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New research collaboration to reduce offshore wind costs

NGI will chair the REDWIN Project - a new research collaboration for more economical offshore wind energy. The production of renewable energy increases year by year in Europe, and the development of offshore wind is crucial for a future without fossil fuels. However, overall costs need to be reduced in order to make offshore wind competitive.

Offshore wind turbines are designed and constructed in a number of different ways according to wind and wave conditions, sea currents, depths and soil

conditions. It is time consuming to establish a complete, comprehensive wind farm under varying conditions. Advanced computational tools are therefore needed in order to optimize design and engineering.

Today, the geotechnical engineers working on the foundations and the structural engineers working on the construction operate within separate professional fields. There are no comprehensive tools that can combine the two areas, enabling them to jointly arrive at the best solutions.

As a consequence, both expert groups often need to repeat their calculations several times before they can arrive at a solution that satisfies all needs. The engineering phases often take longer than scheduled, with no guarantees that the resulting solutions are the best possible. Since foundations represent 25- 30 per cent of total construction costs, there is a great potential for savings.

REDWIN brings together experts from the two engineering fields, in order to jointly develop better methods. The aim is to design new models describing soils and foundations that will be integrated with the computational tools used by structural engineers today. This will contribute to optimized engineering and design, resulting in less expensive offshore wind energy.

REDWIN is headed by NGI (Norwegian Geotechnical Institute) with Amir Kaynia as the project leader. Partners are NTNU (The Norwegian University of Science and Technology), IFE (Institute for Energy Technology), Dr Techn Olav Olsen, Statoil and Statkraft. The project is launched in 2015 and will be finalized in 2018.

The Norwegian Geotechnical Institute (NGI) is a leading international centre for research and consulting within the geosciences. NGI develops optimum solutions for society, and offers expertise on the behaviour of soil, rock and snow and their interaction with the natural and built environment.

NGI works within the markets Offshore energy; Building, construction and transportation; Natural hazards, and Environmental Engineering.

NGI is a private foundation with office and laboratory in Oslo, branch office in Trondheim, and daughter companies in Houston, Texas, USA, and Perth, Western Australia. NGI was established in 1953.

Contacts



Kjell Hauge

Press Contact

Senior Communications Advisor

kjell.hauge@ngi.no

+4793449553