

ABOUT

exFan is an EU funded collaborative research project set out to devise a novel heat dissipation and recovery system within a high-powered electric fan propulsion system driven by fuel cell technology. Central to this objective is the incorporation of a ducted heat exchanger (HX) within the propulsion system's nacelle. It will use the "Meredith effect" (ME) incorporating the ram jet effect to generate thrust from waste heat.

The breakthrough innovations proposed in exFan will:

- allow aircraft manufacturers to offer savings in operation costs,
- enable European aeronautics industry to maintain global competitiveness and leadership,
- create significant contribution in the path towards CO₂ and NO_x emission free aircraft,²
- investigate how heat propulsor can be integrated within a hydrogen-electric propulsion system, advancing it to Technology Readiness Level 3 (TRL 3)

TEAM

Project Coordinator



Technical Coordinator



Research Coordinator



Project Partners



CONNECT WITH EXFAN

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01.12.2023

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48 Months



Funded by the European Union under GA 101138184. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor CINEA can be held responsible for them.

Design by EASN-TIS

"WHERE INNOVATION
MEETS SUSTAINABILITY
IN AVIATION"



EXFAN

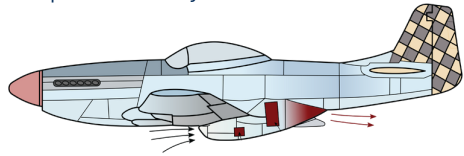
NOVEL RECUPERATION SYSTEM
TO MAXIMIZE EXERGY FROM ANERGY
FOR FUEL CELL POWERED
GEARED ELECTRIC AIRCRAFT
PROPULSION SYSTEM



Funded by
the European Union

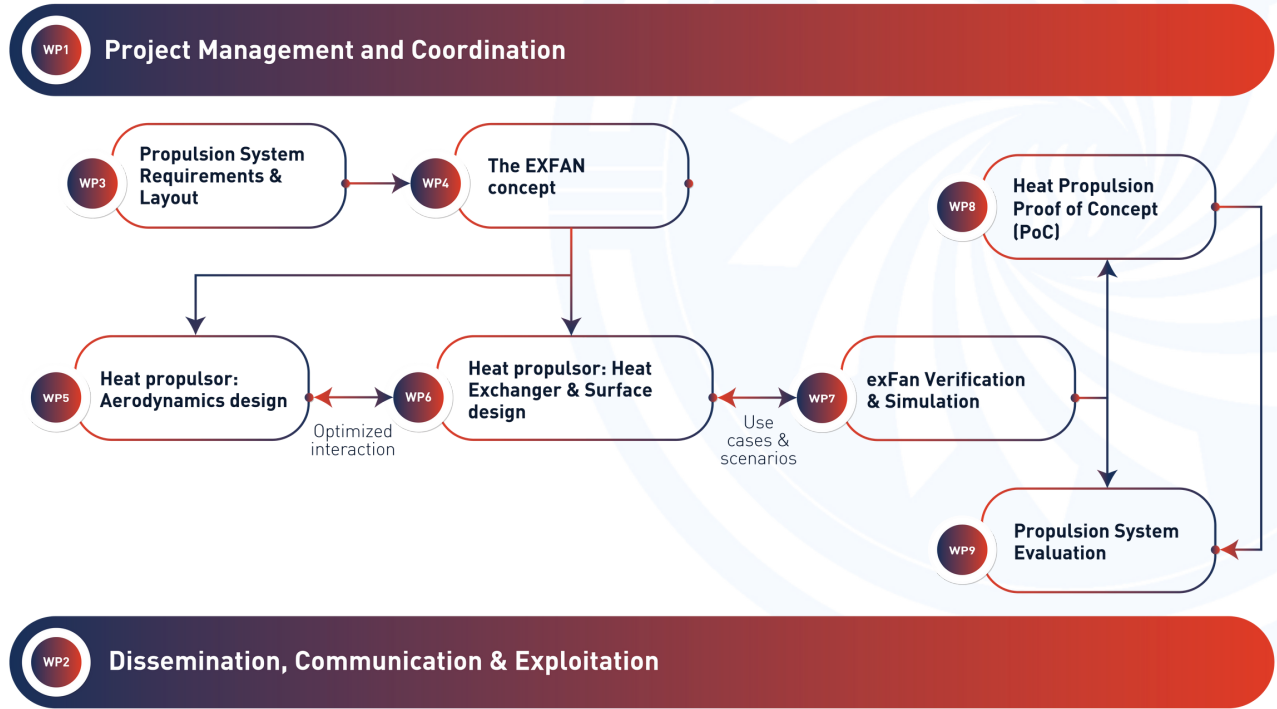
OBJECTIVES

exFan will develop a novel thrust generating and heat dissipation system for a geared electric fan of mega-watt class powered by fuel cell.



- Heat Dissipation**
Design a revolutionary heat exchanger integrated into a geared electric fan.
- Recuperation Technology**
Develop an advanced recuperation device, harnessing cutting-edge technology to efficiently convert waste heat into additional thrust.
- Thermal Management System**
Lay out a sophisticated thermal management system to elevate heat quality.
- System Simulations**
Implement comprehensive system simulations providing invaluable insights into the complexity of the novel propulsion system.
- Impact**
Reduce global warming potential.
- Information Exchange**
Facilitate knowledge transfer by sharing results with Clean Aviation and Clean Hydrogen JUs.

WORK PLAN



CHALLENGES

Thrust vs Drag <p>There is a tradeoff between the possible generated thrust and the drag of the HX</p>	Operation conditions <p>The optimal concept of operations for the exFan system might be different to standard aircraft operations</p>	Heat quality <p>Heat Exchanger (HX) heat transfer rate depends on temperature difference</p>	Validation <p>The exFan concept needs to be validated at a low TRL to justify further development</p>	Integration <p>The integration of exFan into the propulsion system is necessary to enable interaction between the developments</p>
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