

With the FH Aachen University of Applied Sciences acting as the central coordinator, the project is being realised in cooperation with two industry partners, Fa. Gebr. Käufer GmbH and ematec AG.

At the FH Aachen, two faculties, the Faculty of Aerospace Engineering and the Faculty of Mechanical Engineering and Mechatronics, as well as the MASKOR Institute, jointly work on the project.

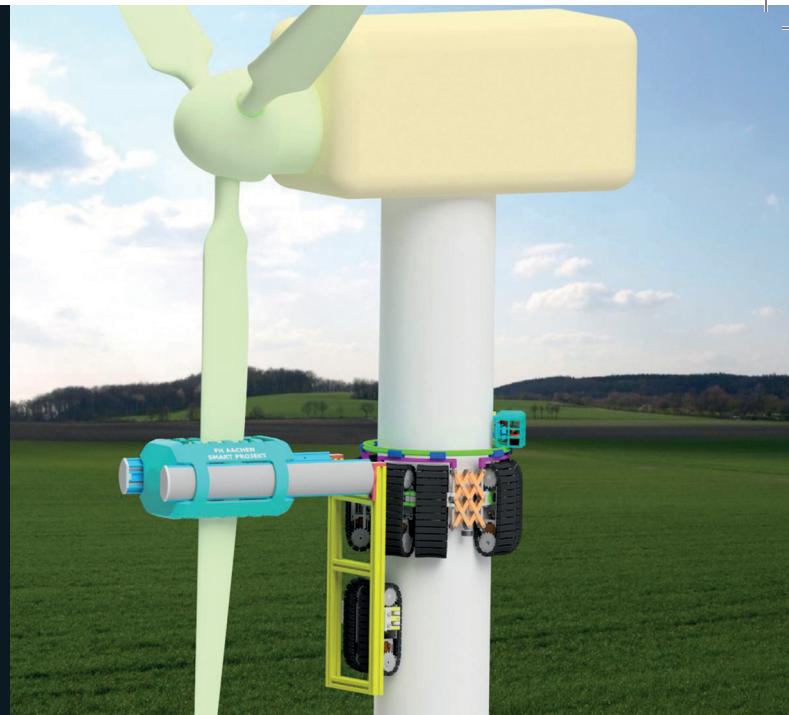
The FH Aachen has filed applications for patents for various inventions relating to this development: DE-A 102012001725 / WO 2013/113494 / US-B 9,327,784 / EP-A 2896823 and DE-A 102015010804 / WO 2017/032438 A1.

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Homepage

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Development of a Climbing Platform for Wind Turbines (SMART)



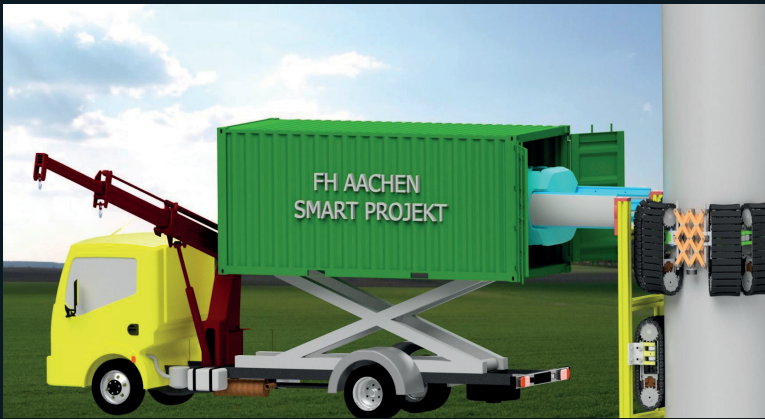
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Advantages of the SMART Concept



The SMART (Scanning, Monitoring, Analysing, Repair and Transportation) project has been funded by the Federal Ministry of Economic Affairs and Energy in Germany (BMWi) since August 2014.

The aim of the SMART research project is the development of a climbing service platform for wind turbines. Using a work booth, the rotor blade is encased at a desired section, so that fault detection and maintenance can be carried out independent of weather conditions. In the work booth workers can move around freely and work at great height, without the risk of vertigo. In particular, it is possible to utilise both measurement and repair technologies, autonomously or teleoperatively, within the robust work booth, which helps avoid accidents with people beforehand.

In combination with a trend monitoring system, the analysis of the measured data can be automated while the availability of wind turbines can be increased in a sustainable manner.

With due regard to the requirements of the industry, great importance is attached to logistics and a quick operational readiness of the SMART platform. This has a huge effect on economic efficiency.

The project was funded by the BMWi with a funding sum of approximately € 5.3 million for the project duration of four years in two project phases. During the first phase, a down-sized demonstrator was successfully developed, built and put into operation at FH Aachen in 2015. In the second phase of the project, a prototype for the maintenance of 2.5 MW turbines will be developed, tested and certified by 2019.

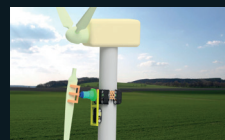
Work booth for all-year maintenance of wind turbines, independent of weather conditions. Additionally, the SMART concept provides a platform for the following potential applications:

- > semi-autonomous and teleoperated repair of mounted rotor blades can be carried out by e.g. laser scarfing,
- > non-destructive materials testing by using thermography, microwave and ultrasonic instruments,
- > trend monitoring and data analysis of measurement data increases the availability of wind turbines.



Transport of wind turbine components (e.g. spare parts within the framework of maintenance) along the tower axis

Cleaning, inspection and maintenance of tower surfaces



Feasibility study for the rotor blade exchange for small to medium sized wind turbines