuable to offshore wind projects than PTCs (based on electrical production) given the relative expense of offshore projects compared to onshore projects, and the additional tax credit value through 2025 should translate to substantially more tax equity investment for project sponsors.

To qualify for the ITC or PTC, projects need to start construction (by the end of 2025 for ITCs and the end of 2021 for PTCs) by either incurring at least five percent of qualified project cost ("the five percent safe harbor"), or by commencing either on-site or off-site physical work of a significant nature. The IRS has taken the position in numerous sets of guidance that once construction begins, the sponsor needs to demonstrate continuous progress towards completion unless the project is placed in service by a deadline prescribed by the IRS. The IRS extended the deadline applicable to offshore wind projects in January 2021 to 10 years after the year in which construction begins – a significantly longer runway than afforded to other renewable asset classes.

The five percent safe harbor is very capital intensive given the cost of offshore wind projects, so we anticipate that may deter certain projects from selecting this option. On-site physical work is also difficult because of a lack of access to the site in the ocean and limited ability to do on-site work at preliminary stages. An off-site physical work strategy will likely be the most popular option in many cases. In all cases a financeable tax credit qualification strategy will be critical for U.S. offshore wind projects. Projects should expect significant scrutiny of their qualification strategies given the cost of the offshore projects and the expectation that multiple tax equity and debt providers could participate in the financing of these projects and reap significant federal income tax benefits. Despite these various challenges, it is expected that a number of upcoming U.S. offshore wind projects will be able to utilise the existing federal tax credits and obtain tax equity financing.

United States Atlantic Seaboard

Offshore wind project development along the Atlantic seaboard continues to progress rapidly. The 30 MW/five turbine Block Island project completed its fourth year of commercial operation in December 2020, providing the sector with a much-needed tangible precedent for the enormous potential of U.S. offshore wind. Dominion Energy's Coastal Virginia Offshore Wind (CVOW) demonstration project, located in Dominion's BOEM lease area off the coast of Virginia, was completed in September 2020. Many more megawatts of offshore wind energy are in advanced stages of development.

The following section provides a high-level update on some of the most notable recent developments in the rapidly evolving offshore wind project landscape along the Atlantic Seaboard.

Massachusetts

In 2016, Massachusetts passed a law requiring its utilities to procure 1,600 MW of offshore wind power by 2027. In March 2021, Massachusetts passed new legislation and raised its procurement target to 4,000 MW by 2027.¹³ The state's first offshore wind solicitation took place in May 2018. Avangrid Renewables and Copenhagen Infrastructure Partners' 800 MW Vineyard Wind project was selected as the winner. The project, which includes PPAs with National Grid USA, Eversource Energy, and Unitil Corp., will be developed in two phases to be located south of Martha's Vineyard.

In August 2019, BOEM announced it would require a supplement to Vineyard Wind's environmental impact statement (EIS) to inform its decision on the project's Construction and Operations Plan (COP),¹⁴ unexpectedly delaying the project's development. Approval of a COP is needed before construction of a project can commence. BOEM issued the notice of availability of the final EIS for Vineyard Wind's COP on March 21, 2021 and issued the Record of Decision approving the COP on May 10, 2021.¹⁵ The project is expected to begin delivering energy to Massachusetts in 2023.¹⁶

Mayflower Wind (a joint venture between Shell and Ocean Winds) won the second request for proposals (RFP) process in October 2019 and was selected to move forward with contract negotiations to provide 804 MW of offshore wind power to Massachusetts. In February 2020, Eversource Energy, National Grid, and Unitil filed initial PPAs with the Massachusetts Department of Public Utilities.

The March 2021 offshore wind legislation also set the stage for a third round of bidding for offshore wind projects. In the upcoming auction, companies will be able to bid on projects up to 1600 MW, up from 800 MW in the previous two rounds. Unlike in the first and second round, the third round will place a special emphasis on environmental justice, diversity, equity and inclusion.¹⁷

Massachusetts is also facilitating the development of a local supply chain by upgrading the New Bedford Marine Commerce Terminal, which will serve as the primary staging and deployment base for Vineyard Wind and Mayflower Wind.¹⁸ The state also created the Massachusetts Clean Energy Center's Wind Technology Testing Center, which offers turbine blade certification tests for turbine blade sections up to 90 meters in length, and established the first-in-the-nation offshore wind training facility located at the Massachusetts Maritime Academy.

New York

BOEM is moving forward with an environmental review to support lease auctions in an area known as the New York Bight (an area between Long Island, New York and New Jersey). An auction is anticipated in late 2021. Projects in this area are anticipated to help New York reach the goal of developing 9,000 MW of offshore wind energy by 2035. To help encourage offshore wind energy development, NYSERDA created an OREC programme (described above in this update) under which NYSERDA procures ORECs from the offshore wind project owners on behalf of load serving entities, which in turn are required to purchase the ORECs from NYSERDA. In the 2018 solicitation for offshore wind power, NYSERDA selected two projects, the 816 MW Empire Wind 1 project (Equinor US Holdings, Inc.) and the 880 MW Sunrise Wind project (a joint venture of Ørsted A/S and Eversource Energy). Previously, and separately from NYSERDA's procurements, the Long Island Power Authority approved a 20-year PPA to take power from the proposed 90 MW South Fork Wind project (Ørsted U.S. Offshore Wind and Eversource Energy). This agreement was amended in 2018 to add another 40 MW of power.

NYSERDA held its second offshore wind solicitation in 2020. On January 13, 2021 NYSERDA provisionally awarded two projects, Empire Wind 2 (1,260 MW) and Beacon Wind (1,230 MW), to Equinor Wind US LLC, a subsidiary of Equinor, the Norwegian energy company.¹⁹ Beacon Wind is expected to be a multi-phase project and could eventually grow to a total capacity of 2,400 MW.²⁰

13. See <https://www.spglobal.com/platts/en/market-insights/latest-news/electric-power/032621-massachusetts-governor-signs-climate-change-legislation-calling-for-net-zero-emissions>.

14. BOEM explained that the supplement was needed because a more "robust cumulative analysis" of environmental impacts was required as a result of the reasonably anticipated greater buildout of offshore wind projects in the area as compared to what was contemplated when the original draft environmental impact statement was prepared.

15. See <https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Final-Record-of-Decision-Vineyard-Wind-1.pdf>.

16. See <https://www.vineyardwind.com/press-releases/2021/3/8/vineyard-wind-statement-on-release-of-final-environmental-impact-statement>.

17. Bids must include plans for creating employment, procurement, and contracting opportunities for minorities, women, veterans, LGBT and people with disabilities. Furthermore, bidders will also be required to detail the environmental and socio-economic impacts of the project on environmental justice communities and coastal communities that will be impacted by the project.

18. See <https://www.mass.gov/news/baker-polito-administration-announces-agreements-with-vineyard-wind-and-mayflower-wind-for-new>.

19. See <https://www.nyserdera.ny.gov/All-Programs/Programs/Offshore-Wind/Focus-Areas/Offshore-Wind-Solicitations/2020-Solicitation>.

20. See <https://www.offshorewind.biz/2021/01/14/equinor-and-bp-win-big-offshore-new-york/>.

New Jersey

New Jersey plans to meet its goal of 7,500 MW of offshore wind by 2035 using an OREC programme similar to that of Maryland and New York, and also tax incentives. In June of 2019, the New Jersey Board of Public Utilities (NJBP) granted the state's first award of offshore wind to Ørsted's 1,100 MW Ocean Wind project. The Ocean Wind project is located approximately 15 miles off the coast of Atlantic City, New Jersey. In 2020, New Jersey conducted an additional solicitation for ORECs resulting in a combined award of 2,658 MWs of ORECs to EDF/Shell's Atlantic Shores Offshore Wind and Ørsted's Ocean Wind II. Additional solicitations to meet New Jersey's offshore wind target are scheduled for 2022, 2024, 2026, and 2028.²¹ The NJBP requires New Jersey's electricity supply companies to purchase ORECs from the selected projects according to a set percentage of kWh of energy sold in the state. The programme's "OREC administrator" facilitates the OREC payments to the project and transfer of ORECs to the electricity suppliers required to purchase the ORECs, as well as the transfer of revenues from the projects' sale of energy and products into PJM back to the ratepayers.

New Jersey also created an offshore wind tax credit program that provides projects with tax credits up to 100 percent (with a US\$100 million limit) of the qualified capital investments made in an offshore wind-related facility. New Jersey is also working to support development of a local supply chain with various initiatives to develop port infrastructure.

Rhode Island

In addition to the Block Island project, the Rhode Island Public Utilities Commission approved a 20-year PPA in 2019 between DWW Rev I, LLC (a joint venture of Ørsted U.S. Offshore Wind and Eversource) and National Grid for 400 MW from the Revolution Wind project located in federal waters roughly halfway between Montauk, New York and Martha's Vineyard, Massachusetts.

Connecticut

In June 2019, Connecticut passed a bill requiring the Department of Energy and Environmental Protection to solicit up to 2,000 MW of offshore wind capacity by 2030, and on December 5, 2019, the Department selected Vineyard Wind's bid of 804 MW from the development-stage Park City Wind project, allowing the Park City Wind project to enter into negotiations with United Illuminating Company and Eversource Energy, the state's two electric companies, for a long-term PPA. The parties filed executed PPAs with Connecticut's Public Utilities Regulatory Authority on May 21, 2020.²² The selection of Park City Wind project marked the state's third procurement of offshore wind energy.

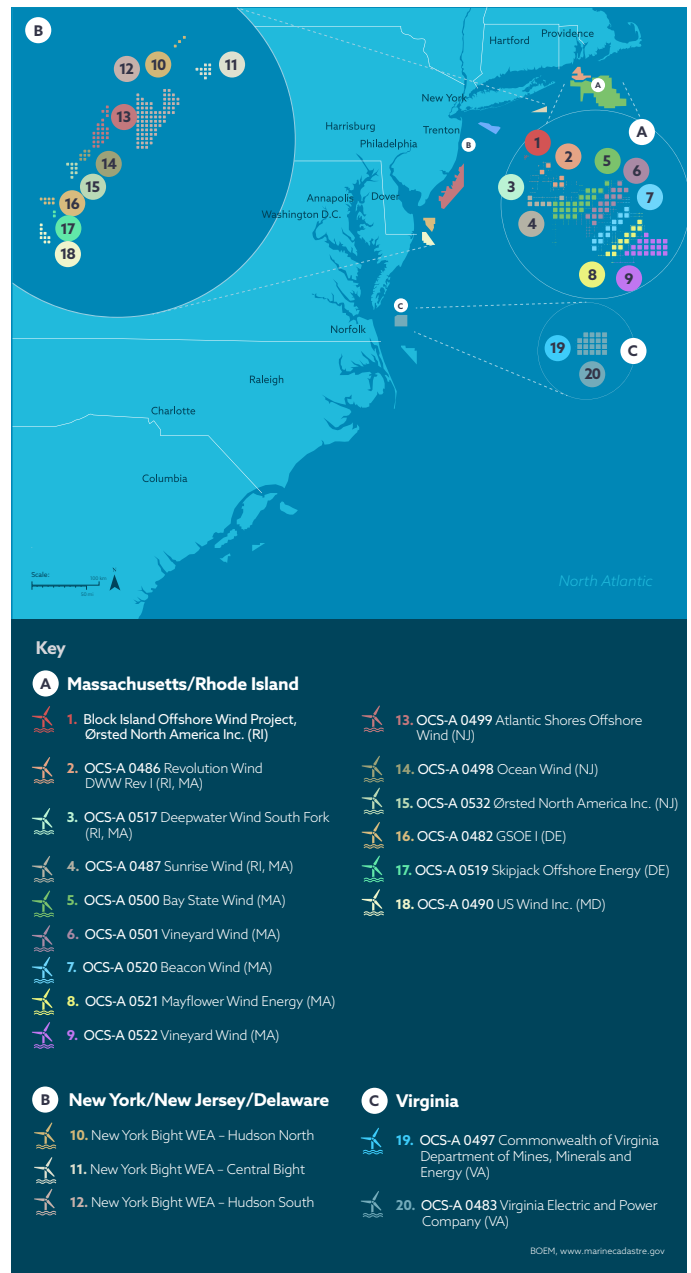
Previously in 2018, the state authorised two procurements for a total of 304 MW from Ørsted's Revolution Wind project (a joint venture of Ørsted U.S. Offshore Wind and Eversource). A 20-year PPA was signed for the supply of energy from the project.

21. See <https://www.njcleanenergy.com/renewable-energy/programs/nj-offshore-wind/solicitations>.

22. See <https://portal.ct.gov/DEEP/News-Releases/News-Releases--2020/DEEP-Selected-Power-Purchase-Agreement-for-804-MW-Offshore-Wind-Project-Filed-with-PURA>.

23. See <https://portal.ct.gov/Office-of-the-Governor/News/Press-Releases/2021/02-2021/Governor-Lamont-Announces-Host-Community-Agreement-Signed-by-New-London>.

MAP 13: U.S. WIND FARMS - EASTERN SEABOARD



This included commitments to the development of State Pier in New London, with Governor Ned Lamont announcing in May 2019 a public-private partnership investing in upgrades to the pier so as to support infrastructure requirements of offshore wind projects. In March 2021, the City of New London and the Ørsted/Eversource Joint Venture signed a Host Community Agreement, which represents a key milestone in the redevelopment of the pier.²³

Maryland

In May 2019, Maryland passed a law requiring the acquisition of, at minimum, an additional 1,200 MW of offshore wind, effectively doubling the state's 2030 offshore wind goal. Maryland's second offshore wind solicitation period took place in 2021.²⁴ Under Maryland law, additional solicitations are also planned for 2022. Maryland has encouraged offshore wind through its own OREC programme, under which all retail electricity suppliers must purchase ORECs from selected offshore wind project owners in accordance with guidance set out by the MDPSC. To be eligible for OREC payments, the project owners must sell all energy, capacity and ancillary services associated with the OREC into the regional PJM Interconnection-operated markets and then distribute the resulting proceeds to the electricity suppliers purchasing the associated ORECs from an escrow account. In 2017, the MDPSC awarded the state's first OREC agreements to Ørsted's 120 MW Skipjack project and the 270 MW MarWin project owned by US Wind, Inc.

In October 2020, Maryland, North Carolina and Virginia announced a three-state pact (formally known as SMART-POWER) to promote offshore wind development through actions such as removing regulatory hurdles, identifying regional assets, and providing economic incentives for offshore wind construction and industry-related supply chains. Through the pact, the states hope to catalyse at least 6,800 MW of offshore wind in their coastal waters.²⁵

Virginia

Virginia committed itself to 100 percent carbon-free electricity by 2050. Virginia's new plan calls for 5,200 MW of offshore wind to be developed by 2034.²⁶ Construction of Dominion Energy's Coastal Virginia Offshore Wind (CVOW) two-turbine demonstration project, located in Dominion's BOEM lease area off the coast of Virginia Beach, was completed in September 2020 and is currently operating. The CVOW project, which was built by Ørsted, is the first operational offshore wind facility in federal waters. Dominion is expected to expand upon the CVOW project with a 2,640 MW project. Construction is expected to begin in 2024 and will be carried out in three, 880 MW phases through 2026 and is expected by Dominion to be the largest offshore wind project in the United States.²⁷

Maine

In November 2019, Maine Public Utilities Commission approved a contract with Central Maine Power and Maine Aqua Ventus for the 12 MW Maine Aqua Ventus floating demonstration project. In August 2020, the project received US\$100 million in funding from New England Aqua Ventus (a joint venture of Diamond Offshore Wind and RWE Renewables).²⁸ This project is part of the Maine Offshore Wind Initiative, a state initiative to identify opportunities for offshore wind development in the Gulf of Maine.

In January 2021, Governor Mills called for a 10-year moratorium on offshore wind projects in state-managed waters. The governor believes that such a moratorium is required to protect fishing and recreational activities in state waters and to allow for further consultation with Maine's fishing industry. The moratorium will not affect the Maine Aqua Ventus project, and New England Aqua Ventus will still be able to site one offshore wind turbine in state-managed waters near Monhegan to demonstrate its technology.²⁹

North Carolina

In October 2020, North Carolina, Maryland, and Virginia announced their SMART-POWER pact to promote offshore wind development. In December 2020, Avangrid Renewables submitted its Construction and Operations plan to BOEM for the first 800 MW phase of its Kitty Hawk Offshore project. Located 27 miles from the Outer Banks, Kitty Hawk Offshore is expected to have a total generation capacity of 2,500 MW. Construction of the project's first phase could begin in 2024.³⁰

Ohio

In May 2020, the Ohio Power Siting Board approved the Certificate of Environmental Compatibility and Public Need for the Icebreaker Wind Inc. project to be constructed in Lake Erie.

²⁴. See <https://www.psc.state.md.us/wp-content/uploads/Notice-of-Maryland-Offshore-Wind-Project-Application-Period-Round-2-Year-1.pdf>.

²⁵. See https://governor.maryland.gov/wp-content/uploads/2020/10/SMART-POWER-MOU_FINAL.pdf.

²⁶. See <https://www.governor.virginia.gov/newsroom/all-releases/2020/june/headline-858909-en.html#:~:text=The%20legislation%20that%20Governor%20Northam,planned%20to%20interconnect%20into%20Virginia.>

²⁷. See <https://www.transmissionhub.com/articles/2020/06/dominion-construction-completed-on-12-mw-offshore-wind-pilot-project-off-virginia-beach-va.html#:~:text=Dominion%20Energy%20said%20at%20the,of%20wind%20energy%20by%202024.>

²⁸. See <https://www.greentechmedia.com/articles/read/maines-floating-offshore-wind-project-scores-major-backers-rwe-and-mitsubishi>.

²⁹. See <https://www.maine.gov/governor/mills/news/governor-mills-announces-actions-advance-floating-offshore-wind-research-array-gulf-maine-2021>.

³⁰. See <https://www.offshorewind.biz/2020/12/15/avangrid-submits-kitty-hawk-construction-and-operations-plan/>.

California and Pacific Coast Market Updates

Siting offshore wind projects in the Pacific Ocean presents unique challenges compared to siting projects along the Atlantic seaboard. California and Hawaii have various specific governmental approval requirements and the U.S. Department of Defense has unique military interests. Also, the depth of the Pacific Ocean precludes the use of fixed foundation wind turbines and instead requires floating platforms with underwater cable tethering to the ocean floor. BOEM is in the process of Area Identification following comments from its June 24, 2016 Call off of the coast of Oahu, Hawaii.

New legislation being considered in California may further support offshore wind development and companies are interested in developing projects. Assembly Bill 525, which is backed by a broad coalition of clean energy, labor and environmental groups, is under consideration in the California legislature to provide for significant investment in building the state's utility-scale offshore wind industry. The bill requires the California Energy Commission to develop a strategic plan for California to achieve at least 3 GW of installed offshore wind by 2030, and 10 GW of installed offshore wind by 2040, which will contribute to the state's goal of constructing an average of 6 GW of new clean energy resources annually to achieve 100 percent carbon free electricity by 2045.³¹

In October 2018, BOEM published a Call with respect to three areas based on the stakeholder engagement process and a number of other factors, including close proximity to existing transmission infrastructure. In response, fourteen companies responded to the Call with indications of interest. BOEM announced on May 25, 2021 that two of the three areas would be advanced for further development – the Morrow Bay and the Humboldt Call Areas.³² The advanced Morrow Bay area is approximately 399 sq. miles beginning approximately 24 miles offshore from Cambria, California. The Humboldt area is off the northern coast of California. BOEM set mid-2022 for target auction of these areas. A BOEM auction for these lease areas is expected in 2022.

Project Interconnection and Transmission

When connecting an offshore wind project to the U.S. transmission grid, a developer must follow interconnection procedures and pro forma interconnection agreements developed and implemented by the interconnecting utility or regional transmission organisation (RTO), as set forth in its open access transmission tariff accepted by the Federal Energy Regulatory Commission (FERC). These interconnection procedures and agreements were designed for onshore projects and generally require that the developer pay the costs of engineering, designing, and constructing generation tie lines (gen-ties), related interconnection facilities, and transmission network upgrades necessary to connect its project to the transmission grid. For offshore projects the costs associated with these facilities and upgrades can be prohibitively expensive. Although developers can leverage economies of scale and share costs by developing shared gen-ties, FERC is evaluating other ways to facilitate offshore wind interconnections.

On October 27, 2020, FERC convened a technical conference to consider whether RTO interconnection and transmission planning rules require revision to accommodate the anticipated growth of offshore wind generation in the U.S. Testimony submitted on behalf of trade groups, offshore wind developers and state utility commissions highlighted challenges associated with interconnecting each prospective wind project individually. Multiple entities suggested that integration of offshore wind would benefit from consolidated transmission planning, which could mitigate the time and expense of constructing offshore projects. On March 11, 2021, FERC issued a notice requesting public comments on the issues raised at the technical conference. Based on the comments received, FERC could initiate a rulemaking proceeding to propose improvements in RTO interconnection and transmission planning rules to facilitate integration of offshore wind projects. Separately, on June 17, 2021, FERC announced the creation of a joint federal-state task force to, among other things, identify barriers that inhibit planning and development of transmission necessary to achieve federal and state policy goals, as well as potential solutions to those barriers. The task force could become a useful forum to advance transmission solutions for offshore projects.

³¹ See the "2021 SB 100 Joint Agency Report Summary, Achieving 100% Clean Electricity in California: An Initial Assessment" by the California Energy Commission, the California Public Utilities Commission and the California Air Resources Board, March 2021.

³² See <https://www.doi.gov/pressreleases/biden-harris-administration-advances-offshore-wind-pacific>.

Project Permitting and Environmental Considerations

BOEM oversees the development of wind projects on the Outer Continental Shelf, or OCS. With the exception of Texas and the Gulf Coast of Florida that extend out to nine nautical miles, the start of the OCS for other states is three nautical miles from the coastline.

BOEM's roadmap below outlines the overall offshore wind development process. Briefly, BOEM issues leases under either a competitive or non-competitive process. Under the noncompetitive process, project developers submit a request for interest in a particular area to BOEM. After BOEM receives such a request, it seeks comments to understand if competitive interest exists in that particular area. If there is no competitive interest, BOEM can proceed and issue a lease noncompetitively.

BOEM REGULATORY ROADMAP



This Regulatory Roadmap provides guidance on the requirements for acquiring an offshore wind commercial lease on the Outer Continental Shelf (OCS), pursuant to 30 CFR 585. The Bureau of Ocean Energy Management (BOEM) is providing this document to clarify the steps and approvals necessary to develop an OCS wind facility.

This document is intended to be used as guidance to developers to outline the requirements of BOEM and other agencies that industry must follow when developing offshore wind projects. For public guidance outlining the process for overseeing renewable energy projects on the OCS and opportunities for public involvement, please see A Citizen's Guide.

If there is competitive interest, BOEM follows its competitive leasing process.³³ The competitive process starts with the publication of a Call for Information and Nominations (Call), which requests comments about areas of the OCS that parties believe should be evaluated for potential development of offshore wind energy. Prior to and during this time, BOEM also meets with various stakeholders, including established Intergovernmental Renewable Energy Task Forces in states that have expressed interest in developing offshore wind.³⁴

³³. This process occurred in Massachusetts. In 2016 and 2017, Statoil Wind US LLC and PNE Wind USA, Inc., individually submitted unsolicited lease requests in the wind energy area off the coast of Massachusetts. After BOEM determined that both entities were qualified to hold an OCS lease, competitive interest existed and BOEM followed the competitive leasing process. BOEM has used the competitive process since then to issue leases in the Atlantic.

³⁴. To date, there are Intergovernmental Task Forces established in California, Delaware, Florida, Hawaii, Maine, Maryland, Massachusetts, New Jersey, New York, North Carolina, Oregon, Rhode Island, South Carolina, and Virginia.

³⁵. See White House Fact Sheet: Biden Administration Jumpstarts Offshore Wind Energy Projects to Create Jobs dated March 29, 2021 (available at <https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/29/fact-sheet-biden-administration-jumpstarts-offshore-wind-energy-projects-to-create-jobs/>).

BOEM uses information gathered during this process for Area Identification. During this step of the development process, BOEM identifies areas for environmental analysis and consideration for leasing. BOEM considers competing uses and concerns during this determination to help identify offshore locations that are suitable for leasing. After the Area Identification is made, but before a lease auction occurs, BOEM performs an environmental review to comply with its obligations under the National Environmental Policy Act (NEPA) to assess potential environmental impacts associated with lease issuance. NEPA requires consultation with appropriate Federal agencies, States, local governments, affected Indian Tribes, and other interested parties.

Following issuance of proposed and final sale notices, an auction is held and parties bid competitively on lease areas. Winning bidders may then enter into a lease with BOEM. It's important to understand that a BOEM lease is not approval of a particular project. A BOEM lease gives the lessee the right to seek the necessary approvals to construct and operate a specific project in that lease area. Importantly, it also gives the lessee the right to one or more project easements without further competition for the purpose of installing gathering, transmission, and distribution cables as necessary for the lease.

BOEM leases have a preliminary term of 12 months during which time most projects file a Site Assessment Plan or SAP with BOEM for approval. A SAP describes the initial activities needed to study the lease area, commonly through the deployment and use of met buoys. BOEM leases provide five years to complete site assessment work. Six months before that five-year term ends, a COP is due. A COP contains information describing all planned facilities that will be constructed and used for the project, along with all proposed activities including proposed construction activities, commercial operations, and conceptual decommissioning plans for all planned facilities, including onshore and support facilities. There is also the ability to concurrently file a SAP and a construction and operations plan or COP, but so far, no developer has done this. Review of the COP requires BOEM to assess the potential environmental impacts of the specific project under NEPA along with its cumulative impacts. This can be a lengthy process, however, the Biden Administration announced plans to advance offshore wind lease sales and complete review of at least 16 COPs by 2025.³⁵ After the final environmental report is prepared, BOEM will issue a record of decision and decide whether to approve the COP and what, if any mitigation measures to impose. BOEM also must review and approve Facility Design and Fabrication and Installation Reports prior to project development/construction.

Offshore projects will also need to obtain other permits from various federal agencies (e.g., United States Army Corps of Engineers, United States Marine Fisheries Services, United States Coast Guard and the United States Environmental Protection Agency) and will likely require certain state and local permits, particularly associated with the landfall of any electric transmission line and construction of associated infrastructure. As a result, the due diligence with respect to environmental permitting and support for the ongoing development of upcoming projects, or potential financings or acquisitions remains complex and highly project-specific.

Jones Act

Section 27 of the Merchant Marine Act, commonly referred to as the Jones Act, restricts the transportation of merchandise between two points in the United States to qualified United States' flagged vessels owned and operated by United States citizens.³⁶ Briefly, under the Outer Continental Shelf Lands Act, a "point" is anything permanently or temporarily attached to the seabed "erected thereon for the purpose of exploring for, developing or producing resources."³⁷

The practical effects of the Jones Act ripple through all aspects of offshore wind development. Currently, there are no U.S.-flagged jack up vessels (vessels designed to install offshore wind turbine structures). As a result, while efforts to build U.S. flagged vessels progress,³⁸ developers have also considered the use of feeder vessels transporting turbine components from U.S. ports for installation by a foreign-flagged jack up vessel to install offshore wind turbines to comply with the Jones Act. Since the Jones Act is also implicated in other aspects of an offshore project (e.g., placement of scour protection and the ferrying of crew),³⁹ offshore wind developers must pay special attention to this law and the rulings from the Customs and Border Patrol that implements the law.⁴⁰

^{36.} We note that the industry must also be aware of the Passenger Ship Act of 1886 that applies to the transportation of passengers in U.S. waters and the Dredge Act that applies to vessels engaging in coastwise trade and dredging.

^{37.} The U.S. Congress added an amendment to the National Defense Authorization Act to make it clear that the Jones Act applied to offshore energy development on the OCS.

^{38.} Dominion announced plans for construction of a wind turbine installation vessel. See <https://news.dominionenergy.com/Dominion-Energy-Continues-to-Advance-Development-of-First-Jones-Act-Compliant-Wind-Turbine-Installation-Vessel>. According to Dominion, they expect the vessel to be ready in 2023 to support construction of US offshore wind construction. See <https://news.dominionenergy.com/2021-06-01-Dominion-Energy,-rsted-and-Eversource-Reach-Deal-on-Contract-to-Charter-Offshore-Wind-Turbine-Installation-Vessel-Vessel>.

^{39.} Ørsted announced plans to build two crew transport vessels and Ørsted and its joint venture partner Eversource Energy announced intentions to build a Jones Act compliant service operation vessel. See <https://us.orsted.com/news-archive/2020/10/edison-chouest-offshore-affiliate-executes-long-term-charter-agreement-with-orsted-and-eversource>.

^{40.} See e.g., CBP Ruling on February 2021 regarding offshore wind development (available at https://www.customsmobile.com/rulings/docview?doc_id=HQ%20H316313&highlight=category%3ACARRIERS#) and CBP Ruling on March 25, 2021 with respect to placement of scour protection (available at https://www.customsmobile.com/rulings/docview?doc_id=HQ%20H317289&highlight=date%3A%5B2015%20TO%20%2A%5D).





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China

The offshore wind market in China is still relatively new but is growing at a pace faster than any other jurisdiction in the world and is the second-largest offshore wind market globally, after the UK (No. 1) and with Germany following behind at No. 3.

In total, 52 GW of offshore wind capacity is expected to be connected to the Chinese grid by 2030 according to a Global Wind Energy Council report. This would make China the world's largest offshore wind market (with the UK being second, at 40 GW) by 2030.

While the Chinese offshore wind market continues to soar, foreign participation is still limited, as access to the market presents legal, language, information and other barriers. China's "big five" state-owned independent power plant operator groups tend to dominate the industry.



India

With approximately 7,600 km of coastline at its disposal, India has high offshore wind resource potential and is predicted to be a future player in the offshore wind market following the rise of offshore wind projects in the wider Asia-Pacific region.

Promisingly, the Indian government has earmarked the potential for up to 70 GW of offshore wind capacity in the regions of Gujarat and Tamil Nadu. However, the government's offshore wind targets of 5 GW by 2022 and 30 GW by 2030, which were set to kick-start the industry, are already anticipated to be missed.



Brazil

The Brazilian government envisages offshore wind to generate a total of 16 GW of electricity by 2050.

There are currently no operational offshore wind farms in Brazil, but on 17 November 2020, the Brazilian Institute of Environment and Renewable Natural Resources concluded a "Standard Terms of Reference" for the licencing of offshore wind projects in the country. Developers are therefore in the process of seeking environmental licencing, with seven offshore wind projects in the pipeline:

- Neoenergia/Iberdrola has applied for three projects: Águas Claras, Maravilha and Jangada, totalling 9 GW;
- Equinor has applied for Aracatu 1 and Aracatu 2, totalling 4 GW;
- Eólicas do Brasil has applied for Asa Branca, totalling 400 MW; and
- BI Energia has applied for Camocim (1.2 GW) and Caucaia (600 MW).



Italy

Italy has tremendous offshore wind potential. A recent study shows that by 2030 Italy could install up to 5.5 GW of offshore wind capacity, a significant amount more than the 900 MW target set by the Italian government. There are, however, various policy constraints which are limiting offshore wind activity in Italy, although this is expected to change in light of recent political developments (including creation of The Ministry for Ecological Transition) and general pressure from the EU on unlocking investments for green energy.

Italy could be at the forefront in the development of floating offshore wind projects, a technology that could overcome the difficulties related to the high sea floors associated with the Mediterranean Sea.

There are some key projects in the pipeline, and Italy is on track to establish the first offshore wind project in the Mediterranean. The 30 MW pilot project will be located offshore of the town of Taranto, with commissioning expected to start by the end of 2021, and construction of the project is underway.

The company 7 Seas Med has submitted a 30-year maritime state concession to develop a 250 MW floating offshore wind project off the coast of the Sicilian city of Marsala. The project will have 25 turbines (10 MW capacity each) installed on TetraSpar floating foundations.

The Toto-Renexia group has filed an application to construct a 2.8 GW floating offshore wind project in the Strait of Sicily, whilst Saipem and Qint'x have filed a joint application to construct a 620 MW project combining floating solar and wind capacity, electrochemical energy storage and hydrogen production.



Spain

Spain doesn't currently have any offshore wind projects. However, Iberdrola, responsible for the operation of a number of offshore wind projects worldwide, plans to invest more than EUR 1 billion at home to develop an industrial-scale floating offshore wind farm project. It is hoped that this investment will kick-start the development of up to 2 GW of offshore wind projects identified off the coasts of Galicia, Andalusia and the Canary Islands.

In addition, a consortium led by BlueFloat Energy, a floating offshore wind start-up backed by Quantum Energy Partners, is looking to develop the 1 GW Tramuntana wind project, which will be located off the Catalan coast.



Vietnam

Given its favourable wind speeds, water depths and extensive coastline, Vietnam is seen as a strong prospect for offshore wind in Asia. Although only a handful of near-shore offshore wind projects have been commissioned to date, a recently published draft of the country's new national power development plan (Master Plan 8), which is due later this year, indicates that the Vietnamese government is targeting deployment of up to 3 GW of offshore wind energy by 2030 (which is arguably a conservative target; recent analysis by the Danish Energy Association suggests that Vietnam's offshore wind potential is much greater than this).

Although the country's offshore wind sector attracts significant interest amongst developers and financiers, there are several key hurdles which remain before Vietnam can realise the potential of its offshore wind resources. One of the key hurdles relates to the standard form Vietnamese law PPA which developers of offshore wind projects would have to enter into with the state-owned power company, Vietnam Electricity. The PPA omits a number of protections which international financiers would be expected to require in order for the PPA to be bankable (e.g. lack of lender step-in rights, curtailment protection and termination payment provision). It is hoped that these issues will be addressed following the publication of Master Plan 8. Note also that the PPA is not backed by a state guarantee (notwithstanding that the credit rating of the offtaker is below the level which many financiers would ideally like to see). Another key area of focus for developers and financiers is the level of FiT which an offshore wind project will be entitled to, given that the current FiT expires in November 2021, together with the uncertainty as to whether the onshore or offshore FiT will apply, given that (currently) the onshore FiT is available to offshore wind projects located in water depths of less than 20m. That being said, these issues have not discouraged major developers from exploring the country's potential, with confidence being high that the challenges can be overcome. Vietnam is one to watch.

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