ORRICK
GLOBAL OFFSHORE WIND REPORT

A JURISDICTION BY JURISDICTION UPDATE AND OUTLOOK

2022/2023

orrick

ORRICK'S OFFSHORE WIND TEAM
RECENT EXPERIENCE

UK

- Barrow
- Beatrice
- Burbo Bank
- Burbo Bank Extension
- Dudgeon
- East Anglia 1
- Galloper
- Gunfleet Sands 1, 2, & 3
- Gwent y Môr
- Hornsea 1
- Hornsea 2
- Hornsea 3
- Kinkardine
- Lincs
- London Array 1
- Moray Firth
- Neart Na Gaoithe
- Ormonde
- Race Bank
- Seagreen
- Sheringham Shoal
- Walney 1 & 2
- Walney Extension
- West of Duddon Sands
- Westermost Rough
- Various ScotWind Projects

NL

- Hollandse Kust West

BE

- Belwind I
- Thornton Bank I, II & III

SE

- Swedish offshore wind projects

DE

- Arkona
- Baltic II
- Butendiek
- EnBW Baltic
- Global Tech I & II
- Gode Wind I, II & III
- Meerwind
- Merkur
- Veja Mate

FR

- Advising the French government on numerous offshore wind projects

JP

- Shizuoka
- Wakayama
- Ishikari
- Kanagawa
- Tsugaru
- Yamagata Yuza

KR

- South Korea offshore wind project

TW

- Changfang & Xidao
- Hai Long
- Zhong Neng
- Greater Changhua 1
- Formosa 2
- Formosa 3
- Round 3 projects
- Yunlin

US

Several offshore wind projects off the coasts of:

- Massachusetts
- Rhode Island
- New York
- New Jersey
- Delaware
- Maryland
- California

VT

- La Gan
- Thang Long

GR

- Greek offshore wind project

IT

- Several floating offshore wind projects

AU

- Star of the South

OFFSHORE WIND AT ORRICK

> **"ORRICK'S ENERGY AND INFRASTRUCTURE TEAMS HAVE AN EXCELLENT SENSE FOR THE MARKETPLACE AND A DEEP ENOUGH BENCH TO DEDICATE TO A DEAL THAT'S ON FAST TRACK. THEY'RE ALWAYS WILLING TO STEP UP AND DO IT."**
>
> CHAMBERS AND PARTNERS, 2020

CHAMBERS ASIA

Top Ranked

Asia Pacific Rankings for Projects & Energy: International and Power & Renewable Transactions, *2022*

A WORD ABOUT WIND

Top 100 Legal Power List

Evan Stergoulis, Ravinder Sandhu and Giji John named to the list, *2022*

Top 100 Women's Power List

Ravinder Sandhu named to the list, *2020/21*

CHAMBERS GLOBAL — The Legal 500

Band 1

USA Rankings for Renewables & Alternative Energy and Power & Renewable Transactions, *2022*

The Asset 財資

Power Transmission M&A Deal of the Year, 2022

Diamond Transmission Partners Hornsea One

Law360

Project Finance Group of the Year

Law360 (for the 7th time), *2020*

CHAMBERS UK — The Legal 500

Top Ranked

18 UK individuals ranked for Energy & Infrastructure and a top practice ranking in Power (including electricity, nuclear and renewables) (UK), *2021*

Inframation

Ranked #2

Global Renewables legal adviser (by deal count), *H1 2022*

Ranked #3

Europe Renewables legal adviser (by deal count), *H1 2022*

Inspiratia AWARDS 2022 — IJGlobal Awards 2021

Deal of the Year

Zhong Neng Offshore Wind Farm

IJInvestor Awards 2021

EMEA Renewables & Energy Transition Deal of the Year — Wind Power

Sale of Beatrice Offshore Wind Farm

Chambers AND PARTNERS

Band 1 (Global and UK)

Ranking for ***Evan Stergoulis*** for his Offshore Wind Experience, *2022*

"He has a superb commercial approach and finds solutions to unlock complex situations."

IFLR1000

Highly Regarded

Evan Stergoulis
Yves Lepage
Yoichi Katayama
2022

Notable Practitioners

Adam Smith
Simon Alsey
Ravinder Sandhu
Kristin Seeger
Les Sherman
Minako Wakayabashi
2022

Chambers AND PARTNERS — The Legal 500

Top Ranked

31 U.S. individuals ranked for Energy & Infrastructure, *2022*

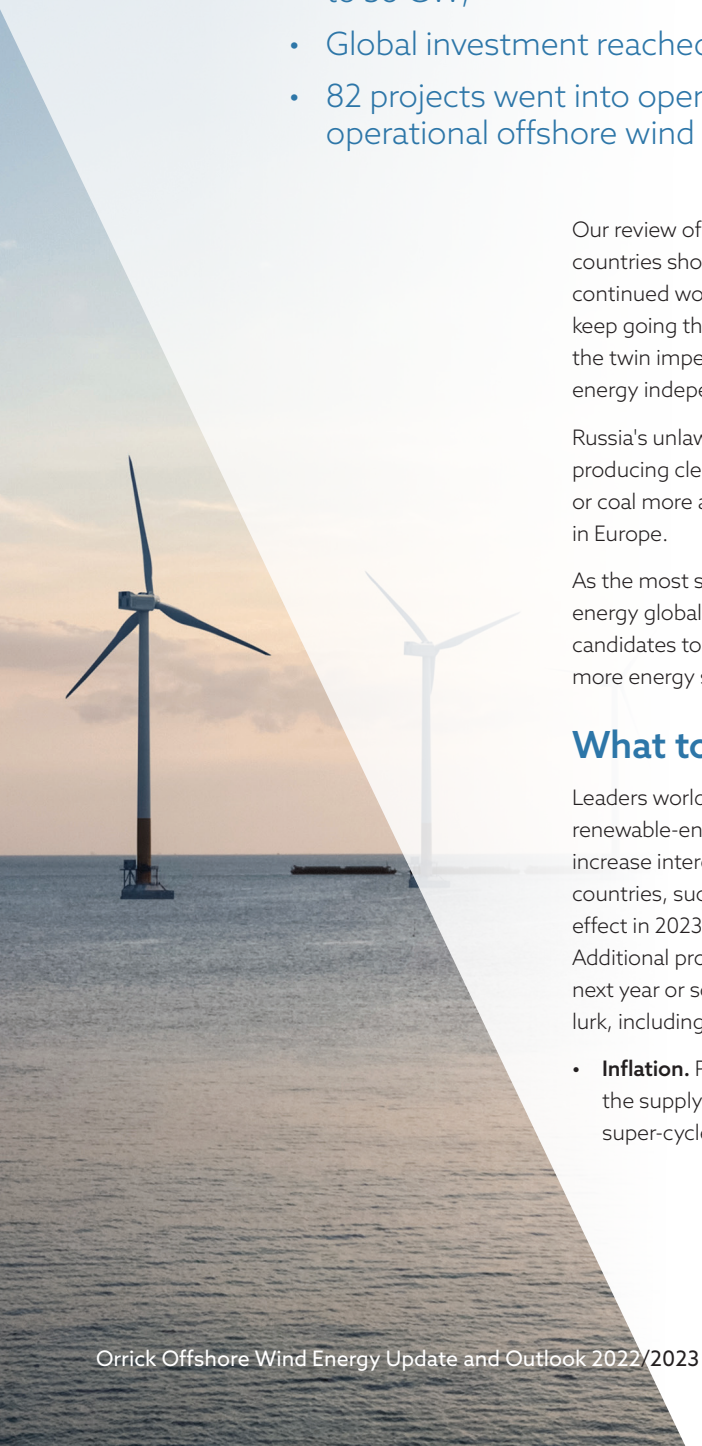
Contents

INTRODUCTION

Powering Forward: Offshore Wind Growth Signals Things to Come

Our review of offshore wind in over twenty countries shows that the sector has grown rapidly in recent years, with an accelerating trajectory in 2022 after a record-breaking 2021 in which:

- Installed offshore wind capacity increased by 21 GW globally to 56 GW;
- Global investment reached US$46 billion; and
- 82 projects went into operation, increasing the number of operational offshore wind projects worldwide to 260.



Our review of offshore wind in over twenty countries shows that the upward trajectory continued worldwide in 2022. It is poised to keep going through this decade, driven by the twin imperatives of energy transition and energy independence.

Russia's unlawful invasion of Ukraine made producing clean power without importing gas or coal more appealing than ever, especially in Europe.

As the most scalable source of renewable energy globally, offshore wind leads other candidates to drive the transition to a greener, more energy secure future.

What to Expect in 2023

Leaders worldwide have set ambitious renewable-energy growth targets that will increase interest in offshore wind. In some countries, such as Germany, new laws take effect in 2023 that fuel continued growth. Additional projects will come online in the next year or so, but significant headwinds lurk, including:

- **Inflation.** Prices have risen fast across the supply chain, fed by a commodity super-cycle and the effects of COVID-19. This has squeezed suppliers and investors, tempering appetite for the sector (at least for some) and calling into question the deliverability of projects.
- **Skills/availability gap.** Demand for offshore wind specialists across the supply chain is high, but supply is not keeping up. The International Renewable Energy Agency has warned that skills shortages will increase globally without more proactive steps. In addition, key assets like vessels are sometimes unavailable due to high demand. This can lead to delays and exacerbate inflation.
- **Competitive auction processes.** Competition remains high to participate in greenfield auction processes. Option fees run into the hundreds of millions of dollars, putting increased pressure on the investment case.
- **Transmission infrastructure.** Some countries that have bold offshore wind targets lack the necessary transmission infrastructure once the power comes onshore. Such grid infrastructure will need to be upgraded in order to efficiently distribute the power generated offshore, onshore.

Offshore Wind Enjoys Strong Prospects for Long-Term Growth

Nonetheless, as demonstrated by some themes identified in this report, the long-term prospects are strong; the sector will overcome current challenges. These include:

- **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 and the United States is remarkable. Taiwan has just completed its next auction for a further 3 GW of power. In the United States, 2022 saw record-breaking lease auctions for the New York Bight ocean area off of the coast of New York and two sites off of the coast of North Carolina.
- **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 Asia, where deeper sea waters make some fixed-bottom projects impractical and local industry is well-placed to provide floating platforms. France also saw the first project financing of a floating offshore wind project. We expect to see a much faster progression than we saw in the fixed-bottom evolution from demonstration-size to commercial-size (300MW+) floating projects.

  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 in progress. There is real hope that Power-to-X based on offshore wind will displace the more carbon intensive fossil fuels and provide a reliable supply of renewable energy not subject to intermittency.

We explore these trends in the pages that follow. We also address various legal/regulatory points and provide general market updates, building on our 2021 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.

Orrick's Global Offshore Wind Practice

Our global offshore wind team is collaborating on a range of mandates across Asia, Europe and the United States. 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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AUSTRALIA

authored in collaboration with CLAYTON UTZ

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Introduction

Along with many other governments around the world, the Australian government has recently pledged to be net zero by 2050. However, Australia is a country rich in coal and reliant on the carbon-heavy resource for a large percentage of its gross domestic product. It will move towards its net zero target by decommissioning a number of its coal-fired power stations and using technologies, such as offshore wind, hydrogen energy and carbon capture and storage, to offset its fossil fuel production.

Offshore wind is an obvious choice for Australia, with the potential being significant, as the country not only has vast wind resources, similar to the UK's North Sea, but also has an estimated 2,000 GW of capacity for offshore wind projects within 100 km of the Australian shoreline.

However, this potential will not be realised overnight. Until recently, Australia did not have the legislative framework in place to enable this offshore wind potential to be realised.

Legislation

As foreshadowed above, until recently, there has been no regulatory framework for the licensing, construction, operation, maintenance and decommissioning of offshore wind farms in Australia. However, this changed in June 2022, when the Australian government's Offshore Electricity Infrastructure Act 2021 (the **Act**) came into effect. The Act provides a much-needed and dedicated legislative framework for the country's offshore wind industry and gives developers the confidence to continue with the next stages of the development of their proposed offshore wind projects in the country.

The Act regulates offshore projects contained in the Commonwealth offshore area, which includes both Australia's territorial sea and exclusive economic zone. Offshore wind projects located within three nautical miles of the coastline will still be governed by the relevant state's legislation, which is also yet to be developed in relation to offshore wind. The Act empowers the Minister for Climate Change and Energy (the **Minister**) to declare sections of the Commonwealth offshore area as being suitable for offshore activity, in accordance with Part 2 of Chapter 2 of the Act.

The Minister can only declare an area suitable after it has gone through a public consultation process. On 5 August 2022, the Minister issued a Notice of Proposal to Declare an Area and commenced consultation for the Bass Strait area off Gippsland, Victoria. This is welcome news, given the number of proposed projects in the region which includes the Star of the South project, Australia's most progressed offshore wind farm. Macquarie Group has also released plans for its Great Eastern Offshore Wind project in Gippsland's Bass Strait region which will host a massive capacity of 2.5 GW. A formal declaration is expected after the consultation process concludes on 7 October 2022.

In the same announcement, the Minister noted five additional areas that would open for consultation in due course, those being the:

- Pacific Ocean region off the Hunter region in New South Wales;
- Pacific Ocean region off the Illawarra region in New South Wales;
- Southern Ocean region off the city of Portland in Victoria;
- Bass Strait region off Northern Tasmania; and
- Indian Ocean region off Perth/Bunbury, Western Australia.

Once an area has been declared suitable, developers can apply for various licences within the 'declared area,' with the type of licence determined by the activity that the developer wishes to undertake at that area.

The Act categorises such offshore activities by reference to four separate licences. Offshore wind developers in Australia may apply for the following:

1. **Research and demonstration licence:** authorises developers of small-scale projects to conduct research into emerging offshore wind technologies or electricity transmission technologies for a specified period of up to 10 years at that declared area;
2. **Feasibility licence:** provides developers with an exclusive right to assess the feasibility of a proposed offshore wind farm (e.g., measuring wind strength and direction) for a specified period of up to seven years at that declared area. Importantly, feasibility licences cannot overlap with an area covered by another feasibility licence. Given the exclusive nature of the feasibility licence, feasibility licences are awarded to developers through a competitive allocation process with declared areas expressly tendered to eligible developers who are assessed on their technical and financial capabilities, as well as financial offers for the licence;

3. **Commercial licence:** authorises the construction and operation of an offshore wind farm for up to 40 years at that declared area, with the option to extend such licence for a further 40 years subject to ministerial approval. A commercial licence is only granted to a holder of a feasibility licence and can only be granted within the area specified in that feasibility licence; and
4. **Transmission and infrastructure licence:** permits developers to store, transmit and convey electricity (which may or may not be from renewable sources), has no prescribed term and by their nature are not required to be limited by a declared area. A holder of a transmission and infrastructure licence does not need to also hold a feasibility or commercial licence.

The order of the above licences follow the life span of an offshore wind project and are applied for by a developer sequentially. Licences will be granted by the Minister, who will assess applications against merit-based criteria prescribed by the Act, such as the developer's technical and financial capabilities and the viability of a project. The applicant must also satisfy any other criteria prescribed by the licensing scheme contained in the regulations, a draft of which was released for public consultation in March 2022. While the public consultation closed on 22 April 2022, we have not yet seen updated drafts of the regulations. The industry is keenly awaiting the updated draft to see whether they reflect the new Labor government's declared commitment to energy transition and the offshore wind sector. The consultation version of the regulations provided that the Minister is not bound to consider each of the merit-based criteria in the Act or regulations and may consider any other relevant matter.

Licences will be enforced by the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA)** in its capacity as the "Offshore Infrastructure Regulator," who will also be responsible for prescribing the amount and timing of financial securities to be provided by developers to cover the decommissioning of offshore wind projects.

As the Act does not provide for environmental assessments, developers should continue to adhere to the environmental requirements set out under the Environment Protection and Biodiversity Conservation Act 1999, which will apply to offshore wind projects.

As shown in Map 1, there are currently 25 proposed offshore projects (representing over 32 GW) currently planned.

Although the Act is Australia's greatest offshore wind advancement to date, the lack of supporting legislation complementing such Act and the infancy of the regulation governing offshore wind activities are some of the main barriers to entry to the Australian offshore wind market. The Act will need to be backed up by substantive regulations, which are not expected to be complete until late 2022.

Victoria's offshore wind targets

Victoria is the first state in Australia to set offshore wind generation targets, which form part of the state government's plan to replace energy generated by closing coal-fired power stations. The plan, released in the "Victorian Offshore Wind Policy Directions Paper" in March 2022, relies on three staged targets:

1. 2 GW by 2032 (this will involve procuring an initial offshore wind tranche);
2. 4 GW by 2035; and
3. 9 GW by 2040.

The Offshore Wind Implementation Statement, released in September 2022, includes a more detailed plan for achieving these targets.

NSW Renewable Energy Zones (REZs)

With its long coastline and stable continental shelf, the state of New South Wales (**NSW**) has strong potential for offshore wind. While the NSW government has not announced any regulation or targeted government support, it is hoping to attract offshore wind projects in its upcoming REZs. REZs combine renewable energy generation forms, including wind, solar, batteries and high-voltage poles and wires in the same location to deliver clean energy and capitalise on economies of scale.

In NSW, the Electricity Infrastructure Act 2020 and the Electricity Infrastructure Roadmap will help facilitate the development of renewable energy projects by delivering five REZs with a total intended network capacity of 12 GW.

While REZs are not targeted specifically at offshore wind, it is clear that offshore wind will feature strongly. Energy Corporation of NSW (the statutory authority responsible for delivering the REZs) has already suggested that the Illawarra Offshore Windfarm and the Wollongong Offshore Wind Project could both be connected to the REZ planned in the Illawarra region.

Revenue Model (Subsidies + Corporate Power Purchase Agreements (CPPAs))

Currently, the Australian government does not offer any support mechanisms for offshore wind, such as contracts for differences, or feed-in tariffs.

However, the Victorian state government, which has expressed its intention to develop Australia's first offshore wind sector, has offered funding support through its Energy Innovation Fund (**EIF**).

Round 1 of the EIF, which was conducted in the first half of 2021, was dedicated to offshore wind. Three projects secured funding with a total of A$37.9 million provided to support feasibility and pre-construction work.

The NSW government will also offer support to renewable energy projects (including offshore wind) by inviting them to bid for Long-Term Energy Service Agreements (**LTESAs**). LTESAs are similar to contracts for difference. They are essentially swap arrangements entered into with an independent special financial vehicle established by the NSW government. As such, they are likely to offer minimum revenue assurance rather than acting as a primary source of revenue.

In addition to any centralised government revenue support which may be available to offshore wind projects in Australia, developers of Australia's offshore wind farms will also be eyeing up potential opportunities to sell the power generated from an offshore wind farm via CPPAs to power-hungry offtakers, such as one of the country's large miners or aluminium smelters. Indeed, this appetite for power from offshore wind is evidenced through proposals for the Portland Aluminium smelter to be powered by the electricity generated by the Spinifex offshore wind farm (see Map 1).

CPPAs have been successfully deployed to Australia's solar and onshore wind projects, meaning that the market is familiar with how such agreements work, which is not a barrier, as seen in other markets, where CPPAs are in their formative stages.

Floating + Green Hydrogen

All of Australia's coastline states have deep waters, particularly NSW where almost the entire state's wind resources arise from deeper waters. Although the depth does not prohibit the use of fixed-bottom technologies, it does provide an opportunity for floating wind turbines to be used. This is something that is clearly recognised by developers, with BlueFloat Energy, Energy Estate, Oceanex and Equinor planning to deploy floating turbine technology in the Illawarra region and the Hunter region (see Map 1).

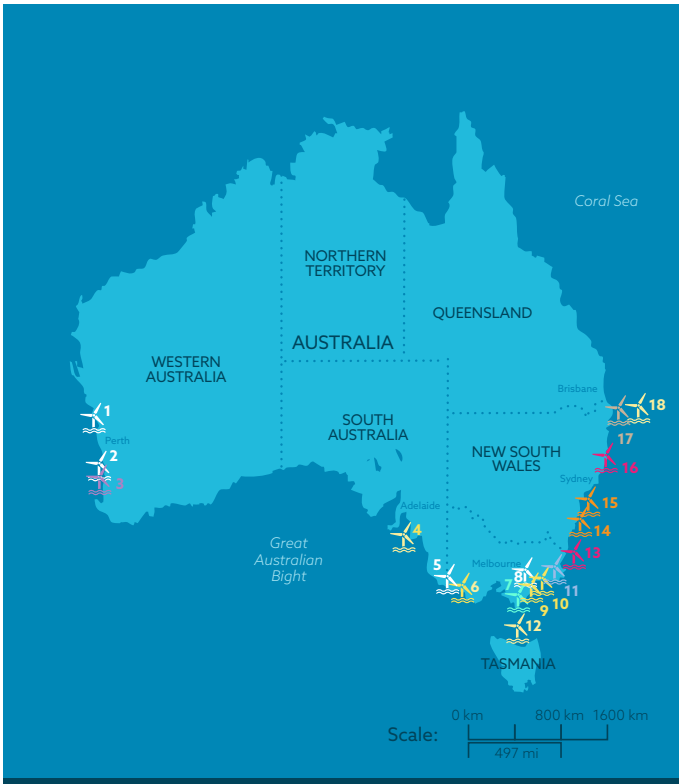
The production of green hydrogen from excess power generated from Australia's offshore wind farms is also intended to help Australia reach its goal of net zero by 2050. There are several plans afoot to monetise the production of green hydrogen through using it to subsequently produce ammonia, which can be shipped and sold as fertiliser to the highest bidder.

There are those who question why renewable energy generation needs to go offshore at all, given that Australia has an abundance of space, wind and sunlight onshore. Such individuals also cite issues with migratory birds, environmental impacts and visual aesthetics for reasons why Australia does not need to explore its offshore wind potential. However, due to the abundantly windy offshore conditions and at times low onshore wind and solar generation, offshore wind is the only renewable technology asset class that can deliver power at a scale and in the amounts required for Australia to offset its carbon emissions to reach its net zero target by 2050. This is unrealistic and unfeasible from onshore wind and solar alone.

Further, the support for an Australian offshore wind industry can be seen as several notable European investors have entered or announced their intention to enter the market. This includes Copenhagen Infrastructure Partners, Iberdrola and Copenhagen Energy. In particular, Copenhagen Energy has announced plans to develop four 3 GW offshore wind farms in Australia which will be the largest in the country, if they go ahead.

Although still in its formative years in comparison to its European counterparts, the Australian offshore wind era has begun and now has the framework required to realise the country's offshore wind potential.

MAP 1: AUSTRALIA'S OFFSHORE WIND PROJECTS



Key: Project Name, Connection Year, Developer, Capacity

1. - **Midwest Offshore Windfarm:** Copenhagen Energy - 3.0 GW
2. - **Velella Offshore Windfarm:** Copenhagen Energy - 3.0 GW
3. - **Cliffhead (TBC):** Pilot Energy & Triangle Energy - 1.1 GW
4. - **Perth Array Offshore Wind Project:** Floatation Energy - 0.5 GW
5. - **Samphire Offshore Windfarm:** Copenhagen Energy - 3.0 GW
6. - **WA Offshore Windfarm Project (2026):** Australis Energy - 300 MW
7. - **Bunbury (TBC):** OceanEx Energy - 2 GW
8. - **Leeuwin Offshore Windfarm:** Copenhagen Energy - 3.0 GW
9. - **SA Offshore Windfarm Project (TBC):** Australis Energy - 600 MW
10. - **Victoria Offshore Windfarm Project (TBC):** Australis Energy - 495 MW
11. - **Spinifex (2030):** Alinta - 1 GW
12. - **Portland Offshore Wind Project:** Floatation Energy - 0.75 GW
13. - **Southern Wind Offshore Windfarm:** Bluefloat Energy & Energy Estate - 1.2 GW
14. - **Great Southern (2030):** Corio Generation - 1.5 GW
15. - **Great Eastern Offshore Wind (2030):** Corio Generation - 2.5 GW
16. - **Greater Gippsland (2030):** BlueFloat & Energy Estate - 1.4 GW
17. - **Star of the South (TBC):** Copenhagen Infrastructure Partners - 2.2 GW
18. - **Seadragon (TBC):** Flotation Energy - 1.5 GW
19. - **Bass Offshore Windfarm (2026):** Nexphase - 360 MW
20. - **Eden Offshore Windfarm (TBC):** OceanEx Energy - 2 GW
21. - **Ulladulla Offshore Windfarm (TBC):** OceanEx Energy - 1.8 GW
22. - **Ilawarra Offshore Windfarm (TBC):** OceanEx Energy - 2 GW
23. - **Wollongong (2030):** BlueFloat & Energy Estate - 1.6 GW
24. - **Novocastrian Offshore Windfarm (TBC):** OceanEx Energy - 2 GW
25. - **Hunter Coast (2030):** BlueFloat & Energy Estate - 1.4 GW

BELGIUM

authored in collaboration with LOYENS & LOEFF

Authored by Adam Smith (Orrick), Oliver Sikora (Orrick), David O'Donovan (Orrick), Thomas Chellingsworth (Loyens & Loeff), Christine Delagaye (Loyens & Loeff) and Laura Pellens (Loyens & Loeff) — refer to page 76 for contact details.

Introduction

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 in 2021, all Belgian offshore wind farms together injected 6.77 TWh of electricity into the transmission grid, representing approx. 8% of total electricity consumption in Belgium.

There are currently nine operational wind farms in the Belgian North Sea, operated by eight different entities. (Please see Map 2) In March of this year, the Belgian government announced that it has the ambition to raise its offshore wind target to 8 GW by 2030. It aims to achieve this principally through (i) a second offshore wind zone (the **Princess Elisabeth Zone**) and (ii) increasing the capacity of the existing offshore wind zone (the **Eastern Zone**) through repowering.

The First Offshore Wind Phase

The Eastern Zone is Belgium's first offshore wind zone and was completed following the commissioning of the Northwester 2 and the SeaMade wind farms (Seastar and Mermaid) in 2020.

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 projects 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 (the **Spatial Plan**) established plans for the new Princess Elisabeth Zone. According to the Spatial Plan, the Princess Elisabeth Zone consists of three areas: Noordhinder North, Noordhinder South and Fairybank (see Map 2).

The new concessions to develop, construct and operate offshore wind projects within this Princess Elisabeth 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 its structuring are ongoing. The government launched a public consultation on the features of the tender earlier this year, which ran from 20 January to 18 February (the **Public Consultation**). The results of the Public Consultation are due to be published later this year.

In any event, the tender process will 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, nondiscriminatory 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 support mechanism, if any, for a maximum of 15 years (although the maximum term of such support mechanism might be extended).

In addition, the Belgian Transmission System Operator (**TSO**), Elia, is working on a second offshore grid extension (see below). Elia also plans to reinforce the existing onshore high-voltage grid (the so-called Ventilus and Boucle du Hainaut projects) to ensure that increasing volumes of electricity generated offshore can be accommodated.

The first portion of the Princess Elisabeth Zone is expected to be tendered by the end of 2023. According to the Public Consultation, bidders are expected to be selected by 2025, and the final taking over of the relevant offshore wind farm must occur within 42 months after the date on which the selected offer is announced to the winning bidder. Installations of new offshore wind farms in the Princess Elisabeth Zone are therefore expected to be delivered mainly by 2027.

For the second and third portions of the Princess Elisabeth Zone, it is expected that the tenders will take place in Q2 2025. Bidders will be selected by mid-2026, and installation must be finalised by the end of 2029.

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/or
- 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 based on a formula that approximates the logic of a one-sided 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 defined, for each calendar year N, as the average in EUR/MWh of the daily prices "Endex Cal + 1" in year N - 1, as published by APX Holding B.V. 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 the CREG must periodically adapt for each concession in principle in light of the PPA selling price). The LCOE for Rentel is EUR 129.8/MWh. For Norther, this is EUR 124.00/MWh. However, during certain periods of negative imbalance or day-ahead prices, the certificate's price is zero. The support term is 19 years from the commissioning of each installation.

For Northwester 2, Seastar and Mermaid, the LCOE is EUR 79/MWh. The 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 is 17 years from commissioning of each installation or 31 December 2037 if this is earlier. The support is also limited to 63,000 full load hours of electricity production at wind farm level (i.e., not on a per-WTG basis). The same rule on zero-pricing of certificates in case of negative imbalance and day-ahead prices applies for Rentel and Norther.

In addition to the above, existing offshore wind projects have 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, taken the form of a capital subsidy and/or an LCOE markup.

The Public Consultation launched in relation to the features of the Princess Elisabeth Zone tender includes consideration of two alternative arrangements for use in the tender, which the government has proposed to put forward following a review of support mechanisms for offshore wind projects in other European countries:

i. a 2-sided contract-for-difference (**CfD**) mechanism; and
ii. a "zero bid" mechanism.

The Public Consultation suggests that the 2-sided CfD mechanism would be based on equivalent mechanisms seen in Denmark and the United Kingdom, while the "zero bid" mechanism would be similar to that employed in the Netherlands. Depending on which support mechanism is selected, the selection criteria for the new offshore wind tenders suggested in the government's consultation document are as follows:

TABLE 1: SELECTION CRITERIA FOR OFFSHORE WIND TENDERS

2-sided CfD	Within area qualified as Natura 2000	Outside area qualified as Natura 2000
Strike Price	70 points	70 points
Energy production	5 points	0 points
Civil participation	10 points	10 points
Local content	5 points	5 points
Sustainability and multifunctional use	5 points	0 points
Impact on nature	5 points	0 points
Innovation and system integration	0 points	10 points
Zero bid	**Within area qualified as Natura 2000**	**Outside area qualified as Natura 2000**
Energy production	17 points	0 points
Civil participation	33 points	33 points
Local content	17 points	17 points
Sustainability and multifunctional use	17 points	17 points
Impact on nature	17 points	0 points
Innovation and system integration	0 points	33 points

Modular Offshore Grid

The MOG is an offshore platform that connects to the Belgian onshore grid through various submarine cables. It has been operational since 2019 and transports the energy generated by the Rentel, Northwester 2 and SeaMade offshore wind projects to the mainland.

In December 2021, the federal Council of Ministers approved the proposal to expand the MOG in light of the development of the Princess Elisabeth Zone. Elia has been asked to assess the prospect of (i) developing an energy island within the Princess Elisabeth Zone, which would (a) serve as an extension of the MOG, accommodating connection facilities for an additional 3.5 GW of power generation and connect the offshore wind farms in the Princess Elisabeth Zone to the mainland and (ii) ensuring interconnection of the proposed energy island with the grids of other countries.

Additionally, in November 2021, the Danish Climate, Energy and Utilities Minister and the Belgian Energy Minister signed a Memorandum of Agreement to support their continued collaboration and to realise a hybrid interconnector, the Triton link, an interconnector cable between two artificial energy islands in the northern and southern parts of the North Sea, which would be the first connection between two energy islands in the world. At the same time, Energinet (Denmark's transmission system operator) and Elia signed a cooperation agreement to establish the Triton link. These agreements were followed swiftly by an agreement on energy cooperation signed between the British and Belgian Energy Ministers, under which the two countries agreed to work towards establishing a second interconnector (in addition to the existing Nemo-Link interconnector).

Power-to-X

In its hydrogen strategy (published in November 2021 and updated in October 2022), the federal government stated that the production of offshore wind energy and hydrogen in the North Sea and surrounding coastal areas is becoming increasingly important. Reference is made to the Esbjerg declaration of May 2022, in which Belgium, Denmark, Germany and the Netherlands committed to increasing their offshore wind capacity in the North Sea to 65 GW by 2030 and 150 GW by 2050 and their renewable hydrogen capacity to 20 GW by 2030.

According to the hydrogen strategy, the federal government wishes to obtain renewable hydrogen from the North Sea or produce hydrogen in the Belgian coastal areas with additional renewable electricity from the North Sea. In that context, a study will be launched to investigate how electricity and hydrogen networks in the North Sea can complement one another.

Several industrial players are already in the early stages of developing green power-to-hydrogen projects. For example:

- **HyOffWind:** A consortium of developers, consisting of Virya Energy and Fluxys, submitted a permit application in relation to the HyOffWind project in late 2021. The project in Zeebrugge involves industrial-scale conversion of electricity produced by offshore wind to green hydrogen, which will subsequently contribute to the flexibility of the energy system (assuming use of the green hydrogen to produce power when intermittent sources of power are less productive). The consortium is expected to make its final investment decision in the second half of 2022, once the permitting process has been completed and subject to the granting of subsidies by the Flemish government (the government previously provided a EUR 8 million grant to the project). If the project goes ahead, it will be built in two phases with the first phase comprising a 25 MW electrolyser, which will then be scaled up to 100 MW in the second phase.
- **HYPORT Ostend:** A consortium consisting of DEME Concessions, PMV and the Port of Ostend announced the development of an industrial-scale green hydrogen production plant in Ostend for the conversion of electricity produced by offshore wind and solar to hydrogen. If the project goes ahead, it will be built in several stages. The first stage would comprise (i) a mobile shore power demonstration project and (ii) an approximately 50 MW electrolyser demonstration project. This will be followed by a second stage in which a large-scale shore power project fuelled by green hydrogen is to be rolled out. By 2025, in the context of the planned new offshore wind concessions, the consortium expects to construct a commercial-scale green hydrogen plant.

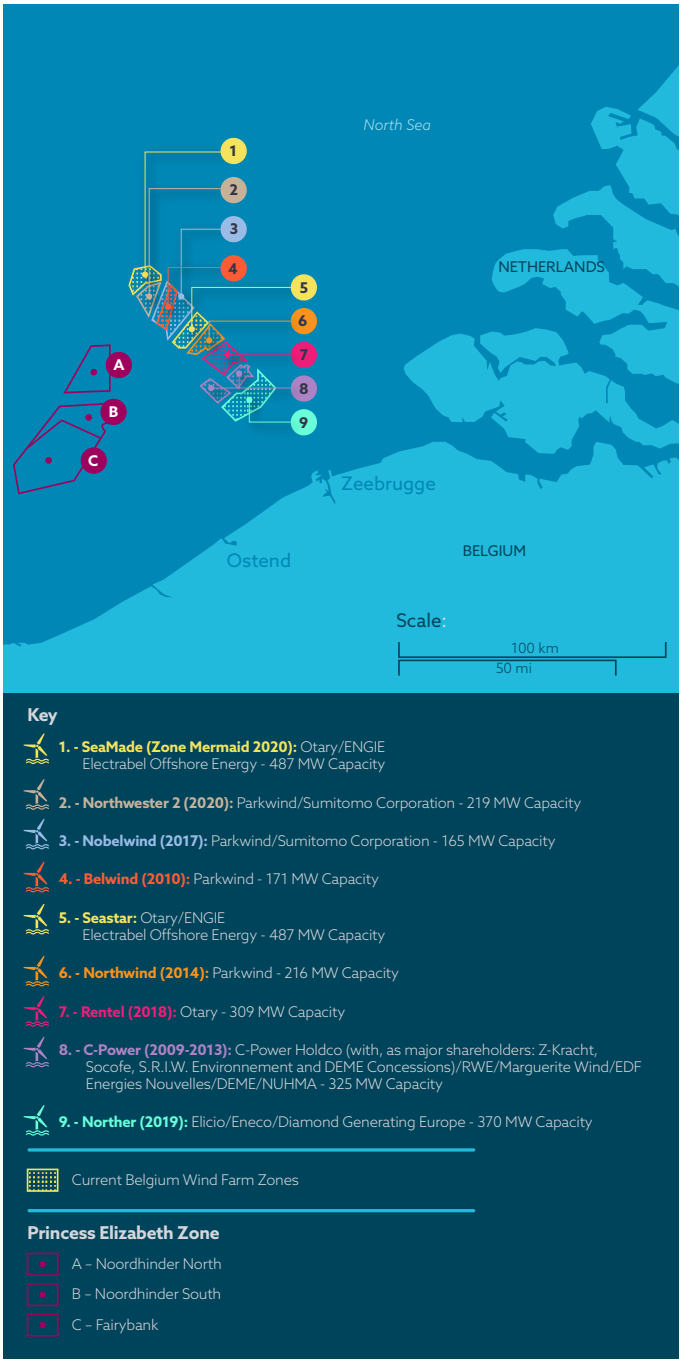
Corporate Power Purchase Agreements

The past year has demonstrated that the market for corporate power purchase agreements (**CPPAs**) in Belgium is becoming more important. For example, in July last year, Air Liquide entered into a CPPA with TotalEnergies' Belgian subsidiary, Lampiris, for the supply of 50 GWh per year for a period of 15 years. The CPPA with Air Liquide follows the entry by Lampiris into a power purchase agreement (**PPA**) with Rentel to offtake all of the output of the latter's offshore wind farm. In January 2022, Ineos announced that it had entered a 10-year CPPA with Eneco to offtake 250 GWh per year in relation to the SeaMade wind farms, representing approximately 13.5 percent of its total capacity. Additionally, in February of this year, Umicore announced that it had entered into a CPPA with Engie to offtake 100 GWh per year until 2030, also in relation to the SeaMade wind farms.

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 enhanced levels of power generation but will require a different approach given the new tender process and proposed introduction of support schemes which have proved successful elsewhere in Europe. The immediate success of the second phase will largely depend on the federal government design of the new tender process following this year's public consultation. The most unpredictable obstacle would, however, appear to be the reinforcement of the onshore grid needed to accommodate the additional offshore capacity and, in particular, the permitting/appeals process.

MAP 2: BELGIUM'S OFFSHORE WIND PROJECTS



BRAZIL

authored in collaboration with **Lefosse**

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Brazilian Offshore Market

With almost 7,500 km of coastline and rich offshore wind resources, Brazil is set to pioneer the development of offshore wind in Latin America. In January this year, the Brazilian offshore wind market finally began to pick up some momentum, taking a first step towards a clear regulatory framework with the publication of a piece of legislation regulating the granting of regulatory authorisations for offshore wind power generation projects.

Big Potential — Potential for 700 GW?

According to some officials and members of the current Brazilian government, Brazil has the potential to build up to 700 GW of offshore wind capacity. Brazil's potential for offshore wind development is based on the length of its coastline, the depth of waters available, and the strength of the winds that blow off its coastline, especially in waters adjacent to Brazil's northeast states. Even though offshore wind electricity generation is not expected to effectively start until 2028, the current projects under review have already positioned Brazil among the world's leading powers in the sector.

Although the offshore wind installation capex is not yet as competitive as other consolidated power generation sources in Brazil (such as onshore wind and solar), as the offshore industry and technologies evolve and become more mature, it is expected that such capex costs will drop, as seen in other offshore wind markets. In this regard, observations from other, more mature, offshore wind markets demonstrate that incentives (including subsidies and tax credits) and macro support programs will be key for Brazil's offshore wind market to be successful.

A legislative and regulatory journey that has finally begun

On 25 January, the Brazilian government published initial guidelines for offshore power generation (Federal Decree No 10.946 **Federal Decree**)—known as the Legal Framework for Offshore Energy. This long awaited legal framework was a key first step for facilitating an investment boost that will hopefully meet the country's ambitions regarding offshore wind power.

The Federal Decree took effect on 15 June. On 20 October, the Ministry of Mines and Energy (MME) published two ordinances: The Ordinance No. 52/GN/MME (Ordinance 52) and The Ordinance No. 3/MME/MMA (Ordinance No 3). Both ordinances observe article No. 28 of the Federal Decree that provides for MME to act as regulator. While Ordinance No. 52 prescribes the conditions and ways for leasing offshore areas, Ordinance No. 3 prescribes that all procedures will be conducted through software called PUG-Offshore. These ordinances do not complete the entire legal framework and further complementary regulations will still be necessary. The Federal Decree creates a landmark piece of legislation in Brazil, through prescribing the conditions for the leasing of seabed in inland waters, territorial seas and on the continental shelf for offshore power generation. The Ministry of Mines and Energy will be responsible for defining the areas of seabed that will be available for potential offshore wind power generation, which do not compete with other offshore industries, and undertake the respective auctions for a right to use specific areas of the seabed and onshore areas required for the development, construction and operation of the proposed offshore wind farm. It is worth mentioning that the Brazilian government will also consider direct approaches from developers interested in developing offshore wind projects outside the areas assigned for offshore wind power generation by the Ministry of Mines and Energy.

Although the size of assigned areas, and when the auctions will be carried out, is yet to be determined, official sources said the first of such offshore wind land right auctions may be held soon.

Initial market reaction

The Federal Decree has been well received by market players. In an offshore wind market that is still taking its initial steps, visibility and clarity from a regulatory standpoint are key to enabling and fostering investment. Since the publication of the Federal Decree, various developers and investors have announced their plans for several gigawatt-scale offshore wind farms in Brazil, including Shell announcing in March that it plans for 17 GW of offshore wind in Brazil. Based on information disclosed by the Brazilian Institute of Environment and Renewable Natural Resources (**IBAMA**), as of August 2022, the list of offshore wind power projects undergoing environmental licensing includes 66 projects, totalling roughly 169.4 GW of capacity. A developer is required to hold its basic environmental licences before it participates in an auction for the offtake of power from the wind farm. No such environmental licences are required to participate in the auction for the right to use an area of seabed.

Appetite to develop offshore wind projects is clearly strong, as shown by the recent announcement from Corio that it plans to develop five offshore wind projects in Brazil, totalling more than 5 GW in capacity.

Federal Decree points that are worth noting

- Establishes a public auction process for the granting of land rights for the implementation of offshore power projects in areas under federal government domain.
- Winning bidders in such auctions will enter into an 'Agreement to Assign the Right to Use' with the Brazilian government followed by the issuance of a generation licence by the regulator (ANEEL).
- The Agreement to Assign the Right to Use will cover both the maritime area and onshore areas required for development, construction and operation of an offshore wind project.
- The Agreement to Assign the Right to Use may adopt one of the following forms: (i) an assignment agreement covering areas defined by the government and subject to an auction; or (ii) an independent use assignment agreement where the area is identified by an interested party and then auctioned to bidders.
- All use assignment agreements shall (i) be preceded by the issuance of a non-interference statement (with other facilities or activities); (ii) be accompanied by technical studies, commissioned and paid for by the developer, which are compliant with statutory rules and duly approved by the regulator; and (iii) be executed through a public bidding process.

Power Purchase Agreements

In Brazil, power purchase agreements (**PPA**) can either be entered into as a result of (a) generators bidding into an auction in the regulated market with the lowest bidders winning the offtake capacity (in this case the PPA is a standard form agreement and the buyer is any distributor or a party accredited in the auction to buy energy); or (b) wholesale energy trading in the free market (in this case the PPA is not a standard form agreement but rather an agreement that follows certain rules prescribed in legislation).

For auction-based PPAs, one of the main challenges to offshore wind projects in Brazil is their cost, which currently results in the power that is generated from the offshore wind project being more expensive than the energy generated by other renewable energy projects (e.g., solar). As such, offshore wind projects would currently lose out in the power auctions mentioned above. If the Brazilian government decides to foster such projects, it will need to provide incentives for consumers and distributors to buy the energy from offshore wind projects.

What's next?

Within the next few months, the Brazilian government is expected to enact complementary regulation to the Federal Decree and to the ordinances detailing and setting forth:

- Rules for determining IRR for use assignments and additional guidance on payments and conditions.
- A draft use assignment agreement within the auction notice, including proposed tenor.
- A schedule and rules for upcoming auctions.
- Procedures and rules for the issuance of non-interference statements.

Green Hydrogen in Brazil—a USD 200 billion investment opportunity over the next 20 years

Brazil has the opportunity to become one of the world leaders in the production of green hydrogen. The total opportunity will amount to USD 15-20 billion in revenue by 2040, with the majority (USD 10-12 billion) of such green hydrogen being used to serve the domestic market, especially trucking, steel production and other energy-intensive industries. Another USD 4-6 billion could come from exports of green hydrogen-derivatives, such as ammonia, to the United States and Europe, as the landed costs of Brazilian green hydrogen would be competitive versus exports from other countries.[1]

The presentation of PL 725/2022 (so called **Draft Hydrogen Act**) earlier this year took place in a very favourable global environment to the promotion of green hydrogen as an important source of energy. PL 725/2002 seeks to establish and set forth incentive parameters for the use of green hydrogen.

Draft Hydrogen Act points that are worth noting

- Provides for a clear distinction between "hydrogen" (defined as pure hydrogen, which natural gas is still the primary source) and "sustainable hydrogen" (defined as hydrogen generated by renewable energy).
- The definition of "sustainable hydrogen" is solely linked to renewable energy as a source of power and not necessarily limited to electrolyser production process.
- Clearly provides for ANP (oil and gas local regulator) as the regulator in charge of regulating, authorising and superseding all activities across the hydrogen chain.
- With the aim of promoting the use of hydrogen, the Draft Hydrogen Act sets forth minimum capacity percentages in the gas pipelines to be allocated to hydrogen transportation:
- 5 percent as of 1 January 2032 (60 percent of which must be sustainable hydrogen)
- 10 percent as of 1 January 2050 (80 percent of which must be sustainable hydrogen)

Conclusion

The publication of both Federal Decree and the Draft Hydrogen Act are key and important steps in promoting offshore energy and hydrogen markets, respectively, in Brazil. This is a unique opportunity to create sustainable wealth in Brazil and the world.

Brazil is now establishing a legal and regulatory framework that may offer the guidance and clarity that market players and investors have been actively seeking. The first step has been taken. Brazil must now focus on certain immediate actions, such as to continue developing the regulatory framework and to establish long-term domestic and international demand to provide backing for project funding. Both private and public sectors must engage in serious and productive discussions to come up with a national plan to ensure that Brazil will be able to use its natural resources sustainably and become one of the global leaders in offshore energy and green hydrogen.

1. Source: article published by McKinsey & Company on 25 November 2021.

DENMARK

authored in collaboration with ACCURA

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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 that 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. Together, the islands are expected to host an aggregate electrical capacity equal to 5 GW, with the potential to increase this to 12 GW in the future.

The past year has also seen (i) Denmark increase its 2030 target for offshore wind capacity to 12.9 GW pursuant to a sub-agreement to the Finance Act 2022; (ii) numerous projects being progressed to varying degrees (including lottery success for RWE on Thor and soft foundations proving to be a setback on Hesselø); and (iii) significant activity in, and support for, the Power-to-X space.

North Sea Energy Island

The Danish government approved plans to construct an artificial multiphase North Sea Energy Island in February 2021, which will be located 80 kilometres off Denmark's west coast. The government will take a minimum 50.1 percent stake in the project and a legal framework will be developed to tender the remaining 49.9 percent stake, which will provide an exciting opportunity for offshore wind farm developers and investors. The official tender is expected to be launched in Q3 2023, with a preferred bidder announced in 2024. The Danish Energy Agency (**DEA**) and the Transmission System Operator (**TSO**), Energinet, will also conduct environmental studies, focusing on the impact of the artificial island and its accompanying offshore wind turbines on the surrounding seabed, which are to be completed by 2024. The island is expected to begin to be operable by 2033 (parties to the green sub-agreement to the Finance Act 2022, signed in December 2021, have agreed to develop the North Sea Energy Island to its full capacity as soon as possible, with 2040 as the target point). The first phase (of 3 GW) is expected to cost around 210 billion DKK (approximately EUR 28 billion). The North Sea Energy Island will connect and distribute power from surrounding offshore wind farms, eventually incorporating up to 10 GW of renewable energy capacity.

The North Sea Energy Island may also connect to various European countries. Belgium, the Netherlands and Germany could all benefit from the project. In November 2021, a formal political Memorandum of Agreement was signed by Denmark and Belgium to establish a connection between the countries premised on the North Sea Energy Island. Germany supported the agreement; however, it is yet to enter into an equivalent agreement with the Danish government.

Baltic Sea Energy Island

The Baltic Sea Energy Island will be located on the island of Bornholm in the Baltic Sea. Technical facilities on the island will serve as a hub for offshore wind farms off the coast, supplying 3 GW of energy. The offshore wind farms that will connect to the island will be constructed approximately 15 kilometres to the south and south-west of Bornholm. The Danish parliament has set a target of 2030 to carry out these activities.

Similar to the North Sea Energy Island, neighbouring European countries could benefit from the Bornholm Energy Island. A direct connection to Poland has been earmarked. In January 2021, the German transmission system operator, 50 Hertz, and the 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 carried out studies throughout 2021 to confirm if the joint project is viable, which resulted in the Danish and German governments entering into a political agreement (although the final terms of the contract are yet to be concluded). Additionally, Energinet earlier this year started onshore field investigations to assess the potential to connect the Bornholm Energy Island to the power grids on New Zealand and Bornholm.

Project Pipeline

As well as the announcement of the new Energy Islands, there are several offshore wind projects that are currently in the pipeline. Pursuant to the Energy Agreement of 29 June 2018, the Danish government set a target of approximately 55 percent of Danish energy consumption to be derived from renewable energy by 2030. 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. The DEA received a total of six applications from consortia and companies that qualified to participate in the tender process.

More than one bidder offered to build the project to the maximum capacity of 1 GW at the minimum price of DKK 0.01/kWh, which meant the tender had to be decided by a lottery draw, with RWE being the lucky winner. In addition to the development of the Thor offshore wind farm, RWE will also be responsible for developing and constructing access to the Danish electricity grid. This is unlike previous offshore wind projects in Denmark, whereby the TSO was responsible for the offshore grid connection.

Danish offshore wind projects established via tender are entitled to a 20 year "Contract for Difference" (**CfD**) subsidy. The Thor project will follow the CfD model where RWE is entitled to receive a price premium calculated at the difference between the tendered bid price (DKK 0.01/kWh) 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. Given RWE's bid price of 0.01/kWh, in reality there will be no financial assistance provided by the state to RWE and the wind farm will be run on purely commercial terms, with power sold to the grid on a merchant basis. Additionally, as RWE won the tender with an offer of approximately DKK 2.8 billion, Thor offshore wind farm will be the world's first 'negative-subsidy' offshore wind farm (i.e., it will be constructed with payments to the state). It is anticipated that RWE will pay the DKK 2.8 billion to the state between 2025 and 2028.

Hesselø Offshore Wind Farm was the second offshore wind farm to be announced pursuant to the Energy Agreement of 29 June 2018. The Hesselø project is scheduled to be fully commissioned by the end of 2029 and will have a capacity of between 800 MW and 1.2 GW (depending on tender results). However, the tendering process was suspended in June 2021 to afford the DEA more time to carry out further preliminary site investigations after areas of soft clay were discovered 20–30 metres below the seabed, which would make such areas unsuitable for supporting fixed-bottom foundations and turbines. A new analysis was completed in 2021, and the DEA launched a fresh market consultation with potential bidders in October 2021, but the suspension of the tendering process is likely to delay the progress of the project overall and may ultimately see the project being relocated to an alternative location. The Hesselø project will also follow a similar subsidy scheme to the Thor project, based on the CfD model. A maximum of 1 GW can be delivered to the transmission grid and the DEA is investigating the feasibility of all or part of the excess (i.e., overplanted) electricity being deployed into Power-to-X assets (see Power-to-X section below) or battery assets.

Unsuitable foundations are not the only issue causing delays to the development of offshore projects in Denmark. The development of the Lillebælt Syd project has been delayed a number of times and has now been ongoing for over two years due to issues with the environmental assessment process. The project appeared to turn a corner in July 2021 when Danish utility Sønderborg Forsyning announced that it had entered into a joint venture with European Energy to work together on the development of the project. The joint venture has since been replaced with a joint ownership as Sønderborg Forsyning announced in February that European Energy had purchased 50 percent of the shares in the project. Permission to proceed on development will need to be granted by the DEA before the project can advance to the latter stages.

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.

In addition to the three main projects above, other projects are also moving forward. November 2021 saw separate public consultations opened regarding the environmental impact of the Jammerland Bay and Aflandshage projects. In December, Vattenfall took its final investment decision in its 176 MW Vesterhav Nord and the 168 MW Vesterhav Syd projects, which are expected to become operational by the end of 2023. This also coincided with the successful commissioning of its 604 MW Kriegers Flak project, now Scandinavia's largest wind farm, with enough output to power approx. 600,000 Danish households, following completion of construction in September 2021.

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. On 1 July 2022, an amendment to the Danish Act on the Promotion of Renewable Energy entered into force following a political agreement on the open-door procedure. Following the adoption of the amendment, it is no longer possible to construct offshore wind farms under the open-door procedure further out than 15 km from the coastline. The purpose of the amendment is to reserve the areas outside the 15 km limit to public tenders. However, the parties to the agreement have noted that future exceptions may be relevant to implement if projects include Power-to-X technologies.

Prior to the amendment entering into force, the DEA received 43 applications under the open-door procedure for large-scale wind farms outside of the 15 km perimeter. Out of the 43, the DEA is assessing a shortlist of 16 which are currently undergoing a mandatory hearing procedure with relevant authorities.

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 (Thor, Hesselø and a yet to be confirmed project) are being tendered by the government.

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

- Omø Syd 200 — 320 MW
- Jammerland Bugt — 120 - 240 MW
- Mejl Flak — 60 - 120 MW
- Lillebælt Syd — 160 MW
- Frederikshavn Havvindmøllepark — 21,6 - 72 MW
- Aflandshage — 250 MW
- Nordre Flint — 160 MW
- Kadet Banke Havmøllepark — 504 - 864 MW
- Paludan Flak — 154 - 228 MW
- Treå Møllebugt — 434 - 720 MW

The DEA is responsible for assessing and issuing all licences (both in relation to the tender process and the open-door process). Three licences are required throughout the project life cycle: a licence to carry out preliminary investigations; a licence for construction of the offshore wind project; and a licence for the utilisation of energy.

In August 2021, the Danish Energy Agency launched a new technology-neutral tender for multiple renewable energy technologies, with an 'open-door' procedure in place for offshore wind, meaning developers can apply to develop projects at a location of their choice, instead of competing to build a project at a specific location and of a specific size (which are typically offered through dedicated state tenders). The tender round drew no bids, suggesting that developers are not yet willing to take on for themselves the development risk and cost of choosing where to develop an offshore wind project.

Power-to-X

The Danish government launched its strategy for the development of Power-to-X technology and capacity in December 2021 and announced a DKK 1.25 billion (EUR 161 million) subsidy scheme to support Power-to-X projects with a view to achieving between 4 and 6 GW of electrolysis capacity by 2030, largely underpinned by green electricity generated by Denmark's present and future offshore wind farms (including the offshore wind farms connected to the abovementioned Energy Islands). Numerous Power-to-X projects have already been announced or are underway, for example:

- The 'Green Fuels for Denmark' project, which is linked to the development of the Baltic Sea Energy Island and is targeting a total electrolyser capacity of 1.3 GW. The development is split across three phases and is led by a partnership consisting of Ørsted, SAS, Copenhagen Airports, A.P. Moller — Maersk, DFDS and DSV. Nel, Haldor Topsøe and Everfuel are also partners in the first phase and in the development of the second phase.
- At the end of May 2021, Ørsted and HOFOR (Greater Copenhagen Utility) announced that they had entered into an agreement to work towards enabling Ørsted to offtake the power produced at HOFOR's 250 MW Aflandshage offshore wind farm project, which is expected to contribute to parts of Green Fuels for Denmark's second phase (which is on an accelerated timeline, with a target of rolling out 100 MW of the project's 250 MW electrolysis capacity by 2025) as well as providing power for the first phase. Ørsted has also announced that it intends to build its first carbon capture facility at the Avedøre Power Station in Copenhagen, subject to the Green Fuels for Denmark meeting certain developmental milestones.
- In September 2021, Swiss energy company H2 Energy Europe acquired an 11-hectare site near Esbjerg for a 1 GW offshore wind-to-hydrogen project that could be operational by the end of 2025, adding to the announcement by Copenhagen Infrastructure Partners in February 2021 that it plans to build a 1 GW Power-to-X plant in Esbjerg, which will convert power from offshore wind turbines to green ammonia. Finally, earlier this year, European Energy signed a letter of intent to develop (amongst other things) a Power-to-X plant at the Port of Hanstholm.

Corporate Power Purchase Agreements

Activity in Denmark over the past year has underlined the appetite of and the potential for offshore wind project developers to generate additional revenues by entering into corporate power purchase agreements (**CPPAs**). For example, RWE's bid for Thor is indicative of an increasingly popular 'pay-to-play' approach—in return for the amounts it is expected to pay to the Danish government (capped at DKK 2.8 billion), RWE has obtained the licence to operate and produce power for 30 years, with the strong market for CPPAs (driven by not only corporates (see for example Danfoss' CPPA entered into with Ørsted) but also the demand for wind power to support the development of the Energy Islands and various Power-to-X projects (for example, Green Fuels for Denmark)) opening up the potential to develop diversified revenue streams through a hybrid revenue stack. Legislation is expected to be introduced in early 2023 to further accommodate the increased need for direct cable lines between electricity and Power-to-X facilities.

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 and various Power-to-X projects, represent significant steps towards cutting greenhouse gas emissions by 70 percent by 2030. The development of the Energy Islands in particular, which will be the first of their kind globally, will provide a key opportunity for market players looking to capitalise on these innovative infrastructure projects.

MAP 3: DENMARK'S LARGEST OFFSHORE WIND FARMS

FRANCE

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Introduction

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, clarifying and speeding up the competitive bidding process.

French Offshore Wind Sector — A Top National Priority

The multiannual energy programming (*Programmation pluriannuelle de l'énergie*) (***PPE***) for the period 2019–2028 published by Decree No. 2020-456 of 21 April 2020 set ambitious objectives for 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.

The newly reelected French President, Emmanuel Macron, recently indicated that the objective is to implement 50 offshore wind farms by 2050 for a total capacity of 40 GW.

The development of the French offshore wind sector will thus continue with the implementation of fixed-bottom farms but will also gain momentum with the development of several floating farms in the coming years.

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

As of today, the development of additional fixed-bottom offshore wind farms is expected to continue with at least two projects in the pipeline (see below).

B. THE DEVELOPMENT OF COMMERCIAL OFFSHORE FLOATING WIND FARMS

Floating wind turbines can generate power in deep water where the wind may be stronger and more consistent. Furthermore, the installation of floating wind turbines does not require the developer to build heavy foundations integrated into the seabed or use special construction vessels needed for fixed-bottom offshore wind turbines. The French Environment and Energy Management Agency has already launched several calls for pilot floating offshore projects. These projects benefitted from grants authorised by the European Commission.

Given the promising nature of floating wind technology, the French government showed its support for this technology by including floating offshore wind turbines in the PPE for the period 2019–2028.

As detailed below, two calls for tenders have been launched for offshore floating wind farms: (i) a first call for tenders was launched in April 2021 for a 250 MW floating offshore wind project in Brittany; and (ii) a second call for tenders was launched in March 2022 for two floating offshore wind farms in the Mediterranean Sea with a capacity of 250 MW each (see Map 4 below).

Retrospective and Overview of the Existing French Offshore Wind Farms Pipeline

The French offshore wind project pipeline is busy with five projects being launched in the last two years.

A. TENDER ROUNDS 1 AND 2 AND THE FIT — A CHALLENGING START

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 (500 MW); (ii) Fécamp (500 MW); (iii) Courseulles-sur-Mer (450 MW); (iv) Saint-Brieuc (500 MW); and (v) Saint-Nazaire (480 MW).

A second call for tenders was launched in March 2013 and targeted two zones: Le Tréport (500 MW) and a zone between the islands of Yeu and Noirmoutier (500 MW) for a total installed capacity of 1 GW.

These projects were awarded feed-in tariffs (**FiTs**) as opposed to a contract for difference (**CfD**) (see below).

The procedures for these tenders experienced various issues, including 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 FiTs resulting from these tenders were high when compared to the decreasing construction costs of offshore wind farms (the FiTs awarded ranged between €180 and €230/MWh at the time). This discrepancy led the French government to reconsider carrying on with these projects. However, the abandonment of the projects was avoided thanks to a renegotiation of the FiTs between the French government and the developers (leading to setting FiTs in the range of €131/MWh and €155/MWh). The newly agreed FiTs were validated by the European Commission on 26 July 2019, and the continued development of these projects was able to begin.

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.

The (i) Fécamp, (ii) Courseulles-sur-Mer, (iii) Saint-Brieuc and (iv) Saint-Nazaire projects are under construction and are expected to be commissioned in 2023.

B. TENDER ROUND 3 — A MOVE TO COMPETITIVE DIALOGUE PROCEDURE AND TRANSITION TO CFDS

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

This call for tenders was the first one to be carried out through a competitive dialogue (*dialogue concurrentiel*), meaning that the French government and the bidders discussed certain terms and conditions of the project before the French government issued the final version of the specifications (cahier des charges) of the project. Since Round 3, the competitive dialogue procedure has been the procedure chosen by the French government to award projects (see below).

Round 3 is also a cornerstone for the subsequent rounds as it provided, for the first time, for the conclusion of a CfD rather than awarding a FiT (see as a comparison with Tender Rounds 1 and 2). 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/MWh.

C. TENDER ROUNDS 4, 5 AND 6 — CONFIRMATION OF FRANCE'S OFFSHORE WIND MOMENTUM

An additional fixed-bottom offshore project was called to tender on 15 January 2021 in the French exclusive economic zone 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. A total of six developers, who met the pre-qualification requirements or criteria provided for by the pre-qualification document (*"document de consultation"*), were selected.[2]

These six developers participated in the competitive dialogue, which lasted several months with the French government, and had to submit their bids (*"offre"*) before 10 November 2022. The maximum CfD reference electricity tariff has been set at €75/MWh in the final version of the specifications.[3]

Additionally, for the first time, a commercial floating wind farm project with a total installed capacity of 250 MW near the coast of Brittany was launched on April 2021 (Round 5).[4]

Interested developers were required to submit their applications (*"candidatures"*) for pre-qualifications by 1 July 2021. A total of 10 developers, who—as for round 4—met the pre-qualification requirements or criteria provided by the pre-qualification document, were selected to participate in the competitive dialogue.[5] The competitive dialogue procedure should be over by the end of 2022, following which developers will have to prepare and submit their bids.

Round 6 was launched in March 2022 and aims, as indicated above, to award two offshore floating wind farms in the Mediterranean Sea. The developers had to submit their pre-qualification applications by 23 May 2022. A total of 13 developers met the pre-qualification requirements or criteria provided for by the pre-qualification document (*"document de consultation"*) and were selected to participate in the competitive dialogue.[6]

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1. The public debate 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 selected developers are (i) Eoliennes en Mer Manche Normandie – EDF, Enbridge and CPPIB, (ii) Iberdrola, (iii) Ocean Winds – Engie and EDPR, (iv) Shell, (v) Total and RWE and (vi) Vattenfall, German wpd and Banque des Territoires.

3. See, https://www.cre.fr/media/Fichiers/publications/appelsoffres/dialogue-concurrentiel-1-2020-telecharger-le-cahier-des-charges-notifie-aux-candidats-le-11-04-2022 (in French; no English version available).

4. Although floating wind turbines have been installed in France since 2018, these projects were pilot projects and only concerned a limited number of turbines.

5. The selected developers are (i) a consortium between CIP and ENI, (ii) Eoliennes Flottantes Bretagne Grand Large (SPV between EDF Renouvelables and Maple Power), (iii) a consortium between Elicio and BayWa r.e., (iv) Equinor, (v) Iberdrola, (vi) Ocean Winds – Engie and EDPR, (vii) RWE, (viii) a consortium between Shell, Valeco and Eolien en Mer Participations, (ix) a consortium between TotalEnergies, Green Investment Group and Qair and (x) a consortium between wpd, Vattenfall and BlueFloat Energy.

6. The selected developers are (i) a consortium between BlueFloat Energy, Sumitomo Corporation and Akuo Energy, (ii) Eoliennes Occitanie Grand Large and Eoliennes Méditerranée Grand Larges (two SPVs between EDF Renewables and Maple Power), (iii) a consortium between Elicio and BayWa r.e., (iv) Equinor, (v) Iberdrola, (vi) Ocean Winds (a joint venture between Engie and EDPR), (vii) a consortium between RWE and Bourbon, (viii) Les Moulins du Leonis, a consortium between Shell, Valeco and EnBW, (ix) Archipel Energie Martine, a consortium between TotalEnergies, Qair and Corio Generation, (x) Skyborn Renewables, (xi) Vattenfall, (xii) Cobra Instalaciones y Servicios S.A. and (xiii) Eni Plenitude.

One interesting aspect to note with respect to Round 6 is that a unique competitive procedure has been launched for the award of both projects (each project being a separate lot). The competitive dialogue procedure is still ongoing to date.

D. TENDER ROUNDS 7 AND 8 — CONTINUATION OF FRANCE'S OFFSHORE WIND MOMENTUM

Round 7 and Round 8 are at an early stage of development but have been confirmed by the French government during Summer 2022. Competitive dialogue for these projects is expected during the first trimester of 2023.

In a nutshell:

- with respect to Round 7, 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—ended in February 2022. Round 7 relates to the implementation of a fixed-bottom offshore wind farm (for an installed capacity ranging between 500 MW and 1 GW) near the Island of Oleron. The French Minister in charge of energy confirmed the pursuit of this project in a decision dated 27 July 2022. The competitive dialogue procedure was launched by the Energy Regulatory Commission (the *Commission de Régulation de l'énergie* or ***CRE***) on 21 October 2022.[7] The interested developers have until 23 December 2022 to submit their applications. The commissioning of this wind farm is expected in 2030; and with respect to Round 8, the public debate ended on 16 May 2022. Round 8 relates to the implementation of a fixed-bottom offshore wind farm (for an installed capacity of at least 1.5 GW) in Normandy. The Minister in charge of energy confirmed the pursuit of this project in a decision dated 9 August 2022. The competitive dialogue procedure was launched by the CRE on 21 October 2022[8]. The interested developers have until 23 December 2022 to submit their applications. The commission is expected to be awarded in 2031.

Brief Description of the French 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 several 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 CRE. This procedure may take the form of a competitive dialogue (*"dialogue concurrentiel"*) or a bidding procedure (*"appel d'offres"*). Since Round 3, the competitive dialogue procedure has always been chosen by the French government for all tender rounds but the large number of planned projects and the maturity of the industry, in particular for fixed-bottom wind farms, could lead the French government to standardise procedures and switch to a lite version of this procedure or even a bidding procedure for some future projects.

Permitting

A. DEVELOPER'S PERMITS

When the project is built within the public maritime domain,[9] 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 less than or equal to 1 GW.

In addition to the operating permit, the operator must obtain two main authorisations: (i) an environmental authorisation and (ii) an authorisation to occupy the public domain, it being specified that the duration of such authorisation is of 40 years maximum.

A single authorisation is instead required when the project is built within the French exclusive economic zone (**EEZ**) pursuant to the provisions of Ordinance No. 2016-1687 of 8 December 2016 and Decree No. 2013-611 of 10 July 2013.[10] The maximum duration of such authorisation is 40 years, but discussions are currently ongoing to extend this duration up to 50 years.

One significant aspect to bear in mind is that these authorisations are obtained through application to the relevant authority (and not through a competitive process) after being awarded the project.

B. GRID CONNECTION PERMITS

The grid connection permits are the responsibility of the French operator of the public power transmission system, *Réseau de Transport d'Electricité* (**RTE**).

Furthermore, the expenses related to the grid connection are borne by RTE since 2017 (see below).

Reforms

On the basis of the experiences derived from the previous call for tenders, several amendments to the regulatory regime are worth noting.

A. GRID CONNECTION

As highlighted above, the French 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, **RTE**, carries out, at its own expense, the grid connection of the offshore wind project pursuant to a strict 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.

7. See, https://www.cre.fr/Documents/Appels-d-offres/dialogue-concurrentiel-n-2-2022-portant-sur-une-installation-d-eoliennes-en-mer-posees-de-production-d-electricite-en-sud-atlantique-au-large-de-l.

8. See, https://www.cre.fr/Documents/Appels-d-offres/dialogue-concurrentiel-n-3-2022-portant-sur-un-second-projet-d-installation-d-eoliennes-en-mer-posees-au-large-de-la-normandie-au-sein-de-la-zone.

9. The public maritime domain (**DPM**) corresponds essentially to the territorial sea. It is 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.

10. 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.

B. INSURANCE

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 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"

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." The "envelope 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. Without this legislative flexibility, an offshore wind developer would need to seek consent from the relevant authorities each time there was a change to the characteristics or technologies adopted by an offshore wind project during its development and construction, which would lead to delays in the completion of the relevant project.

D. SIMPLIFYING THE PROCEDURE

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

With respect to the public debate, which is required to be held for determining the viability of the project and the area within 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 debate, which was not previously possible (although we note that the competitive dialogue cannot start before the results of the public debate are published), and (ii) launch a unique public debate for determining several areas for offshore wind projects in the same seafront (*façade maritime*). 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 brought against a project's authorisations, France's highest Administrative Court (the *Conseil d'État*) is now in charge of examining "*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 at reducing the challenges targeted against developers and therefore allow projects to be more quickly developed (cf. Art. L 311-13 and R. 311-1-1 of the French Administrative Code).

E. ADJUSTING THE LEGAL REGIME APPLICABLE TO THE FRENCH EXCLUSIVE ECONOMIC ZONE

Given that several projects could be implemented in the French EEZ, the applicable legal regime has been modified in order to take into account the specifics of such projects.

Ordinance No. 2016-1687 of 8 December 2016 was modified by Law No. 2021-1900 of 30 December 2021. Modifications of Ordinance No. 2016-1687 relate to (i) the fee (redevance) that could be requested from the developer by the French authorities for the occupation of the EEZ and which now can be "*set at zero*" (Art. 27 of Ordinance No. 2016-1687),[11] and (ii) the tax regime applicable to offshore wind turbines, which has been specified (Art. 36 of Ordinance No. 2016-1687).

With respect to Decree No. 2013-611 of 10 July 2013 which was modified by Decree No. 2021-1942 of 31 December 2021, the following modifications can be highlighted:

- the regime applicable to the obtention of a temporary authorisation to carry out, for instance, studies has been amended (Art. 3 of Decree No. 2021-1942);
- while Article 11 of the Decree sets out a validity period of 48 months for the single authorisation, such period can be set otherwise if it is specified in the tender specifications (*cahier des charges*) of the call for tenders; and
- the conditions under which a single authorisation can be repealed have been further specified and notably (i) include the events in which such repeal may be triggered and (ii) allows payment of a compensation under the conditions provided by the tender specifications (in particular in the event of repeal on grounds of public interest).

11. An order dated 8 March 2022 has since set forth the principles applicable to the fee to be paid for offshore wind farms.

The objective of these amendments is to adapt the EEZ legal regime to offshore wind projects in order to encourage investment and the financing of projects while ensuring the protection of the State's interests as well as the conservation of the area.

F. ADDITIONAL MODIFICATIONS CONTEMPLATED IN THE LEGAL FRAMEWORK APPLICABLE TO OFFSHORE WIND FARMS

The abovementioned legal framework may evolve again within the next few months. A bill to accelerate the production of renewable energy (*Projet de loi relative à l'accélération de la production d'énergies renouvelables*) was introduced before the French Parliament on 26 September 2022 and is currently under discussion. This bill includes several provisions to accelerate and simplify the development of renewable energy in France and, especially, offshore wind farms. Regarding specifically offshore wind, the latest version (dated 4 November 2022, as adopted by the French Senate on first reading) provides, in particular, that:

- selection of power generation facilities as part of a tendering procedure would automatically grant the applicant an operating permit (*autorisation d'exploiter*), even over 1 GW (Article 4 bis of the bill);
- the technical and environmental studies required for carrying out the environmental impact assessment and the design of the project shall be transmitted to the candidates at the latest (i) the year before launching the call for tenders with respect to the technical studies and (ii) at the date of designation of the preferred bidder for the environmental studies (Art. 12 *ter* of the bill). This provision is meant to provide sufficient and precise information to candidates as well as to the preferred bidder in order to speed up the award of administrative authorisations;
- offshore wind farms located partly in the territorial sea and partly in the EEZ shall be subject only to rules applicable to the territorial sea (Art. 13 of the bill);
- administrative courts shall benefit from extended powers when a challenge is introduced against an authorisation granted to an offshore wind farm in the territorial sea or the EEZ. In case any illegal action is found, instead of just cancelling the authorisation, courts would now be able to (i) partially cancel the authorisation so as to allow the administration to resume the instruction of the authorisation at the stage or on the part which was vitiated by the irregularity or (ii) allow a regularisation of the situation (Art. 13 bis and *ter* of the bill); and
- Article 30 of Ordinance No. 2016-1687 would be modified in order to clarify that floating offshore wind turbines are not subject to the rules applicable to ships and create a specific status for them (Art. 14 of the bill).

The bill will be discussed on first reading starting from 21 November 2022 in front of the French National Assembly.

Outlook

As the latest publication of public tenders show, the development of offshore wind projects in France is to be accelerated in order to increase the number of wind farms commissioned within the next 10 years.

If offshore wind constitutes a major priority for France, this priority gained significance since 2021 with not only the spectacular increase of energy prices but also the consequences of the conflict in Ukraine, leading the French government to reflect on the development of nonfossil energy resources.

This momentum also seems to be shared by the CRE,[12] which concluded its advice regarding Round 4 by encouraging the French government not only to accelerate the calendar of the bidding procedures but also to reflect on the legal possibility to launch the next call for tenders with no CfD to be awarded.

12. It can be recalled that the CRE is an independent administrative authority.

MAP 4: FRANCE'S OFFSHORE WIND PROJECTS

Tender Rounds

1. Courseulles, Fécamp, Saint-Brieuc and Saint-Nazaire — (450 MW), (500 MW), (500 MW), (480 MW) — **Tendered 2011–2012**
2. Dieppe-Le Tréport and Yeu-Noirmoutier — (500 MW) — **Tendered 2013–2014**
3. Dunkerque — (600 MW) — **Tendered 2016–2019**
4. Centre Manche — (1 GW) — **Tendered launched in 2020**
5. Sud de la Bretagne — (250 MW) (floating) — **Tender launched in 2021**
6. Méditerranée — (2x 250 MW) (floating) — **Tender launched in 2022**
7. Sud-Atlantique — (500 MW) — 1 GW

The leaders of the consortiums are:

- EDF Renouvelables
- ENGIE
- IBERDROLA
- EDF Renouvelables

Developer to be selected

GERMANY

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Introduction

Germany achieved a cumulative installed capacity of approx. 7.7 GW of operational offshore wind farms in 2021. However, no significant growth was seen from 2019 (when the figure stood at approximately 7.5 GW). The transmission capacity amounted to 8.2 GW. In 2022, two offshore wind farms (Arcadis Ost 1 and Kaskasi) are under construction and have a combined capacity of approx. 599 MW.

Germany has seen a gradual reduction in the number of offshore wind farms being commissioned each year. Fuelled by the energy crisis and the effort to reduce dependance on Russian gas, the German Bundestag has passed a legislative package and substantially amended the existing legislative framework to stimulate further growth in offshore wind. In addition to the already ambitious goals in the 2020 legislative package, the new package substantially increases these. To facilitate this growth in offshore wind, additional sites shall be designated in Germany's Exclusive Economic Zone for the development of offshore wind farms. When putting together this new legislative package, the government determined that the construction of offshore wind farms is in the overriding public interest and serves public safety. The new legislative package shall become effective on 1 January 2023. Offshore wind energy will be a cornerstone in Germany's goal to transfer to predominantly renewable sources of energy within the next 15 years.

2022 Amendment to WindSeeG

In July 2022, 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 key amendments are as follows:

- **Ambitious increase in capacity targets.** The amendment increases the already ambitious goals for installed offshore wind capacity by 2030 to 30 GW in total (i.e., an increase of 10 GW). Further increases to 40 GW by 2035 and 70 GW by 2045 are also contemplated. Following the amendment, installed capacity is expected to be between 8 and 9 GW per year for the years 2023–2024, 3 to 5 GW per year for the years 2025–2026 and 4 GW per year starting in 2025.
- **Tender of not pre-surveyed areas.** The growth of offshore wind energy shall be based on two equally important pillars. In addition to the tendering of areas that have already been pre-surveyed, areas that have not yet been pre-surveyed will also be tendered in the future.
- **Amendments to the tender design.** Tenders for areas pre-surveyed by the German state shall be prioritized for tender, and areas that have not been centrally pre-surveyed will be tendered on two separate tender dates per year. Consequently, the tender design will be adjusted and two different tender designs will be introduced. The period for submitting bids for centrally pre-surveyed areas will be reduced to four months. Bidders are not required to submit any form of collateral at the time of the bid.
- **Introduction of the CfD model and quality criteria.** Two different pricing models shall be implemented. The centrally pre-surveyed areas shall be tendered via 20-year CfD contracts. The areas that are not centrally pre-surveyed shall be tendered using qualitative criteria. The contract shall be awarded to the bidder with the highest score. Evaluation criteria are contributing to the decarbonisation of offshore wind energy development, the most comprehensive marketing of offshore electricity via PPAs, noise pollution and sealing of the seabed associated with the foundation technologies used and contributing to securing skilled labour. A payment from the successful bidder is also included as an additional criterion. The new quality criteria shall counter the fact that in previous years many tenders were awarded as zero-cent bids and a lottery procedure was applied to determine the successful bidder.
- **Acceleration of the regulatory approvals.** Several measures shall be implemented to accelerate the regulatory approvals and process. For instance, environmental assessments and participation rights are much more focused. Aspects that have already been investigated are not capable of being re-evaluated. The requirement for a permit to commence construction will be lifted.

  In the future, the offshore grid connection can be awarded directly after the area has been included in the relevant area development plan. This should accelerate the tender process by several years.

  In the case of centrally pre-surveyed areas, the lengthy and complex planning approval procedure shall be replaced by a more expeditious procedure.

- **Caps.** Due to the implementation of the contracts for the difference model, the legislative package introduced caps for such support mechanism. For tenders in 2023 the cap amounts are 5.8 eurocents/kWh and for tenders from 2024 onwards the cap amounts are 5.4 eurocents/kWh. In view of the current market situation, the government does not expect that any payment will be actually made to the offshore operators under the CfD model.
- **Area development plan.** The area development plan (*Flächenentwicklungsplan*) remains the main planning tool for offshore wind development in Germany. The German Federal Maritime and Hydrographic Agency (**BSH**) is responsible for the development and update of the area development plan. However, the legal and technical supervision over the BSH in connection with the WindSeeG has been shifted from the Federal Ministry of Transport to the Federal Ministry of Economics. This is intended to create a more efficient system.

Currently, the BSH is conducting consultation proceedings regarding the update of the area development plan. To cope with the ambitious targets, the tendering volumes will be substantially increased. In 2023, four pre-surveyed areas in the North Sea with a total capacity of 1.8 GW will be tendered with expected commissioning in 2028. In the same year the tender will also include a further four non-pre-surveyed areas in the North Sea with a total capacity of 7 GW and expected commissioning in 2030.

In September 2022, only one site, located around 85 kilometres north of the island of Borkum, with 980 MW having an expected commissioning date in 2027 was tendered. Initially, RWE received the award for a zero-cent bid for that site. However, Vattenfall has subsequently informed the Federal Network Agency in Bonn that it intends to exercise its right of entry for the site. This is because a previous project under the name "Global Tech II" was originally developed at the same site by a consortium led by Strabag. Vattenfall acquired the project in 2016. In the course of the adoption of the new tendering system in 2017, this area has been included in the new tendering system. Given Vattenfall's efforts in developing this area, Vattenfall holds the so-called right of entry allowing it to squeeze out the winning bidder.

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 Nezzy2 floating wind system in the Baltic Sea. A 15–16 MW full-scale prototype will now be trialed in the China Sea.

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 5: GERMANY'S OFFSHORE WIND FARMS

INDIA

Authored by Adam Smith (Orrick), Oliver Sikora (Orrick), Karthik Kumar (Orrick), Mr. Deepto Roy (Shardul Amarchand Mangaldas & Co), Mr. Dnyanraj Desai (Shardul Amarchand Mangaldas & Co) and Mr. Pranav Nanda (Shardul Amarchand Mangaldas & Co) — refer to page 77 for contact details.

Introduction

Although India has approximately 40 GW of installed onshore wind capacity, its offshore wind potential has not yet materialised. However, that is not through lack of ambition, with at least 17 planned offshore wind projects in the pipeline and the Indian government looking to take advantage of a coastline of 7,600 kilometres (approximately 4,700 miles) and targeting 30 GW of installed offshore wind capacity by 2030.

Such ambitions are a product of India's large coastline and favourable wind speeds, especially off the coasts of the Indian states of Tamil Nadu and Gujarat, as well as recent reports suggesting that India has the potential for 140 GW of offshore wind by 2050. These excellent wind resources will need to be capitalised on by the Indian government to help alleviate power supply constraints in a country whose energy demand is set to double in the next 20 years (and with India committed to seek expanded capacity mainly through its renewable sources). Given that India currently has no operational offshore wind farms, for the reasons we will discuss below, it may be challenging for India to meet these ambitions.

Tamil Nadu and Gujarat — the Test States

As noted above, the Indian states of Tamil Nadu and Gujarat hold the greatest potential for India's offshore wind industry, with estimates suggesting that these states combined could account for 71 GW of India's offshore wind potential, spread across eight separate designated zones. As such, these states are set to be the pioneers in India's nascent offshore wind industry. The government Ministry of New and Renewable Energy (**MNRE**) announced in early 2018 that the first offshore LiDAR (Light Detection and Ranging) systems had been installed by the National Institute of Wind Energy (**NIWE**), an autonomous research and development institution under MNRE, in the Gulf of Khambhat in Gujarat for measurement of wind resources. The NIWE has been collecting wind speed data since November 2017 and the data will be valuable in determining the potential sites for the offshore wind projects.

The Indian government recently announced, through the MNRE, that it is to set up processes to promote the ability for developers to conduct technical studies of these states' offshore wind resources, as well as set up a regulatory framework to establish India's first offshore auctions in these states. NIWE has now proposed to set up an offshore wind energy test facility in the state of Tamil Nadu in Dhanushkodi which is the first of its kind in the Asia Pacific region. The project, funded by the Indian government, is expected to launch in 2024. The project will involve the construction of two wind turbines of over 8 MW capacity and will help to perform studies and collect data on the feasibility of large-scale projects.

This is welcome news for developers who, although they see India's offshore wind potential, have so far held back from pursuing offshore wind projects in the country due to the lack of regulatory framework to provide clarity and promote the development of the country's offshore wind farms. Such progress has spurred confidence in the Indian offshore market, with developers now teaming up with local companies to develop offshore wind projects. This was most recently seen when RWE and Tata Power Renewable Energy announced that they will be forming a joint venture to assess and develop potential offshore wind projects in India, with a particular focus on the states of Tamil Nadu and Gujarat.

Government Support

One of the key challenges holding back India's offshore wind industry is a lack of clear and focussed governmental financial support for the sector. This stems from the fact that India has abundant space and favourable conditions for a thriving onshore solar and wind industry, which are both relatively much cheaper to develop (and therefore support) than their offshore counterpart. The flip side to this is that the Indian government is already well-versed in providing financial support mechanisms in support of the country's renewable power industry, so their implementation should be relatively straightforward.

Proponents of India's offshore wind industry argue that the Indian government should not be deterred by such relatively high initial support costs, as the cost to develop and construct the country's offshore wind projects should fall exponentially over time (and therefore also the required level of support) as a result of using the country's strong existing manufacturing base for renewable technologies, such as the existing onshore turbine manufacturing plants to manufacture offshore turbines.

In recent years, the Indian government has been emphatic in its drive to strengthen domestic manufacturing of solar modules and wind turbines. It has indigenised 70–80 percent of the manufacturing of wind turbine generators with a current annual production capacity of approximately 8,000 MW to 10,000 MW.

As evidence of the government's renewed commitment to manufacture locally, the MNRE issued the Approved Models and Manufacturers of Solar Photovoltaic Modules (Requirements for Compulsory Registration) Order 2019 for the purpose of enlisting eligible models and manufacturers of solar PV cells and modules complying with the Bureau of Indian Standards and the publishing of a list of such manufacturers in called the "Approved List of Models and Manufacturers" (**ALMM**). Project bids after 2 February 2019 must include models and manufacturers from the ALMM list in order to be eligible for use in government/ government-assisted projects. A similar list of approved manufacturers has also been developed for wind turbine manufacturers.

Earlier this year, while addressing the ministerial meeting for clean energy, the Union Minister for Power, Mr. R.K. Singh, noted that the government will soon invite bids for 4 GW of offshore wind off the coast of Tamil Nadu. This will be the first of eight auction rounds planned to be held over the next eight years as India plans to auction areas offshore off the states of Tamil Nadu and Gujarat each year until 2030. Four GW of capacity will be auctioned each year until 2025, which will then rise to 5 GW of capacity per year in the following five auction rounds. The tender for the construction of 1 GW of offshore wind off the coast of Gujarat has received the approval from the Ministry of Finance for viability gap funding (VGF) from the government, so as to make the projects financially viable.

According to a strategy paper on offshore wind prepared by the MNRE, a total of 16 zones have been identified off the coasts of Gujarat and Tamil Nadu for harnessing offshore wind energy. The government has proposed three models for the development of offshore wind projects in these zones.

The first model would apply to projects that are located in demarcated offshore wind zones for which the government has carried out detailed studies and surveys. Currently, one zone off the coast of Gujarat is reserved to be considered under this model. Under this model, MNRE or its designated agency will enter into a lease agreement for 30 years with each successful bidder.

The developer will be required to pay an annual lease fee for the entire lease period.

The second model will apply for offshore wind projects for which the government has not conducted detailed surveys. Under this approach, offshore wind developers may select an offshore site within the identified zone and carry out the required surveys themselves with the approval of MNRE, subject to obtaining any permits which are required from various departments to carry out such surveys.

Under the third model, NIWE will, from time to time, identify large offshore wind zones within the exclusive economic zone (**EEZ**) but not covered under either of the other two models. The proposed offshore wind sites demarcated within these zones would be allocated for a fixed period on a lease basis through a single-stage two-envelope bidding process. Power generated from such projects will be used for either captive consumption under the open access mechanism, sold to any entity through a bilateral power purchase agreement or sold through power exchanges.

The Union Minister for Power also stated that power transmission onshore from offshore substations may be provided free of cost for all offshore wind projects proposed to be constructed by 2030. This would involve the government building the export cable from the onshore substation to the offshore substation. The developers of these projects are also allowed to sell power to any company in India, along with other benefits such as carbon credits and renewable energy credits as the government may implement from time to time.

Additionally, the government is also planning to introduce a production-linked incentive scheme to promote the domestic manufacturing of offshore wind turbines.

On 22 April 2022, India's NIWE and UK's Offshore Renewable Energy (ORE) Catapult announced the signing of a Joint Declaration of Intent (JDI) to establish a five-year collaboration programme involving partnership on research and development, innovation, new technology tests, supply chain growth, etc. It is said to also include wind energy technology demonstration infrastructure in Tamil Nadu and aid in addressing unique challenges in deploying offshore wind. The nations consider this as another step forward towards the 2030 roadmap to cooperate and collaborate on clean energy to support India to unlock its offshore wind potential and help its climate change target.

Following on from this, NLC India Limited (**NLC**), a public sector undertaking under the Ministry of Coal, has entered into a memorandum of understanding (MoU) with NIWE for strategic collaboration in developing onshore and offshore wind power projects in the country. This MoU is aimed at synergising the technical expertise of NIWE and the project development capabilities of NLC. Through the MoU, it is also envisaged to reap the benefit of repowering the operating wind turbines and for better O&M practices in the upcoming and operating wind power projects.

Developers are looking forward to the Indian government providing financial support to the country's offshore wind industry, including details as to the form that the support takes and the method for obtaining such support (which need to be clear and effective).

Permitting and Consents

Another challenge developers face is having to navigate India's convoluted permitting and consent process. Pursuant to India's current offshore wind policy, the NIWE is the body responsible for administering the key required consents and permits to develop an offshore wind farm. Developers will be all too aware of the large number of local community objections that onshore renewables projects have faced in India, which have ultimately resulted in substantial delays to such projects.

Although located offshore, and therefore not likely to receive objections based on visual appearance, the states of Gujarat and Tamil Nadu where the core of India's offshore wind farms are proposed to be located are also the country's key fishing grounds. Therefore, the deployment of wind power plants can be stymied by the fishing industry for reasons such as impact on changes in fish habitat, restricted fishing access, increased competition within a smaller sea area, etc.

As seen in other countries where there is an interplay between the fishing and offshore wind industries, e.g., Taiwan, developers will be keen to engage with local stakeholders from an early stage, including fishing associations to obtain their engagement and buy-in, so as to avoid protests and port blockades during the construction and operation of the project.

Experience with coastal conventional power plants (particularly in coastal Gujarat) demonstrates that environment- and fishing-related concerns can significantly delay implementation of projects, particularly in view of the proactive roles played by India's green tribunal and constitutional courts in protecting the rights of indigenous communities and sensitive habitats.

Grid Infrastructure

As is already seen with respect to renewables projects located in certain Indian states, grid infrastructure and 'State Load Dispatch Centres' struggle to absorb increased intermittent loads received from renewable energy projects, with curtailment already an issue which developers of onshore renewables projects face on an intermittent basis. Given the increased power potential of offshore wind farms, compared to their onshore cousins, this is a tangible risk that will need to be addressed.

The associated problem with this is that the distribution companies (**DISCOMS**) which are responsible for building and upgrading the country's grid infrastructure are not profitable, and so do not have the funds required to make such upgrades. Some of the reasons for the DISCOMS' underperformance are recurring issues of high billing and collection inefficiency, low tariffs, huge aggregate technical and commercial losses, poor maintenance and outdated networks. The Indian government has put in place several reform schemes to strengthen the DISCOMS such as a financial restructuring package to prevent the DISCOMS from becoming nonperforming assets (for example, the Reformed Distribution Sector scheme which aims to bring down losses to within 12–15 percent and align the supply costs and revenues to be received by FY 2025, etc). These DISCOMS are responsible for buying and offtaking the power produced from the country's offshore wind farms; however, given that power generated from offshore wind projects will be relatively more expensive than onshore sources, such purchase of offtake would need to be subsidised by the Indian or local state governments, as there are no expectations for this incremental cost to be passed on to the end consumer.

In addition to the above, developers will be mindful that, at present, there is no policy for the delivery and ownership of offshore transmission systems in India, nor any framework for the planning of offshore transmission infrastructure and the country's current connection regime does not address offshore wind.

Corporate Power Purchase Agreements

Recent studies have stated that India is the world's second-largest growth market for corporate power purchase agreements (**CPPAs**). This appetite is largely driven as a result of rising electricity tariffs and commercial consumers' corporate sustainability goals. The appetite from the Indian government to provide direct financial support and develop the offshore wind market is steadily increasing, which is evident by its initiatives in the upcoming bids and potential VGF funding. However, to help the development of the country's offshore wind farms, developers are likely to be eyeing the appetite for CPPAs as well, to potentially create (or form part of) a project's revenue stack.

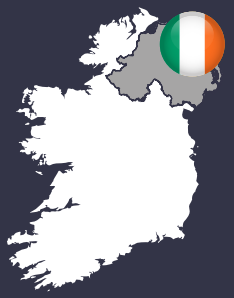
Greener Goals

Given India's strong offshore wind ambitions, it is no surprise that the country has equally strong green hydrogen goals, with the Indian government recently announcing a target of producing five million tonnes of green hydrogen annually by 2030. Indeed, in January of this year, the Indian government announced that it intends to further collaborate with the International Renewable Energy Agency to spearhead the country's renewables and green hydrogen growth.

Conclusion

Evidently, India's offshore wind potential is huge, but this potential will only be met through clear and targeted government support. Provided that there is steady support from the Indian government (which has started to take shape) and changes made to the grid infrastructure, India can achieve its goal of 30 GW installed offshore capacity by 2030.

IRELAND



Authored by Adam Smith (Orrick) and Oliver Sikora (Orrick) — refer to page 77 for contact details.

Big Potential

The Irish government has ambitious targets to install 7 GW of offshore wind farms by 2030, with the potential to increase to 35 GW by 2050. The first projects to be delivered under these policy objectives 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. Several projects are already in the pipeline. In addition, Ireland's west and southwest 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. This potential is reflected in Enterprize Energy's plans to develop up to a 4 GW offshore wind project off the southwest coast of Ireland, which was announced in November 2021, and ESB's Moneypoint offshore wind farm, planned for the Clare/Kerry coast.

A Legislative Wave

The challenges which Ireland faces to meet its initial 7 GW target have been well documented, but there are promising signs ahead. In December 2021, there was a notable development, when the Irish government published and enacted its much-anticipated Maritime Area Planning Act (the **Act**). The Act launched a new streamlined consenting process, which consolidates the previously fragmented consenting process. Pursuant to this new consenting process, developers will apply for a Maritime Area Consent (**MAC**). The MAC process provides for a new "*State consent*" to allow for the occupation of a specified part of the maritime area. Developers are required to hold a MAC before they can apply for a development permit from An Bord Pleanála (Ireland's national independent planning body). Developers will undertake a self-assessment against their financial and technical competency when applying for a MAC, which will then be reviewed by the relevant body (see below). The 'Phase 1 Projects' (discussed below) were invited to apply for their MACs in April 2022 and the first MACs are expected to be granted before the end of the year. In order to implement this new MAC regime, the Department of the Environment, Climate and Communications (**DECC**) reviewed the applications and the Minister for the Environment, Climate and Communications will grant the MACs for the 'Phase 1 Projects.' Once established the Maritime Area Regulatory Authority (a new regulatory authority being established under the Act) will assume this role for all subsequent projects.

The introduction of a new consenting process will be welcome news to developers, as the existing legislative regime was viewed as not fit for that purpose.

The Commission for Regulation of Utilities (the Irish electricity regulator) (the **CRU**) issued its first decision on offshore grid connection policy for the 'Phase 1 Projects' (see below). Under this policy, the 'Phase 1 Projects' became entitled to apply for a grid connection assessment (a precursor to a grid connection offer). 'Phase 1 Projects' that are successful in the ORESS 1 auction (see below) will be eligible to receive a formal grid connection offer for the project. Offshore grid connection policy for later-stage projects continues to be developed by the CRU and system operators.

Phase 1 Projects

There are several offshore wind projects which commenced development under the previous legislative framework (the Foreshore Act, 1933). Under the Act, these projects will benefit from a transitional protocol in the new marine planning process. These so-called 'Phase 1 Projects,' which have a combined capacity totalling approximately 3.5 GW, have been afforded a 'fast-track' into the MAC procedure discussed above and are permitted to engage with EirGrid for grid connection assessments. Obtaining a MAC and grid connection assessment with EirGrid will allow a 'Phase 1 Project' to participate in the support scheme auction scheduled for May 2023 (see Time to Auction below). The Relevant Projects (as also detailed in Map 6) are:

1. Oriel Wind Park;
2. Dublin Array;
3. Codling Wind Park - Codling I;
4. Codling Wind Park - Codling II;
5. Sceirde Rocks;
6. North Irish Sea Array; and
7. Arklow Bank Wind Park Phase 2.

Overall, the 'Phase 1 projects' combined should be able to provide enough electricity to power every home in Ireland, with power to spare.

Phase 2 Projects

The Irish Government has acknowledged that the first phase of offshore wind in Ireland will not be sufficient to reach the 2030 7 GW ambition. As such, an additional phase, comprising projects that can deliver by 2030, is required. These are referred to as 'Phase 2 Projects'.

In December 2021, DECC launched a consultation on 'Phase 2 Projects.' The outcome of that consultation is expected to be published in early 2023.

Time to Auction

On 21 June 2022, EirGrid and DECC published a provisional timetable for ORESS 1 which states that the first offshore wind auction under Ireland's new Renewable Electricity Support Scheme (**RESS**) will be held in May 2023. The structure of the offshore wind auction (or **ORESS 1**) and the draft terms and conditions of the scheme were subject to consultation in Q4 2021. The final terms and conditions are scheduled to be published by the end of Q4 2022.[1] It is expected that ORESS 1 will be the principal route to market for the 'Phase 1 Projects' (discussed above) and that, for future projects, including the 'Phase 2 Projects' subsequent auctions and terms and conditions will be published and held by the Irish government.

ORESS 1 will allow developers to bid for a two-way indexed floating feed-in-premium (**FIP**), with the lowest offer price being successful and subject to a ceiling price. ORESS 1 will be structured as a 'pay-as-bid' auction and will operate similarly to the UK's 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.

ORESS 1 support will be granted up to 30 June 2042, subject to potential extensions for force majeure, commencing on the commercial operations date of the project or on 1 January 2026 (whichever is later). This provides a maximum support period of 16.5 years, which is consistent with that offered by the RESS.

The ORESS 1 terms and conditions set out milestones which, if successful in the auction, a project is required to meet. Such milestones will be set out in an implementation agreement between the developer and the Minister for Environment, Climate and Communications.

ORESS 1 applicants must also provide performance security to the transmission system operator (**TSO**), with the value of the bond to be prescribed in the published terms and conditions. If a project fails to meet any of the contractual milestones set out in its implementation agreement, the TSO will be entitled to make partial draws under the performance security for a failure to achieve interim milestones (subject to a cap of 25 percent in the draft terms and conditions). If a project fails to achieve commercial operations by the date stated in the terms and conditions, then the FIP support period is eroded daily for each day of delay starting from the last day of the support period, subject to a longstop date, whereby, if the project still hasn't achieved commercial operations, the support is withdrawn from that project and the remaining portion of that project's performance security is drawn in full by the TSO.

Corporate Power Purchase Agreements (CPPAs)

CPPAs are already commonplace in the Irish onshore renewables sector and government policy is generally supportive of the development of a CPPA market in Ireland. Subject to the outcome of the auction in ORESS 1, developers of offshore wind farms could choose to pursue CPPAs as an alternative (or complementary) route to market for the offshore wind farms which they are developing in Ireland. However, for 'Phase 1 Projects,' given the proposed interaction with grid connection assessments and grid connection policy, there may be practical challenges in pursuing a CPPA strategy.

Green Hydrogen

The country's propensity for offshore wind power generation has led to many questioning whether the potential to co-locate electrolysers with such offshore wind farms can be capitalised on to produce green hydrogen. The early signs look promising with Enterprise Energy announcing in November 2021 that they plan to build a 4 GW offshore wind farm off the coast of Ireland to power the Green Marlin green hydrogen facility being developed by E1-H2 and Zenith Energy in County Cork.

DECC has stated in the National Energy Security Framework, published on 13 April 2022, that the development of an integrated hydrogen strategy for Ireland is to be prioritised in line with the Climate Action Plan. Following on from that, DECC launched its Consultation on Developing a Hydrogen Strategy for Ireland in July 2022.

Conclusion

2022 has seen significant progress in Ireland's offshore wind journey, with the 'Phase 1 Projects' leading this charge. In order to achieve the goal of 7 GW of offshore wind capacity by 2030, this momentum will need to continue to provide the framework and infrastructure for all future offshore wind projects in Ireland. Ireland's ports in particular will require upgrading to provide the required space, heavy-loading quaysides and deep berths for the offshore wind installation vessels.

1. Readers to note that the details of ORESS 1 quoted in this section are based on the consultation draft terms and conditions, which may change.

In September 2022, Wind Energy Ireland published its National Port Study which provides a synthesis of Irish port infrastructure, with a focus on those ports that are suitable, or have the potential to be made suitable, to support the marshalling of offshore renewable energy projects.

The study considered the existing infrastructure across the entire island of Ireland and the gaps that need to be addressed to ensure Ireland can deliver the projects required to meet the ambitious 7 GW target under the Climate Action Plan.

2021 and 2022 saw a flurry of activity by developers in the Irish offshore wind sector (see Iberdrola's acquisition in February 2021 of a majority stake in DP Energy's 3 GW Irish offshore wind pipeline), as well as significant development activity by many well-known industry players. Therefore, developers clearly see the potential in Ireland's offshore wind industry. As such, the pipeline for future offshore wind projects in Ireland is starting to look promising.

MAP 6: IRELAND'S OFFSHORE WIND FARMS

Key

1. **Oriel Wind Farm:** Parkwind/ESB - Up to 370 MW
2. **Clogherhead:** Parkwind/ESB - 500 MW
3. **Cooley Point:** Hibernian Wind Power (a subsidiary of ESB) - 500 MW
4. **Braymore Point:** SSE Renewables - 800 MW
5. **North Irish Sea Array (NISA):** Statkraft Ireland - 530 MW
6. **Dublin Array:** RWE Renewables/Saorgus Energy - 600-900 MW
7. **Sea Stacks:** ESB - 800 MW
8. **Codling Bank 1 & 2:** Fred Olsen Renewables/ EDF Renewables - Up to 2,100 MW
9. **Arklow Bank:** SSE Renewables - 520 MW
10. **Shelmalere:** Iberdrola/DP Energy Ireland - 1,000 MW
11. **Kilmichael Point:** Hibernian Wind Power (a subsidiary of ESB) - Up to 500 MW
12. **South Irish Sea:** Energia Renewables - 600-900 MW
13. **Helvick Head:** ESB - c.800 MW
14. **North Celtic Sea:** Energia Renewables - 600-900 MW
15. **Celtic Sea Array:** SSE Renewables - 800 MW
16. **Celtic One:** ESB - 800 MW
17. **Inis Ealga:** Iberdrola/DP Energy Ireland - 1,000 MW
18. **Emerald:** Shell/Simply Blue Energy - 1,300 MW
19. **Clarus Offshore Wind Farm:** Iberdrola/DP Energy Ireland - 1,000 MW
20. **Sceirde Rocks:** Corio Generation - 400 MW

JAPAN

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Offshore Wind Promotion Act

Japan has installed approximately 4.6 GW of wind power as of September 2021, 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 government research and testing. That said, developers and industry investors see great potential in Japanese offshore wind, as the era of offshore wind has just started in Japan, with the consortiums for the development of the first four promotion areas having been selected in 2021. The successful developers were chosen through the public bidding process 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, because of the Offshore Wind Promotion Act, developers and industry investors see further opportunity in outer sea areas. TheOffshore Wind Promotion Act enables projects to exclusively utilise a designated outer sea area for up to 30 years (or more if extended). Under the Offshore Wind Promotion Act, the Japanese government will designate "promotion areas" annually, which developers will bid for through a public bidding process pursuant to the public bidding guidelines set for each promotion area by the government. Those selected based on the evaluation on both the price competitiveness and the feasibility of the plan, will obtain permission to use the awarded promotion area to develop and operate a wind farm and benefit from a FiT or an FiP (see below). The Japanese government designated the first promotion area in December 2019 and a further three other promotion areas in July 2020 (please see Map 7 for an overview of Japan's offshore wind promotion areas).

The result of the public bidding was announced for first promotion area (floating wind) in June 2021, and the following three areas (bottom-fixed projects, 1.7 GW in total) in December 2021 (**Round 1**). The latter three promotion areas were won by a single consortium at prices far lower than expected, which caught developers by surprise and thus triggered the debate on evaluation criteria. Faced with a changing landscape in the energy market and after wide-raging discussion on the evaluation criteria, the government consequently announced in March 2022, a potential revision of the guidelines for the ongoing public bidding process for the fifth promotion area (Offshore Happo/Noshiro (Akita)), designated in September 2021.

While the evaluation criteria are being discussed at the expert panel, the government designated three other promotion areas in September 2022. The auctions for these areas and Happo/Noshiro (together, **Round 2**), which have a combined total capacity of 1.8 GW, are expected to be started/resumed concurrently by the end of 2022 under the new evaluation criteria, which will place more emphasis on early COD compared to the old criteria. The government is also suggesting to implement a cap on the total capacity one winner can receive at auctions taking place in the same round (1 GW in total).

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 on 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 successful developers for the four Round 1 promotion areas will be granted a FiT certificate, however going forward, the FiT will not be available for fixed-bottom offshore wind projects in Japan. Consistent with this, the Round 2 projects, which are all fixed-bottom, are only expected to benefit from the FiP support scheme. Floating wind projects will be eligible for both the FiT and FiP support regimes for the time being.

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. Expecting potential ripple effects on the local economy, the Japanese government has been keen to promote offshore wind and related technologies and industries.

Opportunities, Floating and Hydrogen

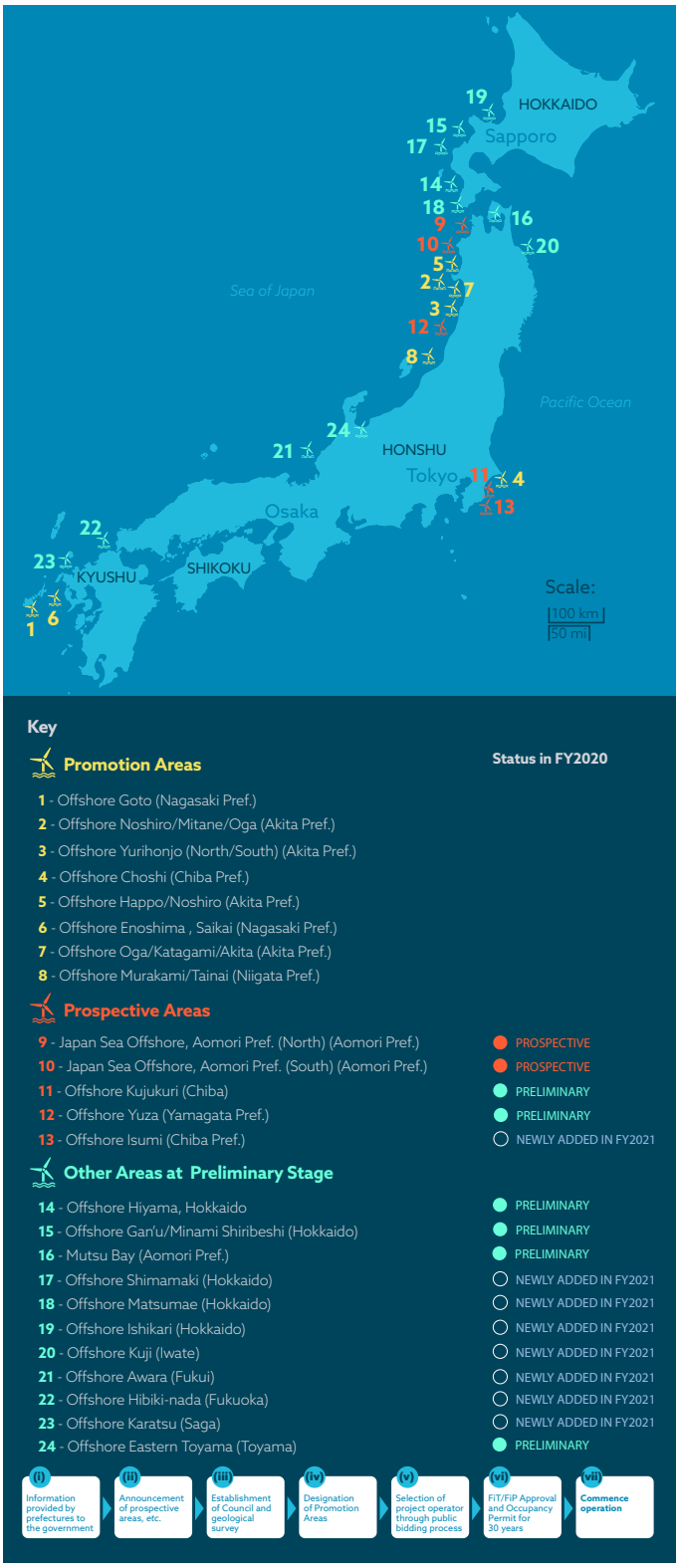
Since the offshore market in Japan has no established players, opportunities for new investors abound, especially considering that numerous foreign companies have recently installed onshore renewable energy projects under Japan's FiT program. European and American companies recognise this potential; 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 lawyers in Tokyo produce periodic updates on Japanese laws and regulations relating to renewables. To subscribe, please email: TokyoRenewableAlert@orrick.com.

MAP 7: JAPAN'S OFFSHORE WIND PROMOTION AREAS



SOUTH KOREA

authored in collaboration with KIM & CHANG

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Bold Ambitions

Although South Korea currently has only around 129.5 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.

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. In 2022, this journey has accelerated with three offshore wind projects totalling 553 MW, either having commenced construction or seeking to reach financial close by next year.

Indeed, these ambitions show no signs of waning, with the South Korean government announcing in February 2021 to support, with the assistance of a number of private power generation companies, the development and construction of what could be the world's largest offshore wind complex—the 8.2 GW greater Sinan Offshore Wind Complex to be developed over three macro-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.

South Korea's offshore wind capacity is expected to be predominantly located within the South Jeolla Province (as part of the greater Sinan Offshore Wind Complex), with additional major offshore wind projects 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 8[1]), 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.

In August 2022, the new administration with President Suk-yeol Yoon assessed the reasonableness of, and reduced, the existing renewable energy supply target of 30.2 percent by 2030 to 21.5 percent. The administration is due to issue their general renewable energy policy soon.

Potential Challenges

Currently, South Korea has a complicated and fragmented permitting process for the development of offshore wind projects, with developers required to obtain multiple permits from various government departments at both a national and local level, which are not always perfectly aligned in terms of process and requirements.

In addition, a developer must prove it has the consent of nearby residents before it can obtain certain permits; this consent is difficult to prove, and many projects are suffering from local opposition. 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. As a result, the Special Act on the Promotion of Wind Power Development and Distribution (often referred to as the **One-stop Shop Act**) was proposed in May 2021 requiring a central administrative agency to be responsible for issuing licences and permits for all wind power projects in South Korea. The One-stop Shop Act is currently under review by the National Assembly.

In addition, as one would expect given its 2,413 km coastline, South Korea's fishing industry is a major employer and generator of GDP, particularly 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 poses 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.

1. Hanlim Offshore Wind Farm (100MW).

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 United Kingdom, 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 permitting problems.

Also, one of the main challenges surrounding what the South Korean government expects regards the use of domestic Korean contractors. There appears to be a degree of expectation from government organisations regarding the use of domestic contractors in order for a project to obtain a REC Offtake Agreement (defined below) with subsidiaries of the majority state-owned Korea Electric Power Corporation (**KEPCO**). To this end, an incentive scheme was introduced by the Korea Energy Agency to grant a more favourable renewable energy certificate (**REC**) multiplier for projects which sources more than 50 percent of their major wind farm components from contractors which manufacture/produce such components in Korea.

Renewable Energy Certificates

Currently, unless a power generator enters into a corporate power purchase agreement (see Power Purchase Agreements below), power generators must generally sell any power that they produce on the single cost-pool wholesale power market, the Korea Power Exchange (the **KPX**), at a spot rate determined by the systems marginal price and in principle, only KEPCO may purchase electricity from the KPX for resale to domestic electric consumers. The inherent price uncertainty of the KPX spot rate will not support project financing on the scale required to fully develop any large-scale offshore wind projects. However, this is mitigated through the issuance of RECs, which may be bought and sold on the KPX-managed REC spot market or through long-term fixed-price contracts for terms of up to 20 years (the **REC Offtake Agreement**).

This supply of RECs to the market is coupled with an enforced demand created by the South Korean government's renewable portfolio standard. Currently, pursuant to the renewable portfolio standard, six KEPCO wholly owned power generation subsidiaries (the **GenCos**), two public institutions and 16 other large generation companies (together, the **Mandatory Generators**) must ensure that 12.5 percent or more of the electricity they supply is derived from new and renewable energy resources (this is set to increase to 25 percent by 2026). If any of these Mandatory Generators fail to meet this requirement through self-generated sources, then they must make up the shortfall through either: (i) purchasing RECs on the KPX-managed REC spot market; or (ii) entering into REC Offtake Agreements to purchase RECs from third-party renewable energy generators through long-term fixed-price arrangements. Such long-term fixed-price arrangements include participating in private contracts or the New and Renewable Energy Center's competitive bidding for fixed-price contracts held once or twice a year.[2] Naturally, for offshore wind projects seeking debt finance, the preferred option would be to enter into REC Offtake Agreements with these Mandatory Generators in order to mitigate revenue uncertainty.

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

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 (the **REC Multiplier**). These RECs have economic value (for the reasons explained above) and provide an additional revenue stream which, through long-term fixed-price contracts (i.e., REC Offtake Agreement), can be projected with long-term certainty to support project financing.

A complicating factor of the REC regime is that the actual REC Multiplier that a project will be entitled to will not be known with certainty until a project is commissioned, as this is when the REC Multiplier is assessed by the New and Renewable Energy Center, which is a subsidiary of the Korea Energy Agency. When an offshore wind project sells its power to the KPX, it will also receive a quantity of RECs equal to 1 REC per MWh of generation multiplied by the REC Multiplier in accordance with the Government Notification of Renewable Portfolio Standard and Renewable Fuel Standard. The REC Multiplier is dependent on several factors, including: (i) the distance between the closest coastline with a KEPCO-owned substation and the centre point of that project's wind turbine closest to such coastline; and (ii) water depth. For offshore wind farms, this REC Multiplier is currently no less than 2.0 for nearshore waters and 2.5 for others.

The economic feasibility of offshore wind in South Korea is also being tested through wider macro-economic factors, as the market price for RECs has been unstable. The price appeared to be decreasing since 2018, which in turn flagged the risk of a reduced fixed-price that a GenCo may offer a project for the RECs produced from its offshore wind farm. Since late 2021, the market price for RECs has started to increase; however, it has been subject to material monthly fluctuations.

This uncertainty around the number of RECs a project may receive, together with the macro-economic market prices, 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 this and, in October 2021, introduced a process that will notify offshore wind project developers of projected REC allotments well in advance of commissioning (although, this projection

2. The New and Renewable Energy Center first introduced the competitive bidding system for fixed-price contracts with respect to solar power in 2017 with the aim to foster the renewable energy industry by offering stable revenue streams for the relevant businesses under long-term contracts. Starting in September 2022, the competitive bidding system has expanded to cover wind power producers. The bidding not only evaluates the pricing but also resident acceptability, economic contribution and system acceptability. The first successful bidder for wind power from the September 2022 bidding will be announced soon.

is not a cast-iron guarantee as to the number of RECs that would be provided, and so some residual uncertainty remains).

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 currently doesn't 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 now enables renewable power developers to enter into either: (i) power purchase agreements (**PPAs**) directly with electricity consumers; or (ii) indirect PPAs with 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.

On 20 April 2021, an amendment to the Electric Utility Act was promulgated into law, signalling the end of KEPCO's monopoly on the resale of electricity by allowing renewable power producers to enter into PPAs with third-party offtakers, rather than selling generated power on the KPX. Meanwhile, two large-scale corporate PPAs for renewable electricity were signed in 2022. In September 2022, the government issued the Notification on Direct Power Purchase Transactions by Renewable Energy Power Suppliers, setting out various requirements for entering into such corporate PPAs.

Although power sold directly under a PPA will not be eligible to receive RECs, the same agency that issues RECs (the Korea Energy Agency) will issue "renewable energy use certificates" to the relevant offtaker with respect to such power. These renewable energy use certificates will include the information currently included in RECs to enable easy tracking of the corresponding environmental attributes and to prevent double-counting by a corporate offtaker for the purposes of its 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 Enerbility 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, as noted above the government is encouraging developers to use the local supply chain through providing enhanced REC multipliers for projects that source more than 50 percent of their major wind farm components from the local supply chain. Therefore, the ability to draw on a strong local supply chain may be critical to foreign developers.

Floating Technologies and Power to "X"

While established fixed-bottom technologies will likely be featured 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 sea floors, the expectation is that floating offshore wind projects will eventually become the dominant form. Indeed, in November 2021, RWE and Ulsan Metropolitan City announced a memorandum of understanding to develop up to 1.5 GW of floating offshore wind projects located off the coast of Ulsan City (although the feasibility of the project was questioned at the recent National Assembly Audit and is under scrutiny by the government).

Given the natural synergies, a number of offshore wind developers with potential projects in South Korea are also looking to co-locate electrolysers with their offshore wind projects, for the production of green hydrogen, possibly for export. Such co-located hydrogen projects are at their early stages.

Expected Market Developments

The year 2023 is expected to see a continued liberalisation of the Korean power market, including as follows:

i. more direct PPAs being entered into between renewable energy generators and electricity consumers;

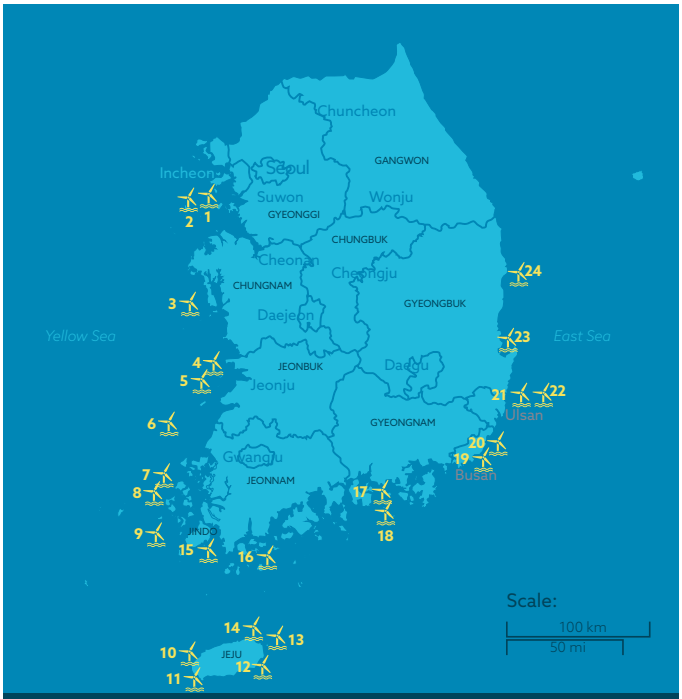
ii. more indirect PPAs (first indirect PPA signed in April 2022) being entered into between renewable energy generators and KEPCO, with KEPCO then entering into a back-to-back PPA with an electricity consumer to sleeve the renewable power supplied from the renewable energy generator;

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 continued use 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 sector.

MAP 8: SOUTH KOREA'S OFFSHORE WIND PROJECTS



Key

1 - **Incheon Offshore Wind** - 600 MW
2 - **Incheon Yeongheung Offshore Wind** - 100 MW
3 - **Taean Offshore Wind** (South Chungcheong Province) - 100 MW
4 - **Gunsan Offshore Wind** - 110 MW
5 - **Southwest Offshore Wind** (Pilot Phase) - 400 MW
6 - **South Jeolla Province Offshore Wind** - 200 MW
7 - **Shinan Offshore Wind** (South Jeolla Provice) - 300 MW
8 - **Jeonnam 1 Offshore Wind** - 99MW
9 - **Shinan Uido Offshore Wind** - 400 MW
10 - **Hanlim Offshore Wind** (Jeju Island) - 100 MW
11 - **Daejeong Offshore Wind** (Jeju Island) - 100 MW
12 - **Pyoseon-Sehwa Offshore Wind** (Jeju Island) - 135 MW
13 - **Handong-Pyeongdae Offshore Wind** (Jeju Island) - 105 MW
14 - **Weoljeong-Haengwon Offshore Wind** (Jeju Island) - 125 MW
15 - **South Korea Government Project** (Jindo Island) - 8,200 MW
16 - **Wando Offshore Wind** (South Jeolla Province) - 400 MW
17 - **Yokjido Offshore Wind** (South Gyeongsang Province) - 350 MW
18 - **Samcheonpo Offshore Wind** - 60 MW
19 - **Haegi Offshore Wind** (Busan) - 540 MW
20 - **Gori Offshore Wind** - 100 MW
21 - **Southeast Coast Offshore Wind** - 99 MW
22 - **Offshore Wind Projects in Ulsan** - 6.1 GW
23 - **Pohang Offshore Wind** - 198 MW
24 - **Yeongdeok-Uljin Offshore Wind** - 200 MW

THE NETHERLANDS

authored in collaboration with LOYENS & LOEFF

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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 objective of the Dutch Climate Agreement is that a minimum of 70 percent of all energy used in the Netherlands will come from renewable sources by 2030. To further this ambition, the Dutch government published the Offshore Wind Energy Roadmap 2030, which set a target to add 7 GW of capacity between 2024 and 2030 to the 4.5 GW that had already been planned under the 2013 Energy Covenant. In November, the government published the Additional Draft North Sea Programme 2022 – 2027, which significantly increases the Netherlands' offshore wind target from the current 11.5 GW to 22.2 GW of operating offshore wind capacity by 2030. For the period after 2030, the government aims to designate space for approximately 17 GW of additional offshore wind capacity through a partial revision of the North Sea Programme 2022 – 2027. The government is expected to decide on this in 2023. Together with around 21 GW of capacity to be realised around 2030, this should enable the Netherlands to realise a further 38 GW of offshore wind capacity in total.

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 Roadmap 2030 and Beyond

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 Roadmap (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 before 2024.

The 2030 Roadmap 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. In October, the Netherlands Enterprise Agency (**NEA**) announced plans to extend the IJmuiden Ver wind farm zone (subject to geophysical investigations). The extended zone would comprise 6 GW total capacity across six sites, increasing the 2030 Roadmap total to nine sites with a total capacity of 9 GW. Studies are expected to be completed by the end of 2024. Additionally, as noted above, the government has published the Additional Draft North Sea Programme 2022 – 2027, which significantly increases the Netherlands offshore wind target from the current 11.5 GW to 22.2 GW of operating offshore wind capacity by 2030. The intention is to develop new offshore wind capacity within newly designated zones as well as the existing zones—in March this year, the NEA confirmed three new wind energy areas—Nederwiek, Lagelander, Doordewind, with the northern part of IJmuiden Ver and the southern part of Hollandse Kust (west) being confirmed as the existing areas that will be used for these developments as well. Spatial planning procedures are already underway.

The Netherlands is also busy laying the foundations for its offshore wind development roadmap post-2030. In July, the government announced that it was studying eight new areas as potential locations where offshore wind farms would be built after 2030. A preliminary study of these areas suggests they have the potential to generate 64.9 GW in additional offshore wind capacity. The Netherlands expects that the country will need at least 38 GW of operating offshore wind capacity to reach the climate-neutral status by 2050, meaning the government will need to develop a minimum of 16 GW of offshore wind capacity between 2030 and 2050, assuming its new ambitious 2030 target is met.

Map 9 shows an overview of existing and new locations of offshore wind farm zones in the Netherlands.

The past year has also seen significant transactional activity in relation to Dutch offshore wind assets, at various stages of development, from pre-construction to fully operational: (i) in June, Ørsted sold a 50 percent stake in Borssele I and II to Norges Bank Investment Management and, later in the year, entered into a loan with Nordic Investment Bank to finance its remaining stake; (ii) June also saw Vattenfall sell a 49.5 percent stake in Hollandse Kust Zuid to BASF; (iii) BASF subsequently sold a 25.2 percent stake to Allianz Capital Partners; and (iv) in December, INPEX Corporation acquired a 50 percent stake in Luchterduinen and a 15 percent stake in Borssele III and IV. The trend looks set to continue this year—in January it was confirmed that Partners Group is seeking to offload its 45 percent stake in Borssele III & IV.

Subsidy vs. Subsidy Free

The Netherlands Enterprise Agency 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. In November, an amendment to the Offshore Wind Energy Act (**OWEA**) came into force to support the offshore wind energy assignment. While the amendment leaves the core intentions of the OWEA intact, important changes have been introduced, including:

- energy carriers other than electricity have been brought within the scope of the OWEA, recognising the Netherlands' Power-to-X potential (see below) (the definition of "wind farm" has been changed as a result and new definitions added for "wind energy" and "connection point");
- two new tender methods have been introduced. The first combines a comparative assessment with a financial bid in which the ranking of the tenderers is determined on the basis of both elements (i.e., the comparative assessment and the financial bid) and the second introduces an auction process in which the wind permit is awarded solely on the basis of the bid price, with the bid price consisting of a fixed amount independent of other factors (e.g., electricity production); and
- the maximum term of a wind permit has been extended from 30 to 40 years (note, existing permit holders can apply to extend their permits from 30 to 40 years).

The amendment to the OWEA has introduced the option to conduct several procedures simultaneously, including the combination of a subsidised and subsidy-free procedure, enabling the government to establish via a single tender whether the wind farm can be developed without a subsidy and, if that is not the case, to proceed directly to the granting of a subsidy and a wind permit (note, where applications for a wind permit can be submitted for multiple tender procedures, the amendment provides for the possibility to limit the number of applications that an applicant may submit to one application).

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 (which includes, for example, 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 assessment.[1]

The tender process of the licensing of the Hollandse Kust (west) VI and Hollandse Kust (west) VII offshore wind zones in the North Sea is ongoing—the auction for the two sites opening for bids closed on 12 May, attracting bids from major players including (amongst others) RWE, Ocean Winds and various consortia, including Orsted and TotalEnergies. The tender is the first time a financial bid (capped at EUR 50 million) by a potential developer is added to the selection process. As of the date of publication, RWE were successful in obtaining the first 700 MW of capacity, under the system integration tender. The remaining results will be announced on 15 December 2022. The preparations for the IJmuiden Ver tenders (4 x 1 GW in Q4 2023) are underway and have been announced in the minister's letter to Parliament of 4 November 2022.

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 that Decision includes all zoning and environmental permitting requirements (EIA, etc.). Therefore, the winning applicant for the licence 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.

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 percent (for subsidy tenders) or 20 percent (for subsidy-free tenders) of the total planned investment of the project and if such equity capital is less than 20 percent for subsidy tenders, confirmation must be provided by financiers in relation to financing the remaining part of the 20 percent; (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 Decision.[2] The comparative assessment was made based on two elements: system integration and environmental impact. For the former, applicants needed to demonstrate how the additional wind capacity is to be integrated in the Dutch onshore power system. For the latter, the applicant needed to demonstrate technical measures that will limit the environmental impact of the construction of the wind farm. For the IJmuiden Ver tenders in Q4 2023, the same criteria will be applied, as per the minister's letter of 4 November 2022.

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.

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.

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 EUR 10 million, granted by a bank established within the European Union, 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 all the 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 all the requirements set out above, while also taking into account the knowledge and experience of the parties involved, the 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 CO_2 reduction, meaning that projects applying for the subsidy will compete on the basis of how much CO_2 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 (**CCS**), aqua thermal power and geothermal energy.

SDE++ opened to applications other than offshore wind at the end of 2020, with a total budget of EUR 5 billion available for 2021. On 8 June, the Ministry of Economic Affairs and Climate announced the results of the first round of SDE++ subsidies, with CCS projects as the big winner, being awarded over EUR 2.1 billion in subsidies.

If offshore wind is tendered with subsidy in the future, it is likely to be auctioned under a separate budget.

Power-to-X

The past year has seen the Netherlands significantly scale up its ambitions, not only regarding offshore wind capacity but also in the Power-to-X space. Notable projects include:

A 200 MW wind-to-hydrogen electrolysis plant in Rotterdam, to be developed by Shell. Operations are due to commence in 2023 and the facility is targeting a generational output of between 50,000 and 60,000 kg of green hydrogen daily. In the summer, Shell also announced that it had signed a memorandum of understanding with Uniper to explore accelerating the development of a hydrogen economy in Europe, including the development of potential synergies to accelerate existing projects in the Netherlands. Additionally. the NortH2 initiative—a project led by a consortium comprising Equinor, Shell, Gasunie and Groningen Seaports—aims to generate 4 GW of green hydrogen by 2030 and 10 GW by 2040.

While growth in the Dutch Power-to-X market is mainly being led by the private sector, government support initiatives have also been rolled out:

The NEA awarded a subsidy of EUR 3.6 million to the PosHYdon offshore green hydrogen pilot project. In December, the NEA also announced that the GROW consortium's (led by Shell) FlexH2 project was awarded a grant as part of the MOOI-SIGOHE tender scheme. The grant of EUR 4 million will be used to fund a research project focused on key aspects of technological innovation in the wind-to-hydrogen space, and is due to run for four years from 1 April. Finally, in February this year, Neptune Energy and RWE entered into an agreement to develop a green hydrogen project called H2opZee, which is supported by the Dutch government although the nature of this support is as yet unspecified.

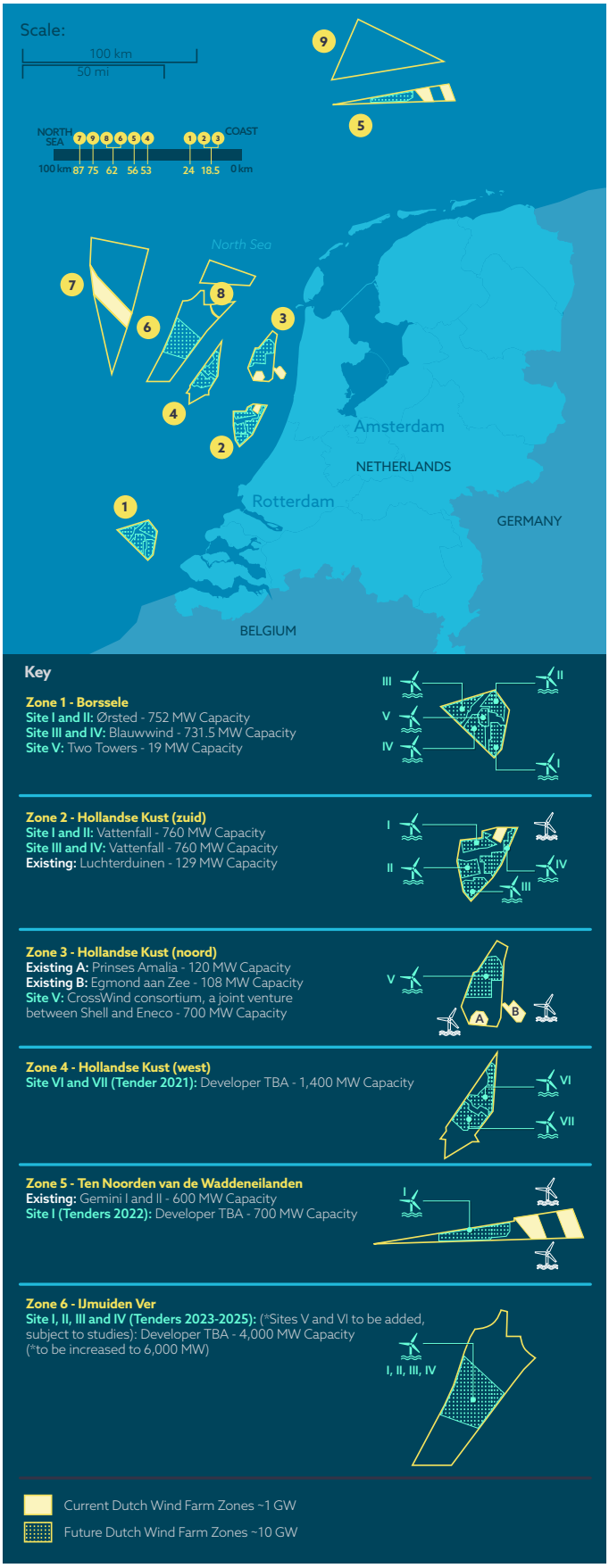
Corporate Power Purchase Agreements

The developing Power-to-X market underlines the potential for offshore wind project developers to generate additional revenues by entering into corporate power purchase agreements (**CPPAs**).

For example, the CrossWind consortium that is developing the Hollandse Kust Noord project last year confirmed that at least part of the electricity generated by the wind farm will be used to power the 200 MW electrolysis plant used as part of the NortH2 project. Power from the project is also expected to power Shell's wind-to-hydrogen electrolysis plant in Rotterdam. In March 2021, Vattenfall entered into a 15-year CPPA with Air Liquide for the purchase of 100 GWh of power from the Hollandse Kust Zuid offshore wind farm, which was increased to an offtake of 500 GWh in 2022. In September 2021, Vattenfall closed a deal with BASF on the sale of 49.5 percent of the Hollandse Kust Zuid offshore wind farm. BASF later sold 25.5 percent of its stake to Allianz Capital Partners.

This is not just confined to Power-to-X however. In July, construction was completed at the Dutch Windpark Fryslân near-shore wind farm, the world's largest wind farm built in a body of fresh water. In addition to selling power to the grid, it was announced in February that USG Industrial Utilities had entered into a 15-year CPPA with the project to acquire approx. 350 GWh per year.

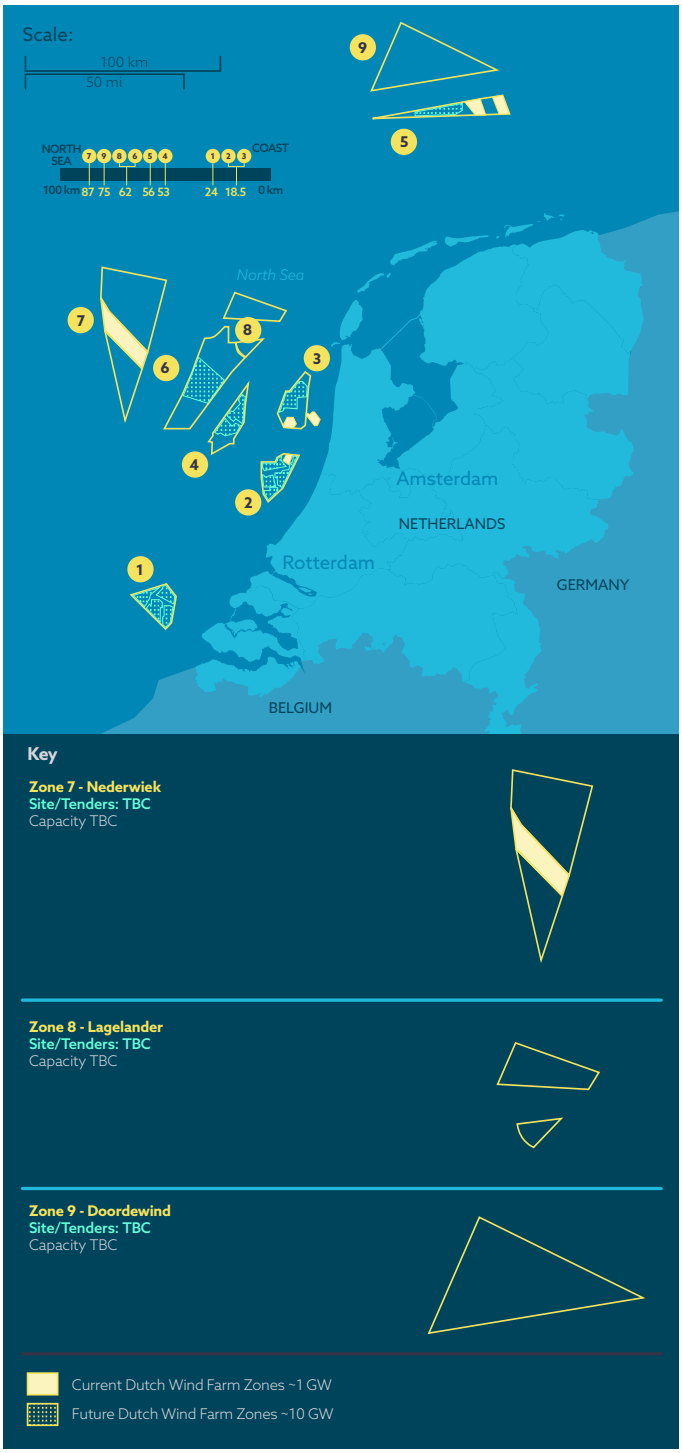
MAP 9: NETHERLANDS' OFFSHORE WIND FARM ZONES



Conclusion

The Netherlands continues to focus on offshore wind as a key tool in tackling climate change. The country has expanded on the targets established in the Offshore Wind Energy Roadmap 2030 through the North Sea Programme 2022 – 2027, amendments to the OWEA and the addition of new, as well as the expansion of existing, development zones to be developed before 2030 and beyond. Additionally, the possibility for developers to benefit from diversified revenue streams driven by not only corporate but also Power-to-X projects means there are clear opportunities in the Dutch offshore wind market.

MAP 9: NETHERLANDS' OFFSHORE WIND FARM ZONES CONT.



NORWAY

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Steady Progress

Norway is a country that already produces large amounts of renewable electricity but mostly from hydropower and onshore wind. For a country with 100,915 km of coastline and wind resources above the European average, Norway's offshore wind power potential is huge, although currently lagging behind its European counterparts. This may be due to the country's deep waters off the coast and fewer areas that are suitable for fixed-bottom wind turbines. However, such depth instead lends itself to the potential for the development of floating offshore wind farms, as seen in the 88 MW Hywind Tampen project, with seven out of 11 turbines expected to start production later this year. Once completed, it will be the world's largest floating offshore wind farm.

To date, the Norwegian government has identified 15 zones for offshore wind development (see Map 10 for further details) and recently announced an ambitious plan to launch a large-scale investment plan to achieve 30 GW of offshore wind capacity by 2040. This goal will be achieved through opening up around one percent of the Norwegian sea area.

In 2020, the Norwegian government opened up licensing applications for the first two of these zones; Sørlige Nordsjø II and Utsira Nord (zone details below), which together will comprise the country's first offshore wind tender.

TABLE 1: ZONE DETAILS

Sørlige Nordsjø II	Utsira Nord
Up to 3 GW capacity	Up to 1.5 GW across three sites
Average water depth around 60 metres	Average water depth of 267 metres
Suitable for fixed-bottom offshore wind, but floating option not excluded	Exclusive floating offshore wind

Despite the apparent push from the Norwegian government to plant their flag in the world's offshore wind industry, there have been no tenders put in place for any offshore wind farms. The government's plan to hold such auctions of up to 4.5 GW has been delayed several times due to delays in deciding and developing the tendering system and the offshore grid structure. The Norwegian government had, as a starting point, decided against offering financial support to fixed-bottom wind farms, and this includes Sørlige Nordsjø II, and instead provide support for the first 1.5 GW of floating capacity in the country. However, in order to support the birth of the industry, the Norwegian government may yet provide support for fixed-bottom projects. At this point, the form this support may take is unclear.

Flagship Offshore Wind Auction

The Norwegian government has stated that it plans to publish the tenders for the Sørlige Nordsjø II zone as well as Utsira Nord within the first quarter of 2023.

The Sørlige Nordsjø II tender is planned to be carried out as an auction for an initial project with a capacity of up to 1.5 GW.

The government has decided that the project selected in this first auction will not be connected to other countries' grids and instead will deliver all of the generated power to Norway. This will require the government to offer some sort of financial support to the chosen project, given that electricity prices in Norway are, in most years, lower than in the United Kingdom and Europe.

This is one step in the right direction for Norway's move into offshore wind, but this announcement from the government omits any substantial confirmations on what form this auction will take. This leaves various questions unanswered, including ones around financing and what financial support the Norwegian government will be offering. Developers are hoping that this support will follow the contract for the difference model seen elsewhere in Europe and the United Kingdom, which ensures stable revenues, gives long-term visibility and lowers financing costs.

An overview of bidders reportedly interested in the Sørlige Nordsjø II zone is set out below:

TABLE 2: SØRLIGE NORDSJØ II ZONE BIDDERS

Companies	Notes
Norseman Wind Consortium: EnBW, NorgesGruppen/ ASKO Fornybar, Aker Solutions, Hitachi ABB, NOV	The plan is to develop a bottom-fixed 1.4 GW plant. Plans in place for green hydrogen, in collaboration with Greenstat.
Equinor, RWE Renewables Hydro REIN	Plans for fixed-bottom of undisclosed capacity.
Arendals Fossekompani (AFK) Ferd	Members of joint venture Seagust plan to bid for Utsira Nord as well.
Aker Offshore Wind, Statkraft, BP	Equal shareholding percentage in the consortium.
Knutsen OAS, Haugaland Kraft AS, and Sunnhordland Kraftlag (SKL)	JV operating through the company Deepwater Wind Offshore.
Parkwind, NorSea	Shipping firm Wilhelmsen, NorSea's majority shareholder, is a part of the partnership.
Fred. Olsen Renewables, Hafslund, Ørsted	Equal partnership in the consortium.
Kvitebjørn Havvind	Company owned by Norwegian company Daimyo.
Vårgrønn and Agder energi	Vårgrønn is a joint venture between ENI and Hitechvision.

In addition to the above companies, other major international companies have confirmed that they are following developments.

Norway also aims to tender 1.5 GW in the separate Utsira North zone, an area that will be dedicated to floating offshore wind farms. As opposed to the planned auction for Sørlige Nordsjø II, the government plans to apply qualitative nondiscriminatory award criteria in the tender competition.

The award criteria in the Sørlige Nordsjø II and Utsira Nord tender is expected to be the subject of a hearing later this year, which will allow interested parties to submit their views on the proposed award criteria before the tender is published.

Power Purchase Agreements (PPA)

The regulatory framework for offshore wind in Norway is still under development. Therefore, as projects develop in parallel to the legislation, potential delays may arise through commissioning or technical-related matters. Therefore, having a water-tight PPA, which addresses where the risk for these potential delays will lay, will be a necessity for developers.

Because of the variable nature of wind power production and the increased risk of a force majeure event in relation to offshore wind power affecting production, the risk relating to the delivery obligation in a fixed-volume PPA can be significant.

For wind power sellers, an "as produced" PPA would expectedly be a more suitable solution—this implies that a seller undertakes to deliver the entirety, or a fixed part, of the actual production at a specific facility. In such PPAs the delivery obligation is not to deliver power "in general," but to produce and deliver power from one or several specific sources. This feature fundamentally changes the risk allocation in the contract per se, and the buyer accepts to share the volume risk with the seller. No or reduced production in the facility means no or reduced delivery to the buyer—and a corresponding reduction in buyer's payment obligation. However, this is less attractive to buyers for obvious reasons, and it requires more tailoring than the standard fixed-volume PPA which in turn increases negotiation risk and cost.

The existing "as-produced" contracts seen in the Norwegian onshore wind power market are however fairly simple. Given the magnitude of the investment to be made and the risks involved, these contracts would expectedly need to undergo substantial updates and amendments in order to address and reflect the nature and risks related to offshore wind power production.

An "as-produced" PPA would for many represent an attractive hedging alternative if drafted thoughtfully.

Power-to-X

Whilst the concept of Power-to-X is still in its infancy, a demonstration project called Deep Purple led by Repsol aims to use power from neighbouring offshore wind farms to create green hydrogen via offshore electrolysers.

Separately, Norway's Hywind Tampen is one of the first examples of the electrification of the oil and gas sector. The electricity from Hywind Tampen will be used by Equinor (partially Norwegian state-owned energy firm and the developer of Hywind Tampen) to directly power the oil and gas platforms of the Snorre and Gullfaks fields. This is a synergy that developers will be eyeing closely, given Norway's developed oil and gas industry.

Outlook

Norway has a lot of potential for offshore wind, particularly to be a front-runner in floating offshore wind. However, this could quickly turn into lost potential should Norway not prioritise this expansion and further development. The government needs to tie down its regulation, its financing process and its PPA in order to ensure successful tenders in 2023 and beyond, and achieve its goal of 30 GW of installed offshore wind capacity by 2040.

MAP 10: ZONES CONSIDERED FOR OFFSHORE WIND POWER IN NORWAY

POLAND

authored in collaboration with Pragmatic Solutions

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Introduction

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 5.9 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 11 GW of installed generation by 2040. In 2023, this journey will continue.

The Two-Phase Approach

The Polish government has previously designated certain zones within the Polish zone of the Baltic Sea where developers can apply to construct and operate an offshore wind farm; each of these zones are located in Poland's Exclusive Economic Zone.

In February 2021, the Polish "Act on promoting production of electricity in offshore wind power plants" became law (the **Act**). The Act provides for Poland's offshore wind industry to be developed in two phases. The Polish government has since started to work on amendments the Act and other offshore wind-related acts in order to clarify certain provisions in response to signals received from developers.

In 2021, eligible Phase 1 Projects applied for a 25-year CPI-index-linked support scheme, which takes the form of a Contract-for-Difference (**CfD**) mechanism (see A Contract-for-Difference). The President of the Energy Regulation Office (the **ERO**) subsequently awarded seven CfDs to each of the following projects: Bałtyk II, Bałtyk III, Baltica-2, Baltica-3, Baltic Power, BTI-RWE, B-Wind Polska and C-Wind Polska. Please see Map 11 for the location of these projects Together, these projects comprise the Phase 1 Projects and have an aggregate capacity of 5.9 GW. The strike price of each of these CfDs is set at PLN 319.60/MWh, subject to indexation (equal to approximately 69 EUR/MWh), which was set by the Minister of Climate and Environment. This is less than what industry participants had hoped for.

Phase 2 is the next stage of Poland's offshore wind rollout, and the Act, together with Poland's new marine spatial management plan, has designated 14 zones which could be used for the development of these Phase 2 Projects. Notably, some developers had already applied for the requisite permits to develop an offshore wind farm prior to the marine spatial plan coming into effect. The consequence of this was that, where a developer's existing permit covered (even partly) an area not included in the zones noted in the marine spatial management plan, that developer's existing permit was cancelled and the relevant zone was reoffered by the government to the market via a competitive procedure. The effect of this was that the permits for only three out of the 14 Phase 2 zones were permitted to be retained, which leaves 11 designated zones available for developers.

Some of the investors which had their existing permits cancelled are challenging this cancellation in the courts. This legal battle will most likely continue into the Supreme Administrative Court. Whilst the legal challenges are being determined by the courts, the review of the applications for the five Phase 2 zones in question, namely zones 14.E.1, 14.E.2, 14.E.3, 14.E.4 and 45.E.4, are suspended.

Notwithstanding the above, competition for the permits to develop Phase 2 offshore wind projects eligible to participate in the 2025 CfD auction is heating up, with Polish energy group PGE having already submitted applications to the Ministry of Infrastructure for nine out of the 11 of the Phase 2 sites, two of which have been submitted in partnership with Enea, one with Ørsted and one with Tauron and with Polish energy group PKN Orlen applying for all 11 sites. They are followed by a group of major offshore wind market players including many new entrants. Please see Map 12 for the location of
these zones.

Despite the strong interest from domestic sponsors, foreign developers are of the opinion that the bid evaluation rules favour domestic companies who have no experience in offshore wind and such rules also do not attribute value to any credentials earned by offshore wind developers outside the EU area. The Act prescribes that potential Phase 2 projects can apply for a 25-year CfD from the President of the ERO but, unlike Phase 1, the CfD 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

The Act legislates that any CfD awarded pursuant to the Act will take the form of a two-sided support structure, similar to the UK's regime, whereby: (i) if the price obtained by a project for the electricity generated by its 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 a project for the electricity generated by its offshore wind farm is higher than the strike price under the CfD, then the project

will be obliged to return this "positive balance" to the state-owned settlements manager. Whether a project has a negative or positive balance is assessed on a monthly basis and in practice, if applicable, any positive balance is netted by the project against the following month's negative balance. If at the end of a calendar year the project still has a positive balance, the amount of the positive balance is paid by the project by 30 June of the following year. As in the United Kingdom, appropriate cash flow management will be expected by project finance lenders in this respect.

The maximum support which a project can receive under its CfD is subject to a capacity cap under both phases of 100,000 hours of electricity production per each MW of capacity installed. Where a project is project financed, that project's forecasted lifetime electricity output should therefore be carefully modelled against this cap to see if there is a risk that the CfD support will expire before the proposed final repayment date of the debt.

Note that, unlike the United Kingdom, there is no separate CfD contract between a project and the relevant Polish state entities. The key mechanics of the CfD are set out in the Act itself.

Importantly, the Act prescribes that a project must transmit electricity into the grid within seven years from the final decision on the award of its CfD. The CfD commences on the date that the project transmits its first electricity to the grid. This means that, where a project is built in phases, but benefits from a single CfD, the support term for the last batch of turbines to be installed will be less than the 25-year support period provided for by the CfD. Assuming a debt tenor of around 20 years, this should not be an issue from a project finance perspective.

Financiers will want to take security over a CfD, in particular, the right to receive any "negative balance," which appears to be contemplated for under the Act.

Transmission Assets

There are many aspects of the Act which developers will need to consider, and which are beyond the scope of this report, but, in particular, we note that the Act prescribes certain parameters relating to local content, equipment age and sell-downs. The Act also provides the transmission system operator, Polskie Sieci Elektroenergetyczne S.A., 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 preemptive purchase right over the third party. In theory, this may be of concern to financiers as it could complicate the enforcement process in respect of any security over the transmission assets. However, in practice, the value of the security is in nominally appropriating the assets for the benefit of the secured creditors (as a means of leverage against unsecured creditors) and the security that is more likely to be enforced is the relevant share pledge.

Regarding local content, we note that although the Act prescribes a requirement for a developer to prepare a local supply chain plan, there is no penalty for failure of a developer to comply with that plan (such a penalty would fall foul of the EU's procurement rules). This contrasts with Taiwan, for example.

The Grid

It also remains to be seen how the Polish government intends to modernise and strengthen the onshore transmission and distribution networks, including the associated costs, in the north part 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. However, due to the continuing dispute between the European Commission and Polish government concerning the rule of law in the common courts, this is delayed.

MAP 11: OFFSHORE WIND PROJECTS IN THE POLISH ZONE OF THE BALTIC SEA

Power Sales

Although corporate power purchase agreements are permitted under relevant Polish laws and regulations, it is not expected at this stage that the Phase 1 offshore wind projects that were awarded CfDs in Poland will seek to sell their power to final corporate offtakers. This is largely because of the comfort and the stability of revenues offered by CfDs backed by the fees collected from every kWh sold on the wholesale market. Phase 1 Projects are expected to sell their power to the wholesale market.

Given the current macro-economic environment, it remains to be seen what strike price the CfDs for the Phase 2 offshore wind projects come out at. The effects of inflation and increased steel prices will likely increase the capex of projects, which may raise the bid price in the Phase 2 2025/26 auctions.

Floating Technology and Power-to-X

Each of Poland's Phase 1 offshore wind projects will deploy fixed-bottom foundations as the Baltic Sea is sufficiently shallow enough to permit this. It remains to be seen whether floating technology will be used on any of the Phase 2 offshore wind projects, or whether any of these projects will seek to incorporate additional Power-to-X capacity. The Act does not specifically contemplate the possibility of adjoining Power-to-X capability to an offshore wind project. In addition, the maritime spatial plan does not allow for Power-to-X, therefore limiting permitted activity to power generation only.

Outlook — Joint Ventures

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 Act, Poland's offshore wind market is an exciting prospect for industry participants. Indeed, several notable joint ventures have already been formed: (i) the Ørsted/PGE 50:50 joint venture to develop the Baltica 2 and Baltica 3 offshore wind projects; (ii) the Northland/PKN Orlen joint venture to develop the Baltic Power offshore wind project; (iii) the Equinor/Polenergia joint venture to develop the Bałtyk II and Bałtyk III offshore wind projects; and (iv) the ENI/CIP joint venture to pursue potential Phase 2 projects. Please see Map 11 outlining the offshore wind projects in Poland, which are currently in development and have exclusive permission to develop an offshore wind project in that area.

MAP 12: PHASE 2 OFFSHORE WIND SEABED ZONES IN THE POLISH ZONE OF THE BALTIC SEA

Key

Phase 2 Offshore Wind Seabed Zones being applied for

Name of Area	Applications
1. 14.E.1 - Ławica Ordzana*	15
2.14.E.2 - Ławica Ordzana*	14
3. 14.E.3 - Ławica Ordzana*	14
4. 14.E.4 - Ławica Ordzana*	15
5. 43.E.1 - Ławica Slupska	13
6. 44.E.1 - Ławica Slupska	13
7. 45.E.4 - Ławica Slupska*	3
8. 53.E.1 - Ławica Slupska	5
9. 46.E.1 - Ławica Slupska	7
10. 60.E.3 - Ławica Środkowa	14
11. 60.E.4 - Ławica Środkowa	12

** - review of applications for these zones are currently suspended pending determination of court challenges to cancellation of previous permits over these zones.*

Phase 2 Offshore Wind Seabed Zones With Seabed Permits

12. 60.E.1 - Polenergia/Equinor — MFW Baltyk 1 (1,560 MW)

13. 60.E.2 - PGE — MFW Baltica I (896 MW)

PORTUGAL

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Potential and Goals

Portugal has a vast coastal area and currently has one of the largest maritime exclusive economic zones in Europe, so it is only natural that the country is paying attention to the use of its maritime resources for electricity generation. Given Portugal's short continental shelf and naturally deep waters, the potential for installing wind energy in Portugal is much more significant for floating turbines (40 GW) than for fixed turbines (1.4 GW to 3.5 GW).

For example, a recent pre-commercial Phase 2 MW prototype project led by the Portuguese-based electricity company EDP Renewables has successfully tested the Windfloat floating offshore wind technology in the Aguçadoura area. As a result of this successful pilot, this floating technology secured funding from the European Commission (under the NER300 Programme) to create a floating offshore wind farm with an installed capacity of 25 MW off the coast of Viana do Castelo.

The Roadmap for an Industrial Strategy for Ocean Renewable Energies, approved by the Portuguese Government in November 2016 (the **Roadmap**), estimates that ocean renewable energies could potentially supply 25 percent of the annual electricity consumed in Portugal. This would contribute not only to the reduction of energy imports but also would prevent the emission of 8 million tons of carbon dioxide per year. The Roadmap further demonstrates the potential to create a new export sector of new energy technologies.

The Portuguese government's current ambitions are that the development of the country's offshore wind sector takes place in an integrated manner using the strategy of Port Tech Clusters at commercial and fishing ports, which the Portuguese Government sees as a platform to accelerate the development of technology for new maritime industries (instead of only focusing on their core, traditional activities). It is also envisaged that synergies will be created with Portugal's naval industry that will accelerate innovation in ocean renewable energies, and can be demonstrated in technological showrooms (near the ports), in a real operational environment. The result is lower costs and shorter development cycles, which will boost the emergence of a dynamic, innovative and efficient offshore industry in Portugal.

To realise this potential, the Portuguese government has implemented legislation: Resolution of the Council of Ministers no. 174/2017, of 24 November 2017, approved the Industrial Strategy for Ocean Renewable Energies (**EI-ERO**), and the Action Plan for Ocean Renewable Energies (**EI-ERO Action Plan**), the purposes of which are explained below.

EI-ERO

EI-ERO is based on two main goals: (i) stimulating exports and value-added investment; and (ii) empowering industry by reducing risks.

Portugal's domestic offshore wind manufacturing capabilities lie in producing turbines and platform segments for floating offshore wind power projects.

EI-ERO Action Plan

The EI-ERO Action Plan contains three major lines of action, as follows:

i. attracting R&D—attracting new ocean renewable energy development and testing projects for installation in Portugal;

ii. supporting the acceleration of ocean renewable energy technologies exports through the attraction of private investment, administrative simplification and promoting innovative products and services; and

iii. implementing investor intelligence initiatives for ocean renewable energies.

The National Energy and Climate Plan for 2030, approved by Resolution of the Council of Ministers no. 53/2020, of 10 July 2020, also addresses Portugal's offshore wind potential while also acknowledging the investment made so far in the grid infrastructures of Viana do Castelo for the Windfloat Atlantic project, which should allow the development of 200 MW of newly installed offshore wind capacity.

Furthermore, the recently enacted Decree-Law no. 15/2022, of 14 January 2022, containing the National Electricity System's framework, creates a Free Zone for Technology in Viana do Castelo specifically for offshore and nearshore pilot projects using renewable energy sources of ocean origin or location. Such free zones have certain benefits for developers, including (i) simplified licensing procedures; (ii) grid connection responsibility that is transferred to the relevant network operator and projects in these zones are exempt from grid access tariffs; (iii) the developer is not required to provide a performance bond; and (iv) no operational certificate is required before a project enters operations.

Offshore Wind Energy in Portugal

Windfloat Atlantic is currently the only offshore wind farm operating in Portugal. The project's three semisubmersible floating turbines have a total installed capacity of 25 MW and are located 20 kilometres off the coast of Viana do Castelo, in the north of Portugal.

The project is operated by Windplus, a consortium, made up of Ocean Winds—the joint venture created by EDP Renewables and ENGIE, Repsol and Principle Power Inc.

The project entered into operation in December 2019—although it only became fully operational in July 2020.

According to public information disclosed by EDP, Windfloat Atlantic has recorded a total cumulative production of 75 GWh, reaching the project's planned figures. The energy produced is enough to supply 60,000 inhabitants and has avoided the emission of 33,000 tons of CO_2.

Public Tenders in 2023

The Secretary of State for Energy has recently announced in several media outlets that the Portuguese government plans to launch a competitive auction for offshore wind energy in 2023, to award a capacity of 6 to 8 GW. The offshore wind tender process will be managed by the members of the Portuguese government responsible for energy and sea affairs. Further detail as to how the tenders will be administrated and any associated entry requirements are yet to be announced.

Licensing Procedure

Offshore wind projects in Portugal that have an installed capacity higher than 1 MW are subject to the attainment of a grid capacity reservation title, which can be obtained either (i) through a request made to the Directorate General for Energy and Geology (**DGEG**); (ii) by means of an agreement with the relevant system operator (when there is grid shortage to connect the project); or (iii) through a public tender run as a competitive auction, such as the one that has been recently announced by the Portuguese Government for offshore wind projects.

Once the grid capacity reservation title is issued, the developer must request the generation licence from DGEG, which authorises the construction of the offshore wind project and, prior to the entry into operation, DGEG will perform an inspection of the project and issue an operation licence.

Offshore wind projects must also obtain an authorisation from the Directorate-General for Natural Resources, Safety and Maritime Services (except when located in the maritime areas adjacent to the Autonomous Regions of Madeira and Azores) to use the maritime space prior to requesting the generation licence.

According to Portuguese law, the competitive procedure for the allocation of grid capacity reservation titles for offshore wind projects shall replace the existing procedures established for the granting of concession agreements authorising the use of the national maritime space.

Unless otherwise determined by the competitive auction procedure's documentation, the general rule is that new capacity does not benefit from a feed-in tariff. As such, offshore wind projects that obtain the grid capacity reservation pursuant to a request submitted to DGEG will trade the electricity generated by the offshore wind project under organised markets or through power purchase agreements (see below), at a price freely determined by the parties.

Ahead of the abovementioned auction, the government created an interministerial working group—as determined by Order no. 11404/2022, of 23 September 2022. The working group has been instructed to prepare a report with recommendations for specialised areas and the relevant interconnection points in the Transmission System that may be awarded to offshore wind projects; proposed timelines and grid capacity to be allocated to such specialised areas, considering the launch of the tender procedure to grant grid capacity reservation titles and the title to use the maritime space; and, a proposed model for the attribution of such titles, based on an international benchmark. Such report is to be submitted to the government by 31 May 2023.

Corporate Power Purchase Agreements

Considering that, as a rule, the energy generated by offshore wind projects shall not benefit from feed-in tariffs, generators may choose to enter into CPPAs with offtakers to provide a route to market for their power. The terms and conditions of CPPAs will be negotiated bilaterally between the parties.

Generators are also allowed to trade electricity under organised markets, such as MIBEL, and/or sell the electricity to an aggregator—this could provide projects with another alternative route to market.

Power-to-X

Windfloat Atlantic injects all electricity generated by the project into the grid.

Pursuant to the applicable legal framework, there are no obstacles to using the electricity generated by offshore wind farms for different purposes, in particular to supply electricity for the production of green hydrogen. Currently, there are no specific requirements to confirm the origin of green hydrogen. However, the European Commission is expected to approve a delegated regulation supplementing Directive (EU) 2018/2001 of the European Parliament and of the Council by establishing a Union methodology setting out detailed rules for the production of renewable liquid and gaseous transport fuels of non-biological origin.

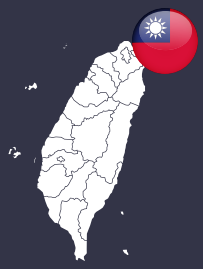
Conclusion

Along with solar and onshore wind energy, which are viewed as mature technologies, given the above, offshore wind energy is expected to help with Portugal's energy transition now that the cost of floating technology is starting to decrease.

The appetite amongst international offshore wind developers is clearly growing with the Portuguese government having met with the world's largest companies in this sector that are interested in investing in Portugal, such as Spain's Iberdrola, Denmark's Ørsted and the Portuguese/French consortium EDP Renewables/ENGIE.

TAIWAN

authored in collaboration with 理律法律事務所 LEE AND LI ATTORNEYS-AT-LAW



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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 percent of Taiwan's total electricity generation) and 15.5 GW by 2035. To date, 11 offshore wind projects have been awarded grid capacity, although this is set to increase later this year when the results of Taiwan's Round 3 auction are expected to be announced. Two of Taiwan's offshore wind farms, Formosa I and Changhua Phase I of Taipower (**TPC**), have entered into the operation stage with the others all at some stage of development or advanced construction. Currently, each offshore wind farm is located on the west coast of Taiwan, in the Taiwan Strait, as shown in Map 13.

The Process 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 results of the first phase of the Round 3 auction, in which the Ministry of Economic Affairs (**MOEA**)/Bureau of Energy (**BOE**) is expected to auction 3 GW of capacity to developers across grid connection years 2026 and 2027 (1.5 GW each), are eagerly awaited and expected in November this year. According to the MOEA/BOE's current plan, the second (grid connection years 2028 and 2029) and third (grid connection years 2030 and 2031) phases of the Round 3 auction, will be held in Q2 2023 and Q2 2024 with the capacity available to be awarded for each grid connection year being limited to 1.5 GW, subject to a total of 3 GW per phase.

Round 2 Projects (Transition)

All Round 1 and Round 2 Projects benefit from the right to a 20-year feed-in tariff (**FiT**) to be paid by 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 seen on Ørsted's Greater Changhua 2b and 4 projects—see Corporate PPAs below for more information). Once grid capacity and corresponding development rights were awarded through the allocation round, a FiT was 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 prescribed criteria based on a range of technical and financial metrics, as provided for in the Guidelines for Grid Allocation published by the MOEA/BOE on 18 January 2018. Applicants were then 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 these Round 2 allocation rounds was set by the government.

Applicants that were unsuccessful in obtaining development rights and a FiT, but 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 Projects (Zonal Development)

In Round 3, developers can choose to submit applications to develop either one 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 2.[1] Capacity awarded to each offshore windfarm in each phase of Round 3 will be subject to a limitation of 500 MW, subject to an adjustment of up to an additional 100 MW after the MOEA/BOE reviews the developer's application for adjustment and grants the approval taking into account the integrity of the entire wind farm, development benefits and efficiency. Therefore, the maximum Round 3 project size in each phase will be 600 MW.

1. 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.

There is also a limitation of 2 GW of capacity per developer in each phase of the Round 3 auctions. Assuming each project is awarded the maximum capacity of 600 MW, given that there is 9 GW of capacity to be auctioned between 2026–2035 this would result in 15 new projects being authorised by the MOEA/BOE.

The applicants in the 2022 Round 3 auction will be assessed in two parts.

Firstly, projects applying for allocation will need to be awarded at least 70/100 points from the MOEA based on prescribed criteria covering a range of technical and financial metrics, as provided for in the Offshore Wind Power Zonal Development Site Capacity Allocation Guidelines published by the MOEA/BOE on 19 August 2021. Based on the experience of Round 2, this technical and financial qualification review is a simple yes/no threshold review, with seemingly no benefit to those Projects which exceed the required 70 points.

In addition, the MOEA will also assess an applicant's localisation commitments. The Round 3 localisation requirements are set out in the Offshore Wind Power Zonal Development Industry Linkage Implementation Plan, which was published by the MOEA/Industrial Development Bureau (**IDB**) on 6 December 2021 and amended on 26 August 2022 (the **Round 3 Localisation Rules**). Localisation requirements are split between 'mandatory' and 'bonus' localisation components with each component to be localised attributed a value of 1 to 6 depending on the difficulty of manufacturing that component in Taiwan. In order to be successful in the localisation review process, an applicant must localise each of the mandatory components (subject to the flexibility referred to in Localisation below) plus be awarded a minimum of 10 localisation 'bonus' points. The comprehensive list of 'bonus' components (> 50 components) is reflective of the MOEA's learnings to date, based on experiences from the Round 1 and Round 2 projects, with the 'bonus' components being those components which have been difficult to localise to date, or for which there is currently little or no supply chain in Taiwan.

If a developer passes this qualification and localisation review process it must submit a bid in the tariff price auction for a FiT, with the lowest bids winning and being awarded grid capacity. The auction bid price for the first phase is capped at NTD 2.49/kWh and has a floor of NTD 0/kWh.

In practice, given the relatively small amount of capacity which is available and the strong appetite for renewable power from private corporations in Taiwan, which allows for developers to negotiate standalone private corporate power purchase agreements (see Corporate PPAs below), it is expected that the Round 3 auctions will be hotly contested with many applicants bidding extremely low, or even NTD 0/kWh, in order to secure grid capacity and development rights.

In the event of a tie (e.g., two projects bid NTD 0/kWh) priority will be given to the project which has the highest localisation 'bonus' points score (see Localisation below). If this still does not produce a clear winner, it is expected that a winner will be drawn at random between such projects.

MAP 13: TAIWAN'S CONSENTED OFFSHORE WIND FARMS

However, this low power price environment coupled with increasing development and construction costs, has resulted in some major developers, e.g., Orsted, not entering the Round 3 2022 auction.

Localisation

As part of the Taiwanese government's push to develop the local supply chain, the MOEA has developed a series of lists of components used in the construction and operation of an offshore wind farm, which a developer must seek to source from local manufacturers in Taiwan. For the Round 2 projects, these were prescribed by the MOEA in its "*Framework of Offshore Wind Power Industry Relevant Implementation Programme*" (published in January 2018). For the Round 2 projects, the exact parameters of a project's localisation requirements were dependent on what year it was/is scheduled to connect 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.

In this regard, although the mandatory localisation components set out in the Round 3 Localisation Rules are more comprehensive than the Round 2 localisation requirements, there are signs that the MOEA acknowledges that it is difficult or impractical to source certain components locally. This is shown by not only the differentiation between mandatory and bonus localisation requirements but also, unlike previous auctions, the mandatory localisation requirements that only apply in respect of 60 percent of the applied-for capacity. Therefore, if a developer applies for a 500 MW project, only 300 MW of such project is required to be constructed using the mandatory localisation components. The remaining
200 MW could be constructed using international suppliers alone. The exception to this is the localisation requirements relating to vessels providing marine spread, e.g., SOVs and engineering design services, such as design of an offshore substation. For the former, domestic work vessels are to be given priority. Accordingly, only when the domestic work vessels are determined to be ineligible/ unavailable to undertake works for offshore wind farm projects in Taiwan (via a non-capacity confirmation) will the authorities consider issuing consent and approval for the use of foreign work vessels. For the engineering design services, the supplier must have at least 50 percent local participation.

There is no additional priority given by the MOEA/IDB to projects that comply with the mandatory localisation requirements for >60 percent of the applied for capacity. However, the Round 3 localisation bonus points will be used to decide a winning bidder in the reverse price auction if more than one developer submits the winning bid, which, as noted above, is probable. Therefore, developers may wish to maximise these bonus localisation items. In the event of a further tie following a review of projects' localisation bonus points, the winner would be selected at random through the drawing of lots.

The localisation requirements have previously caused some concern among developers 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). The flexibility shown by the MOEA in the Round 3 Localisation Rules appears to show an acknowledgement of this concern; however, in practice, given that the Round 3 auctions are expected to be hotly contested and determinative based on bonus localisation commitments, flexibility on the mandatory localisation components could be seen as moot. That being said, there is clearly a strong cooperative relationship developing between the Taiwan government and industry participants as, 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 established. 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

Offshore wind farm developers in Taiwan are cognisant of the high demand for power from some of Taiwan's large corporations, particularly chip manufacturers in the semiconductor industry, some of which are obligated to source a prescribed volume of their power consumption from green power under Taiwan law. Developers plan to capture this appetite through entering into long-term corporate power purchase agreements (**CPPA**) for the supply of power generated from an offshore wind project. CPPAs are made possible in Taiwan through the rules and regulations allowing generators to sell power directly to corporate end users. The relevant rules provide that this supply arrangement can be implemented by either: (i) a generator entering into a wheeling agreement to use wheeling services provided by the grid operator (i.e., TPC)—this is known as the "Indirect Supply" method; or (ii) a generator directly supplying an offtaker with its own transmission cables. Given the infrastructure and costs involved in supplying an offtaker directly we understand that, to date, offshore wind projects have only utilised the Indirect Supply method.

Given the competitive nature expected of future auctions, it is anticipated that the FiT will be driven lower over time, with the expectation that some developers will bid in at NTD0/kWh in the Round 3 price auctions so as to secure grid allocation. The relevance of the FiT as a revenue stream would then be insignificant. For this reason, CPPAs are being pursued 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 and 4 offshore wind farms and more recently in December 2021 when WPD signed a CPPA for over 1 GW of renewable power, which is the largest green CPPA in Asia. Further, in July of this year the majority Northland Power owned Hai Long 2B and 3 projects announced the signing of a CPPA for the offtake of the entire capacity of these projects.

Note that, even if a project secures a CPPA, it must still be successful in the Round 3 auction 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 creates 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. Although, it is questionable how beneficial this switching mechanism will be if zero-FiT bids are produced in the price auctions.

The trend for CPPAs is set to continue. Advances in chip manufacturing processes mean that the chip manufacturers will need much more power than can currently be provided to them, with some analysts suggesting that they will consume more than 10 percent of Taiwan's power in the future and, at the same time, are subject to statutory obligations to ensure that a prescribed amount of their consumed power comes from green sources.

Sell-Downs

As in Europe, there has been notable M&A activity in the Taiwanese offshore wind market. For example, in September 2022, Global Renewable Synergy Company agreed to acquire a 25 percent stake in the 600 MW Changfang and Xidao Offshore Wind Projects from Copenhagen Infrastructure Partners. In addition, earlier this year, WpD's offshore wind business, which owns projects in Taiwan, was acquired by Skyborn Renewables, which is owned by Global Infrastructure Partners and Mubadala. 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 the developers, during the initial Selection Process/qualification review procedure promise the MOEA that the promoters of the company developing the offshore wind farm (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). Pursuant to the Round 3 site recordation rules, projects are required to submit, as part of their site recordation submission, an organigram showing the shareholding structure of the project company up to its ultimate corporate shareholder. Any changes to the corporate shareholding structure of the project company or to that set out in the organigram submitted as part of the site recordation submission will require prior approval from the MOEA.

Conclusion

It is clear that Taiwan's offshore wind industry is burgeoning and has a strong pipeline of projects to facilitate Taiwan in meeting its renewable energy targets. The outcome of the first phase of the Round 3 auction is eagerly awaited and will provide the foundations for the next stage of Taiwan's rapid offshore wind growth.

UNITED KINGDOM

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Introduction

2022 saw continued high levels of activity. This is expected to continue through 2023 and beyond, with the UK's ambition to cement its position as a global offshore wind hub by delivering an installed capacity of 40 GW during this decade, taking the UK's total installed capacity to 50 GW by 2030. At least 5 GW of the new target is to come from floating offshore wind. These ambitions are being put into practice, as we shall explore.

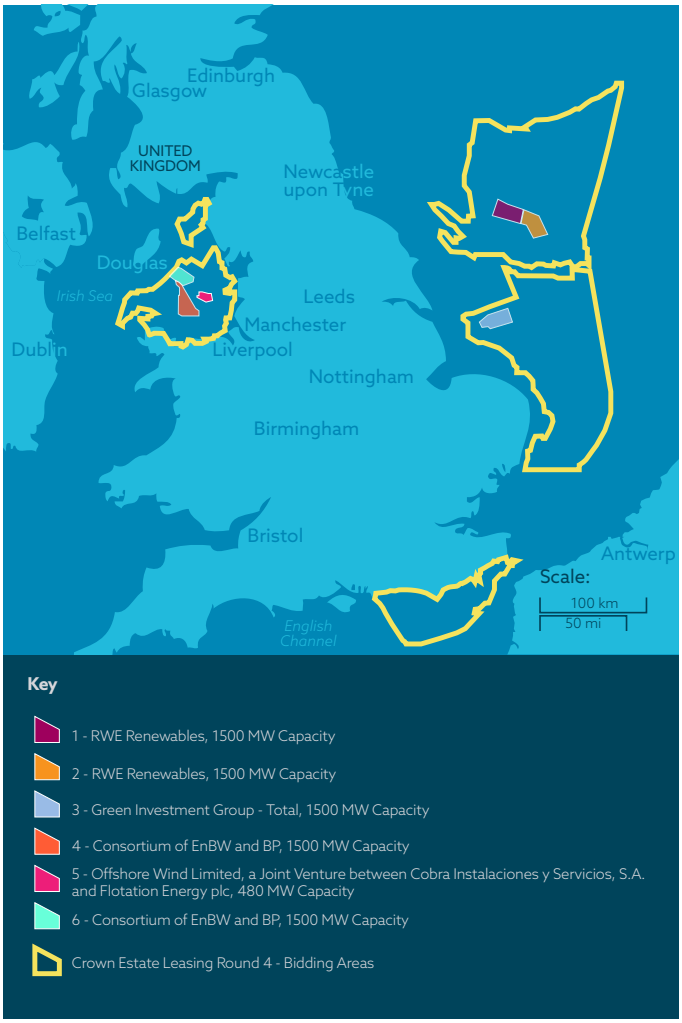
Crown Estate Leasing Round 4 (Applies to England, Northern Ireland and Wales)

The results of The Crown Estate's Leasing Round 4 (**Leasing Round 4**), which commenced in 2020, were announced in February 2021. 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 up-front 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 percent 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 14. 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 annual option fee, calculated by multiplying their bid price in (£/MW) by the proposed capacity of the applicable offshore wind project, with the successful bid prices ranging from £82,552 to £154,000 (£/MW). The annual option fee is to be paid by each developer from its entry into an agreement to lease until that developer receives its final planning permission to build the new offshore wind project (up to a maximum of 10 years). The total fees payable by all of the developers (in respect of all of the projects) equate to £879 million 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 ultimately increase the cost of electricity to consumers (given 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, approximately £0.90 per MWh of minimum expected production; and (ii) during operation, 2 percent of gross revenue.

MAP 14: CROWN ESTATE LEASING ROUND 4 PREFERRED PROJECTS



Celtic Sea Floating Offshore Wind Leasing Round and Areas of Search (in Wales)

Separate to The Crown Estate's Leasing Round 4, The Crown Estate announced in March 2021 that it is establishing a leasing round solely for floating offshore wind projects. Five "Areas of Search" (see Map 15) were announced in July 2022, which were identified following technical analysis and extensive engagement between The Crown Estate, the UK and Welsh governments and key agencies, and specialist stakeholders. It is intended that these areas will deliver 4 GW of floating offshore wind power by 2035.

A competitive tender on the Areas of Search is set to be launched in mid-2023, within which The Crown Estate will be tendering larger, 1 GW-scale projects which may be developed in a phased or "stepping stone" approach. This is intended to provide further opportunities for investment in the supply chain and to facilitate the co-ordination of supporting infrastructure.

The announcements are consistent with the UK government's ambition for 5 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 and Simply Blue Energy. This is an acknowledgment by The Crown Estate 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 The Crown Estate's Leasing Round 4, can attract extremely competitive bids.

MAP 15: AREAS OF SEARCH

Extension Projects

In addition to The Crown Estate's 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[1]
Dudgeon	—	Up to 402 MW	Equinor[2]
Greater Gabbard	North Falls	Up to 504 MW	RWE SSE Renewables
Galloper	Five Estuaries	Up to 353 MW	Corio, RWE, Siemens Fin. Serv, ESB and Sumitomo
Rampion	Rampion 2	Up to 1,200 MW	RWE Enbridge Corio
Gwynt y Mor	Awel y Mor	Up to 576 MW	RWE Stadtwerke München Siemens Fin. Serv.

ScotWind Leasing Round (Applies to Scotland)

The results of Crown Estate Scotland's tender of lease option rights for just under 25 GW of offshore wind capacity across 14 "Plan Option Areas" (**ScotWind Leasing Round**) were announced in January this year: as a result, Scotland now has a development and construction pipeline of over 30 GW of offshore wind—refer to Map 16 for further details. The successful applicants are 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). Driven by the high option fee bids resulting from The Crown Estate's Leasing Round 4 (as discussed above), Crown Estate Scotland set the maximum option fee which developers were able to bid at £100,000 per km2 (although unlike The Crown Estate's Leasing Round 4, this is subject to a cap on the maximum fee and is based on development area, not output). The total fees payable by all the developers (in respect of all of the projects) equate to £699.2 million per year.

In addition to the option fee, developers were required to 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 needed to outline a project's anticipated supply chain, including detailed information in relation to the components which the developer anticipates sourcing 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 percent of the total supply, which a developer must satisfy before they can apply for a lease. Any local supply chain commitments made by developers are to be formally incorporated into its lease agreement and compliance will be assessed during the life cycle of the project.

It is of particular note that more than half the total capacity has been awarded to floating projects (approximately 15 GW) giving Scotland (and the United Kingdom as a whole) the potential to be a world leader in the floating wind industry. This strong appetite from developers is perhaps not wholly surprising given a number of the 14 Plan Option Areas have water depths in excess of 60 metres, which are more appropriate for floating offshore wind projects. The 2021 ScotWind Leasing Round is now expected to lead to the development of some of the first commercial-scale floating wind projects in the world. These projects will complement The Crown Estate's floating offshore wind projects that are anticipated in the Celtic Sea (see above) as well as further floating projects anticipated by Crown Estate Scotland via its INTOG Leasing Round (see Map 16).

MAP 16: SCOTWIND PLAN OPTION AREAS

1. The other Sponsors (Corio, Equitix and TRIG) to the original project have reserved the right to enter the extension during the construction stage.
2. To be developed in parallel with Sheringham Shoal, given the proximity of the two projects.

Innovation and Targeted Oil and Gas (INTOG) Leasing Round (Applies to Scotland)

2022 will see Crown Estate Scotland tender lease option rights under a new leasing round for Innovation and Targeted Oil and Gas projects located in the seabed areas set out in the 'Initial Plan Framework' (with a target of 4 GW generating capacity capped at 5.7 GW) (the **INTOG Leasing Round**). The process will be divided into two pots. One pot will be open to developers of small-scale innovative offshore wind projects of less than 100 MW (the innovation element) and the other pot will be open to larger-scale projects connected to oil and gas infrastructure to electrify and reduce carbon emissions associated with those sites (the targeted oil and gas element). The split is to account for the difference in nature and scale of the innovation and targeted oil and gas elements of the scheme. Similar to the 2021 ScotWind Leasing Round, the INTOG Leasing Round will have comparable local supply chain requirements and the two processes combined suggest considerable opportunity for those participating in the local supply chain.

CfD Allocation Round 4 (Applies to the whole UK)[3]

Developers of offshore wind farms in the United Kingdom 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.

In the CfD auction process, developers must submit their CfD auction bids per megawatt hour to the National Grid ESO, with the bids being ranked lowest to highest. The lowest bids are all accepted until the budget for that technology pot has been exhausted. Allocation Round 4 (discussed below) also includes a capacity cap. Therefore, notwithstanding that a project may be successful on the price element, there would have to be sufficient capacity remaining within the capacity cap for such project to be successful in winning a contract. Successful bidders are awarded a CfD with a strike price which is equal to the auction clearing price. 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.

The latest round closed to bids in January (**Allocation Round 4**). The results were announced in July (see Table 2), and the strike price settled at £37.35/MWh, down from £39/MWh, in Allocation Round 3 in 2019.

TABLE 2: CfD ALLOCATION ROUND 4 OFFSHORE WIND RESULTS

Project Name	Region	Size (MW)	Strike Price (£/MWh)	Delivery Year	No. of Phases
Inch Cape Phase 1	Scotland	1080.00	37.35	2026/27	3
EA3, Phase 1	England	1372.34	37.35	2026/27	3
Norfolk Boreas (Phase 1)	England	1396.00	37.35	2026/27	3
Hornsea Project 3 Offshore Wind Farm	England	2852.00	37.35	2026/27	1
Moray West Offshore Wind Fam	England	294.00	37.35	2026/27	1

Allocation Round 4 included 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). See Table 3 for the capacity caps between these pots.

Extension Projects were also permitted to bid for a CfD in Allocation Round 4, although none were awarded CfDs.

With a view to accelerate the deployment of low-cost renewable generation and to boost energy security, the UK government announced on 9 February 2022 that the frequency of auctions for funding through the CfD scheme will change to every year rather than every two years with the next round to be held in March 2023.

3. This means that projects that were successful in Crown Estate Leasing Round 4 were able to apply to CfD Allocation Round 4, as a UK-wide scheme.

TABLE 3: ALLOCATION ROUND 4 CfD POTS

Pot	Scope	Allocation
1 — Established Technologies	Onshore wind (>5MW), Solar Photovoltaic (PV) (>5MW), Energy from Waste with CHP, Hydro (>5MW and <50MW), Landfill Gas and Sewage Gas.	£10M
2 — Less-Established Technologies	ACT, AD (>5MW), dedicated biomass with CHP, **floating offshore wind**, geothermal, remote island wind (>5MW), tidal stream, wave.	£75M (**£24M** of which allocated to floating offshore wind
3 — Offshore Wind	**Offshore wind**	**£200M**

OFTO Tender Rounds 7, 8 and 9

Pursuant to the unbundling regime,[4] an entity cannot be both a generator and a transmitter of power from an offshore wind farm. Governments of states with offshore wind farms have adopted different models for how to deal with the transmission assets relating to offshore wind farms, and in the United Kingdom 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 licence entities to acquire and operate these transmission assets. Such entities are known as "offshore transmission operators" (or simply **OFTOs**).

Tender Round 7 relates to two UK offshore wind farms, Triton Knoll and Moray East, which are at the preferred bidder and invitation to tender rounds respectively. Tender Round 8 relating to Hornsea Two is currently at the invitation to tender round and Tender Round 9 regarding Seagreen Phase 1 launched in January this year with the invitation to tender round expected to commence in H2 2022 or H1 2023.

In July 2021 Ofgem published its decision following a consultation on its competitive tender process to select and licence OFTOs. The overarching aim of the consultation was to ensure that the OFTO regime (implemented in 2009) continues to be efficient, economic and fit for purpose as offshore wind projects continue to grow in size and complexity. The full practical implications of the decision remain to be seen as Tender Rounds 7, 8 and 9 progress, but notably it includes that Ofgem: (i) intends to explore potential environmental and consumer benefits by moving towards a more qualitative assessment of each bid (as opposed to the current approach where the contract is ultimately awarded on price provided minimum requirements are met); (ii) has introduced improvements in the data room document management system; (iii) will work with developers to explore increasing the certainty of the cost assessment process; (iv) will continue to consider introducing CPI-linked revenue indexation in future tender rounds; and (v) will consider comments received in response to the consultation relating to the longer-term development of the offshore transmission regime as part of their wider process to facilitate more co-ordinated transmission assets.

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. Ofgem published a first set of decisions in July 2021 in relation to three specific policy elements: (i) timing and responsibility for asset health reviews; (ii) the possibility of multiple extensions; and (iii) the settlement of availability liabilities, but a fuller picture on the tender revenue stream going forward will only be apparent when Ofgem releases its second round of decisions. This was expected in spring 2022 but as at the date of this report, has yet to be released.

Building on the July 2021 policy decisions, Ofgem further consulted on the proposed policy framework in relation to the OFTO end of tender revenue stream, notably: (i) whether there are additional key contextual issues that should be borne in mind in relation to the policy; and (ii) whether the policy objectives are appropriate. This consultation closed in August 2022 and, as at the date of this report, no decision has been published.

M&A Activity

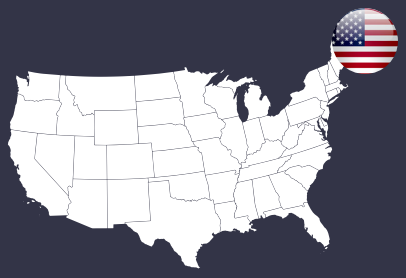
2021 saw a hotbed of M&A activity in the offshore wind sector, which continued into 2022 and likely beyond. Indeed, in 2021 we advised (i) Beatrice Offshore Windfarm Limited (a joint venture owned by SSE Renewables (40 percent), Red Rock Power (25 percent), Equitix (17.5 percent) and The Renewables Infrastructure Group (17.5 percent)) on the sale of the Offshore Transmission Assets of the 588 MW Beatrice Offshore Wind Farm, Scotland's largest operational offshore generation asset, to Transmission Capital Partners (TCP). TCP is a consortium comprising Amber Infrastructure Group, International Public Partnerships Limited and Transmission Investment; and (ii) AIP Management P/S (AIP) on the sale of PKA's 25 percent equity interest in the Burbo Bank Extension offshore wind farm (BBE) to Greencoat Renewables PLC (on behalf of Greencoat UK Wind PLC and Greencoat Renewable Income LP). See our press releases here: "Orrick Advises Beatrice Offshore Windfarm on Sale of Transmission Assets" and "Orrick Advises AIP on Sale of PKA's Interest in Burbo Bank Extension." 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 crave. This was highlighted in 2021 when compared 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 goals to hold significant portfolios of renewable assets in order to meet net zero targets, the consequence of which is that those majors have either started developing renewable assets themselves, as seen in Leasing Round 4 and the ScotWind Leasing Round, 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 percent stake in the third phase of Dogger Bank Wind Farm (expected to be the world's largest once complete) in February 2022 (on top of its existing 20 percent stake in the first two phases).

4. See s.10F, Electricity Act (1989).

UNITED STATES OF AMERICA



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Current Status and Outlook For U.S. Offshore Wind

The United States offshore wind sector has been making rapid progress and has gained major momentum after a long ramp-up period dating back to the early 2000s. A number of very significant offshore wind projects along the Atlantic Seaboard are advancing quickly toward their construction and operating phases. For instance, the 800 MW Vineyard Wind 1 project, located off of the coast of Massachusetts, is now under construction and will be one of the first large scale offshore wind projects in the United States. The Vineyard Wind 1 project follows in the footsteps of the 30 megawatt (MW) Block Island wind project off the coast of Rhode Island, which reached commercial operation in 2016, and the 12 MW demonstration project completed by Dominion Energy in 2020 off the coast of Virginia Beach, Virginia as part of its Coastal Virginia Offshore Wind project. Meanwhile, the U.S. Bureau of Ocean Energy Management (BOEM) recently concluded its latest lease auctions for offshore wind leasing off the coast of California, in the New York Bight ocean area off the coast of New York and for two sites off of the coast of North Carolina. BOEM is also assessing areas in the central Atlantic, off the coast of Oregon and in the Gulf of Mexico.

The U.S. federal government has made significant commitments to advance the floating offshore wind sector. About two-thirds of the U.S. offshore wind potential exists over deep water that will require deployment of floating wind turbines.[1]

On September 15, 2022, the Biden Administration announced an initiative to advance lease areas in deep waters to deploy 15 GW of floating offshore wind capacity by 2035, including the first U.S. lease auction for offshore wind in the Pacific Ocean that took place for sites off the California coast on December 6 and 7, 2022. The Biden Administration has also launched the Floating Offshore Wind Shot initiative to lower the costs of floating offshore wind by more than 70% by 2035 through prioritization of research and development, establishment of a domestic supply chain, and transmission development.[2]

Finally, significant new power purchase and OREC (offshore wind renewable energy credit) solicitations will occur or are expected in the near term in key offshore markets such as New York and New Jersey to provide the revenue contracts that are key to the viability of any current U.S. offshore wind project. The sector is clearly moving quickly now and energy companies, investors, equipment manufacturers and other stakeholders from North America, Europe and Asia are making significant investments.

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 expressed interest in financing U.S. offshore wind projects. This includes numerous European lenders with offshore wind financing experience who will likely be a driving force for offshore wind financing in the United States. Some of these European lenders will need to adapt to the financing structures that are unique to the U.S. renewable energy 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. This perception is likely to change over time as more projects reach commercial operation.

Offshore wind financing will not be limited to European lenders. U.S. onshore wind projects with strong economics and sponsor backing have traditionally benefitted from widely available debt and tax equity. It is expected that many of these 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 sponsors, and good long-term revenue contracts or OREC awards.

The Inflation Reduction Act, which was enacted into law in August 2022, significantly expanded the US federal income tax regime for renewables projects, including offshore wind. The two tax credits available for offshore wind projects are the investment tax credit (ITC) and the production tax credit (PTC). These tax credits will exist for offshore wind until at least 2032. The ITC, which is calculated as a percentage of the cost of the electric generating equipment in a project, starts at 6% and increases to 30% if the project satisfies new prevailing wage and apprenticeship requirements, or if construction begins before an outside date that is 60 days after administrative guidance is published regarding prevailing wage and apprenticeship. That guidance is expected to be released in late 2022 or early 2023.

1. https://www.energy.gov/sites/default/files/2022-09/floating-offshore-wind-shot-fact-sheet.pdf

2. Announcement available at https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/15/fact-sheet-biden-harris-administration-announces-new-actions-to-expand-u-s-offshore-wind-energy/

The PTC, which is calculated based on the quantity of energy produced and sold to an unrelated party over a 10-year period, is worth a base rate of 0.3 cents/kWh and an increased rate of 1.5 cents/kWh, and is adjusted annually for inflation. The increased rate for 2022 is 2.75 cents/kWh. Projects qualify for the maximum PTC rates by meeting the prevailing wage and apprenticeship requirements, or by beginning construction before the grandfathering deadline. The ITC and PTC amounts can be increased further by up to 10% (for a total increase of 20%) if the project includes a minimum percentage of US-sourced "domestic content," or if it is located in an "energy community" (generally, a brownfield site, and area with a minimum percentage fossil fuel-related employment or tax revenues, and higher than average unemployment, or near a recently closed coal mine or coal-fired plant).

Prior to the Inflation Reduction Act, offshore wind projects could only qualify for a 30% ITC, and there was an additional requirement to begin construction by the end of 2025. The extended tax credit runway, ITC/PTC optionality and potential added value for projects meeting the domestic content and energy community rules should translate to substantially more tax equity investment for project sponsors. However, as described above, the tax credit amounts are ultimately contingent on factors such as apprenticeship and prevailing wage compliance. 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 utilize the tax credits at the full rates and obtain tax equity financing. Since construction costs for offshore wind are very high, we expect most of these projects would elect to use the ITC over the PTC.

Project Permitting and Environmental Considerations

BOEM oversees the development of wind projects on the United States' 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 adjacent 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. 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.

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, 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.[3] 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 is important to understand that a BOEM lease is not an 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.

3. 30 C.F.R. § 585.214.

BOEM leases have a preliminary term of 12 months during which time most projects file a Site Assessment Plan (SAP) with BOEM for approval. A SAP describes the initial activities needed to study the lease area. BOEM leases provide five years to complete site assessment work. At least six months before that five-year term ends, a construction and operations plan (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. 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.[4] After the final environmental report is prepared, BOEM will issue a record of decision and decide whether to approve the COP and what 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 permitting and development process for upcoming projects remains complex and highly project-specific.

Structure of Energy Purchase Transactions (PPAs and OREC Transactions)

Two different transaction structures have been utilized 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, the Bluewater Wind project off of the shore of Delaware, 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 local utilities. These PPAs have been similar to utility PPAs for U.S. onshore wind and solar projects, but with customized 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, Delaware and 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 utilized for very significant procurements of offshore wind energy in Maryland, New Jersey and New York.

Both PPAs and OREC transaction structures are expected to be utilized in upcoming procurements of U.S. offshore wind, including upcoming solicitations in New York, New Jersey and Rhode Island.

Despite being prevalent in US onshore wind project structuring, corporate or C&I (commercial and industrial PPAs) and hedging transactions have not yet been utilized yet as the primary revenue contract for any of the offshore wind farms under development or construction in the U.S.

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 organization (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. 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.

On April 21, 2022, FERC issued a notice proposing reforms to its pro forma Open Access Transmission Tariff, which are intended to improve regional transmission planning and cost allocation for certain types of transmission facilities. If implemented by FERC, the proposed rule would require transmission providers to conduct regional transmission planning on a sufficiently long-term, forward-looking basis to satisfy transmission needs driven by changes in generation resource mix and demand. In developing their transmission plans, transmission providers would be required to consider federal, state, and local laws and regulations that would affect the generation resource mix and demand. Such policy considerations would include renewable portfolio standards and other policies supporting the development and integration of renewable resources, including offshore wind. FERC will issue a final rule implementing these reforms likely later this year or early next after reviewing public comments on its proposals.

4. 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/).

On June 16, 2022, FERC issued a notice of proposed rulemaking to reform its standard large generator interconnection procedures and pro forma interconnection agreement to address the growing backlog of interconnection requests. According to FERC, the average time that projects spend in interconnection queues before starting construction has increased to over three years. To mitigate these delays, FERC proposed to revise its standard interconnection procedures to implement a "first ready, first-served" cluster interconnection study process, meaning that projects demonstrating commercial readiness will move ahead first in the study process. In addition, FERC proposes to increase study deposit and site control requirements while implementing penalties for withdrawing a request from an interconnection queue. Offshore wind projects with sufficient funding for study costs and network upgrades should benefit from FERC's reforms by being able to progress through interconnection queues more quickly. As with the transmission rulemaking discussed above, FERC will issue a final rule implementing these reforms likely later this year or early next after reviewing public comments.

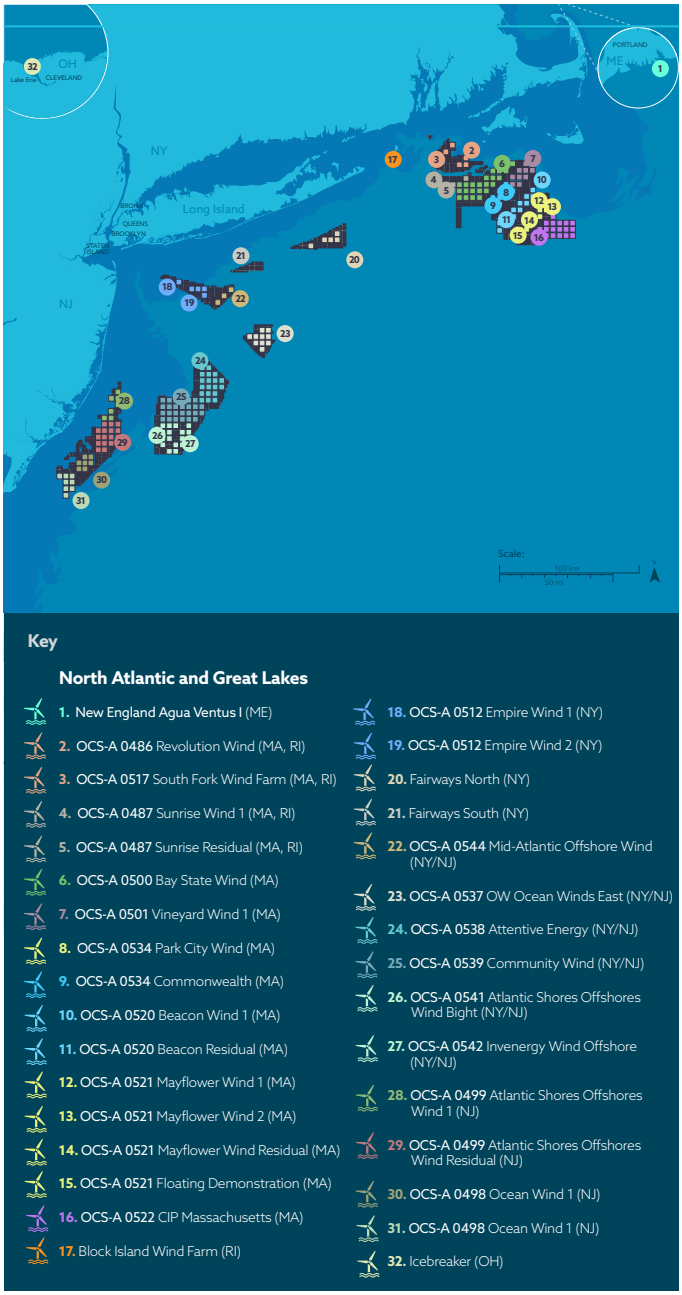
Jones Act

Section 27 of the Merchant Marine Act, commonly referred to as the Jones Act, prohibits the transportation of merchandise between two points in the United States to qualified United States' flagged vessels owned and operated by United States citizens.[5] 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."[6]

The practical effects of the Jones Act ripple through all aspects of offshore wind development. Currently, there are no operating 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, one Jones Act compliance strategy employed by developers is the use of U.S. flagged feeder vessels to transport turbine components from U.S. ports for installation by a foreign-flagged jack up vessel. Other approaches suggested are to use a foreign-flagged vessel able to jack up U.S. flagged barges or use of a combination of US-flagged vessels to install turbine foundations and the turbines themselves. The first U.S.-flagged offshore wind turbine installation vessel, the Charybdis that is under construction by Dominion Energy, is expected to be at sea in late 2023.

North Atlantic and Great Lakes

MAP 17: UNITED STATES OFFSHORE WIND ACTIVITY IN NORTH ATLANTIC AND GREAT LAKES



United States Department of Energy, Office of Energy Efficiency & Renewable Energy Offshore Wind Market Report: 2022 Edition.

5. 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. Customs and Border Patrol has issued multiple rulings interpreting the Jones Act and these other laws in the context of offshore wind projects.

6. 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.

The North Atlantic region of the United States has the first operating commercial offshore wind project (Block Island Wind Farm) and experienced many major developments in 2022. Notably, BOEM issued the following six leases following a record-breaking auction in the NY Bight lease auction area:

TABLE 1: NORTH ATLANTIC LEASE AUCTION AREAS

No.	Lease	Purchaser	Developer
22	OSC-A 544	Mid-Atlantic Offshore Wind LLC	CIP
23	OSC-A 537	OW Ocean Winds East LLC	EDPR & Engie
24	OSC-A 538	Attentive Energy LLC	Total Energies
25	OSC-A 539	Community Wind (name changed after lease issuance to Bight Wind Holdings LLC)	RWE & National Grid
26	OSC-A 541	Atlantic Shores Offshore Wind Bight LLCC	Shell & EDF
27	OSC-A 542	Invenergy Wind Offshore Wind LCC	Invenergy & EnergyRE

Adapted from United States Department of Energy, Office of Energy Efficiency & Renewable Energy Offshore Wind Market Report: 2022 Edition.

Also, on 19 August 2022, BOEM published a Request for Interest in the Federal Register to identify competitive interest in a 13,713,825-acre area in the Gulf of Maine. BOEM will use the information gathered as part of this process to identify areas for potential development in the Gulf of Maine off of the coasts of Massachusetts, New Hampshire and Maine. According to BOEM's Offshore Wind Leasing Path Forward 2021-2025, BOEM is targeting auctions in the Gulf of Maine in 2024.[7]

General information about various projects in the North Atlantic and Great Lakes is provided in Table 2.

TABLE 2: STATUS OF OFFSHORE WIND DEVELOPMENT IN THE NORTH ATLANTIC AND GREAT LAKES

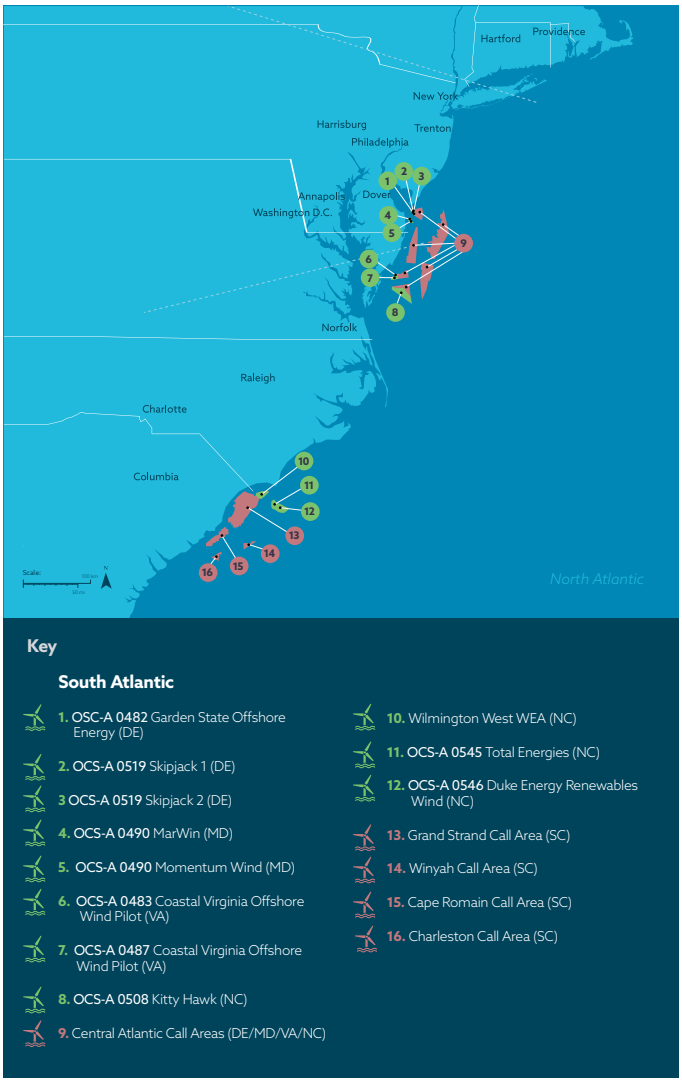
No.	State	Project	Developer	Lease	Offtake
1	ME	New England Agua Ventus I	Univ. of Maine/ Diamond Offshore/ RWE	State Lease	PPA (ME)
2	MA/ RI	Revolution Wind	Ørsted & Eversource	OCS-A 0486	PPA (RI) PPA (CT)
3	MA/ RI	South Fork Wind Farm	Ørsted & Eversource	OCS-A 0517	PPA (NY)
4	MA/ RI	Sunrise Wind 1	Ørsted & Eversource	OCS-A 0487	PPA (NY)
5	MA/ RI	Sunrise Residual	Ørsted & Eversource	OSC-A 0487	TBD
6	MA	Bay State Wind	Ørsted & Eversource	OSC-A 0500	TBD
7	MA	Vineyard Wind 1	Avangrid & CIP	OSC-A 0501	PPA (MA)
8	MA	Park City Wind	Avangrid	OSC-A 0534	PPA (CT)
9	MA	Commonwealth Wind	Avangrid	OSC-A 0534	PPA (MA)
10	MA	Beacon Wind 1	Equinor & BP	OSC-A 0520	OREC (NY)
11	MA	Beacon Wind Residual	Equinor & BP	OSC-A 0520	TBD
12	MA	Mayflower Wind 1	Ocean Winds & Shell	OSC-A 0521	PPA (MA)
13	MA	Mayflower Wind 2	Ocean Winds & Shell	OSC-A 0521	PPA (MA)
14	MA	Mayflower Wind Residual	Ocean Winds & Shell	OSC-A 0521	TBD
15	MA	Floating Demonstration	Shell/Kent Houston Offshore Engineering/ Ocergy	OSC-A 0521	TBD
16	MA	CIP Massachusetts	CIP	OSC-A 0522	TBD
17	RI	Block Island Wind Farm	Ørsted & Eversource	State Lease	PPA (RI)
18	NY	Empire Wind 1	Equinor & BP	OSC-A 0512	OREC (NY)
19	NY	Empire Wind 2	Equinor & BP	OSC-A 0512	OREC (NY)
20	NY	Fairways North	—	WEA	NY
21	NY	Fairways South	—	WEA	NY
22	NY/ NJ	Mid-Atlantic Offshore Wind	CIP	OSC-A 0544	TBD
23	NY/ NJ	OW Ocean Winds East	EDPR & Engie	OSC-A 0537	TBD
24	NY/ NJ	Attentive Energy	Total Energies	OSC-A 0538	TBD
25	NY/ NJ	Community Wind	RWE & National Grid	OSC-A 0539	TBD
26	NY/ NJ	Atlantic Shores Offshore Wind Bight	Shell & EDF	OSC-A 0541	TBD
27	NY/ NJ	Invenergy Wind Offshore	Invenergy & Lighthouse Energy	OSC-A 0542	TBD
28	NJ	Atlantic Shores Offshore Wind 1	Shell & EDF	OSC-A 0499	OREC (NJ)
29	NJ	Atlantic Shores Offshore Wind Residual	Shell & EDF	OSC-A 0499	TBD
30	NJ	Ocean Wind 1	Ørsted & PSEG	OSC-A 0498	OREC (NJ)
31	NJ	Ocean Wind 2	Ørsted & PSEG	OSC-A 0532	OREC (NJ)
32	OH	Icebreaker	LEEDCo	State Lease	PPA (OH)

Adapted from United States Department of Energy, Office of Energy Efficiency & Renewable Energy Offshore Wind Market Report: 2022 Edition. Note that Fairways North (No. 20 depicted on Map 16 North Atlantic) and Fairways South (No. 21 depicted on Map 16 North Atlantic) are currently dormant wind energy areas.

7. Available at https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/OSW-Proposed-Leasing-Schedule.pdf.

South Atlantic

MAP 18: UNITED STATES OFFSHORE WIND ACTIVITY IN THE SOUTH ATLANTIC



United States Department of Energy, Office of Energy Efficiency & Renewable Energy Offshore Wind Market Report: 2022 Edition.

BOEM auctioned the following two leases off of the coast of North Carolina on 11 May 2022:

TABLE 3: NORTH CAROLINA AUCTIONED LEASES

Lease	Purchaser	Acres
OCS-A 0545	TotalEnergie Renewables USA, LLC	54,937
OCS-A 0546	Duke Energy Renewables Wind, LLC	55,154

BOEM published a Call in the Central Atlantic on April 27, 2022.[8] In response, BOEM received nominations of interest from Avangrid Renewables LLC, US Mainstream Renewable Power Inc. and OW North American Ventures LLC. According to BOEM's Offshore Wind Leasing Path Forward 2021-2025,[9] BOEM is targeting auctions in the Central Atlantic Area in 2023.

TABLE 4: STATUS OF OFFSHORE WIND DEVELOPMENT IN THE SOUTH ATLANTIC

No.	State	Project	Developer	Lease	Offtake
1	DE	Garden State Offshore Energy	Ørsted	OCS-A 0482	TBD
2	DE	Slipjack 1	Ørsted	OCS-A 0519	OREC (MD)
3	DE	Slipjack 2	Ørsted	OCS-A 0519 & OCS-A 0482	OREC (MD)
4	MD	MarWin	U.S. Wind	OCS-A 0490	OREC (MD)
5	MD	Momentum Wind	U.S. Wind	OSC-A 0490	OREC (MD)
6	VA	Coastal Virginia Offshore Wind-Pilot	Dominion Energy	OSC-A 0483	Utility Owned
7	VA	Coastal Virginia Offshore Commercial	Dominion Energy	OSC-A 0487	Utility Owned
8	NC	Kitty Hawk	Avangrid	OSC-A 0508	TBD
9	DE/ MD/ VA/NC	Central Atlantic Call Areas	—	Call Areas	—
10	NC	Total Energies	Total Energies Renewables	OCS-A 0545	—
11	NC	Duke Energy	Duke Energy Renewables Wind	OCS-A 0546	—
12	SC	Grand Strand Call Area	—	Call Area	—
13	SC	Winyah Call Area	—	Call Area	—
14	SC	Cape Romain Call Area	—	Call Area	—
15	SC	Charleston Call Aream	—	Call Area	—

Adapted from United States Department of Energy, Office of Energy Efficiency & Renewable Energy Offshore Wind Market Report: 2022 Edition. Note that Wilmington West WEA (No. 10 of Map 17 South Atlantic) is currently a dormant wind energy area.

8. See, https://www.boem.gov/renewable-energy/state-activities/central-atlantic.

9. Available at https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/OSW-Proposed-Leasing-Schedule.pdf.

Gulf of Mexico

BOEM announced the finalization of two wind energy areas (WEA I and WEA M) in the Gulf of Mexico.[10] According to BOEM, WEA I is 508,265 acres in size off the coast of Galveston, Texas and has the potential to power 2.1 million homes and WEA M is 174,275 acres in size off the coast of Lake Charles, Louisiana with a potential to power over 740,000 homes.[11] BOEM anticipates issuing a Proposed Sale Notice in late 2022 or early 2023 for a 60-day public comment, which will be followed by a Final Sale Notice and auction.

Pacific

BOEM held its auction on December 6 and 7, 2022 for five leases off of the coast of California. The provisional winners[12] of each lease are listed below.

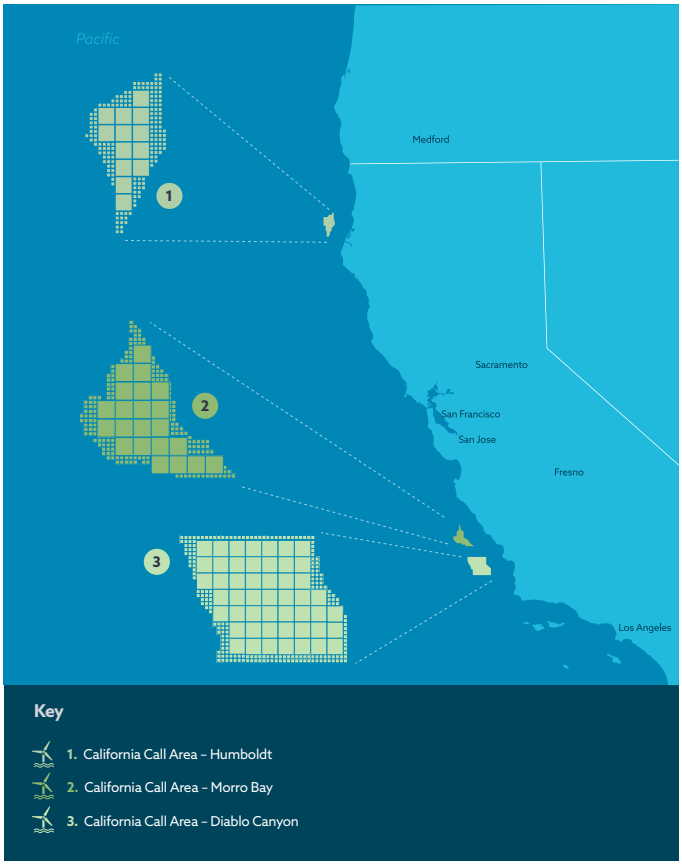
TABLE 5: PACIFIC LEASE AREAS

Lease	Geographical Area	Acres	Provisional Winner
OSC-P 0561	North Coast (Humboldt)	63,338	RWE Offshore Wind Holdings
OSC-P 0562	North Coast (Humboldt)	69,031	California North Floating, LLC
OSC-P 0563	Central Coast (Morro Bay)	80,062	Equinor Wind US, LLC
OSC-P 0564	Central Coast (Morro Bay)	80,418	Central California Offshore Wind, LLC
OSC-P 0565	Central Coast (Morro Bay)	80,418	Invenergy California Offshore

The Morro Bay Call Area is located about 20 miles offshore from Cambria, California. The Humboldt Call Area is approximately 20 miles off the northern coast of California. Together, these areas have the potential to generate up to 4.6 GW of clean energy for California and represent a first step to meeting the State's preliminary goal of developing 2 GW – 5 GW of offshore wind by 2030, and up to 25 GW by 2045.

Concurrent with the BOEM California lease auction, the California Energy Commission's strategic planning process is ongoing to address offshore wind energy deployment, including port and infrastructure

MAP 19: PACIFIC LEASE AREAS



development, transmission planning and coordination of an efficient permitting process for offshore wind projects and associated transmission infrastructure.[13] The strategic plan, which will be completed by June 30, 2023, will be backed by the State's $45 million Offshore Wind Energy Deployment Facility Improvement Program[14] to advance necessary infrastructure for offshore wind in California, including port upgrades, waterfront facilities and other necessary capabilities.

BOEM also published a Call on April 27, 2022 to assess commercial interest in offshore wind development off of the coast of Oregon in the Coos Bay and Brookings areas.[15] The Coos Bay area is about 872,854 acres in size off of the coast of Coos Bay, Oregon and the Brookings area is about 286,444 acres in size off of the coast of Brookings, Oregon. BOEM is assessing information received during this process that ended on June 28, 2022. According to BOEM's Offshore Wind Leasing Path Forward 2021-2025, BOEM is targeting auctions in this area in this area in late 2023 to early 2024.

10. See, https://www.boem.gov/renewable-energy/state-activities/gulf-mexico-activities.

11. See, https://www.boem.gov/renewable-energy/state-activities/gulf-mexico-activities.

12. Provisional winners must comply with BOEM regulations governing lease execution and undergo an antitrust review pursuant to 43 U.S.C §1337(c)

13. See, https://www.energy.ca.gov/filebrowser/download/4361.

14. See, https://www.ebudget.ca.gov/2022-23/pdf/BudgetSummary/ClimateChange.pdf.

15. See, https://www.boem.gov/renewable-energy/state-activities/Oregon.

VIETNAM

authored in collaboration with YKVN

HANOI • HO CHI MINH • SINGAPORE

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Ambitious Plans for Development

During the COP26 meetings, Vietnam committed to transitioning the country away from its reliance on conventional power sources, such as coal, towards energy generation technologies that will allow the country to reach net zero by 2050. Offshore wind is a natural candidate for Vietnam to achieve this, given the country's 3,260 km of coastline, shallow water and consistent high winds, making the country widely viewed as one of the most promising new offshore wind markets.

However, there are challenges, including the prescribed form of power purchase agreement, extensive permitting process, insufficient grid infrastructure and lack of regulatory framework, each of which is discussed below. Consequently, Vietnam has not yet been able to realise its potential, with only a handful of nearshore projects being commissioned to date. The Vietnamese government views these challenges as being surmountable, as the country's latest plan is to develop up to 7 GW of installed offshore wind capacity by 2030, ramping up exponentially to 87.5 GW of installed offshore wind capacity by 2050.

The Power Development Master Plan VIII (the **Master Plan VIII**), which is expected to be issued soon, will provide the foundations for offshore wind development in Vietnam. Developing offshore wind power projects will need to be consistent with the approved capacity in Master Plan VIII. In addition, for projects included in Master Plan VIII whose investors have not been identified, the selection of developers for those projects would be conducted through a competitive bidding process.

PPA Bankability Issues

One of the key hurdles to offshore wind development in Vietnam relates to the form Vietnamese law power purchase agreement (**PPA**) into which developers of offshore wind projects are required to enter with the state-owned power company, Vietnam Electricity (**EVN**). At present, this PPA is not widely seen as being bankable, which is an essential requirement to attract the syndicates of financiers required to finance the development of Vietnam's offshore wind farms.

The PPA omits a number of protections that international financiers would be expected to require for the PPA to be bankable, including the inclusion of:

1. lender step-in rights;
2. settlement of disputes in neutral jurisdictions;
3. credit support for EVN—the PPA is not proposed to be backed by a state guarantee nor other credit support (notwithstanding that the credit rating of the offtaker is below the level which many international financiers would ideally like to see);
4. payment protection for political force majeure;
5. change in law protection;
6. curtailment protection; and
7. termination payment provisions.

It is hoped that at least some of these issues will be addressed following the publication of the approved Master Plan VIII.

Support Regime

Another key area of focus for developers and financiers is whether an offshore wind project in Vietnam will be entitled to benefit from a financial support regime. The feed-in tariff (**FiT**), which would provide developers with a guaranteed revenue stream for their renewable energy project, was discontinued from 1 November 2021.

International developers therefore want surety on what the FiT is going to be replaced with and at what level this financial support is going to be set so that figures can be modelled for the purposes of raising debt to finance development and construction. Based on the latest legislative developments, it is unlikely that any new FiT will be approved. On 3 October 2022, the Ministry of Industry and Trade (the **MOIT**) issued Circular No. 15/2022/TT-BCT on the method for the formulation of a price framework, effective from 25 November 2022 (**Circular 15**), which is designed to compensate for those transitional ground-mounted and floating solar and onshore and offshore wind power plants that signed PPAs with EVN before 1 January 2021 and were not entitled to FiTs. In Circular 15, the earnings after taxes are embedded in the fixed-cost element of the price framework and is determined to be set at 12 percent (ROE), which is reportedly lower than the current 15 percent to 20 percent internal rate of return earned by an eligible wind power project under the FiT regime.[1] Other wind power projects not falling within the scope of application of Circular 15 will have to be subject to a competitive bidding mechanism, the details of which have not been finalised.

1. See, https://baodautu.vn/dien-gio-dien-mat-troi-het-mo-sieu-loi-nhuan-d160593.html, in Vietnamese.

Extensive Permitting Procedures

Offshore wind-farms are multiyear development projects, typically requiring multiple permits and licences for a sponsor to carry out various activities at an offshore site. In more established offshore wind markets, governments have recognised the benefits of having only a few or a single point organisation(s), which issues such permits and licences. This adds transparency to the application process and inevitably ensures a streamlined, consistent approach to permitting, which developers can take confidence in. At present, this is not the case in Vietnam. In total, nearly 20 different permits and licences are required to develop an offshore wind farm in Vietnam. However, these need to be obtained from multiple different authorities and stakeholders at varying governmental levels, which naturally makes the permitting process slow, costly, inconsistent and bureaucratic.

Grid Connection Issues

The quality of Vietnam's grid varies by province, and with potential offshore wind sites located down the breadth of Vietnam's coastline, grid improvement works will be required in certain areas to transmit the power generated from offshore wind farms to load centres, including from the South-Central region where the grid is already congested due to it being a hotspot for renewable power generation. These grid upgrade costs are unlikely to be able to be completed in parallel to the development and construction of offshore wind farms in grid-constrained regions, such that there will be a bottleneck of development in these areas.

Grid improvement works that are necessary to supply the increased capacity flowing to Northern Vietnam (where there is a significant lack of grid connectivity) would be costly at a time when EVN is under pressure to keep electricity prices low to counter inflation and the effects of COVID-19. The private financing of grid connections is one potential option to promote development as seen in, for example, the United Kingdom.

Lack of Regulatory Framework

Vietnam lacks the robust regulations needed to develop large offshore wind farms. The existing regulations do not supply the level of detail required to provide the industry with the information and clarification it needs to develop offshore wind farms in Vietnam. As offshore wind power is a relatively nascent industry in Vietnam, both business and local authorities alike are attempting to scale the learning curve. For now, the expectation is that regulations governing power development in general and PPP projects specifically may be analogously applied to the development of offshore wind farms.

As Vietnam does not yet have a maritime spatial plan for its offshore areas, in October, the Ministry of Natural Resources made a proposal to the PM for a temporary halt in appraisal and approval for the surveying of offshore wind power projects until a comprehensive legal framework can be established, e.g., wind measurement, geological and topographic survey, and environmental impact assessment at sea. Such a proposal is still under consideration by the PM.

Corporate PPAs

In Vietnam, developers must obtain a power generation licence from the Electricity Regulatory Authority of Vietnam (**ERAV**) in order to generate and sell power. At present, state-owned EVN has a monopoly over the transmission, distribution and purchase (wholesale and retail) of offshore wind electricity in Vietnam, and, therefore, corporate power purchase agreements (**CPPAs**) are not possible. This contrasts with the country's rooftop solar industry where CPPAs are possible. As discussed above, given the credit rating of EVN, the lack of regulation enabling CPPAs is one of the key factors restricting the development of offshore wind in Vietnam.

However, this is expected to change. In May 2022, the MOIT released a draft decision of the PM (proposed legislation) to enable the implementation of a pilot scheme permitting the synthetic purchase of power between renewable energy generators and third-party offtakers. Although the draft decision needs to be approved by the PM, pursuant to the contents of the draft decision, the pilot scheme would run for one year and will be available to those wind and solar projects included in the master plans (e.g., Master Plan VIII) with a capacity of more than 30 MW (up to an aggregate scheme cap of 1 GW). Priority will be given to larger projects and by reference to when a project is scheduled to reach commercial operations. Third-party offtakers will be limited to companies purchasing electricity that serve industrial manufacturing purposes at voltage levels of 22 kV or higher.

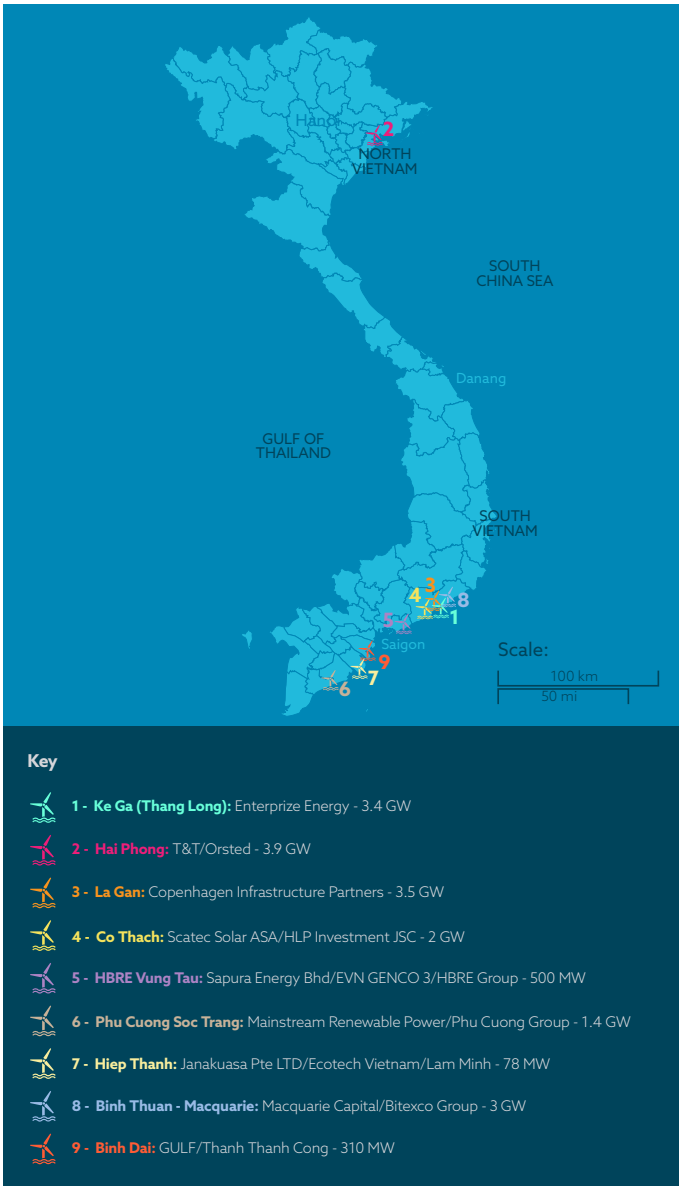
The draft decision also proposes that where a CPPA is entered into between a renewable energy generator and a third-party offtaker, the agreement will be a synthetic arrangement, with no physical delivery of power. A contract for difference will therefore be required to arbitrage the cost between the strike price under the CPPA and the spot price achieved by the generator through selling its power to EVN/ Vietnam Wholesale Electricity Market under a standard form EVN PPA. This pilot scheme would therefore require a contract for difference to be used for the first time in the Vietnam power market. The decision is expected to be approved by the PM and become law later this year. If successful, it is anticipated that CPPAs will be available to market participants from early 2023.

Unfortunately, it is unlikely that this pilot scheme will be relevant for the offshore wind projects currently in development in Vietnam, as to be eligible for the scheme, the offshore wind project would have to achieve commercial operations within 270 working days from the date when the pilot scheme is launched. Given the long construction schedules for offshore wind farms and the ongoing legal and technical problems, this would clearly not be feasible.

Outlook

Whilst offshore wind development is new territory for Vietnam, once favourable mechanisms have been created to facilitate a viable legal framework and an attractive investment opportunity for international institutions, so there is no reason why Vietnam will not be a major player in the offshore wind sector. Indeed, many developers think that the challenges will be overcome with several international sponsors currently developing projects in the country, as set out below:

MAP 20: VIETNAM'S OFFSHORE WIND PROJECTS UNDER DEVELOPMENT



Key

1 - **Ke Ga (Thang Long):** Enterprize Energy - 3.4 GW

2 - **Hai Phong:** T&T/Orsted - 3.9 GW

3 - **La Gan:** Copenhagen Infrastructure Partners - 3.5 GW

4 - **Co Thach:** Scatec Solar ASA/HLP Investment JSC - 2 GW

5 - **HBRE Vung Tau:** Sapura Energy Bhd/EVN GENCO 3/HBRE Group - 500 MW

6 - **Phu Cuong Soc Trang:** Mainstream Renewable Power/Phu Cuong Group - 1.4 GW

7 - **Hiep Thanh:** Janakuasa Pte LTD/Ecotech Vietnam/Lam Minh - 78 MW

8 - **Binh Thuan - Macquarie:** Macquarie Capital/Bitexco Group - 3 GW

9 - **Binh Dai:** GULF/Thanh Thanh Cong - 310 MW

OTHER KEY JURISDICTIONS

Authored by Adam Smith (Orrick) and Oliver Sikora (Orrick) — refer to page 79 for contact details.

China

China's offshore wind market is growing at a pace faster than any other jurisdiction in the world with 2021 seeing China connect more offshore wind projects to its grid than all other countries in the world managed to connect in the last five years combined. This means that China operates around half the capacity of all global offshore wind farms.

In total, 52 GW of offshore wind capacity is expected to be connected to the Chinese grid by 2030 according to the Global Wind Energy Council report. This would make China the world's largest offshore wind market (with the United Kingdom 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. Overall, inward investment into the sector has been limited.

Greece

Although Greece currently has no offshore wind capacity, it has a target to install at least 2 GW of offshore wind capacity by 2030. With its deep seas, Greece is ideally suited for floating offshore wind projects and it is expected that 2023 should see the ramp-up of Greece's offshore wind journey.

Following the approval earlier this year by the Greek government of a new legislative framework for the development of the country's offshore wind farms, it is expected that Greece will hold its first auctions for offshore wind as early as 2025. Although Greece's authorised support mechanism is yet to be outlined by the European Commission, it is expected that the government will adopt a sliding feed-in premium scheme to support offshore wind development. Interest from international developers is high, with some entrants forming joint ventures with local Greek renewable energy companies, such as the JV between Ocean Winds and Terna Energy.

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, significantly more than the 900 MW target set by the Italian government.

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. The Ministry for Ecological Transition has received several proposals to install 40 floating offshore wind projects off the Italian coasts. The Ministry is now working with the proposing companies to evaluate the projects and, should the evaluation be positive, to authorise them.

The first offshore wind project in the Mediterranean was completed earlier this year. The 30 MW pilot project is located offshore of the town of Taranto and marks the start of the Mediterranean's offshore wind journey.

Lithuania

Although there are no operational offshore wind farm projects in Lithuania, parliament passed a suite of legislation in April to facilitate the development of its flagship offshore wind tender of 700 MW in the Baltic Sea.

This approval by the Lithuanian government of the development of offshore wind in the Baltic Sea indicates its strategy to now utilise the sea for its renewable energy potential. Offshore wind development is part of Lithuania's renewable energy targets set by the National Energy and Climate Action Plan. The 700 MW project is set to cover up to 25 percent of Lithuania's current annual electricity demand. It is clear that offshore wind will be a key player in Lithuania achieving its green energy targets.

New Zealand

The New Zealand government has a target of 100 percent renewable electricity generation by 2030 and, given that New Zealand has one of the best wind resources of any country in the world, the New Zealand government intends to capitalise on this through the build-out of offshore wind. 2022 should see the New Zealand government begin work on a new regulatory framework for development of the country's offshore wind industry. Appetite from international developers is growing, as evidenced through the recent announcement of Copenhagen Infrastructure Partners and NZ Super Fund entering a joint venture to explore the potential for an up to 1 GW of offshore wind projects in New Zealand's South Taranaki Bight.

Romania

Romania is still very much in the early stages of offshore wind development, but developing, nonetheless. The Black Sea (being the only opportunity for Romania to explore offshore wind and currently not home to any operational wind project) is stirring interest. The Romanian territorial waters of the Black Sea are already tipped to offer 76 GW of wind potential, 22 GW of which would be for fixed-bottom and the remainder for floating.

WPD became the first company, in 2021, to apply for the development of an offshore wind project in the Black Sea. The Romanian government is already working to adopt new 'offshore wind' legislation, which will include subsidy schemes such as contracts for difference in order to facilitate investments. Experienced offshore wind developers are working closely with the government to support the drafting of the legislation.

The race is on for Romania to become the first country to develop offshore wind projects in the Black Sea.

Spain

Spain does not currently have any offshore wind projects (given the weather conditions, Spain has a strong solar sector, and the Mediterranean does not lend itself well to fixed-bottom 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 of 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 of the Catalan coast.

Sweden

2022 has seen the Swedish government further its offshore ambitions with the country announcing a plan to have up to 120 terawatt-hours of generating capacity annually from offshore wind. However, to meet this goal, further suitable sites will need to be identified by the Swedish Energy Agency for the development of offshore wind farms—sites have already been identified in the Gulf of Bothnia, the Baltic Sea and the North Sea.

Developers clearly recognise Sweden's massive potential with developer OX2 having a strong pipeline of potential Swedish offshore wind projects and recently submitting an environmental impact assessment application for the 5.5 GW Aurora wind farm, to be located between the islands of Gotland and Oland. Orrick recently advised OX2 on the sale of a 49 percent stake in three offshore wind projects in Sweden to Ingka Investments (link).

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ABOUT ORRICK

Orrick is a global law firm with a strategic focus on Energy and Infrastructure, Finance, and Technology and Innovation. For more than 40 years, Orrick has been one of the most active firms globally in renewable energy, regularly advising on innovative and high-profile matters worldwide. We are proud to be one of only three law firms ranked at the highest level for U.S. renewable energy work by both *Chambers* and *The Legal 500*.

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