* **Title:** Development and Optimization of an Integrated Nacelle Lifting and Blade Guiding Tool for Offshore Wind Turbine Installations
* **Field:** Wind Energy
* **Project Start Date:** 01/11/2023
* **Tentative End Date:** 01/07/2024
* **Supervisors:**
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* **Problem statement:** In the context of offshore wind turbine installation, a critical challenge exists in designing an effective and versatile nacelle lifting tool that not only facilitates the secure and precise placement of wind turbine blades at hub height but also addresses the complex dynamics and environmental forces involved in the offshore setting. The primary issue to be addressed is the synchronization of the nacelle lifting tool's arm with the blade movement to ensure a secure grip and optimal positioning during installation. This research project aims to develop a comprehensive solution to these challenges through the design and evaluation of such a tool, exploring its performance under various scenarios, including differing numbers of already installed blades.
* **Main Objective:** The objective of this project is to design a versatile nacelle lifting tool that can also function as a guiding tool for installing blades onto the hub, for offshore wind turbines. A comprehensive study will be conducted to understand the behaviour of the nacelle and blades at hub height, focusing on their aerodynamics and other relevant factors. The primary goal is to synchronize the movement of the nacelle lifting tool's arm with that of the blade, ensuring a secure grip and optimal positioning for installation. The tool's performance will be assessed under different scenarios: with 0, 1, and 2 blades already installed.