Zephyros AIRTuB

Publieke samenvatting / Public summary

Aanleiding

The wind industry has been exploiting offshore wind energy for about a decade by now, therefore wind turbine Operations & Maintenance (O&M) is a rapidly growing, but as yet unoptimized, activity to keep wind parks profitable. While the gearbox, the generator and many other parts of the wind turbine can be monitored with dozens of sensors, monitoring of the blades remains a challenge. The rotors of off-shore wind turbines are getting bigger. The blade tip speeds and forces are increasing and the physical limits of structures and composites are within reach. Blade inspection is not only expensive and dangerous, it is also time-consuming, causes downtime and can only be carried out under certain conditions (weather / availability of experts etc.) Blade damage ensures lower aerodynamic yield, greater load on drive trains and downtime . Repairing blade damage is only possible under certain circumstances, is time-consuming and expensive.

Doelstelling

The purpose of Fieldlab Zephyros is to develop, test and demonstrate innovations and to develop knowledge and skills. The ultimate goal: no unnecessary downtime and no need for on-site maintenance of the offshore wind energy system. Working on this accelerates the development of large-scale offshore wind energy, making it a competitive and sustainable energy source from an ecological and economic point of view.

Korte omschrijving

Leading Edge Erosion (LEE), induced by offshore

Projectinformatie / Project information

Projectnummer / Project number
TEHE119002
Subsidiebedrag / Grant amount
€ 2.990.369,00

Algemene informatie / General information

Penvoerder / Secretariat
World Class Maintenance

Publicaties en materialen / Publications and attachments

- **04.06.2020**

  Zephyros AIRTuB (Presentation Matchmaking Day 2020)

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weather conditions (water, salt, dirt) and damage from precipitation (rain, hail) is currently one of the largest challenges in the wind industry, and presents significant operational, maintenance and cost challenges. - LEE affects the aerodynamic performance of a blade, leading to a reduced AEP (Annual Energy Production). - Secondly severe LEE degradation can lead to reduced availability, caused by downtime for maintenance and repair, thus contributing to a lower AEP and an increase in O&M costs, while inspection and maintenance work put employees in challenging situations. In addition to LEE, structural damage, such as delamination and porosity, of operational blades similarly have a negative effect on O&M costs and AEP. The importance of O&M for the AEP is recognized by the Top Sector Energy (TSE), stating that: - Management and maintenance of wind farms account for more than a quarter of the total LCOE;1 - The availability and production of wind turbines can be increased by effective maintenance, leading to a lower LCOE.

Resultaat

The consortium intends to prove in this project that more advanced automated sensor -and coating systems can enhance inspection and repair operations around offshore wind parks, in order to increase AEP and decrease the cost of O&M. The basic idea is: - To use a drone platform with a sensor module for remote sensing to detect and measure the level of LEE of operational turbine blades. The drone with the module as load is launched from a CTV (Crew Transfer Vehicle) near an offshore wind turbine. The drone will hoover in front of the turbine blades to enable remote sensing and will land on the LE of the blade where it will lock itself to the LE and crawl along its length. - A second sensor package, to detect and measure structural damage, and third package, an automated coating system for the repair of LEE, will be developed in parallel. Both packages have the potential to be developed to plug and play modules in a later stage, that can be carried as payload by the drone. Both modules would require the drone to make contact with the blade. It is estimated that a LCOE reduction

of 3,3% from 45,6 €/MWh to 44,1 €/MWh can be achieved.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.
Voor meer informatie over de Topsector Energie, ga naar **www.topsectorenergie.nl**.

Voor meer informatie over de TSE / Energie-Innovatie regelingen die RVO aanbiedt, ga naar **www.rvo.nl/tse**.