



# HYBRID ELECTRIC AIRCRAFT TECHNOLOGIES

The AIT Austrian Institute of Technology actively supports the European aeronautic industry by providing technological solutions for the advancement of “More Electric Aircraft” and “Hybrid Electric Aircraft.”

As air travel continues to experience rapid growth, with one billion passengers flying within, into, or out of Europe in 2018, along with 11 million scheduled flights, we recognize the urgent need to address the environmental and sustainability challenges associated with this trend.

Our efforts encompass two key areas: the development of an electrothermal Ice Protection System for aircraft and rotorcraft, and the advancement of solid-state batteries for hybrid propulsion in regional and short to medium-range electric airliners.

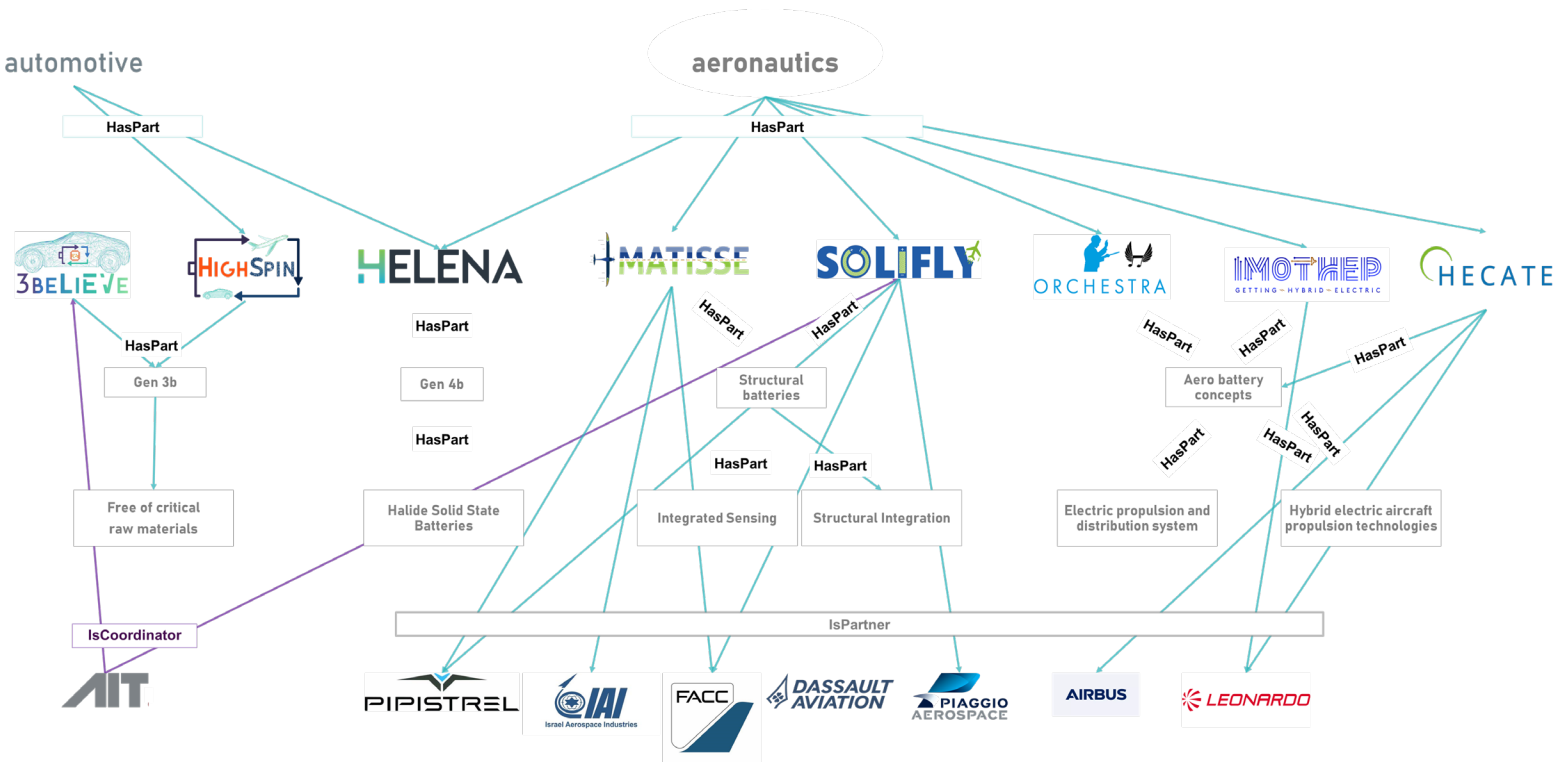
In our pursuit of decarbonization, we specialize in delivering technological solutions for energy storage, electric propulsion, and electrical auxiliaries, lending our support to the European

aeronautics industry. One significant area of focus is achieving energy efficiency through the implementation of innovative ice protection systems for aircraft. Within this domain, we offer comprehensive services ranging from simulating ice formation under certification-relevant environmental conditions to designing and validating performance.

Additionally, we dedicate our research efforts to the development of solid-state batteries specifically tailored for the propulsion of hybrid electric aircraft. Our services encompass modeling large-scale distributed battery systems, including the aircraft grid, as well as further advancing high-power and high-energy density battery cells, modules, and packs. These advancements are designed to handle high discharge rates while adhering to the stringent safety requirements of the aeronautics industry.

Through our commitment to technological innovation and sustainability, we aim to contribute to the transformation of the European aeronautic industry, paving the way for a greener and more efficient future in aviation.





## EXEMPLARY PROJECTS

- **IMPACT:** Aircraft advanced rear end and empennage optimisation enhanced by anti-ice coatings and devices  
*CleanSky2*
- **InSPIRe:** Innovative wing ice protection system for future regional aircraft  
*CleanSky2*
- **TRIceEPS:** Development of integrated engine air intake and protection systems for Tilt Rotor  
*CleanSky2*
- **No-Ice-Rotor:** Development and demonstration of materials and manufacturing process for ultra-high reliability electric Anti-ice/De-ice thermal layers for high strain rotor blades and airframe sections of a civil tilt-rotor  
*CleanSky2*
- **SOLIFLY:** Multifunctional aircraft components with integrated semi-solid state battery  
*CleanSky2*
- **ORCHESTRA:** Optimised electric network architectures and systems for More-Electric Aircraft  
*Horizon 2020*
- **IMOTHEP:** European aviation research and industry initiative on Hybrid Electric Propulsion  
*Horizon 2020*

- **MATISSE:** Multifunctional structures with quasi-solid-state Li-ion battery cells and sensors for the next generation climate neutral aircraft  
*Horizon Europe*
- **HighSpin:** High-voltage spinel LNMO silicon-graphite cells and modules for automotive and aeronautic transport applications  
*Horizon Europe*
- **HELENA:** Halide solid state batteries for electric vehicles and aircrafts  
*Horizon Europe*
- **HECATE:** Enabling technologies for hybrid-electric regional aircraft  
*Horizon Europe*
- **SNOWING:** Exploring realistic snow simulation for aircraft safety  
*BMK/FFG*
- **LOM-Ice:** Development of a Laser Optical Measurement technique for the characterization of particle clouds in icing wind tunnels  
*BMK/FFG*



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