SEASTARS Project Sets Sail to Revolutionize Maritime Sustainability

Composite Recycling to Ensure Circularity of Advanced Composite Materials in Next-Generation Ships

Ecublens, Switzerland – April 15, 2025 — The European Union-funded SEASTARS Project has officially launched, bringing together a dynamic international consortium to decarbonize the maritime sector through innovation in ship design, alternative fuels, and sustainable materials. With ambitious goals to reduce greenhouse gas emissions by 30% (vs. 2008) and boost energy efficiency by 20% (vs. 2022) by 2030, SEASTARS is charting a new course toward a more sustainable shipping industry.

The project will demonstrate eight vessel designs—four retrofits and four newbuilds—covering inland, short-sea, and high-seas shipping. Each vessel will integrate a suite of advanced technologies, targeting three main performance areas:

- Hydrodynamics: Innovations like propeller-hull optimization and air lubrication systems;
- Machinery: Adoption of fuel cells, electric motors, integrated solar panels, sails, and electrochemical storage systems;
- Energy Systems: Exploration of biofuels, hydrogen, methanol, ammonia, LNG, and cutting-edge carbon capture technologies (pre- and post-combustion).

To guide these developments, SEASTARS uses a Model-Based Systems Engineering (MBSE) approach and phased, assembly-to-order ship design strategies. This modular system allows shipowners to integrate and scale emission-reducing technologies over time—adapting to regulations while managing investment risk and ensuring long-term fleet flexibility.

One of the project's innovations is greater incorporation of composite materials—primarily glass and carbon fiber—in ship construction. These materials offer weight savings, increased strength, and resistance to corrosion, all of which contribute to significantly improved energy efficiency.

But performance is only part of the equation.
Composite Recycling, a Swiss clean-tech startup and SEASTARS partner, will ensure that these high-performance materials also meet strict circularity and sustainability standards. Using their proprietary thermolysis-based recycling process, Composite Recycling will work with SEASTARS engineers from the start to design composite parts for recyclability—and manage the end-of-life recovery of these components. This approach recovers high-quality fibers and oils, enabling the production of new composites and keeping waste out of landfills.

> "At Composite Recycling, we believe a green solution is only truly sustainable when its materials are designed with circularity in mind," said **Guillaume Perben**, CEO and Co-founder of Composite Recycling. "We're proud to contribute our expertise to help SEASTARS close the loop in composite use—from shipbuilding to recycling."

The SEASTARS consortium consists of 19 partners and 5 associated partners across five EU countries, Liberia, and the UK, including shipowners, ship design consultants, leading universities, research institutes, and pioneering technology providers. Together, they aim to build a replicable model for clean, efficient, and circular maritime transport.

Learn more and follow project updates at: seastars-project.eu

About Composite Recycling
Composite Recycling specializes in next-generation recycling solutions for composite materials, enabling industries to transition towards circular and sustainable practices. By recovering high-quality fibers and oil from composite waste, the company provides a cost-effective and eco-friendly alternative to landfill disposal and incineration. Visit their website at www.composite-recycling.ch.

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