

GENEX

New end-to-end digital framework for optimized manufacturing & maintenance of next generation aircraft composite structures

A multi-disciplinary digital twin enabling data management across the entire lifecycle of the next-generation aircraft composite structures

ABOUT GENEX

GENEX is an EU-funded collaborative research project aiming to create a multi-disciplinary digital twin-driven framework for optimized aircraft composite manufacturing and Operation & Maintenance (O&M) processes for ensuring aircraft's safety and airworthiness.

Without drastic measures, aviation related CO₂ emissions will become, by 2050, ten times higher than in 1990. For that purpose, **efficient** and **sustainable manufacturing, robust repairing processes** and an **operationally upgraded** and **extended aircraft lifecycle** are necessary to achieve the environmental goals set by the EU.

GENEX commits to developing:

- » Advanced and efficient manufacturing of recyclable composites
- » New structural health and usage monitoring and management systems
- » Digital-assisted repair processes and tools

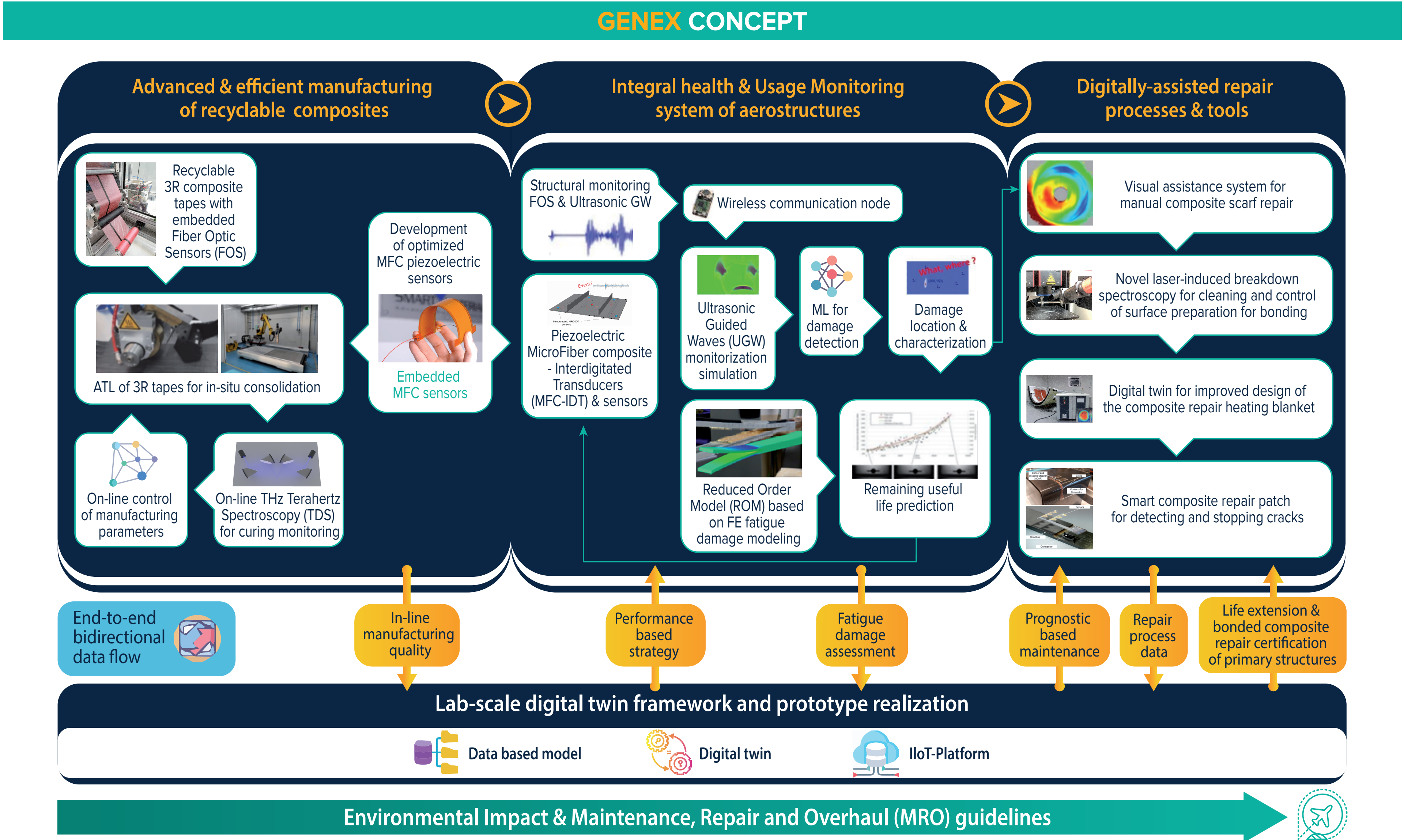
GENEX OBJECTIVES

To produce **eco-efficient materials** and processes, monitoring systems, and numerical models supporting **advanced manufacturing** of composite aircraft components.

To invent a methodology built on **coupled physics -and data-based- algorithms** to improve the assessment of fatigue damage and residual life estimation of the aircraft structure under variable usage scenarios.

To develop **pioneering digital-based processes** and **tools** to optimize **maintenance** and **repair** operations while assisting the digital transformation of composite repair.

To create a **multi-disciplinary digital twin** of the aircraft component, rendering feasible a continuously updated model of the aircraft lifecycle.



Environmental Impact & Maintenance, Repair and Overhaul (MRO) guidelines

As part of this holistic view, an environmental assessment of the potential benefits of the project will be performed, together with MRO guidelines for the next aircraft generation.

OUR TEAM

CONNECT

www.genex-project.eu

@genexuproject

@genex_eu

Funded by the European Union

Funded by the European Union. 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 the granting authority can be held responsible for them.