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EnerKite - Latest Achievements Towards Next Generation Renewables

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The EnerKite team has been successful in automation of kite systems for more than a decade. Our first autonomous kite flights with figure of eight patterns took place in May 2008. Since then the technology of the ground-station, the wing and tether and the landing and launching system has been systematically developed, implemented and improved – driven by cost, performance and safety targets derived and approved by customers.

By use of ultra-lightweight wings with high lift configurations, the specific designs by EnerKite allow for extraordinary capacity factors.

Based on a techno-economical comparison of different launching and landing techniques[1], EnerKite has chosen a rotating arm. In favour of good scalability, low weight and low complexity of the bridled wings all control forces are introduced solely through actuators from the ground.

On the way to reach higher tether length and altitudes out of the rotation, lots of lessons have been learned, models have been enhanced and validated. Together with

the comprehensive software developments and testing and validation programs - including full scale and component, indoor and outdoor testing - we focus now on the further development of the wing structure itself. This is covered by a comprehensive R&D cooperation with leading research institutes and other industry players.

This presentation will give a brief overview on the status of EnerKite and the currently running R&D programs and cooperation's such as a 2.3 EURm SME phase 2 grant and the EnerWing Project, which is funded by the German federal ministry of economy.

The authors will illustrate major lessons learned and achievements in the field of autonomous landing and launching and lightweight structures.

References:

[1] B. Rieck, M. Ranneberg, A. Candade, A. Bormann, and S. Skutnik, "Comparison of Launching & Landing Approaches," *Airborne Wind Energy Conf. 2017*, vol. 137, p. 2018, 2017.

