

Hydrogen Research Factory MV Presented

During the kick-off for the "Maritime Future Concept" today in Rostock, the plans for the hydrogen research factory were also a topic of discussion. "The establishment of a green hydrogen economy, the development of a carbon cycle economy and the production of electricity-based fuels from green hydrogen and CO₂ offer the opportunity to combine climate protection and value creation. The goal is to use electric power generated in the state locally to secure high-quality jobs in the state as well as to create new future-oriented jobs," said Reinhard Meyer, Minister of Economic Affairs, Infrastructure, Tourism and Labor. At the beginning of the event, the joint project of Fraunhofer and Leibniz was presented in a short [Video](#).

The Research Factory Hydrogen MV is a merger of the Fraunhofer Institute for Large Structures in Production Engineering IGP and the Leibniz Institute for Catalysis (LIKAT) Rostock and the Leibniz Institute for Plasma Research and Technology (INP) Greifswald. This bundling of competencies enables the development of holistic and application-oriented solutions for the transformation towards a climate-neutral hydrogen economy. The Research Factory Hydrogen MV will consist of three cooperating areas, each under the responsibility of one of the participating institutes.

PtX Transfer Technical Center of the Leibniz Institute for Catalysis in Rostock's Südstadt

The first infrastructure part of the research factory is currently being built in Rostock's Südstadt with the PtX Transfer Technology Center of LIKAT. PtX stands for the production of any material from sustainably produced electricity. "With our expertise in the development and production of catalysts for the generation of climate-friendly fuels, we will provide the basis for the successful establishment of a green hydrogen economy. Increasing the efficiency and production of the respective conversion steps are our primary goals," explains Prof. Matthias Beller, Institute Director of LIKAT. The building of the *Catalysis2Scale* transfer pilot plant has already been completed and will henceforth be extended proportionally in the PtX transfer pilot plant as part of the Hydrogen MV research factory with technical facilities for PtX processes, such as electrolysis and synthesis plants, as well as with preparation lines for catalysts or nanomaterials..

PtX plasma development environment of the Leibniz Institute for Plasma Science and Technology

The INP in Greifswald is expanding its research into the production of hydrogen to include plasma analysis and is developing future-proof technologies to the point where they are ready for application. In the process, other materials besides hydrogen are to be integrated into the recyclable material and energy cycle. "In contrast to the common process of electrolysis, plasmalysis requires only a fraction of the energy from renewable sources. In addition, hydrogen is produced - quasi as a waste product – urgently needed carbon. This carbon can then be used, for example, in the automotive, aviation, electrical or cosmetics industries," says Prof. Klaus-Dieter Weltmann, director of the INP. In the first step, the INP will build a laboratory sample for hydrogen and carbon supply using plasma technologies.

Application Center Hydrogen of the Fraunhofer Institute for Large Structures in Production Technology IGP

The core element of the hydrogen application center is a large engine test field, with which suitable engine technology for the sustainable industrial use of PtX fuels can be developed and tested, especially in maritime applications. The engine combustion of hydrogen as a primary fuel or as an additive is just as important as the combustion of hydrogen derivatives such as methanol or other e-fuels. In addition to testing hydrogen-based fuels and designing alternative drive systems, the evaluation and classification of fuels from "green" electricity and the provision of open-type test bench capacity for external parties are other key topics. "The development of alternative drive systems on a real scale and the conversion of the existing fleet are essential in order to achieve the ambitious climate policy goals as quickly and sustainably as possible," explains Prof. Wilko Flügge, director of the Fraunhofer IGP.

Extensive investments in the infrastructure of the research factory hydrogen MV are planned for the coming years. The application center for hydrogen is being built in the north of Rostock in the immediate vicinity of the shipyards. The start of construction is planned for this year. Among other things, a test field for tank structures, a demonstrator based on a ship section and a test hall including a modern office complex are to be built on the site. The Greifswalder INP will also be represented at the location of the application center with a functional model for plasmalysis.

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