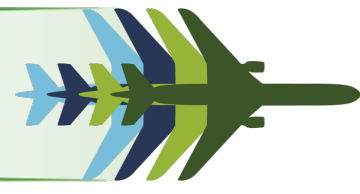


Pipistrel LH2 Range Extender.

Contact: Royal Netherlands Aerospace Centre | info@nlr.nl | © Royal NLR 2024

BACKGROUND



Civil aviation committed to achieve net-zero carbon emissions by 2050.

Electrification of aircraft is an important step to reduce emissions. However, the low specific energy of batteries limits their application to short range flights.

For medium to long range flights, hydrogen powered aircraft is one of the most promising novel aircraft technologies to contribute to the climate goals and ambitions.

HOW?

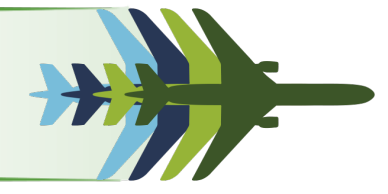


The Pipistrel Velis Electro will be modified to include a LH2 Powertrain. To this end, the following activities will be undertaken:

- System configuration analysis;
- Design and development of aircraft modifications, a fuel cell system and a fuel tank;
- System integration & testing;
- Obtain a 'Permit to Fly';
- Ground test and flight demonstration.

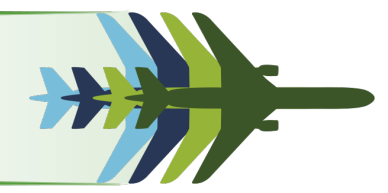


OBJECTIVE(S)



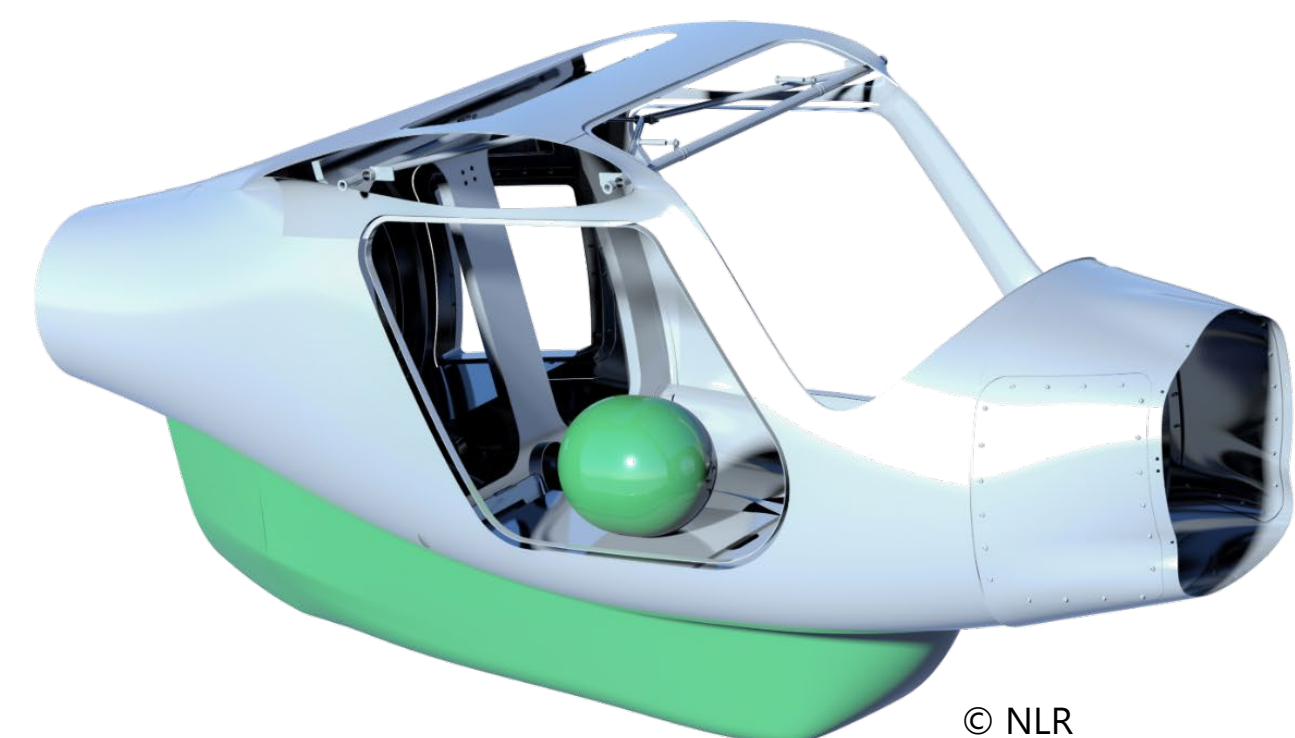
- Gain experience and knowledge on development and integration of hydrogen power trains in manned aircraft.
- Perform a flight demonstration with the NLR Pipistrel in 2026, equipped with a LH2 based range extender.

WHY?



Addressing the key challenges for the introduction of hydrogen on board aircraft:

- LH2 powertrain components and operations;
- Aircraft architecture and integration;
- Safety and Certification.



RESULTS



In 2024, we have achieved the following results

- Architectural design
- Operational Concept Description
- System Requirements Specification
- Selection of suppliers for:
 - I. Fuel Cell System
 - II. LH2 fuel tank