

AELIOS Project Targets TRL 6 Maturity at Official Kick-Off

After two days of collaborating, meaningful insights, workshops, and brainstorming, the kick-off meeting for the AELIOS project was held from May 6 to May 7, 2026, marking the official beginning of the project.

The consortium, composed of top-tier partners, gathered at the TECNALIA headquarters in San Sebastián, Spain.

The AELIOS project launches with a **clear focus on transforming advanced research into a commercially viable product**. By combining rapid engineering with a robust digital backbone, the project aims to **accelerate the path to TRL 6**, ensuring the technology is both high-performing and protectable in the global green hydrogen market.

A "Renewable-Ready" Vision

Maria Lekka (TECNALIA), coordinator of AELIOS, emphasized the **urgency** behind the project, framing AELIOS as a vital step in **reducing Europe's dependence on Critical Raw Materials while accelerating the move toward carbon neutrality**. As a four-year Horizon Clean Hydrogen initiative, the project's core ambition is to make alkaline electrolysis "renewable-ready."

"AELIOS is tackling the **practical challenges of alkaline electrolysis head-on**, specifically the efficiency drops and degradation that occur when power is variable," Lekka explained. "By optimizing systems for the fluctuations of renewable energy like wind and solar, we are **increasing durability** while drastically **lowering CAPEX and OPEX**, making green hydrogen production truly cost-competitive."

Technical Breakthroughs: Stability and Speed

During the sessions, Pino Kirsch (Stargate Hydrogen), outlined the key technological breakthroughs that set AELIOS apart. Central to the strategy is the **development of electrodeposited electrodes** designed for superior stability during dynamic operations.

"These innovations, combined with our disruptive stack design, allow for faster ramping times and a more stable dynamic operation," Kirsch noted. To validate these claims, the project will move from **single-cell laboratory tests to a rigorous 2,000-hour endurance test of the 80 kW stack under dynamic load conditions**, ensuring the system can handle the real-world stresses of industrial use.

Tangible Outcomes and Future Modeling

Beyond technical KPIs, the project **expects to deliver a deeper understanding of degradation mechanisms**, such as catalyst leaching. AELIOS will also implement a hybrid physics-based and machine learning (ML) model for system simulation. This hybrid approach will allow the consortium to extrapolate results and provide the market with a proven, durable, and scalable solution for green hydrogen production.

About the project

AELIOS is an ambitious project aiming to develop a resilient and sustainable Alkaline Electrolyser to move Europe's clean energy transition forward. The project targets the delivery of a high-performance system based on **highly efficient 3D-structured electrodeposited electrodes and innovative operational strategies for seamless integration with renewable energy sources**. AELIOS aims to substantially reduce the carbon footprint of the hydrogen industry through a focus on advanced materials, circularity and reduced operational costs (CAPEX and OPEX).

Partners



Funding



The project is supported by the Clean Hydrogen Partnership and its members.

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 Clean Hydrogen Joint Undertaking under the powers delegated by the European Commission. Neither the European Union nor the granting authority can be held responsible for them.