



## First-of-its-kind: ionysis, ReCatalyst and EKPO Demonstrate PFAS-Free Fuel Cell Stack

*Freiburg / Dettingen / Ljubljana – Within the European EIC Transition project ENABLER, the project partners ionysis, EKPO Fuel Cell Technologies, and ReCatalyst have successfully built and operated a fully PFAS-free PEM fuel cell stack.*

The project ENABLER, funded by European Innovation Council addresses one of the key challenges facing fuel cell technology today: replacing fluorinated materials (PFAS) while maintaining high performance and industrial relevance.

For the first time, a complete PEM fuel cell short stack was assembled using exclusively PFAS-free components, including the membrane, electrode ionomers, and gas diffusion layers. Based on ReCatalyst's high performance catalysts, ionysis built full-size and PFAS-free catalyst-coated membranes. The stack was successfully assembled, operated and tested at EKPO, demonstrating the fundamental feasibility of a fully PFAS-free approach on true pilot level.

Within the project, the fully PFAS-free catalyst-coated membranes were characterized thoroughly: In full-size single-cell tests, the PFAS-free catalyst-coated membranes (CCMs) developed within ENABLER achieved current densities of up to 2 A/cm<sup>2</sup> at 0.65 V, placing them on par with state-of-the-art PFSA-based reference cells.

Stefan Dwenger, Managing Director of EKPO Fuel Cell Technologies, commented: "From our perspective, the ENABLER project is a strong proof point. We were able to operate and measure a fully PFAS-free stack using EKPO's commercialized NM12 platform. The results show that PFAS-free material systems are no longer just a laboratory concept, but a considerable option for future fuel cell generations."

Dr. Matija Gatalo, CEO of ReCatalyst, added: "ENABLER demonstrated how our advanced catalyst design and ionysis' PFAS-free electrode architectures can go hand in hand. Achieving this level of performance with our catalyst confirms the high quality of our patented catalyst technology – sustainable catalyst and MEA solutions do not require compromises in electrochemical activity."

Lisa Langer, CFO of ionysis, stated: "The project was an important proof-point to de-risk PFAS-free MEA technology from both a technical and a business perspective. Demonstrating performance parity at full-format single-cell level, combined with successful stack operation, is a crucial step towards market readiness and future commercialization. But now, the real work begins with thorough performance and durability testing on stack level."

As next steps, the project partners will focus on improving performance, long-term durability testing and further process and integration improvements, with the goal of transferring the strong single-cell results into robust and scalable stack performance.

The ENABLER project was funded by the European Innovation Council (EIC) and combines complementary expertise in catalyst development (ReCatalyst), PFAS-free MEA and CCM technology (ionysis), and industrial fuel cell stack validation (EKPO).



### **About ionysis**

ionysis GmbH develops highly efficient, emission-free and sustainable core components for electrochemical converters such as fuel cells and electrolyzers. This includes the so-called "membrane electrode assemblies" with a significantly reduced content of perfluorinated substances. The aim is to further develop novel, more performant and environmentally friendly membrane electrode assemblies and to demonstrate their technical feasibility on a large scale. ionysis began operations in September 2022, and by 2026, it has grown to a team of 26 people. The foundation for this spin-off from Hahn-Schickard and the University of Freiburg was established through several publicly funded research projects. The company secured seed financing by two strategic partners. The ISO 9001 certification was issued by DEKRA.

### **About ReCatalyst**

ReCatalyst d.o.o. is a Slovenian deep-tech spin-out from the National Institute of Chemistry developing an advanced nanotech materials platform for catalyst innovation across decarbonization technologies. With a strong focus on hydrogen applications such as fuel cells and water electrolysis, the company designs and produces high-performance catalyst materials that maximise the efficiency of platinum group metal use and reduce critical raw material intensity. By combining proprietary catalyst design, scalable manufacturing approaches, and industrial validation with partners across the value chain, ReCatalyst aims to support more efficient, resilient, and sovereign clean-tech supply chains in Europe and beyond. ReCatalyst completed an oversubscribed Seed financing round in June 2023 and, by 2026, has grown to a team of 14 operating under an ISO 9001-certified quality management system.

### **About EKPO**

EKPO Fuel Cell Technologies is a global leader in the development and manufacturing of polymer electrolyte fuel cell stacks for sustainable mobility and stationary applications. EKPO's expertise spans the design, engineering, and production of high-performance, cost-efficient fuel cell stacks and their components, as well as system integration and operation for hydrogen technologies.

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