

Assessing the turbulent content of wind using spinner anemometry

Publieke samenvatting / Public summary

Aanleiding

The lack of detailed, real time offshore turbulence measurements hinder the design of offshore wind turbines on the one hand, because models are insufficiently validated. On the other hand, wind turbine manufacturers and owners have insufficient grip on the regulation and operation of offshore wind turbines.

Doelstelling

The aim of the project is to develop technology to evaluate the performance of wind turbines during their operational life. The method is based on better understanding of the turbulent wind field at the turbine's rotors in operating wind farms using spinner anemometry. When successful, the monitoring over lifetime can also be used to improve wind turbine design, operation, load control and yield generation, which needs to be researched in a subsequent project.

Korte omschrijving

Within the project ECN, GE and ROMO will develop the technology to analyse the performance of the wind turbines in an operational wind farm. For that reason, near field and far field behind wind turbines are important to characterize. The development of the analyses technology is supported by a measurement campaign comprising turbine operation measurements, IEC compliant meteorological mast measurements, nacelle LiDAR measurements and, particularly, ROMO iSpin measurements. The models and performance are

Projectinformatie / Project information

Projectnummer / Project number

TKITOE_TT_WIIP1_1603_ECN

Subsidiebedrag / Grant amount

€ 29.386,00

Algemene informatie / General information

Penvoerder / Secretariat

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tested against a variety of conditions: standard deviation and spectral behavior of longitudinal, transverse and vertical wind fluctuations for near field and far field rotor. These are performed both in free wind field as in waked conditions.

Resultaat

The developed method to analyse the performance of wind turbines in an operational wind farm must lead to the creation of a Joint Industry Project with developers, operators and wind turbine manufacturers. The JIP must lead to implementation of the new method in offshore wind farms: by means of an innovative measurement technology (iSpin) for better understanding of the performance of operational wind turbines. The results of the project will be presented at an international acknowledged conference or workshop.

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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