NREL Airborne Wind Energy Workshop and Technical Report 2021

Jochem Weber[1], Melinda Marquis[1], Aubryn Cooperman[1], Caroline Draxl[1], Rob Hammond[1], Jason Jonkman[1], Alexsandra Lemke[1], Anthony Lopez[1], Rafael Mudafort[1], Mike Optis[1], Owen Roberts[1], Matt Shields[1], Benjamin Hallissy[2]

[1]National Renewable Energy Laboratory

[2]U.S. Department of Energy's Wind Energy Technologies Office

Jochem Weber

Chief Engineer
National Renewable Energy Laboratory
(NREL)

15013 Denver West Parkway
Golden, Colorado 80401-3305
United States

jochem.weber@nrel.gov
www.nrel.gov

In response to a request in The Energy Act of 2020, the U.S. Department of Energy's (DOE's) Wind Energy Technologies Office (WETO) provided a Report to Congress on the Challenges and Opportunities for Airborne Wind Energy in the United States [1]. This effort was supported by the National Renewable Energy Laboratory (NREL) through outreach to the airborne wind energy industry and research community and through internal research and analysis. Supported by WETO, NREL hosted a technical workshop on U.S. Airborne Wind Energy in March 2021 which was attended by over 100 domain experts and relevant stakeholders, predominately based in the United States [2]. Further detailed insight, separate from the workshop, was gained though stakeholder meetings with over 50 domain related experts including 14 different technology development entities (4 from the United States and 10 from the European Union [EU]). Following a broad literature study the NREL team conducted internal studies covering research and analysis across 6 topics: a) Technology assessment and upscaling, b) Techno-economic analysis and markets, c) Resource potential and energy output, d) Technical potential, social and environmental impacts, and permitting, e) Research, development, demonstration, and commercialization needs. The findings were published in an NREL technical report [3] assessing the potential for, and technical viability of airborne wind energy in the United States including research, development, demonstration, and commercialization recommendations, outlined in a conceptual 10-year program, to further examine and validate the technical and economic viability of AWE technologies.

References:

[1] U.S. Department of Energy, "Challenges and Opportunities for Airborne Wind Energy in the United States", (2021)

[2] Weber, J., Marquis, M., Lemke, A., Cooperman, A., Draxl, C., Lopez, A.., Roberts, O., Shields, M., "Proceedings of the 2021 Airborne Wind Energy Workshop", (2021)

[3] Weber, J., Marquis, M., Cooperman, A., Draxl, C., Hammond, R., Jonkman, J., Lemke, A., Lopez, A., Mudafort, R., Optis, M., Roberts, O., Shields, M., "Airborne Wind Energy" (2021)