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Scaling of rigid wing Airborne Wind Energy Systems to MW

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Airborne Wind Energy Systems (AWES) using soft kites are heading towards commercialization with first products in the range of 100 kW, achieving a major milestone in the AWE sector. Product-market fit studies TwingTec has done with potential large-volume customers in the decentralized power/offgrid sector clearly indicate, that products in the range of 100 kW start to become commercially attractive, however, systems in the range of one MW allow for considerably lower LCOE values while still offering a high degree of mobility due to containerized transport, both key USP's of AWE for this market segment. TwingTec assesses the total addressable market for AWES in the decentral and off-grid market in the order of EUR 70 B/y with the biggest share resulting from systems in the MW range, making the scalability of the chosen technical AWE concept a key driver for a high-volume market penetration.

It is TwingTec's ambition to develop and commercialize a technical AWES concept which can be scaled to several MW. To this end we have done a detailed study of a rigid wing VTOL AWES in the MW range in a project partially funded by Innosuisse and supported by external aviation experts. A major tool for this study has been our proprietary simulation tool KITESIM [1], which we have developed over the last ten years and validated with experimental data from our small-scale prototypes. The study shows that rigid wing VTOL AWES can be scaled to MW,

enabling TwingTec to develop a stepwise commercialization road map from smaller scale systems to the MW scale based on the same technical concept. Results from this study will be shown in this presentation.



Rendering of TwingTec's 1 MW system.

References:

[1] Gohl, F., Luchsinger, R. H.: *Simulation Based Wing Design for Kite Power*. In: Ahrens, U., Diehl, M., Schmehl, R. (eds.) *Airborne Wind Energy, Green Energy and Technology*, Chap. 18, pp. 325–338. Springer, Berlin Heidelberg (2013). doi:10.1007/978-3-642-39965-7_18