

Analysis of Flow Fields for the Assessment of global BLockage Effect

Publieke samenvatting / Public summary

Cause

The Global Blockage Effect (GBE) caused by wind farms is currently not well understood and is currently accounted for by applying a loss factor of up to 4% to the entire wind farm's predicted energy yield ('lead row' methodology). There is a growing body of opinion that the 'lead row' methodology is not fully supported by evidence and could lead to overly conservative estimates. Moreover, the uncertainty around how to account for blockage is itself significant. This lack of understanding of wind flow in and around wind farms may also make wind farm layout optimisation less effective, since layout design is performed using low-fidelity 'analytical' energy yield models, which currently do not fully capture the physics of such effects.

Objective

The AFFABLE project will mainly focus on enhancing the design and applying modern analysis techniques to a planned measurement campaign. The campaign will use multiple scanning Lidar units, deployed around a large wind farm cluster owned by RWE. By further developing and applying TNO's state-of-the-art wind field reconstruction techniques, much more insight into the GBE will be obtainable, along with a data set which will be used to validate commercial energy yield models.

Projectinformatie / Project information

Projectnummer / Project number
TKITOE_WOZ_2101_TNO-ECN_AFFABLE
Subsidiebedrag / Grant amount
€ 180.000,00

Algemene informatie / General information

Penvoerder / Secretariat
TNO

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Short description

It is essential to support this with the development of effective calibration techniques, for minimising uncertainty in measurement location when one or more Lidar units are to be used on an unstable offshore platform.

Result

Last, AFFABLE will develop and assess the capabilities of TNO's FarmFlow energy yield assessment software to capture global blockage effects. By creating and demonstrating a statistically-robust procedure for assessing performance against the validation data set, the AFFABLE project will assist industry with designing more effective offshore wind farms.

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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