Sea4Volt project kicks off to advance hydrogen production directly from seawater

Dresden,10 October 2025.

The Sea4Volt project officially started on 1st September 2025, running for 36 months to develop a novel low-temperature Anion Exchange Membrane (AEM) electrolyser concept that can produce green hydrogen directly from seawater. With a budget of nearly €4 million, the project is co-funded by the European Union and the Clean Hydrogen Partnership. Coordinated by VTT Technical Research Centre of Finland, the project brings together eight partners: Fraunhofer IFAM, Cidaut, Aalto University, Politechnika Gdańska, Stargate Hydrogen, Hydrolite, and F6S. Following an initial online kick-off on 5 September, the consortium met in Dresden, Germany, on 9 - 10 October 2025 to set the course for the coming three years.

Freshwater scarcity is one of the major barriers to scaling up hydrogen production, as most current systems depend on clean water. Sea4Volt addresses this challenge by developing an electrolyser that can operate directly on seawater. The project focuses on PFAS-free membranes and ionomers, corrosion-resistant components, and cost-effective materials, including novel non-critical raw materials and advanced protective coatings. These innovations will be tested step by step, from materials development to prototype validation, using seawater from the Atlantic, Mediterranean, and Baltic to ensure robust performance under different conditions.

Beyond the electrolyser itself, Sea4Volt will also explore brine valorisation through a zero-liquid-discharge approach, turning by-products into resources rather than waste. Together, these advances are expected to reduce the cost of green hydrogen and open new opportunities for coastal and water-stressed regions.

" I believe the future of green hydrogen technologies is promising and we are exploring one path to add our contributions to societies that lack freshwater and are dependent on seawater purification. " said the Project Coordinator Farhan Ali, VTT.

Co-funded by the European Union

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Clean Hydrogen Partnership

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

About Sea4Volt

Sea4Volt is a Horizon Europe project co-funded by the European Union and the Clean Hydrogen Partnership. Running from September 2025 to August 2028, the project develops a novel low-temperature Anion Exchange Membrane (AEM) electrolyser designed to operate efficiently, selectively, and durably with a direct seawater feed. By using PFAS-free membranes, corrosion-resistant components, and cost-effective materials, Sea4Volt aims to reduce the cost of green hydrogen production, while advancing brine valorisation and avoiding competition with scarce freshwater resources.

More Information

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