



**EUROPEAN RECYCLING & CIRCULARITY
IN LARGE COMPOSITE COMPONENTS**

Newsletter 02
October 2023



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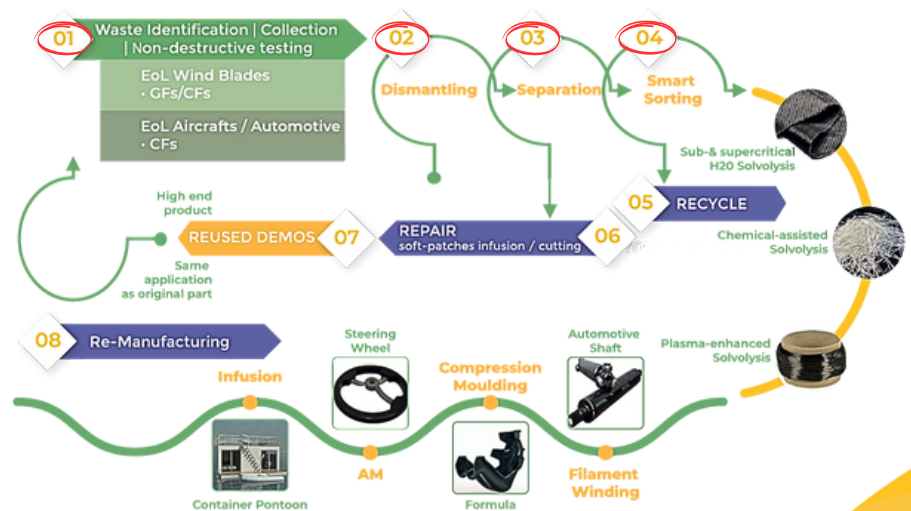
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Dear Reader,

I am glad to share with you, **Issue#2** of the EuReComp Newsletter.

In this edition, we are excited to share some remarkable progress and achievements from Work Package 1 (WP1) and Work Package 2 (WP2), both of which play pivotal roles in advancing waste stream management for composite materials. WP1 describes the strategic workflow throughout the project and will provide a digital platform to connect suppliers of EoL composites and recyclers. WP2 plays a crucial role in the scope of the project since is developing the Smart tool that will provide, supported by machine learning, recommendations to support the decision about the most profitable route for EoL components.



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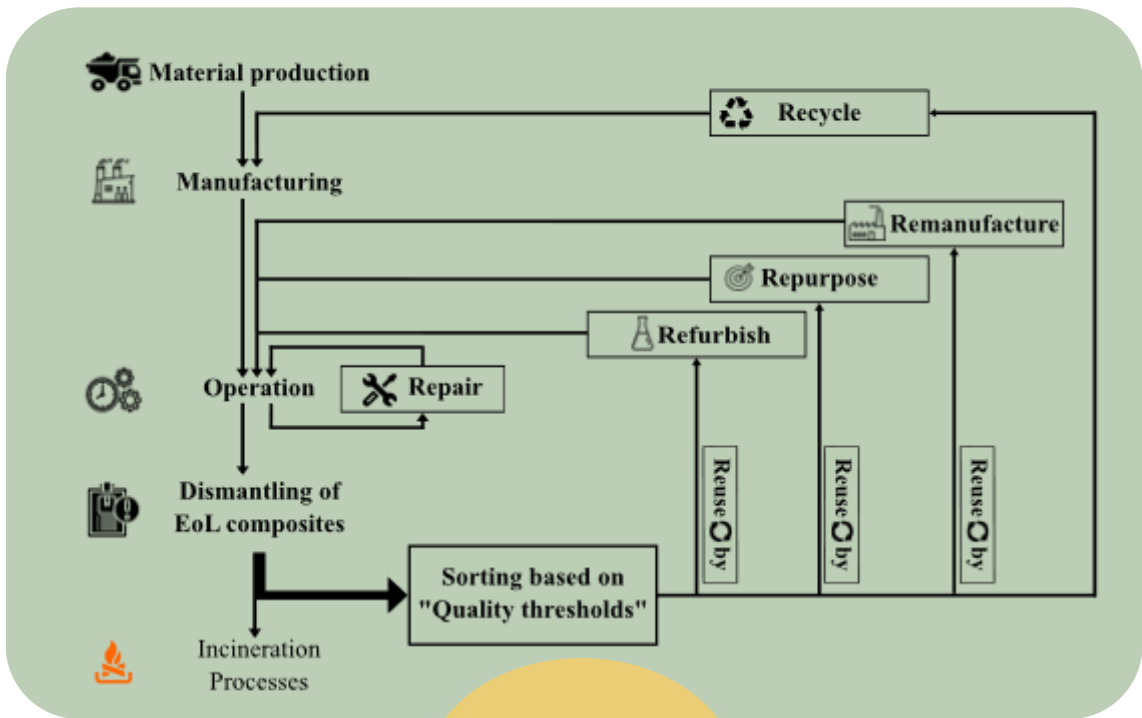
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Enjoy the read and stay connected with the EuReComp project via our website!!! ””

“ WP1: R6 strategy for waste streams management ”

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One of the standout achievements of the EuReComp project is the development of the R6 strategy for waste stream management. This strategic approach, led by Leipzig University of Applied Sciences (**HTWK Leipzig**), focuses on the return of decommissioned composite parts back into the material chain. The R6 strategy is not only about waste reduction but also aims to achieve significant energy and emission savings. We are thrilled to announce that the R6 strategy has been successfully published in a conference paper.



Schematic representation of the interactions of the R6 strategy's treatments

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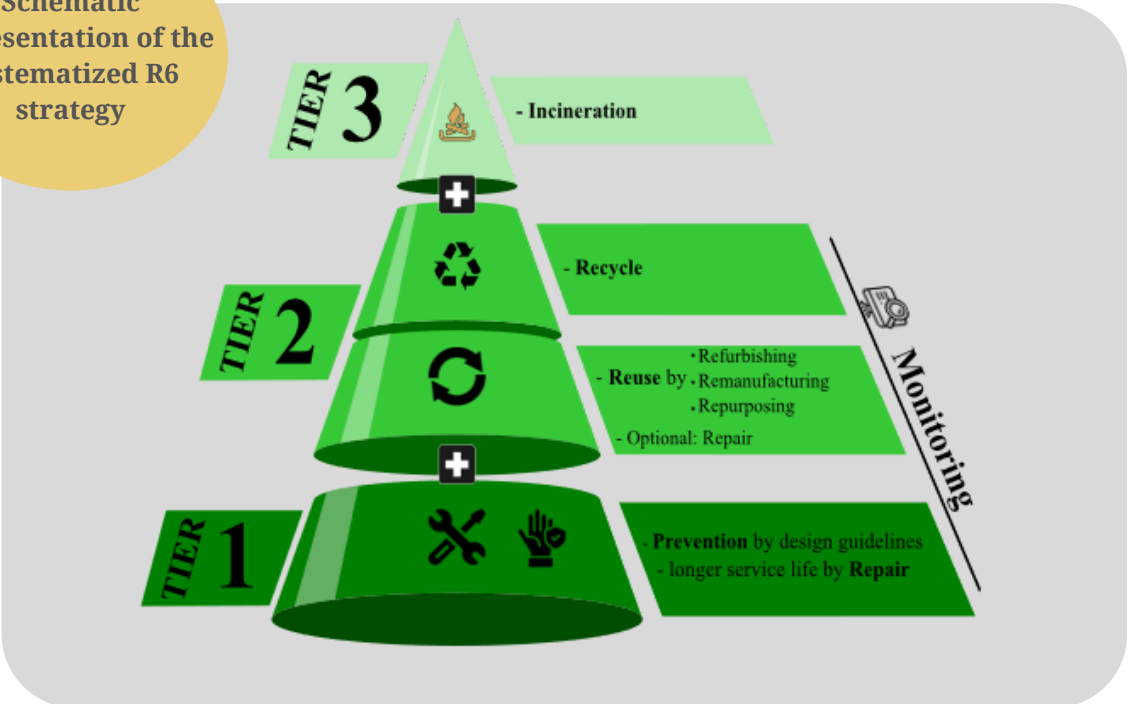
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“ WP1: R6 strategy for waste streams management ”

“ **Circular Strategic Approach**

The heart of the R6 strategy lies in its circular approach, emphasizing six key principles: reuse, repair, refurbish, remanufacture, repurpose, and recycling. This systematic approach not only reduces end-of-life composite waste but also contributes to substantial energy and emission savings. Circular eco-settings have been identified, creating closed loops that start with quality threshold sorting of used composite structures, enabling cascading use of composite products.

Schematic representation of the systematized R6 strategy

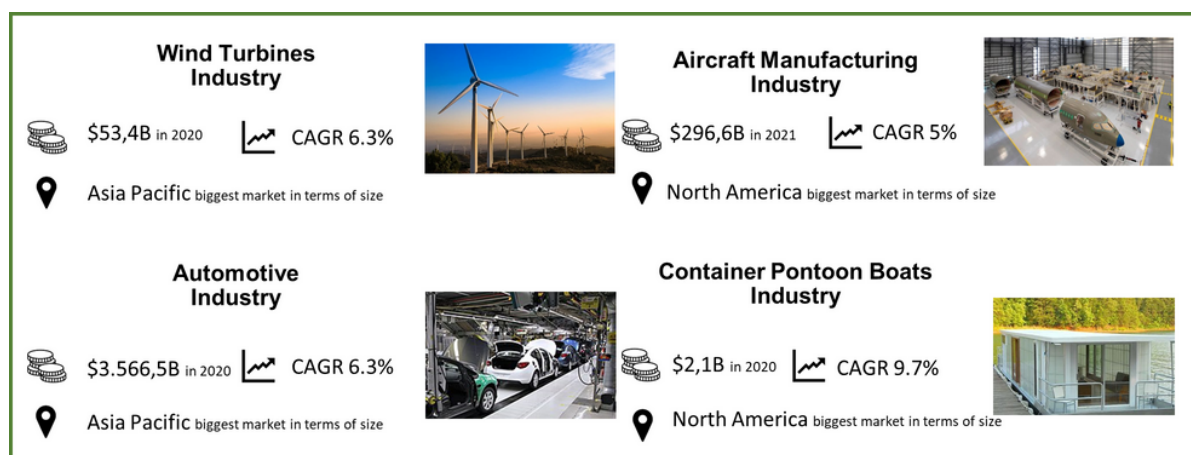


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“ WP1: R6 strategy for waste streams management ”

“ **Market Analysis** ”

As part of WP1's efforts, consortium partners STRATAGEM (STR) conducted a comprehensive market analysis for selected composite sectors, including the composites market, the wind turbine market, the aviation market, and the container pontoon boat market. This analysis provides valuable insights and informs our strategies for a sustainable future. Furthermore, some strategies to achieve customer acceptance for higher prices, e.g. for recycled composite components, were also outlined by partners from INEGI and IRES. The market analysis was conducted for the composites market, the wind turbine market, the aviation market, and the container pontoon boat market.



What's Next for WP1

Moving forward, close coordination of available material resources and information flows related to end-of-life (EoL) material data is crucial among various stakeholders within the composite material circular ecosystem. To address this, consortium partners from Circularise (CRC) will create a digital platform that connects suppliers of EoL composites with recyclers and provides tailored information to stakeholders. This digital platform will serve as a key deliverable within WP1. CRC has already defined data needs and information to trace among the value chains for the aerospace and wind energy sectors, incorporating these data points into their system.

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“ WP2: Separation decision making tool for demo cases ”

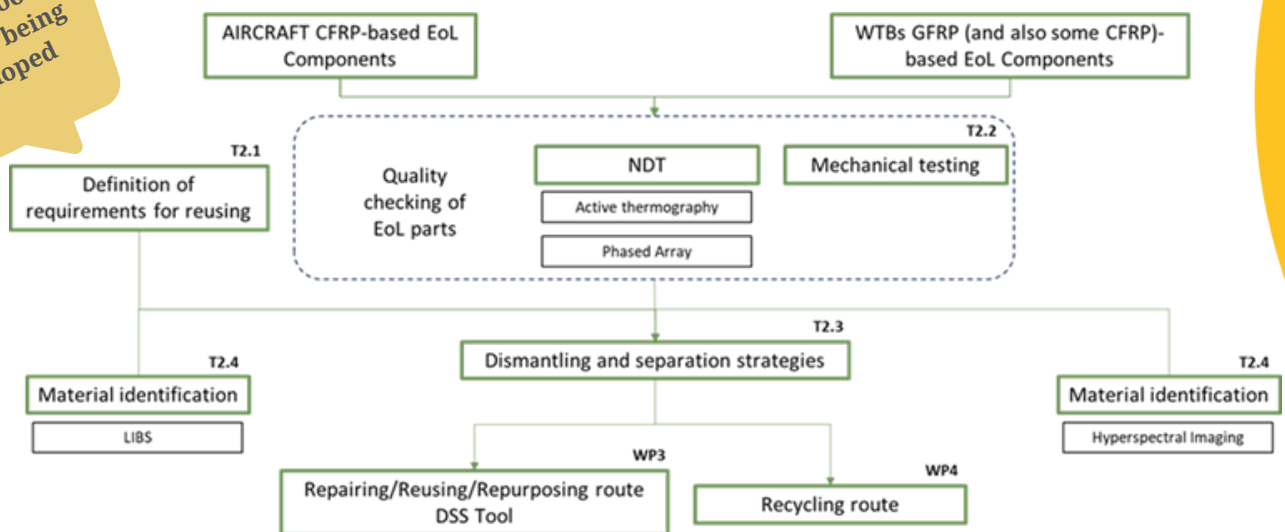
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In parallel, Work Package 2 (WP2), led by **AIMEN**, is making significant strides in developing a powerful Separation Decision-Making Tool, the " SMART TOOL ". By Month 18 (M18) of the project, WP2 has achieved several key milestones:

Methodology Development

WP2 successfully developed the methodology that will serve as the foundation for the SMART TOOL. This methodology lays the groundwork for intelligent decision-making regarding end-of-life (EoL) components from both the wind turbine blade (WTB) and aircraft industries.

Scheme of the Smart tool that is being developed



Requirements Definition for Redesigning and Reusing

Extensive research has been conducted, encompassing regulations for structural design, case studies, guidelines on conventional material reuse, and relevant national and European laws related to waste management and recycling. This rich data forms a vital input to the SMART TOOL, enabling informed decisions about the potential second life of WTB and aircraft EoL parts. Specifications for suitable segmentation approaches have also been established.

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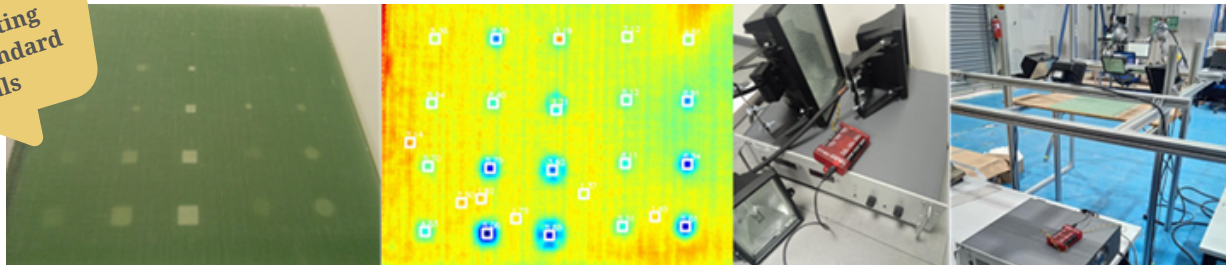
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“ WP2: Separation decision making tool for demo cases ”

“ **INDT Systems Development**

WP2 is actively working on developing Non-Destructive Testing (NDT) systems based on Infrared (IR) Active Thermography and Ultrasound for defect detection in EoL parts. Advanced algorithms are being applied to NDT data for intelligent defect detection.

Active thermography being applied onto reference specimen representing WTB standard materials



Comparative Study of Dismantling Approaches

AIMEN is conducting a comparative study of current dismantling and segmentation approaches for both WTBs and aircraft EoL parts. Initial separation methods are being applied to remove possible contaminants, streamlining the recycling processes in WP4.

Dismantling and separation of an aircraft component



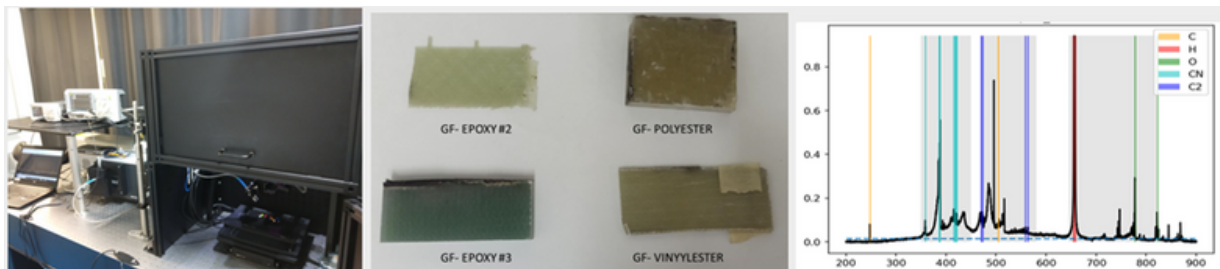
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Development of LIBS System and Hyperspectral Imaging

The project is advancing the development of Laser-Induced Breakdown Spectroscopy (LIBS) and hyperspectral imaging techniques to identify the chemical composition of EoL parts. This chemical data is crucial for efficient chemical recycling processes. AIMEN has established a state-of-the-art LIBS station for temporal studies of plasma, optimizing signal collection and resulting spectra.

WP2: Separation decision making tool for demo cases

New LIBS system installed at AIMEN for determining chemical composition and additives onto EoL parts, composite specimens of different resins, reference LIBS spectra for resin identification



What's Next for WP2

In the upcoming phases of Work Package 2 (WP2), there is a clear roadmap to advance the Separation Decision-Making Tool, the "SMART TOOL." WP2's immediate tasks include formalizing requirements and drafting product specifications, refining thermography applications and developing smarter defect detection algorithms, identifying key improvements to streamline dismantling processes and reduce environmental impact, and enhancing material characterization through complementary laboratory techniques while boosting classifier model performance.

These concerted efforts are pivotal in WP2's commitment to sustainable waste stream management for composite materials, bringing us closer to a more eco-friendly and resource-efficient future.

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“ Events / Conferences / Exhibitions ”



The 1st Open Workshop 2023 of EuReComp has been successfully completed in Dresden, Germany!

EuReComp team successfully participated in JEC World 2023.



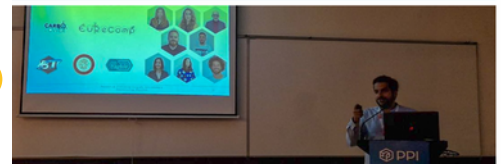
JEC WORLD 2023 The Leading International Composites Show
 April 25-27, 2023 | PARIS-NORD VILLEPENTE



Participated in the 23rd International Conference on Composite Materials (ICCM 23)

Taking part in the 3rd Polymer Process Innovation Conference (PPI 23)

PPI Polymer Process Innovation | 13th-15th september 2023 | Guimarães, Portugal
www.ppiconference.eu | info@ppiconference.eu



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