



PRESS RELEASE

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UNINA Researchers Publish Breakthrough Study on Tri-Source Hybrid-Electric Aircraft Optimization

A pioneering study on mission-level optimization for sustainable aviation has been published in Elsevier's Applied Energy by Giuseppe Grazioso (lead author) and Agostino De Marco (co-author), esteemed researchers from the University of Naples Federico II (UNINA). The research introduces a Simulation and Performance-based Mission Model (SPMM)—a novel framework that orchestrates power delivery from gas turbines, hydrogen fuel cells, and batteries across all phases of flight. This tri-source configuration marks a significant advancement beyond traditional dual-source models, positioning the work as a first-of-its-kind in aviation optimization.

Key findings include:

- 31.5% reduction in CO₂ emissions over baseline designs
- 12.3% total energy savings through battery-intensive strategies
- Robust throttle scheduling validated through sensitivity analysis

This work directly supports the EU's Fit-for-55 and ICAO's LTAG sustainability goals, offering a scalable pathway toward net-zero regional aircraft operations.

 Read the full article: <https://www.sciencedirect.com/science/article/pii/S0306261925015995>

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About HERA

HERA aims to identify and trade off the concept of a regional aircraft, serving the need for sustainability. The high-level goals are, first, to develop the required aircraft-level technologies and, second, to integrate the required enablers to meet the 50% less technology-based greenhouse gas emissions.

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