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Backgrounder ›

Research project:
Nezzy² floating offshore wind turbine

Offshore wind power is growing to become a mainstay of Germany's energy transition. But it is currently prevented from reaching its full potential because so far, offshore wind turbines can only be installed economically at water depths of 50 metres or less. That limits the choice of suitable marine areas. EnBW is therefore joining forces with partners to investigate various ideas for floating offshore wind turbines that can then be deployed at greater depths in future offshore projects. France especially is an attractive market for EnBW together with its subsidiary Valeco. EnBW and aerodyn engineering, a north German engineering company, are now jointly testing Nezzy², a floating turbine model, on a scale of 1:10.

Floating platform with twin turbines

Nezzy² consists of two wind turbines supported by a partially submerged floating foundation. The 18 metre tall model is being tested in two different rotor configurations featuring two and three rotor blades respectively. It is based on a horizontal Y-shaped foundation. This consists mainly of precast prestressed concrete elements that are flooded so that only the three floats and the central tower protrude from the water. The floating foundation self-aligns with the wind direction and is moored by six chains to anchors on the seabed. Two towers rising in V-formation from the centre of the foundation support the two wind turbines. Guy ropes link the towers together and to the foundation.

First test in a flooded gravel pit near Bremerhaven, second in the Baltic Sea

The model is first being installed on a scale of 1:10 in a flooded gravel pit between Bremerhaven and Cuxhaven. A lack of waves and currents means that wind tracking can be studied there in isolation. The water is about ten metres deep, which is equivalent to 100 metres water depth at full scale.

In summer 2020, subject to regulatory approval, the model will be tested in wind and wave conditions in the Baltic Sea. It will operate solely to take measurements and the electricity it

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generates will not be fed into the grid. After two-and-a-half months of testing at sea, the model will be dismantled. Testing of a 15-megawatt full-scale model is scheduled off the coast of China with another partner in late 2021.

Advantages of Nezzy²: enhanced performance and stability

aerodyn already successfully tested a 1:10-scale predecessor of Nezzy with a single turbine in the sea off Japan in 2018. Nezzy², its successor with an improved design, has two rotors and has so far been tested on a scale of 1:36 in an artificial wave channel in Cork, Ireland. The two rotors double the output per floating foundation. Due to the two adjacent rotors, the point of attack for the wind is far lower than with a single large rotor. This gives the model greater stability in the water.

About aerodyn engineering

aerodyn engineering gmbh was established in 1997 to develop innovative wind turbine concepts. Over the past decade, it has developed the SCD wind turbine technology and the nezzy/nezzy² floating foundation technology. Due to this diverse development pipeline and longstanding market experience, aerodyn has wide-ranging expertise spanning all stages from development to type approval to production. aerodyn's business activities include licensing and supporting licensees in order to ensure full transfer of knowhow to implement the nezzy floating foundation technology on local markets.

About EnBW

EnBW is one of the largest energy companies in Germany and Europe, and supplies electricity, gas, water and energy-related products and services to around 5.5 million customers with a workforce of 21,000 employees. By 2025, EnBW plans to invest over five billion euros to further expand renewables. In wind power, the company provides design, construction, operation, maintenance and repair from a single source. It aims to operate onshore and offshore wind turbines with a total output of at least 3,500 megawatts by 2025.

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