clean energy pipeline

# EUROPE: OFFSHORE WIND OUTLOOK 2020

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# Executive Summary

*Conrad Purcell, Banking and Finance and Projects Partner at global law firm Bird & Bird*

There can be few moments in time when it has been more difficult to accurately predict what will happen in any sector of the economy than now. While Europe remains in the grip of the COVID-19 pandemic, China, which is so crucial to many supply chains, is now returning to work. European governments are balancing the competing needs: i) to protect public health through lockdown; ii) maintain civil society by permitting essential services to continue operating; and iii) protect the economy by letting businesses reopen.

Many existing offshore wind farms were built using project finance, in relation to which lenders and sponsors should be aware of the high level of regulatory, central bank and governmental intervention that has taken place recently affecting their ability to exercise remedies under their finance documents.

These measures which include, for example, moratoriums on debt payments and changes to insolvency laws are intended to ensure that fundamentally sound businesses are protected from the one-off effects of COVID-19. However, the measures are not the same in each country, meaning that additional analysis is required on cross border transactions, and the scope and number of these interventions changes daily. Care should be taken when implementing any planned mitigation strategy to avoid unintended consequences e.g. taking advantage of a debt payment moratorium could put a borrower in breach of an event of default containing a broadly drafted definition of insolvency.

Owners of, and lenders to, offshore wind farms that are currently under construction will also be studying the impact of COVID-19 on their construction contracts and supply chains very carefully. China, which accounts for nearly half of the global wind supply chain, was the first country to be hit by COVID-19 and the impact of factory shutdowns there will be felt across the world for some time.

Investors will be watching the market for opportunities that may arise from COVID-19 to see if assets come to market as a result of incumbent sponsors needing to release cash from their holdings. Operating offshore wind projects are highly sought after by infrastructure investors from around the world and the range of financing options for the sponsors of offshore wind farms has never been greater with both institutional lenders and banks continuing to support the sector strongly. Based on what we are seeing at Bird & Bird, I predict that the number of corporate PPAs for offshore wind farms will continue to grow across Europe.

The report below confirms that the UK is the world's leading offshore wind market with Germany in second place. CfDs remain the primary basis for supporting UK offshore wind projects and the Low Carbon Contracts Company has no plans to defer the next CfD auction in 2021.

For projects commissioned from 2026, Germany plans to hold annual tenders with a volume of 700MW to 900MW. France's offshore wind sector has finally received positive news following a decision of the European Commission last July approving the construction of six offshore wind farms.

The Netherlands remains committed to offshore wind and plans to bring up to 7 GW online between 2024 and 2030, while Denmark, which generated 47% of its electricity exclusively from wind last year, plans to launch its next tender in H2 2020, for the 800MW – 1000MW Thor offshore wind farm.

Finally, Poland has several large offshore wind projects in the development pipeline and the government has plans to auction up to 10 GW of new offshore capacity by 2027. The relative success of traditional renewable energy auctions in Poland should bode well for the country's upcoming offshore wind tenders.

# United Kingdom

Clean Energy Pipeline's Data and Research team recorded over $44 billion of project finance investment for offshore wind in the UK between 2010 and 2019.

The UK is the world's leading offshore wind market with 9.3 GW of offshore wind farms in operation and a further 4.4 GW of projects that are currently under construction.

The levelised cost of wind-generated energy has fallen continuously over the past decade to firmly establish the technology as one of the most cost-effective choices for electricity, and offshore wind will play a huge role in supporting the government's Net Zero by 2050 emissions target while providing energy security for the decades to come.

Launched in 2019, The Offshore Wind Sector Deal sets out a roadmap for the industry to achieve 40 GW of installed offshore wind capacity by 2030 and the Contracts for Difference (CfD) mechanism remains the primary avenue for new project developments.

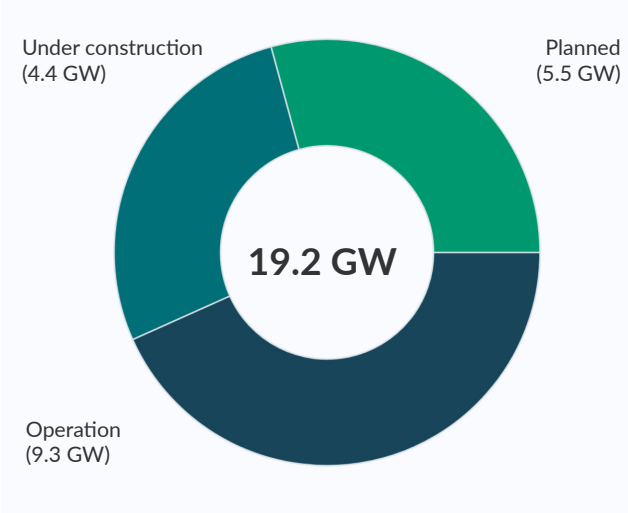
Despite the fallout from the COVID-19 outbreak, the UK's Low Carbon Contracts Company affirmed that the fourth CfD auction was still scheduled to take place in 2021.

The outlook for the UK's offshore wind market remains relatively robust up until 2030, thanks to a relatively stable framework for new project developments, and with the Net Zero target by 2050 looming, offshore wind has been pegged as a crucial cornerstone in achieving the country's green and sustainable economy.

Since the first allocation round in 2014, strike prices have continued to fall in each successive CfD auction for offshore wind, in which developers are paid a flat (indexed) rate for the electricity they produce over a 15-year period with the Low Carbon Contracts Company.

With the next auction scheduled for 2021, the UK's Department for Business, Energy & Industrial Strategy most recently awarded contracts for six offshore wind projects in the third CfD auction round last September 2019, resulting in record-low strike prices for the technology at £39.65 MWh.

## UK OFFSHORE WIND CAPACITY




The CfD stands as the UK's primary mechanism for supporting offshore wind and other renewables technologies. Winning proponents such as Equinor, SSE and innogy were lauded in their efforts for driving a near 30% reduction in prices from CfD round two in 2017, a demonstrable sign of the technology's maturity within the global energy mix.

The teams winning out in the third CfD auction will contribute over 5.4 GW of new offshore wind project investment in the coming years.

The Dogger Bank offshore wind projects are expected to cost a total of £9 billion and will be financed between 2020 and 2026, with SSE and Equinor specifically stating they would look for non-recourse project financing to fund the collective.

German developer innogy plans on making a final investment decision on the 1.4 GW Sofia offshore wind farm in late 2020, according to Sofia Project Director David Few, who helped spearhead the team's winning bid in the third-round auction.

innogy's team then plans on reaching financial close in 2021, before offshore wind construction begins in 2022/23. As per the CfD delivery date, Sofia will generate first power in 2024/25 and will be fully operational in 2026.

# Offshore Wind Farms in the United Kingdom

## OPERATIONAL

| Project | Stage | MW |
|---|---|---|
| Walney Extension | o | 659 |
| London Array | o | 630 |
| Beatrice extension | o | 588 |
| Race Bank | o | 580 |
| Gwynt y Môr | o | 576 |
| Greater Gabbard | o | 504 |
| Dudgeon | o | 402 |
| Rampion | o | 400 |
| West of Duddon Sands | o | 389 |
| Walney | o | 367 |
| Sheringham Shoal | o | 317 |
| Thanet | o | 300 |
| Lincs | o | 270 |
| Burbo Bank Extension | o | 258 |
| Humber Gateway | o | 219 |
| Westermost Rough | o | 210 |
| Lynn and Inner Dowsing | o | 194 |
| Robin Rigg | o | 180 |
| Gunfleet Sands 1 & 2 | o | 172 |
| Ormonde | o | 150 |
| Kentish Flats | o | 140 |
| EOWD Centre | o | 93 |
| Barrow | o | 90 |
| Burbo Bank | o | 90 |
| Rhyl Flats | o | 90 |
| Teesside | o | 62 |
| North Hoyle | o | 60 |
| Scroby Sands | o | 60 |
| Hywind Scotland | o | 30 |

## UNDER CONSTRUCTION & PLANNED

| Project | Stage | MW |
|---|---|---|
| Hornsea Two | u | 1386 |
| Hornsea One | u | 1218 |
| Moray East | u | 950 |
| Triton Knoll | u | 857 |
| East Anglia One | u | 714 |
| Sofia Phase 1 | p | 1400 |
| Doggerbank Creyke Beck A P1 | p | 1200 |
| Doggerbank Creyke Beck B P1 | p | 1200 |
| Doggerbank Teeside A P1 | p | 1200 |
| Seagreen Phase 1 | p | 454 |

Key

o - Operational

u - Under construction

p - Planned

# Germany

Germany is Europe's second largest market for offshore wind, after the United Kingdom, and a steady build-out of turbines in the German North and Baltic Seas over the past decade has positioned offshore wind as a major contributor to the country's production of renewable energy.

Renewables generated energy was responsible for a record-breaking 52% of Germany's domestic supply of electricity in Q1 2020, though the country's clean energy sector still finds itself in a rather tenuous position, not least due to a pronounced decline in interest in the German onshore wind sector, an increasing strain on the state to support solar power, in addition to a projected economic slump as a result of the COVID-19 outbreak.

The German government has also faced repeated calls from the offshore wind industry to firmly establish a target of at least 20 GW by 2030 and to build upon the 7.5 GW of current installed capacity, especially as the country faces lagging behind its European neighbours for new offshore wind investment in the early part of this decade.

Project financing for offshore wind farms in Germany amounted to $25.1 billion between 2010 and 2019. Operational projects also remain highly sought after assets among sustainable infrastructure investors, with close to $10 billion of M&A investments made in the sector during the same timeframe.

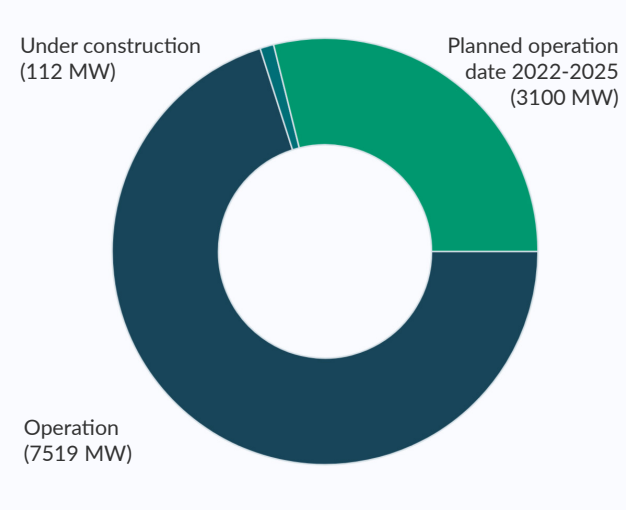
Germany's next auction for offshore wind are scheduled for 2021. According to the German Federal Maritime and Hydrographic Agency (BSH), three zones will be tendered in the German North (N-3.7 and N-3.8) and Baltic (O-1.3) Seas, with these projects scheduled to be commissioned by 2026.

Germany's Offshore Wind Act was introduced in 2017 and ushered in a new era of competitive auctions for the technology.

To date, Germany has allocated a total of 3.1 GW of offshore wind capacity from tenders that were held between 2017 and 2018. The wvinning projects are to be installed by 2021 to 2025.

The German Federal Network Agency (Bundesnetzagentur) awarded EnBW and Ørsted with contracts for four offshore wind projects totalling 1.49 GW, which notably resulted in successful bids to develop 1.38 GW of the amount without any form of state subsidy support.

## GERMAN OFFSHORE WIND CAPACITY




Ørsted attributed its zero-subsidy bid to a number of factors, including the 2024 realisation window, allowing for larger wind turbines to be deployed (potentially up to 15 MW), the exclusion of grid connection costs from the bidding process and the possibility to extend the operational lifetime of the wind farms to 30 years.

For projects commissioned from 2026, Germany will hold annual tenders with a volume of between 700 to 900 MW per auction under a new centralised model in the predetermined sites, which will include a permit lasting up to 20 years.

# Offshore Wind Farms in Germany

## NORTH SEA

| Project | Stage | MW |
|---|---|---|
| Alpha Ventus | o | 60 |
| Amrumbank West | o | 302 |
| BARD Offshore 1 | o | 400 |
| Borkum Riffgrund 1 | o | 312 |
| Borkum Riffgrund 2 | o | 450 |
| Borkum Riffgrund 3 | p | 900 |
| Butendiek | o | 288 |
| DanTysk | o | 288 |
| Deutsche Bucht | o | 252 |
| EnBW Albatros | u | 112 |
| EnBW He Dreiht | p | 900 |
| EnBW Hohe See | o | 497 |
| Global Tech 1 | o | 400 |
| Gode Wind 1 | o | 332 |
| Gode Wind 2 | o | 252 |
| Gode Wind 3 | p | 242 |
| Kaskasi | p | 325 |
| Meerwind Sud Ost | o | 288 |
| Merkur | o | 396 |
| Nordergrunde | o | 111 |
| Nordsee One | o | 332 |
| Nordsee Ost | o | 288 |
| Riffgat | o | 113 |
| Sandbank | o | 288 |
| Trianel Windpark Borkum | o | 200 |
| Trianel Windpark Borkum II | o | 200 |
| Veja Mate | o | 400 |

## BALTIC SEA

| Project | Stage | MW |
|---|---|---|
| Arcadis Ost 1 | p | 247 |
| Arkona | o | 384 |
| Baltic Eagle | p | 476 |
| EnBW Baltic 1 | o | 48.3 |
| EnBW Baltic 2 | o | 288 |
| Wikinger | o | 350 |
| Wikinger Sud | p | 10 |

Key

o - Operational

u - Under construction

p - Planned operation date 2022-2025

# France

French offshore wind will be vital in boosting the country's share of renewables in the total energy mix to 33% by 2030, particularly as a means of shifting reliance away from nuclear power.

However, France's offshore wind sector has fallen behind other countries in Europe due to a number regulatory hurdles that developers and investors have contended with during the country's state-led auction process over the years.

The market outlook has thankfully improved after the European Commission gave approval last July for the construction of six long-awaited offshore wind farms, and the French government most recently set out details in April 2020 to establish new tenders in the coming years to bolster the country's offshore wind sector.

Under the Programmation pluriannuelle de l'énergie (PPE), France will tender up to 8.75 GW of offshore wind capacity between 2020 and 2028, scaling the amount from 5 GW.

The PPE was established in April 2020 and includes another increase to France's operational targets for offshore wind, which is now set at 2.4 GW by 2023 and 5.2-6.2 GW by 2028.

Barring any delays to the timeline due to the COVID-19 outbreak, France's first tender will be held later this year for 1 GW of offshore wind capacity in Manche Est Mer du Norb, followed by three 250 MW floating offshore wind tenders in Britany and the Mediterranean between 2021 and 2022, and a subsequent series of 1 GW tenders.

None of the projects previously awarded under the French auction process have yet been brought online, though the recent EU approval has now cleared a smooth path for the winning developments to be financed and brought online by 2022.

The Saint-Nazaire offshore wind farm, located off the coast of the Guérande Peninsula, was the first of the project to be financed from France's offshore wind pipeline.

French company EDF Renewables and Enbridge, a Canadian energy infrastructure company, secured €2 billion of non-recourse financing in November 2019 to develop and construct Saint-Nazaire, which will add 480 MW of offshore wind capacity to the French grid once the project is brought online.

The Dunkirk offshore wind farm was the most recent project to be auctioned off by France and the success of the tender last summer acted as catalyst for the government to finally scale its exposure to the offshore wind in the PPE.

France's Ministry for the Ecological and Inclusive Transition awarded Dunkirk to a consortium led by EDF Renewables, in partnership with innogy and Enbridge, in June 2019 at a price €44 per MWh.

## OFFSHORE WIND FARMS UNDER DEVELOPMENT IN FRANCE

| Project | Expected Operation |
|---|---|
| Noirmoutier-Île-d'Yeu (496 MW)<br>Sponsors: Engie / EDPR / CDC | 2023 |
| Saint-Nazaire (480M MW)<br>Sponsors: EDF / Enbridge | 2022 |
| Saint Brieuc (496 MW)<br>Sponsors: Iberdrola / Eole-RES / Caisse des Depot | 2023 |
| Courseurlles dur Mer (450 MW)<br>Sponsors: EDF / Enbridge / WPD | 2023 |
| Fécamp (498 MW)<br>Sponsors: EDF / Enbridge / WPD | 2023 |
| Dieppe-Le Tréport (496 MW)<br>Sponsors: Engie / EDPR / CDC | 2023 |
| Dukerque (600 MW)<br>Sponsors: EDF / innogy / Enbridge | 2022 |

# Netherlands

The Netherlands has installed 1.118 GW of offshore wind capacity to date, giving it the fifth largest offshore wind fleet in Europe, and recent growth in the sector has been delivered largely in line with the Dutch Energy Agreement for Sustainable Growth to achieve 4.45 GW of installed renewables capacity by 2023.

Dutch offshore wind project financing totalled $8.9 billion between 2010 and 2019.

Despite the fallout from COVID-19, the Netherlands Enterprise Agency (RVO) pressed ahead with its next offshore wind tender in April 2020 for the Hollandse Kust Noord permit, allocating 700 MW within zone site 5.

The Dutch government aims to deploy 11 GW of offshore wind energy by 2030, and the tender for Hollandse Kust Noord is the fifth competitive auction to bolster the country's capacity from the technology.

RVO received several applications for its latest subsidy-free tender and expects to announce winner within a three-month window, with the auction window closing on 30 April 2020.

Companies are competing to develop a 700 MW offshore wind farm, capable of supplying approximately 2.5% of the total current electricity consumption in the Netherlands.

Ørsted confirmed its participation in the Dutch offshore wind auction, in contrast to Vattenfall and EnBW, which both decided not to compete due to uncertainties caused as result of the COVID-19 outbreak. Ørsted brings prior experience to the Dutch auction system, previously securing a bid to build the Borssele 1 & 2 Offshore Wind Farm in 2017, which started delivering first electricity in April.

According to Steven Engels, Country Manager for Ørsted in the Netherlands, the construction of Borssele 1 & 2 Offshore Wind Farm was 'so far going as planned', and that the company expected the project to be 'generating enough green energy to power one million Dutch households later this year'.

Swedish energy company Vattenfall, the winner of the first two Dutch offshore wind auctions, announced that it would not be competing in the latest competition because of the uncertainties caused due to COVID-19, focusing instead on its existing project pipeline.

Vattenfall won out in two separate auctions for Hollandse Kust Zuid I and II in 2018 and Hollandse Kuzt Zuid III and IV in 2019. The two projects together will have a total capacity of 1.5 GW and are set to be the world's first subsidy-free offshore wind farms.

As per the tender rules, Vattenfall is under obligation to bring the Hollandse Kust Zuid projects online within five years after receiving the permit.

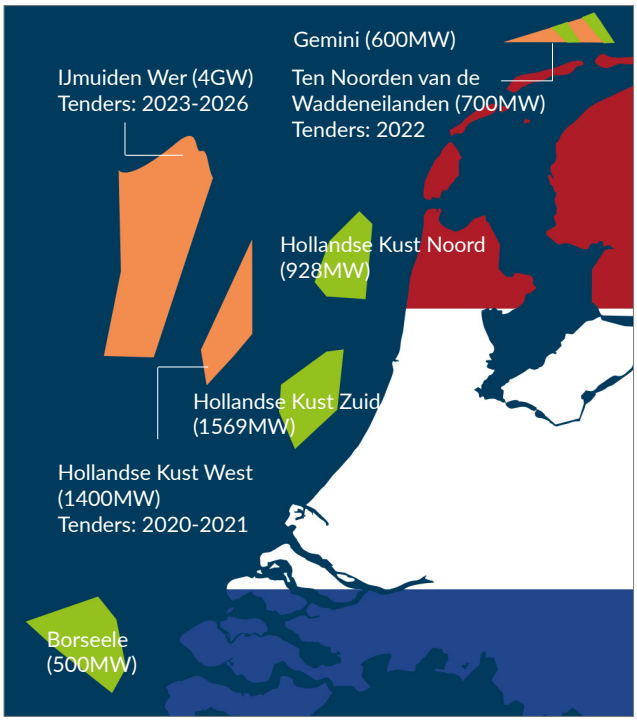
TenneT is the designated offshore grid operator and will be responsible for connecting the wind farms to the grid.

Following Hollandse Kust Noord, the Netherlands will launch a series of tenders from 2021 for installations across three designated wind farm zones.

Developers will be bidding for up to 1.4 GW in Holland Coast (West), 700 MW in the North of the Wadden Sea Islands, and 4 GW in the IJmuiden Far Offshore zone.

The Netherlands plans to bring up to 7 GW of offshore wind capacity online from 2024 to 2030.

## THE DUTCH OFFSHORE WIND ENERGY ROADMAP 2030



# Belgium

The Government of Belgium aims to install 4 GW of offshore wind capacity by 2030, adding to six offshore wind farms that are fully operating in the Belgian North Sea, producing an average of 639 GWh of clean electricity per month.

Belgium's installed capacity for offshore wind increased from 1.556 GW to 1.616 GW in February 2020 after the first wind turbines from the Northwester 2 offshore wind farm were commissioned.

Even with the global pandemic, Belgium remains on track to increase its total offshore wind capacity to 2.3 GW this year via the commissioning of the 219 MW Northwester 2 and the 487 MW Seamade projects, and construction work is proceeding ahead as planned for both projects.

"We are aiming for a timely completion of Belgium's largest offshore wind farm, despite the current Corona crisis, as this is an important step in the country's energy transition," said Mathias Verkest, CEO of Otary, developer of SeaMade, with the installation of 58 Siemens Gamesa's 8.4 turbines starting in spring 2020.

To date, Belgium has secured $8.5 billion worth of financing for offshore wind projects.

Belgian developer Parkwind most recently reached financial close on the Northwester 2 offshore wind farm in 2018 at a total cost of €642 million.

There were nine commercial lenders in total that took part in the financing, comprising:

BNP Paribas Fortis, Rabobank, Sumitomo Mitsui Banking Corporation, ASN Bank, Belfius Bank, Triodos Bank, ING Bank, Société Général, and KBC Bank.

Offshore wind has been pushed to the forefront of the Belgium's future energy mix, especially with the phase-out of nuclear power looming in 2025.

The Belgian Federal Parliament established a new law on the competitive bidding procedure for offshore wind in April 2019, which includes an objective to deliver at least 1.75 GW of additional offshore wind capacity, while effectively reducing the level of state support granted to projects, in line with EU Guidelines on State Aid.

Under the law, winning proponents in the auctions will be awarded a maximum concession of 30 years and a period of support lasting up to 15 years.

Belgium's next public tender is scheduled to take place in 2022, ahead of planned installations by 2025.

# Denmark

Denmark has one of the world's premier offshore wind markets and boasts Europe's third largest offshore wind fleet, with a cumulative installed capacity of 1.7 GW.

After Vattenfall commissioned the 407 MW Horns Rev 3 wind farm in August 2019, Denmark went on to hit a major milestone as the country generated 47% of its electricity exclusively from wind energy last year.

With $2.4 billion invested in Danish offshore wind projects between 2010 and 2019, Lars Christian Lilleholt, Energy, Supply and Climate Minister, has led calls for Denmark to become the 'Silicon Valley' for offshore wind power, relying on new project solicitations to bolster the country's domestic fleet.

As a result of the Energy Agreement that was established in 2018, Denmark plans to install three new offshore wind projects with a minimum capacity of 800 MW each, generating the equivalent power demand for 800,000 Danish households.

Notwithstanding any delays from COVID-19, Denmark's next tender will be for the Thor offshore wind farm, which will have a total capacity of between 800 MW and 1,000 MW.

The Danish Energy Agency issued a prior information notice for Thor in March 2020, ahead of plans to launch the tender in Q3 2020, with a view to schedule the final deadline for bids in Q4 2021.

Under a 20-year concession, the winning proponent for Thor will receive subsidy support in the form of a premium paid on top of the electricity price generated. The tender will feature a two-way CfD scheme that will be capped for Denmark's payment to the concession owner and the concession owner's payment to Denmark, thereby sharing the risk of electricity price fluctuations between both parties.

Thor is slated to come online no later than 2027 and will be located in the North Sea, west of Nissum Fjord.

Horns Rev 3 Offshore Wind Farm
Image credit: Vattenfall

# Ireland

Ireland's Department of Communications, Climate Action & Environment published the country's first climate action plan in June 2019, detailing a series of actions to push the country to net-zero carbon emissions by 2050, in line with the EU Green Deal.

Ireland aims to deploy at least 3.5 GW of new offshore wind capacity over this decade, with 2030 as an interim target, as well as 8.2 GW of new onshore wind and 1.2 GW of grid-scale solar power – all of which should take Ireland's total renewable electricity share to 70%.

To aid in the achievement of these targets, Ireland is leaning on the Renewable Electricity Support Scheme (RESS) as the country's first foray into an auction-based scheme to attract international investment and expertise for clean energy.

The RESS aims to be more inclusive of new forms of clean energy generation outside of onshore wind and the Irish government is particularly keen on leveraging the potential for offshore wind around the Irish coastline.

Ireland's new RESS came about after lengthy consultation period involving the private sector and two separate public dialogues, while also reviewing similar auction models from countries such as Denmark, Germany, Canada and Scotland.

Ireland has forecast that a 'minimum of four auctions will occur between 2020 and 2027' in order to hit the country's 70% renewable electricity target by 2030, though future RESS auctions would depend on 'the renewable electricity project supply pipeline'.

# Poland

Poland has emerged as a potentially exciting investment destination for offshore wind, with several promising projects in the development pipeline.

The Polish government published a Draft Offshore Wind Bill in early 2020 to help exploit the untapped potential for offshore wind in the Baltic Sea, with plans to auction up to 10 GW of new offshore wind capacity by 2027.

In the first stage of the strategy, Poland's energy regulator will procure up to 4.6 GW of offshore wind capacity by awarding fixed-priced CfDs for projects that are in the advanced-stages of development.

In the second stage, Poland will place up to 5.5 GW of offshore wind up for auction. The first tender with a volume of 500 MW will be held in 2023, followed by auctions for 2.5 GW in 2025 and 2027. There will be an option to hold an extra 500 MW allocation round if more offshore wind capacity is needed.

There have been several leading energy companies that already started investing in early-stage offshore wind developments in Poland.

Norwegian energy company Equinor most recently closed a deal with Polish power group Polenergia to acquire a 50% stake in the Bałtyk Środkowy I (BSI) offshore wind project in the Baltic Sea.

Equinor's deal in December 2019 now means it controls half of all three Bałtyk Środkowy developments, which have the potential to generate up to 3 GW of combined offshore wind capacity, or the equivalent power for nearly 4 million homes.

Equinor first purchased shareholdings in BSII and BSIII and created joint ventures with Polenergia in March 2018 to advance its position in Poland's offshore wind market.

"The acquisition of Baltyk I strengthens our presence in the Baltic Sea area," Jens Økland, Senior Vice President of Business Development at Equinor, said of the latest offshore wind project in the team's portfolio, which is located 80km from the port of Łeba in Poland.

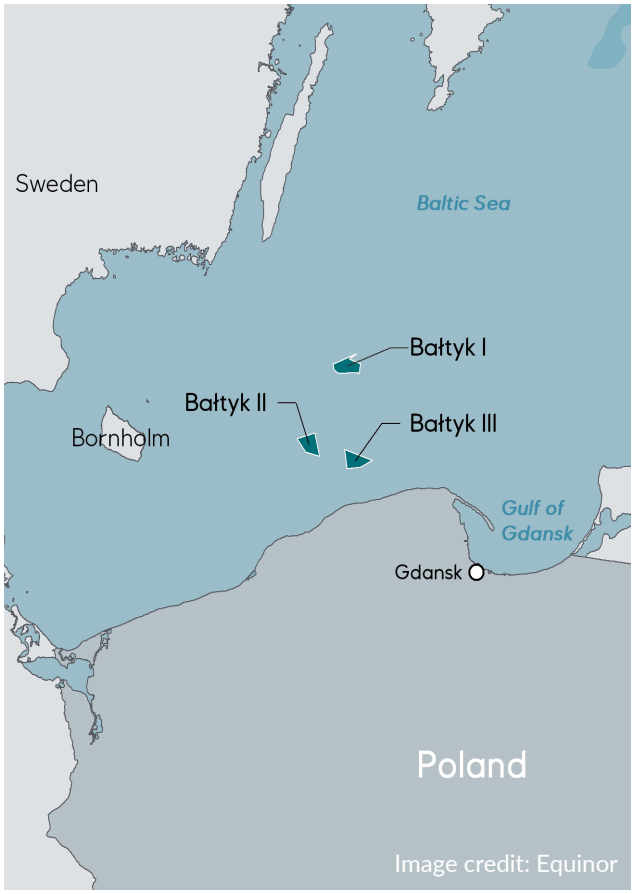
"With interest in all three, Baltyk I, II and III projects, we have the opportunity to build scale and value in what we see as an important energy region."

German company RWE Renewables similarly acquired a pipeline of four offshore wind projects in October 2019 from various private owners and developers in Poland

The Polish offshore wind quartet totals 1.5 GW of potential generating capacity and is currently in various stages of the development process, with all four assets are located near the Slupsk bank area in the Baltic Sea.

According to RWE, construction work on the Polish offshore wind projects could begin 'as early as 2023'.

## THE BAŁTYK OFFSHORE WIND SITES IN POLAND



# Floating Offshore Wind


Floating offshore wind is still in the relatively nascent stages of market development, though a few notable demonstration projects have started to be deployed in countries such as Scotland, Wales, Norway, and Spain.

In Portugal, the Windfloat Atlantic Phase is the most recent floating offshore wind farm to be connected to the grid, generating first power on 31 December 2019. Windfloat 1 is located 20 kilometres off Costa Viana do Castelo, adding 8.4 MW of new offshore wind-generated electricity to the grid. The project is notable for featuring the largest installed floating turbine in the world using semi-sub technology.

The Windfloat projects were approved with a total volume of 25 MW in 2016, despite being initially rejected by the Energy Services Regulatory Authority over fears of increasing connection costs.

An international consortium was able to push the project forward after undertaking a cost review to reduce the overall end cost to the consumer, led by a subsidiary of EDP Renewables (54.4%), ENGIE (25%), Repsol (19.4%) and Principle Power Inc. (1.2%).

European Investment Bank (EIB) has provided a €60 million loan to support the construction of the 'first-of-its-kind' floating offshore wind farm in Portugal.

Windplus also received funding €29.9 million from the EU's NER300 programme, and up to €6 million from the Government of Portugal, through the Portuguese Carbon Fund.

The successful financing of Windfloat signified an important step towards the bankability of floating offshore wind projects in Portugal as well as other markets in Europe.

Since then, Equinor received approval in April from the Norwegian government to build a new floating offshore wind farm, all during a lockdown of the country due to the COVID-19 outbreak.

Despite the restrictions, Norway's Ministry of Petroleum and Industry gave Equinor the green light in April to develop and operate the Hywind Tampen wind farm, which has been designed to supply clean power to the Snorree and Gullfaks oil and gas platforms in the Norwegian sea.

The approval came six months after Equinor made a final investment decision for the floating offshore wind farm and signed NOK 3.3 billion ($357 million) worth of supply chain contracts to support the project's development.

At a total cost of NOK 5 billion ($547 million), Hywind Tampen will benefit from NOK 2.3 billion ($273 million) in funding from the Norwegian government via Enova, while a contribution of up to NOK 566 million ($62 million) will come from the country's Business Sector NOx fund.

Hywind Tampen will comprise 11 wind turbines, each with a rates capacity of 8 MW, and will supply 35% of the annual power demand of the five platforms Snorre A and B and Gullfaks A, B and C.

Equinor's floating offshore wind farm in Norway is slated to come online by 2022.

French oil and gas giant Total similarly navigated its way through the COVID-19 crisis to sign an agreement in March for the acquisition of an 80% stake in a floating offshore wind development in the Celtic Sea, off the coast of Wales.

Total purchased a shareholding in the Erebus floating wind project from UK developer Simply Blue Energy.

Erebus is being developed as a pathfinder project for floating wind projects and will have a potential capacity of 96 MW at water depths of 70 metres. Simply Blue has already submitted an application for the project to the Crown Estate.

The UK's Department for Business, Energy and Industrial Strategy (BEIS) launched a consultation in March 2020 for the expert views and opinions of the energy industry on a number of sweeping proposals that will affect how developers participate in the fourth CfD auction in 2021 and beyond.

BEIS is currently studying whether to classify floating offshore wind as a separate technology within the CfD scheme and outside of offshore wind projects with fixed bottom foundations.

The UK is aiming for 40 GW of installed offshore wind capacity by 2030, via The Offshore Wind Sector Deal, and floating offshore wind projects could play an important role in reaching this ambitious target, though the technology is still in the nascent stages of market development, despite the potential to deploy the technology at deeper water sites.

*"The successful financing of Windfloat signified an important step towards the bankability of floating offshore wind projects in Portugal as well as other markets in Europe."*

With floating offshore wind still in its infancy, the technology hasn't had the chance to fully climb down the cost curve or benefit from the economies of scale, and creating a new asset class for floating offshore wind could allow it to compete away from its cheaper, fixed bottom offshore wind counterpart.

# Offshore Wind Project Finance Transactions

## SINCE 2018

| Project | Date | Country | Deal value ($m) | Equity provider | Debt provider |
|---|---|---|---|---|---|
| Offshore wind farm (325MW) - Kaskasi | Apr-20 | Germany | - | Innogy SE | |
| Offshore wind farm (112MW) - Albatros (Hohe See Extension), Offshore wind farm (497MW) - EnbW Hohe See (Hochsee Windpark Nordsee) | Feb-20 | Germany | 557.3 | Canadian Pension Plan Investment Board (CPPIB) | |
| Offshore wind farm (448MW) - Neart na Gaoithe | Nov-19 | UK | 2317.6 | Mainstream Renewable Power Ltd.; EDF Renewable Energy (f.k.a. EnXco Inc.); ESB Group (Electricity Supply Board of Ireland) | European Investment Bank (EIB); Banco Santander SA; Bank of China Ltd.; Barclays; BNP Paribas SA; CaixaBank (f.k.a. Criteria Caixa Corp. SA); Commerzbank AG; Credit Agricole Corporate and Investment Bank (a.k.a Credit Agricole CIB); Credit Industriel et Commercial SA (CIC); DZ Bank AG; ING Group NV (incld. ING Bank and ING Capital); KfW IPEX; Landesbank Baden-Wuerttemberg (LBBW); Helaba Landesbank Hessen-Thuringen Girozentrale; Lloyds Banking Group plc; National Westminster Bank plc; Norinchukin Bank; Oversea-Chinese Banking Corp.; Shinsei Bank; Siemens Bank GmbH; Skandinaviska Enskilda Banken AB; Societe Generale; Sumitomo Mitsui Banking Corporation (SMBC); Mizuho Financial Group (Mizuho Bank, Mizuho Corporate Bank, Mizuho Trust & Banking); Mitsubishi UFJ Financial Group (Bank of Tokyo-Mitsubishi UFJ) |
| Floating offshore wind farm (30MW) - Golfe du Lion | Nov-19 | France | - | EDP Renovaveis SA; ENGIE (f.k.a. GDF SUEZ SA) | |
| Floating offshore wind farm (88MW) - Hywind Tampen | Oct-19 | Norway | 547.2 | Equinor (fka: Statoil); Enova SF; NOx Fund | |
| Offshore wind farm (480MW) - Saint Nazaire | Sep-19 | France | 2604.7 | Enbridge Inc.; EDF SA (a.k.a. Electricite de France) | BNP Paribas SA; Societe Generale; KfW IPEX; Mitsubishi UFJ Financial Group (Bank of Tokyo-Mitsubishi UFJ) |

| Project | Date | Country | Deal value ($m) | Equity provider | Debt provider |
|---|---|---|---|---|---|
| Offshore wind farm (400MW) - Rampion | Aug-19 | UK | 520.25 | | Sumitomo Mitsui Banking Corporation (SMBC); Santander Bank (f.k.a Sovereign Bank); Norddeutsche Landesbank (Nord/LB); Mitsubishi UFJ Financial Group (Bank of Tokyo-Mitsubishi UFJ); ING Group NV (incld. ING Bank and ING Capital); Allied Irish Banks plc |
| Offshore wind farm (588MW) - Beatrice | Jul-19 | UK | 3225.9 | | |
| Offshore wind farm (309MW) - Otary Rentel | Apr-19 | Belgium | 952.1 | | Rabobank |
| Offshore wind farm (30MW) - Beleolico | Feb-19 | Italy | 133 | Renexia SpA | Natixis SA |
| Floating offshore wind farm (3.6MW) - TetraSpar | Feb-19 | Norway | 20.48 | Innogy SE; Royal Dutch Shell plc; Stiesdal Offshore Technologies | |
| Offshore wind farm (950MW) - Moray East | Dec-18 | UK | 3309 | ENGIE (f.k.a. GDF SUEZ SA); EDP Renovaveis SA; Diamond Generating Europe; China Three Gorges Corp. | Eksport Kredit Fonden (EKF); Japan Bank for International Cooperation; Banco Santander SA |
| Offshore wind farm (336MW) - Galloper | Dec-18 | UK | 1770 | | |
| Offshore wind farm (573MW) - Race Bank | Dec-18 | UK | 253 | | |
| Offshore wind farm (402MW) - Dudgeon | Dec-18 | UK | 1595 | | Societe Generale; Mitsubishi UFJ Financial Group (Bank of Tokyo-Mitsubishi UFJ); Sumitomo Mitsui Banking Corporation (SMBC); BNP Paribas SA; DBS Bank Ltd.; DNB Group (a.k.a DnB NOR Bank ASA); SEB Skandinaviska Enskilda Banken AB; Norinchukin Bank |

| Project | Date | Country | Deal value ($m) | Equity provider | Debt provider |
|---|---|---|---|---|---|
| Offshore wind farm (487MW) - Seamade (Seastar & Mermaid) | Dec-18 | Belgium | 1471 | Otary RS NV; Eneco Holding NV; Electrabel SA (Electrabel GDF Suez S.A.) | European Investment Bank (EIB); Eksport Kredit Fonden (EKF); Banco Santander SA; Bank of China; Belfius Bank; BNP Paribas SA; Commerzbank AG; Rabobank; ASN Bank; ING Group NV (incld. ING Bank and ING Capital); KBC Bank NV; KfW Bankengruppe; Mitsubishi UFJ Financial Group (Bank of Tokyo-Mitsubishi UFJ); Siemens Financial Services Ltd. (inlcd. Siemens Bank & Siemens Project Ventures); Societe Generale; Triodos Bank NV; Sumitomo Mitsui Trust Bank Limited |
| Offshore wind farm (25MW) - WindFloat Atlantic / WindFloat Phase 2 | Oct-18 | Portugal | 68.8 | | European Investment Bank (EIB) |
| Offshore wind farm (860MW) - Triton Knoll | Aug-18 | UK | 2594.37 | RWE Innogy UK (f.k.a. RWE npower Renewables) | Natixis SA; ABN AMRO Bank NV; Skandinaviska Enskilda Banken AB; BayernLB (a.k.a. Bayerische Landesbank AG); Lloyds Banking Group plc; ING Bank Hipoteczny; KfW IPEX; National Westminster Bank plc; BNP Paribas SA; Commerzbank AG; Helaba Landesbank Hessen-Thuringen Girozentrale; Mitsubishi UFJ Financial Group (Bank of Tokyo-Mitsubishi UFJ); Landesbank Baden-Wuerttemberg (LBBW); Sumitomo Mitsui Banking Corporation (SMBC); Banco Santander SA |
| Offshore wind farm (210MW) - Westermost Rough | Aug-18 | UK | 492.91 | | |
| Offshore wind farm (400MW) - Merkur Offshore (f.k.a. MEG 1) | Jul-18 | Germany | 1754.45 | | KfW Bankengruppe |
| Offshore wind farm (50MW) - Kincardine | Jul-18 | UK | 328.27 | Atkins plc (WS Atkins Plc); Pilot Offshore Renewables | |
| Offshore wind farm (224MW) - Northwester 2 | Jul-18 | Belgium | 810 | Sumitomo Corp.; Colruyt Group; TTR energy; Incontrol S.A.; Parkwind | European Investment Bank (EIB) |

| Project | Date | Country | Deal value ($m) | Equity provider | Debt provider |
|---|---|---|---|---|---|
| Offshore wind farms (735.1MW) - Borssele III & IV (Blauwind II) | Jun-18 | Netherlands | 1506.88 | Partners Group Holding; Eneco Holding NV; Royal Dutch Shell plc; Van Oord NV; Diamond Generating Europe | European Investment Bank (EIB); ABN AMRO Bank NV; BNP Paribas SA; Rabobank; Sumitomo Mitsui Trust Holdings; ING Bank Hipoteczny; Societe Generale; Mizuho Financial Group (Mizuho Bank, Mizuho Corporate Bank, Mizuho Trust & Banking); Sumitomo Mitsui Banking Corporation (SMBC); Industrial and Commercial Bank of China Ltd.; Bank of China Ltd.; Bank Nederlandse Gemeenten; Mitsubishi UFJ Financial Group (Bank of Tokyo-Mitsubishi UFJ) |
| Offshore wind farm (112MW) - Albatros (Hohe See Extension), Offshore wind farm (497MW) - EnbW Hohe See (Hochsee Windpark Nordsee) | May-18 | Germany | 389.5 | Canada Pension Plan Investment Board | |
| Wind farm (28MW) - Aeolus, Ireland | Apr-18 | Ireland | 61.19 | | |
| Offshore wind Farm (156MW) - Adria [Offshore] | Mar-18 | Croatia | | Norinco International Cooperation Ltd. | |
| Offshore wind farm (92.4 MW) - Aberdeen Bay | Jan-18 | UK | | | |

# Offshore Wind M&A Transactions

## SINCE 2018

| Target | Date | Country | Deal value ($m) | Acquirer | Seller |
|---|---|---|---|---|---|
| Offshore wind farm (500MW) - Norway (Magnora) | Mar-20 | Norway | | Magnora ASA | Undisclosed |
| Ailes Marines; Offshore wind farm (496MW) - Saint-Brieuc | Mar-20 | France | | Iberdrola S.A. | |
| Offshore wind farm (1000MW) - Codling Bank II; Offshore wind farm (1100MW) - Codling 1 | Feb-20 | Ireland | | EDF Renewable Energy (f.k.a. EnXco Inc.) | Hazel Shore Ltd |
| Offshore wind farm (400MW) - Merkur Offshore (f.k.a. MEG 1) | Dec-19 | Germany | | TRIG Investments; APG Asset Management NV | Partners Group Holding; InfraRed Capital Partners Ltd.; DEME Group (a.k.a. Dredging, Environmental and Marine Engineering NV); GE Energy Financial Services (GE Capital); Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME) |
| Offshore wind farm (448MW) - Neart na Gaoithe | Nov-19 | UK | | ESB Group (Electricity Supply Board of Ireland) | EDF SA (a.k.a. Electricite de France) |
| Offshore wind farm (576MW) - Gwynt y Mor | Oct-19 | UK | 216.8 | Macquarie Infrastructure and Real Assets | Siemens AG |
| Offshore wind porfolio (1.5GW) - 4 wind farms in Slupsk bank (Polish Baltic Sea) | Oct-19 | Poland | | RWE AG | Undisclosed |
| Offshore wind portfolio (2500MW) - Elektrownia Wiatrowa Baltica 2, 3 | Oct-19 | Poland | | Orsted (f.k.a. DONG Energy A/S) | PGE Polska Grupa Energetyczna SA |
| Offshore wind transmission Line Project - Race Bank | Oct-19 | UK | | Diamond Transmission Partners | |
| Offshore wind farm (385MW) - Arkona Becken Südos | Oct-19 | Germany | 547.85 | Credit Suisse Group AG | Equinor (fka: Statoil) |

| Target | Date | Country | Deal value ($m) | Acquirer | Seller |
|---|---|---|---|---|---|
| Offshore wind farm (714MW) - East Anglia 1 (East Anglia One) | Aug-19 | UK | 2071.1 | Green Investment Group (fka: UK Green Investment Bank) | Iberdrola S.A. |
| Offshore wind farm (400MW) - BARD 1 | Aug-19 | Germany | 1120 | Macquarie Infrastructure and Real Assets | Ocean Breeze; Unicredit Spa |
| Offshore wind farm (184.6MW) - Walney, Phase 2; Offshore wind farm (183.6MW) - Walney, Phase 1 | Jul-19 | UK | | PGGM | Ampere Equity Fund |
| Offshore wind farm (350MW) - Gode Wind I | Jul-19 | Germany | | Glennmont Partners (f.k.a. BNP Paribas Clean Energy Partners GP Ltd.) | Global Infrastructure Partners |
| Offshore wind farm (350MW) - Gode Wind I | Jun-19 | Germany | 439.9 | The Renewables Infrastructure Group Ltd. (TRIG) [listed yieldco] | Global Infrastructure Partners |
| Offshore wind farm (270MW) - Lincs | Mar-19 | UK | | Arjun Infrastructure Partners Limited | Green Investment Group (fka: UK Green Investment Bank) |
| Offshore wind farm (402MW) - Veja Mate | Feb-19 | Germany | | INGKA Holding BV; KGAL GmbH & Co KG; WPD Offshore GmbH; Commerz Real AG | Copenhagen Infrastructure Partners (CIP); Highland Group Holdings (a.k.a. Laidlaw Capital Group); Siemens Financial Services Ltd. (inlcd. Siemens Bank & Siemens Project Ventures) |
| Offshore wind farm (402MW) - Veja Mate | Feb-19 | Germany | | Siemens Financial Services Ltd. (inlcd. Siemens Bank & Siemens Project Ventures) | Copenhagen Infrastructure Partners (CIP); Highland Group Holdings (a.k.a. Laidlaw Capital Group) |
| Offshore wind farm (330MW) - Oriel | Jan-19 | Ireland | | ESB Group (Electricity Supply Board of Ireland) | Parkwind |
| Offshore wind farm (500MW) - Clogherhead | Jan-19 | Ireland | | Parkwind | ESB Group (Electricity Supply Board of Ireland) |
| Offshore wind farm (2.3MW) - Hywind Project | Jan-19 | Norway | | Unitech Offshore AS | Equinor (fka: Statoil) |
| Offshore wind farm (950MW) - Moray East | Jan-19 | UK | 44.45 | China Three Gorges Corp. | EDP Renovaveis SA |
| Offshore wind farm (172.8MW) - Gunfleet Sands | Dec-18 | UK | | Jera | Marubeni Corp. |

| Target | Date | Country | Deal value ($m) | Acquirer | Seller |
|---|---|---|---|---|---|
| Offshore wind farm (1560MW) - Baltyk I | Dec-18 | Poland | | Equinor (fka: Statoil) | Polenergia SA |
| Offshore wind farm (496MW) - Noirmoutier; Offshore wind farm (496MW) - Le Treport | Dec-18 | France | | Sumitomo Corp. | EDP Renovaveis SA; ENGIE (f.k.a. GDF SUEZ SA) |
| Offshore wind farm (950MW) - Moray East | Nov-18 | UK | 69.8 | Diamond Generating Europe | EDP Renovaveis SA |
| Offshore wind farm (40MW) - Middelgrunden | Nov-18 | Denmark | | HOFOR | Orsted (f.k.a. DONG Energy A/S) |
| Offshore wind farm (1218MW) - Heron Wind and Njord / Hornsea Phase 1 | Sep-18 | UK | 5870 | Global Infrastructure Partners | Orsted (f.k.a. DONG Energy A/S) |
| Offshore wind farm (224MW) - Northwester 2 | Aug-18 | Belgium | | Sumitomo Corp. | |
| Offshore wind farm (860MW) - Triton Knoll | Aug-18 | UK | | J-POWER Electric Power Development Co. Ltd; Kansai Electric Power Co. Inc. | Innogy SE |
| Offshore wind farm (247MW) - Arcadis Ost 1 | May-18 | Germany | | Parkwind | KNK Wind GmbH |
| Offshore wind portfolio (609MW) - Hoho See, Germany; Renewables portfolio (1300MW) - North America | May-18 | Canada | 1760 | Canadian Pension Plan Investment Board (CPPIB) | Enbridge Inc. |
| Offshore wind farm (112MW) - Albatros (Hohe See Extension); Offshore wind farm (497MW) - EnbW Hohe See (Hochsee Windpark Nordsee) | May-18 | Germany | 1363 | Canada Pension Plan Investment Board | Enbridge Inc. |

| Target | Date | Country | Deal value ($m) | Acquirer | Seller |
|---|---|---|---|---|---|
| Offshore wind farm (448MW) - Neart na Gaoithe | May-18 | UK | | EDF SA (a.k.a. Electricite de France) | Mainstream Renewable Power Ltd. |
| Offshore wind farm - UK | Apr-18 | UK | 111.48 | Gravis Capital Partners LLP | |
| Offshore wind farm (402MW) - Veja Mate | Apr-18 | Germany | | Commerz Real AG; INGKA Holding BV; WPD AG; KGAL GmbH & Co KG | Highland Group Holdings (a.k.a. Laidlaw Capital Group); Siemens Financial Services Ltd. (inlcd. Siemens Bank & Siemens Project Ventures); Copenhagen Infrastructure Partners (CIP) |
| Offshore wind Farm (750MW) - North Irish Sea Array | Apr-18 | Ireland | | Element Power | Gaelectric Developments Ltd. |
| Offshore wind Farm (156MW) - Adria [Offshore] | Mar-18 | Croatia | 71 | Norinco International Cooperation Ltd. | Undisclosed |
| Offshore wind farm (210MW) - Westermost Rough | Mar-18 | UK | | Green Investment Group Inc. | Marubeni Corp. |
| Offshore wind farm (21MW) - Sprogo/ Storebaelt | Mar-18 | Denmark | | European Energy A/S | Storebælt A/S |
| Offshore wind farms (735.1MW) - Borssele III & IV (Blauwind II) | Jan-18 | Netherlands | | Partners Group Holding | Eneco Holding NV; Diamond Generating Europe |
| Offshore wind farm (317MW) - Sheringham Shoal | Jan-18 | UK | 112.57 | TRIG Investments | |

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