

PROMISERS, a new European project to boost renewable hydrogen production without PFAS



Illustration 1 Group picture of the PROMISERS team

Terrassa, 21th March 2025 – Leitat, a European-accredited technological centre is coordinating the new European project **PROMISERS**. This project is funded by the **Horizon Europe** programme of the **European Commission** with the support of the **Clean Hydrogen Partnership**.

Formed by a consortium of European leaders in industry and research, **PROMISERS** has a duration of three years and a budget close to **€3 million**. The project's goal is to develop **Fluoropolymer-free materials** to replace membranes, inks, and other components of **electrolysers** and **fuel cells**, key technologies for the production of clean energy, such as **hydrogen**. The project aims to drive the **energy transition** through more sustainable and environmentally safe solutions.

The consortium members include: **Syensqo, Fumatech, De Nora, RINA Consulting, Hysytech, TNO, IIT, Cellfion**, and **Leitat** as coordinator.

"**Electrolysers** and **fuel cell** applications are fundamental technologies for the **renewable hydrogen** production and the decarbonisation of the economy, but we need to develop sustainable alternatives to **Per- and polyfluoroalkyl substances (PFAS)** substances used

in these electrolyzers and fuel cells," states **Marcel Boerrigter**, project coordinator at **Leitat**.

PFAS encompass a wide group of thousands of synthetic chemical substances that are extensively used across the **European Union** and globally in a wide variety of everyday products. These substances are known for their high stability and ultimately transform into persistent substances, leading to irreversible environmental exposure and accumulation. Due to this accumulation in the environment, they end up and accumulate in human tissues, associated with adverse health effects.

Nowadays, these **PFAS** substances are widely used in fundamental hydrogen technologies like electrolyzers and fuel cells applications. **PROMISERS'** objectives are aligned with the European emission reduction targets outlined in the **EU Hydrogen Strategy**, **REPowerEU**, and the **Green Deal** agreement. Additionally, the project is implementing sustainability principles as well as prioritizing safe, scalable, and eco-friendly materials and processes to achieve zero environmental impact.



Illustration 2 Project coordinator, Marcel Boerrigter, opening the project launch event at DFactory, Barcelona

PFAS are essential for the manufacturing of hydrogen-related products, especially in **fuel cells** and **electrolyzers**. They typically operate with membranes based on these compounds, most commonly **PFSA** (perfluoroalkyl sulfonic acids), such as **Nafion**. This material exhibits excellent conductivity due to its intrinsic microstructure (ion-conductive channels separated by microphases) while being chemically and mechanically robust. Furthermore, this material is widely used in the **catalyst layer**, the **microporous transport layer** located between the electrode and the reactive gas flow field, and the electrodes that form the electrolyser or fuel cell.

Currently, no commercially viable alternative possesses the physical and chemical characteristics as desirable as fluoropolymers. Banning **PFAS** without a suitable replacement would have destructive effects on the **€30 billion** investment made by the industry over the last decade (only including electrolyzers and fuel cells).

Therefore, the development of **non-fluorinated components** (PFAS-free) in the project **PROMISERS**, focusing on fuel cells and electrolyzers, will enable the safe and sustainable production of **renewable hydrogen**. This advancement will benefit a wide range of applications, such as **vehicles**, **electricity generation**, and **industrial processes** (steel, cement, and fertilizers), making a significant contribution to the decarbonisation of the European economy.

About Leitat:

Leitat is the oldest technological center in Europe, with over 100 years of history and a reference point at both the national and European levels. It has a team of more than 400 professionals, experts in applied research, technical services, and the management of technological and innovation initiatives. Leitat's primary mission is to become a tool to improve the competitiveness of European companies through innovation and technology transfer. Leitat provides social, industrial, economic, and sustainable value, offering comprehensive solutions to multiple sectors and fields like health and biomedicine, development of new materials, eco-sustainable production, occupational health prevention systems, waste revaluation and utilization of natural resources; interconnectivity and digitization of industry, green energy, and maximization of energy efficiency. Leitat develops R&D&I projects for companies and institutions and leads research projects with competitive funding both within the framework of the European Union and the Spanish Ministry of Science, Innovation, and Universities.

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