

Wrapped Composite Joints for Next Gen Offshore wind support struc. (WrapNode-I)

Publieke samenvatting / Public summary

Aanleiding

With the increasing size of turbines and the deeper location of wind farms, the monopile foundations of offshore wind turbines increase in size, weight and costs. Alternatives for the support structures such as jackets are lighter but have challenges for an economical design and manufacturing speed/capacity due to its unfavourable welded joints. TU Delft together with partners is introducing the wrapped composite joint to solve these challenges. This innovation is developed at the faculty of Civil Engineering of the TU Delft and since 2017 over 80 tested wrapped composite joint has shown that this joint is a major improvement compared to welded connections. The composite joint is capable to replace all of the complex welding in jacket structures allowing for increase in fatigue resistance in joints for jackets for offshore wind turbines. This offers a cost reduction to offshore wind developers of 25%-50% for the supporting structures and a carbon footprint reduction of 30%-70%.

Doelstelling

The goal of the project is to lower the LCOE and carbon footprint of offshore wind by further development of the wrapped composite joint in offshore wind structures. Within the WrapNode-I project the wrapped composite joint technology is developed towards full-scale application and validated on critical points. Prediction tools and the manufacturing process are developed, optimised and validated with scaled and full-scale composite

Projectinformatie / Project information

Projectnummer / Project number

HER+-01085007

Subsidiebedrag / Grant amount

€ 2.850.811,00

Algemene informatie / General information

Penvoerder / Secretariat

Techn. Universiteit Delft

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joints. These results will validate the wrapped composite joint to be used in offshore jackets and supports the step towards implementation in a Jacket structure planned in the follow-up project called WrapNode-II.

Korte omschrijving

The WrapNode-I project is divided into three work packages dealing with technology and an overarching work package dedicated to project planning/management and dissemination. 1. Jacket and Joint design study 2. Performance validation 3. Project management and dissemination The project will be executed by a consortium consisting out of TU Delft, Tree Composites, HSM offshore, Smulders, Siemens Gamesa Renewable Energy, Shell, AOC Nederland, BuFA Benelux, Salzgitter Renewables GmbH and Enersea.

Resultaat

The project will deliver the following results: • Reports on performance validation on the long-term behaviour of the composite joint including environmental, scaling, multi-axial loading and manufacturing influences; and • Insight into cost, CO2 footprint, and production rate of a jacket with wrapped composite joints at full-scale; • Development of methods to predict the static and fatigue performance and establishment of design procedures.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

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