

Infrastructure – especially transmission – is key to developing offshore wind

It has long been known that one of the many factors deciding the future impact of offshore wind on the global energy mix will be transmission infrastructure that connects electricity producers with distribution companies and end-customers and consumers.

However transmission infrastructure is lacking globally. Many especially European governments are struggling to expand and develop the proper transmission grids in order to accommodate the future larger volumes of electricity especially from offshore wind.

We have previously reported on the Danish government's preliminary plans for one or more "energy islands" or wind power "hubs" in the North Sea or the Baltic Sea. You can see the article [here](#). Energy islands is an exciting tool for boosting offshore wind's competitiveness. However at least in the short term challenges from sub-optimal transmission infrastructure will continue to persist.

Most recently, on the basis of press reports and subsequent discussions in the Climate, Energy and Utility Committee¹ of the Danish parliament, some of the challenges have been highlighted.

The immediate reason for the discussion was press reports, according to which an over-supply of electricity exported from Denmark to Germany had necessitated a close-down of production at the request of the German off-takers.

The Danish minister for energy confirmed that Danish wind turbines are switched off for periods due to restrictions on the German electricity grid and temporary restrictions on the Danish electricity grid.

The Danish transmission systems owner, Energinet, has recently stated that out of a total wind production in Denmark in 2019 of approx. 16.1 TWh approximately 0.4 TWh was voluntarily downregulated. This corresponds to approx. 2.75 per cent of total wind production and approx. 1.3 per cent of the total Danish electricity consumption.

According to the minister, it is not an effective or desirable long-term solution that Danish wind turbines are paid to stand still.

In the short term, per the minister, international connections such as Viking Link to the UK, the Danish West Coast connection to Germany and the strengthening of the network from Endrup to Idomlund (a North-South connection in Western Denmark) from its commissioning in 2023 alleviates and reduces the need for down-regulation.

In addition, Germany has undertaken to expand the German electricity grid.

¹ Answer dated 10 February 2020 from the Minister of Climate, Energy and Utility to a question dated 20 January 2020 from the Committee's Mr. Morten Messerschmidt, Danish People's Party

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In the longer term, further infrastructure investments are required over the most of Europe. In addition, technologies that make it possible to store power, which could ensure a more flexible energy system that can utilize large amounts of wind energy, must be developed.

The Danish Energy Agency (the DEA) provided the following additional information on the reason wind turbines are taken out of production due to the German electricity grid:

Danish wind turbines are at times voluntarily standing still due to bottlenecks in the German electricity grid and adaptation of German renewable energy production. The reason is that wind turbines can today bid on the so-called special regulation market. Here, wind turbines compete on an equal footing with, for example, power plants to sell flexibility to the power system.

Today, Energinet uses special regulation to, among other things, downgrade Danish electricity generation or increase consumption, including wind, both as a result of limitations in the German electricity grid and temporary restrictions in the Danish electricity grid.

Down-regulation of wind turbines is therefore used to ensure balance in the power system. All players who can offer flexibility can bid and the cheapest to deliver is awarded the contract.

The DEA stated that the fact there is a need for down-regulation for relatively many hours, even when wind turbines are standing still, is a result of the fact that Germany continues to have difficulties to adapting the power grid to the green transition.

WSCO works with legal, regulatory and commercial issues relating to both power production from offshore wind and transmission infrastructure and will continue to monitor and report on this important area of the Danish energy industry.

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For questions or comments to this newsletter or energy and offshore in general, please contact Bo Sandroos on +45 4088 5422 or bos@wsko.dk.

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