



Aircraft Electrification – System-Level Potentials for Aviation Decarbonization

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Abstract:

Aviation's ambitious climate targets have fueled the search for innovative and energy-efficient propulsion concepts. In that context, introducing electrical energy into the propulsion train opens up a vast design space. Various architectures employing battery electric and/or fuel cell electric concepts have been proposed and attract considerable attention fostered by their perspective contributions to aviation decarbonization. To understand the potential impact of these concepts, a holistic assessment regarding technological, but also system level aspects is highly relevant.

Against this backdrop, this talk will first provide an overview on aircraft electrification strategies and related technological implications, requirements and considerations. Then, their pertinence for different market segments will be examined, leading to a discussion of their possible impact on reducing aviation's overall footprint based on current flight and emission distribution. Finally, we will look at transition scenarios factoring in fleet penetration of different technological options, fuel alternatives and associated development rates. By shifting the perspective to "the bigger picture" and deconvoluting individual contributions towards the envisaged carbon-neutrality of aviation, associated potentials of the above-mentioned electrified concepts can be holistically addressed.

Curriculum Vitae:



Dr. Kathrin Ebner is leading the competence domain Energy & Fuels and acts as Strategic Research Coordinator of Hydrogen and (Hybrid-) Electric Aviation at Bauhaus Luftfahrt, Taufkirchen, Germany. Her main research focus is on electrochemical energy storage and conversion in the context of sustainable fuel production as well as propulsion applications. She holds a PhD in electrochemistry from ETH Zurich.

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