Pressinformation

BINE Informationsdienst

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Wind energy: Reduce noise without forfeiting output

Aeroacoustically optimised rotor blades in the wind tunnel

The expected noise emissions and the resulting necessary distance to residential buildings are of great importance in the approval of wind farms. Scientists have designed a rotor blade profile that is as low-noise as it is high-performance and have tested its potential for noise reduction. The new BINE-Projektinfo brochure “Testing low-noise rotor blades in the wind tunnel” (08/2018) presents the first results. The measurement data gained from the tests are necessary to improve simulation tools in such a way that developers can already compare possible variants on the computer.

To date, the prediction for the noise emissions of new rotor blades are predominantly based on empirical knowledge. However, in order to develop complex and innovative geometries for noise reduction and to assess improved blade tips, physics-based, largely non-empirical 3D simulation methods are required. The scientists have tested the aeroacoustically improved profile in wind tunnels under typical flow conditions. The primary objective of the measurements was to get precise validation data for existing 2D and newly developed 3D simulation approaches. In addition, during these tests various passive technologies for noise reduction were also deployed.

Low-noise rotor blades can open up new opportunities for repowering in wind farms. A reduction of noise emissions, for example, by 2 decibels – based on the total noise – numerically increases the possible number of wind turbines in a farm by 58%. The BELARWEA research project is conducted by the Institute of Aerodynamics and Flow Technology of the DLR in Braunschweig in conjunction with an industrial advisory board.

The BINE-Projektinfo brochure, which can be obtained free of charge from the BINE Information Service at FIZ Karlsruhe, is available online at www.bine.info or by calling +49 (0)228 92379-0. The brochure cover and additional image material can also be downloaded from this web portal in the press section.

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