Copenhagen Offshore Wind 2005

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Go ahead Dutch off shore wind: Windfarm Egmond aan Zee is under construction

The Offshore Windfarm Egmond aan Zee (OWEZ), formerly known as the Near Shore Windfarm, is the first offshore windfarm under construction in the Netherlands. The project will be situated 10 - 18 kilometres off the Dutch coast. After a tender procedure by the government NoordzeeWind, a joint venture of Shell Wind Energy and Nuon Renewable Energy, won the offshore concession in 2002. Following a development period of three years, the Final Investment Decision was taken earlier this year and on 30 May all contracts were signed. Construction works on the onshore grid connection are currently under way, and offshore installation is scheduled to commence in March 2006. The offshore works will be completed in a single summer season, and the wind farm is expected to be fully commissioned by the end of 2006.

The wind farm consists of 36 Vestas V90 wind turbines, built on steel monopile foundations driven into the seabed, and protected against scour. Axis height will be 70 meters above MSL. The water depth at the site varies between 15 and 20 meters.

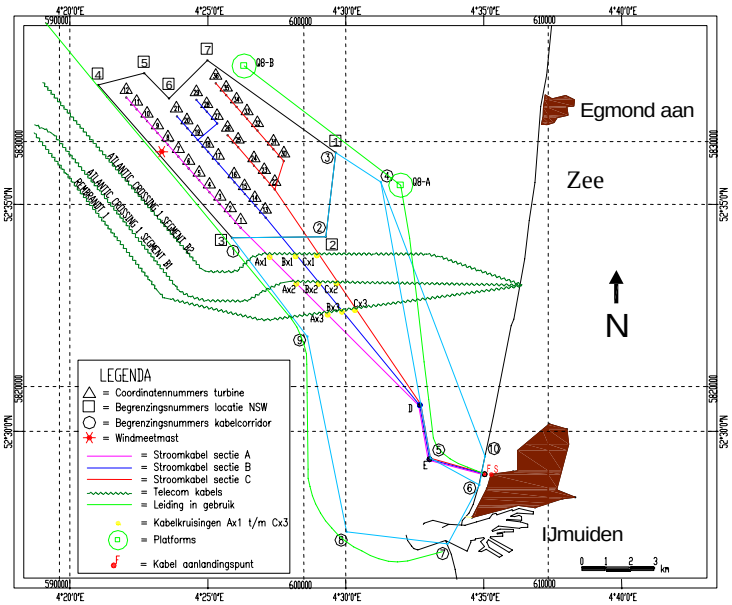

Figure: site lay out

The wind farm comprise three sections of 12 turbines and each section has a separate 34 kV subsea cable connection to shore. The cables will be buried to a depth of 2 metres below the seabed, and regular inspections are planned to ensure that the cables remain buried. Conversion of the electricity to a high voltage (150kV) and connection to the main grid will take place on shore at Velsen. From this substation the local grid operator Continuon will make the grid connection to the 150kV substation in Velsen with a 7 km underground cable.

The work will be carried out under a lumpsum turnkey EPC contract by the "Bouwcombinatie Egmond" (BCE), a joint venture of Dutch civil and marine construction company Ballast Nedam Infra and wind turbine manufacturer Vestas. Foundation installation work will be done by Ballast Nedam's own heavy-lift vessel Svanen, and turbine installation will be carried out by A2SEA.

Construction work of the substation started in September 2005, together with preparation work for the dune crossing of the cables. Three conductor tubes have to be installed by horizontal drilling before the storm season commences, as the dunes are sea defences and work is only permitted in the summer. Offshore cables will be pulled through these tubes next year. Construction at the offshore site will commence in March 2006. An efficient installation method has been designed by BCE. In a continuous work flow the filter layers of the scour protection will be laid on the sea bed, the foundation piles will be driven, transition pieces lifted on and scour protection armour layers installed. Finally the wind turbines will be erected. Commissioning will take place in three strings according to the electrical lay out of the wind farm, and the entire wind farm is expected to be in operation by the end of 2006.

Part of the OWEZ project is a monitoring and evaluation program on environmental and technical issues, known as the "NSW-MEP". The aim of the program is to generate knowledge that can be used for further development of wind energy offshore. The knowledge gained will be available to NoordzeeWind, the Dutch government, and many interested stakeholders including the general public. To manage the interests of NoordzeeWind and its contractors a data classification system has been designed and will be applied. Requests of third parties to receive data, whether made to the government or to NoordzeeWind, will be handled according to this system.

As part of the NSW-MEP a 116 meter tall meteorological mast has been operating at the offshore site since early 2004. Wind speed and direction are measured at three heights: at lower tip, rotor shaft and upper tip height. This means that the mast has a total height of 116 m above average sea level. In addition, air temperature, humidity and rainfall are monitored. An Acoustic Doppler Profiler installed close to the seabed measures the current profile across the water depth. Power for the systems is generated by solar panels and a small wind generator hooked up to a battery system. The data gathered is sent to the shore by means of a mobile telephone connection. During the construction of the wind farm the met mast will be connected to the wind farm by means of a cable that will provide power and data transport capacity for the future operation.

The OWEZ is an important step for the further development of off shore windenergy. This commercial operated wind farm will generate a lot of knowledge and it will provide clean energy for over 100.000 households in the Netherlands.