

# FUTPRINT50

## Future Propulsion & Integration: towards a hybrid-electric 50-seat regional aircraft

### Results in a Nutshell



*A pathway unfolds – Greening tomorrow's aviation*

In FUTPRINT50, researchers have achieved significant advancements in energy storage, energy harvesting and thermal management of hybrid-electric systems and aircraft design. These include:

- Rapid battery pre-designs that prioritize safety and consider thermo-electric and aging constraints.
- Investigation of propeller noise and especially negative thrust condition (harvesting) with high-fidelity simulations and industrial grade wind tunnel experiments.
- Analysis of various thermal management architectures depending on temperature levels and heat exchanger concepts.
- Integration of all propulsion components in system analysis and overall aircraft design: Allowing for assessment and investigation of dependencies, interaction and synergies.

- Introduction of a web application that provides interactive multi-dimensional data presentation and offers a user-friendly interface.
- Creation of a roadmap for the development of a hybrid-electric 50-seat regional aircraft, outlining a clear technology and regulatory development path for an anticipated entry-into-service by 2035–2040.
- All generated surrogate models, the visualization and aircraft design tools are publicly available and open-source.



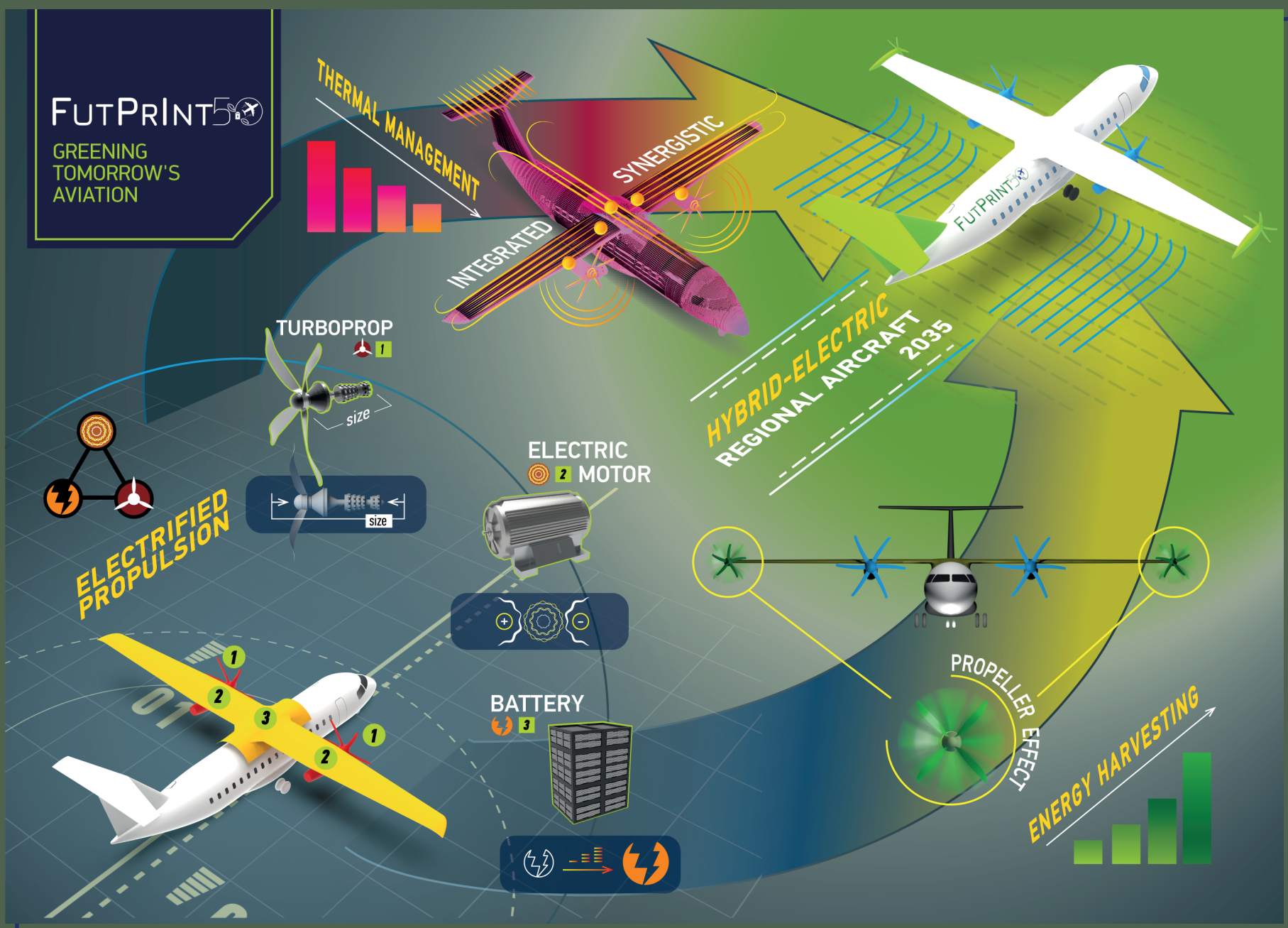
### Significant Achievements

#### Advancing Subsystem Models and Integration: FUTPRINT50 Insights

The FUTPRINT50 team created new knowledge and data, improving fidelity level and scalability for hybrid-electric subsystems and propulsion components. To show dependencies and synergies, these models were integrated into the overall aircraft design with SUAVE.

#### FUTPRINT50 Academy: Encouraging the future generation of innovators

An initiative of the FUTPRINT50 partners, the FUTPRINT50 Academy aimed to prepare early-stage engineers for the aviation sector's most urgent challenges and provide answers to the crucial scientific question: "How can we continue flying without a negative impact?"



The assessment of the parameter study is mainly based on environmental and operational criteria: emissions like CO<sub>2</sub>, NO<sub>x</sub>, noise, and also operating costs. The interactions and findings are major inputs for the project's roadmap. All the results are used to develop a path and timeline towards hybrid-electric aircraft.



#### Unified International forces towards sustainable aviation globally

An exceptionally qualified and international consortium, bridging the EU, UK, and Brazil, has successfully implemented the FUTPRINT50 project. The project has also received support from the European Union Aviation Safety Agency (EASA) and partners from the EU, UK, and Canada, forming an International Advisory Board.

### Consortium Partners

### Connect with FUTPRINT50

External Partners

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Prof. Andreas Strohmayr  
info@futprint50.eu  
futprint50.eu  
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