HiPRwind

High Power, High Reliability Offshore Wind Technology

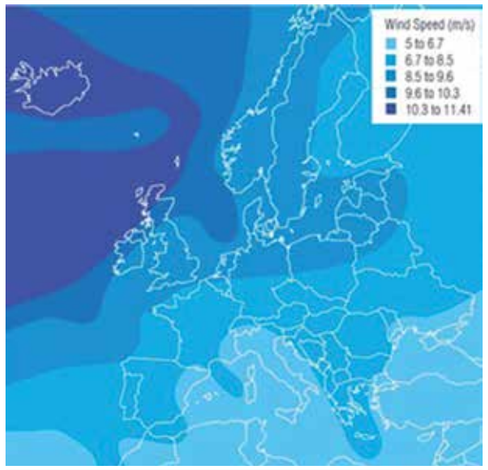
During the last 20 years, the research group led by Prof. Fritzen has been dealing intensively with the development and application of methods for damage diagnosis and structural health monitoring (SHM) of mechanical, aeronautical and civil engineering structures. Based on the experience gained in the last five years in monitoring of Offshore Wind Energy Plants (OWEP) in a national collaborative research project (IMO-WIND), the research group was invited to participate in a new innovative project regarding OWEP: High Power, high Reliability offshore wind technology (HiPRwind) starting in the year 2010

HiPRwind is an FP7 EU project introducing a new cross-sectoral approach to the development of very large offshore wind turbines. Focused on floating systems, this 5-year pan-European R&D effort will develop and test new solutions for enabling offshore wind technologies at an industrial scale. The project is designed with an "open architecture, shared access" approach in that the consortium of 19 partners will work together in a collaborative way, to develop enabling structural and component technology solutions for very large wind power installations in medium to deep waters.

A central outcome of HiPRwind is to deliver a fully functional floating wind turbine deployed at real sea conditions. This research & testing facility will be used to research new solutions and generate field data. The project will address critical issues of offshore wind technology such as the need for extreme reliability, remote maintenance and grid integration with particular emphasis on floating wind turbines. Innovative engineering methods will be applied to selected key development challenges such as rotor blade designs, structural health monitoring systems, reliable power electronics and control systems. Built-in active control features will reduce the dynamic loads on the floater in order to save weight and cost compared to existing designs. Furthermore HiPRWind will develop and test novel, cost effective approaches to floating offshore wind turbines at a lower 1-MW scale.

In the context of this project, the task of the Univ. of Siegen is to develop algorithms to monitor the vibrations and the acting wind forces on the rotating blades. The information about the loads and vibrations will be used for design and maintenance purposes of the plant.

Simplified pan-European bathymetry and wind speed maps, highlighting the limit area available for wind energy development in shallow water vs. areas for which deepwater solutions are required. (Source: Acciona, 1Tech)



I Project Management and Execution

Management:
Univ.-Prof. Dr.-Ing. Claus-Peter Fritzen

Contact:
Universität Siegen
Dept. Maschinenbau
Institut für Mechanik
und Regelungstechnik-Mechatronik
Prof. Dr.-Ing. Claus-Peter Fritzen
Paul-Bonatz-Straße 9-11
D-57076 Siegen

Telefon: +49 (0) 271/740-4621
Fax: +49 (0) 271/740-2769
E-Mail: fritzen@imr.mb.uni-siegen.de

Call identifier: FP7-ENERGY-2010-1
Topic 2010.2.3-1: "Cross-sectoral approach to the development of very large offshore wind turbines"
Coordinator:
Fraunhofer Institute IWES, Bremerhaven