

# NIMPHEA

## NEXT GENERATION OF IMPROVED HIGH TEMPERATURE MEMBRANE ELECTRODE ASSEMBLY FOR AVIATION



Project ID	101101407
PRR 2024	Pillar 3 – H <sub>2</sub> end uses: transport
Call topic	HORIZON-JTI-CLEANH2-2022-03-08: Development and optimisation of a dedicated fuel cells for aviation: disruptive next-gen high temperature fuel cells technology for future aviation
Project total costs	EUR 4 942 898.75
FCH JU max. contribution	EUR 4 942 898.50
Project start - end	1.1.2023–31.12.2026
Coordinator	Safran Power Units, France
Beneficiaries	Advanced Energy Technologies AE Ereunas & Anaptyxis Ylikon & Proiontonananeosimon Pígon Energeias & Synafon Symvouleftikon y Piresion, Centre national de la recherche scientifique, Commissariat à l'Énergie Atomique et aux Énergies Alternatives, Fraunhofer Gesellschaft zur Förderung der Angewandten Forschung EV, Fundación IMDEA Energía, Safran SA, Université de Strasbourg

<https://www.nimphea.eu/>

### PROJECT TARGETS

Target source	Parameter	Unit	Target	Target achieved?
Project's own objectives	Power density	W/cm <sup>2</sup>	1.25	
	Degradation rate	µV/h	3–5	

### PROJECT AND GENERAL OBJECTIVES

The overall objective of the Nimphea project is to develop and validate at technology readiness level 4 a new-generation high-temperature membrane electrode assembly (MEA) addressing the challenging requirements of fuel cells for aviation. The MEA developed will operate above 120 °C and thus overcome the thermal management issues of high-power systems.

### NON-QUANTITATIVE OBJECTIVES

- Design the concept of the new-generation disruptive MEA operating above 120 °C and develop its components.
- Upscale the small-scale MEA with a view to preparing for manufacturing and future integration at the fuel cell stack level.
- Validate and demonstrate the performances of the new-generation MEA developed at technology readiness level 4.

- Evaluate and validate the suitability of the new-generation MEA by performing a complete life cycle assessment.

### PROGRESS AND MAIN ACHIEVEMENTS

The technical specifications have been described for the new Nimphea MEA. The consortium has harmonised its testing strategy for all products. The components of the first-generation MEA have been developed and delivered for its assembly, which will be performed in the coming months.

### FUTURE STEPS AND PLANS

The next steps are the assembly and characterisation of the first-generation MEA.

After that, the consortium will start working on developing the second-generation MEA components.