

## 【欧州】 【海事】

# Maritime issues - Renewable energy including offshore wind power generation: Preparations for a European Commission' s offshore wind strategy and a new floating offshore wind farm project

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### 【概要 : Summary】

In order to achieve the carbon neutrality by 2050, the EU will have to transform its energy system and to replace fossil fuels with renewable energy sources including also wind power. Besides the onshore wind power generation, the installation of offshore wind farms for power generation has gained importance in Europe, since offshore wind turbines can utilise the more regular and stronger marine winds.

However, the current level of new installations and investments seem not to be sufficient for decarbonising the EU' s energy system and to deliver on the European Green Deal. Offshore wind installations are seen as the key element for achieving the 2050 net zero GHG emission target. However, the construction of offshore wind farms will have to be decisively accelerated, in quantity, size and power capacity.

The European Commission expects that by 2050, between 230 GW and 450 GW of offshore wind power generation will be needed for meeting the carbon neutrality target of 2050. This will require Europe to build 7 GW of new capacity each year by 2030 and to further increase the annual new capacity to 18 GW by 2050. The EU is committed to further support the development of offshore wind power generation and to explore its potential. By using the

technology of floating offshore wind power generation platforms, more sites will become suitable for the installation of wind farms, also in deeper waters of more than 60 metres. The utilisation of floating offshore wind farms would allow an expansion of the utilisation of the up to 80% of offshore wind resources in deep water areas, which cannot be utilised by conventional bottom fixed structures. Considering the 2050 net zero GHG emission target and the 450 GW vision for offshore wind by 2050, these targets need a significant increase in the annual installation rate, not only for offshore wind farms in general, but also for floating winds farms in particular, as they can expand into deeper water of a depth of 60 m and more. Floating offshore wind farm projects funded by the EU will be presented as well as aspects of the European Commission' s new strategy on offshore renewable energy as part of the European Green Deal, which is expected to be presented later in 2020.



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## 【記事 : Article】

### 1. The European Green Deal (EGD) 's offshore wind strategy and further measures

In the EU, the utilisation of wind power is considered being one of the key elements to achieve the net zero carbon emission target of 2050. The European Commission 's European Green Deal (EGD) of 11 December 2019 sets out a growth strategy for the EU to reach this net zero emissions of GHG by 2050. The EGD underlines that " ...increasing offshore wind production will be essential, building on regional cooperation between Member States" .

The EGD includes an offshore wind strategy and the European Green Deal Investment Plan (EGDIP) 's Just Transition Fund (JTF) focuses on GHG emission reductions, among others. Increasing offshore wind production through regional cooperation between the EU Member States will be an essential part of delivering the EU Green Deal 's target of a clean, affordable and secure energy supply. The European Commission expects to cover half of the EU needs of electricity generation by 2050 with the deployment of wind energy. Regarding offshore wind capacity, currently, Europe has a total installed offshore wind capacity of 22,1 GW. The Commission expects that between 230 GW and 450 GW of offshore wind power generation is needed by 2050 in order to meet the European Green Deal 's targets. Therefore, the offshore wind installations will have to increase significantly in order to achieve the expansion of renewable energy share in power generation in Europe. The related European Commission 's offshore wind strategy is expected to be presented in October 2020. Germany will hold the EU presidency from July to December 2020 and at the same time, it holds the presidency of the North Sea Cooperation in 2020. Germany is expected to use this double function for working out an international framework for the construction of wind farms before the end of the year.

The Commission will also take forward the work on

the Clean Energy for EU Islands Initiative to develop a long-term framework to accelerate the clean energy transition on all EU islands. Furthermore, the EU Member States are currently working on their maritime spatial plans until 2030, in which they set out which offshore projects they want to build. Once the national plans are submitted, which is planned before March 2021, the Commission will have one year to compare them with National Energy and Climate Plans and the EU 's new climate targets for 2030. The offshore targets for the European Green Deal are ambitious, and EU Member States like Germany are in talks with other Member States to promote joint offshore projects. The aim is to optimise spatial planning and cost sharing between countries so that Europe has a chance of reaching 450 GW of offshore wind capacity by 2050. However, the EU still lacks of a EU-wide regulatory framework for joint projects of this kind. Some questions, such as how to distribute the high costs of connection to the land or the responsibility of national grid operators, remain unresolved.

### 2. The concept of floating wind farms

In past decades, the offshore wind power generation has gained momentum based on the benefits from the utilisation of the stronger and steadier winds at sea. In Europe, the offshore wind industry started with the first wind turbine of the Vindeby Offshore Wind Farm, in 1991.

In 2009, the European Environment Agency (EEA) presented a report entitled "Europe 's onshore and offshore wind energy potential" in order to evaluate the Europe-wide resource assessment of onshore and offshore wind potential. The EEA report confirmed that, alongside other renewable sources such as biomass, wind energy could play a major role in achieving Europe 's renewable energy targets. Regarding offshore winds farms, the study concluded that the environmental and social related constraints have a larger impact on the expansion of offshore wind parks due to the existing restrictions imposed by shipping lanes, gas and oil

platforms, military areas, and environmentally protected areas. The report classified the relationship between wind energy potential and distance to the shore and assumed, that only 4% of the offshore area in the 0-10 km distance from shore would be available for developing wind farms. 10% of the areas 10-30 km and 30-50 km from the coast can be used for wind farms. Regarding distances from the coast above 50 km, a larger share of offshore areas could be utilised, as wind is stronger in these areas while other functions such as shipping are less concentrated.

However, in order to utilise offshore areas at greater distance from the shore, the problem of conventional bottom fixed wind turbines had to be solved. In order to benefit from the 80% of the offshore wind resources in areas of deep waters of 60m and more, the new technology of floating wind farms had to be developed and utilised. Floating installations opening vast new areas and markets for offshore wind. While the technical feasibility of deep-water floating wind turbines has been successfully demonstrated, these installations still need financial support in order to accelerate the exploitation of wind energy. Therefore, the European Commission and the EIB financially support floating offshore wind farm projects in their construction but also in their operation phase.

### 3. Recent projects for floating wind farms

The world's first floating wind farm was installed off the coast of Peterhead, Scotland, in the Statoil Masdar's 30MW Hywind project in 2017. Regarding the further exploitation of deep-water areas with a depth of more than 60 metres, Norway has a head start in floating wind technology thanks to this Equinor (former Statoil) project. Accordingly, Norway intends to further develop its domestic market of floating wind farms. In 2018, the European Commission supported the construction of a floating wind farm in Portugal and earlier in 2019, the European Commission already approved a French plan to support four demonstration floating wind farms.

Several EU co-funded projects for wind farms, including floating wind farms, like the LIFES 50plus project, with research on floating wind turbines and the TELWIND project, with a novel floating substructure and a self-erecting telescopic tower, ended already in April 2019, respectively in November 2018. However, meanwhile, the Spanish utility company Iberdrola announced its involvement in two European demonstration projects, one of which will utilise a 10MW turbine and a semi-submersible floating concrete structure. While in 2019 the average size of installed offshore turbines was 7.8 MW, Iberdrola intends to test a turbine of 10 megawatts (MW) at the Marine Energy Test Centre in Norway. This size would be a definite scope for cost reductions in the offshore sector. Iberdrola together with a consortium of firms from Spain, Germany, France, Norway and Denmark aims at significantly reducing the costs of floating offshore wind energy production. Iberdrola is leading the international consortium of several companies including Core-Marine, Cener, IHC and Zabala Innovation Consulting in Spain, French EDF, Danish DTU, and DNV-GL in Germany, to test a wind turbine of the so-called FLAGSHIP project on a semi-submersible floating concrete structure. The project is connected to the European Commission's Horizon 2020 research and innovation program. Iberdrola hopes to sign an agreement amounting to around EUR 25 million with the European Commission in the second half of 2020 on the FLAGSHIP project. The main objective of the FLAGSHIP project is to help reduce the LCOE (Levelised Cost of Energy) for floating offshore wind to a range of between 40-60 €/MWh by 2030, driven by economies of scale, competitive supply chains and a variety of innovations. Iberdrola has previously been involved in research and development projects for floating offshore wind, but the "FLAGSHIP" project will be the first time the developer has installed a floating wind turbine.

The construction of the project's floating platform is expected to begin in 2021, with the installation

commencing in early 2022. This project is expected to improve the potential globally for floating technology, as it will open up new markets where water conditions that restricts the utilisation of traditional offshore projects. Iberdrola is also considering adding floating turbines to its existing fixed-bottom offshore sites and is investigating the potential large-scale floating projects off the US coast and Scotland.

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