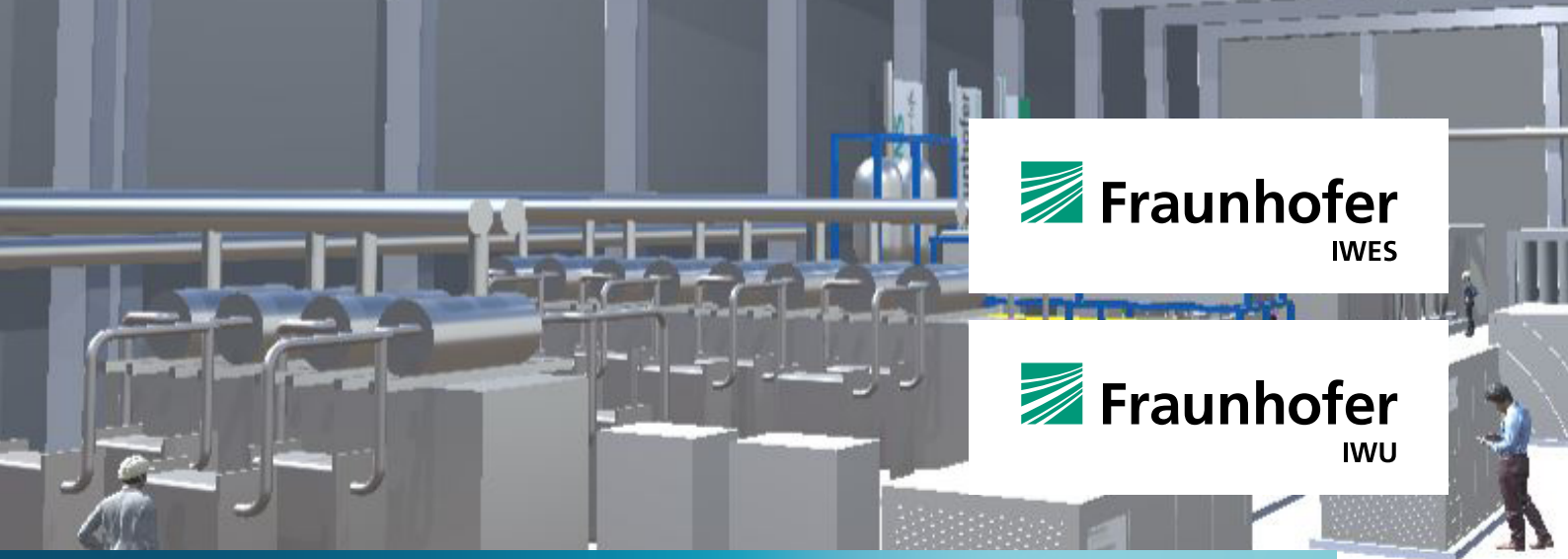


Fraunhofer IWES

Fraunhofer IWU

Data and facts

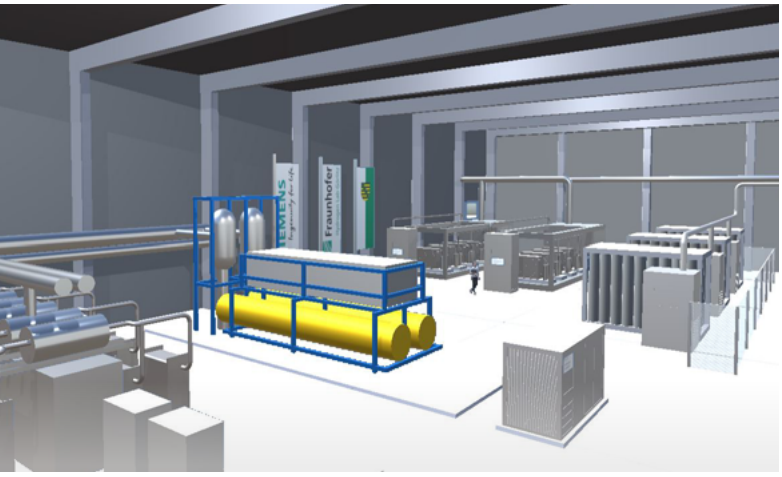
Hydrogen Lab Görlitz – Test infrastructure along the entire H_2 value chain

The Hydrogen Lab Görlitz (HLG) is one of a total of three hydrogen labs already in operation or being set up at Fraunhofer IWES. The Hydrogen Labs offer for the first time a digitally networked infrastructure with testing and qualification capacities for the electrolysis and fuel cell systems totaling more than 25 megawatts (MW), required for the energy transition. They can address almost the same basic requirements, but also set special research priorities. The result is a globally unique range of pilot plants along the entire value chain of the hydrogen economy. Fraunhofer IWES is able to control the allocation of testing capacities and the utilization optimally. Customers thus receive precisely tailored supraregional offers.

The energy transition towards a decarbonized economy is heralding in a profound transformation in energy-intensive industry. For this to happen, a range of technologies must be combined to produce a hydrogen value chain, starting with the development of efficient electrolyzers and fuel cells for mobile and stationary applications, via practicable methods for storage and transport right up to the cost-effective series production of such systems. In order to develop holistic solutions for this range of topics, Fraunhofer IWES and IWU are constructing the HLG, which is being funded by the Free State of Saxony, the Federal Government, and the Federal Ministry for Economic Affairs and Climate Action (BMWK). In close cooperation with Siemens Energy, the transformation process of the manufacturing site there should develop into an innovation center in the heart of the brown coal region and serve the successful structural change right across Germany.

Overview of services

- H_2 production: 12.3 MW building connection capacity, electrolyzer for generation of pure H_2 for different test purposes, flexible electrolysis stack test benches up to 2 MW with subsequent compression, storage, and conversion to electricity via existing H_2 plant technology, flexible electrolysis stack test bench up to 46 kW with climate chamber and vibrating table.
- H_2 processing, systems, and equipment: Infrastructure for the analysis and testing of different H_2 components.
- H_2 storage: Central hydrogen storage for the flexible distribution of pure hydrogen, test fields for the testing of H_2 storage units (pipe containers, etc.).
- H_2 utilization: High-performance fuel cell for cost-efficient conversion of the hydrogen generated by the test fields into electricity, prospectively planned test benches for fuel cell stacks in different power classes and application areas.
- Simulation: Planned knowledge database with models and measurement data along the entire length of the hydrogen value chain for the precise design and integration of H_2 components.



Rendering of the Hydrogen Lab Görlitz currently under construction on the site of the Siemens Energy Campus

Research and development platform for industry

The HLG will provide a research and development platform for the power-to-H_2-to-power value chain, which is crucial in the industrial and mobility sectors. To this end, a multiple-line chain of electrolyzers, pipeline systems, H_2 storage units, and fuel cells with an electrical building connection capacity of 12.3 MW shall be installed. In this chain, individual links can be replaced by test plants and prototypes for the purpose of evaluating their real-world operation in the overall context of the value chain – without having to rebuild the entire chain for individual development projects.

In addition to the testing of hydrogen components and the development of production technologies for electrolyzers and fuel cells suitable for large-scale production, the research activities focus on the digitalization of hydrogen technology. The modeling of individual components and their digital integration into a virtual overall model along defined interfaces allows for a distributed development of optimized plants, which will be supported by modern database systems. At the same time, sensors for real-time monitoring of the production and the operation of electrolyzers, fuel cells, storage solutions, and other H_2 systems will be developed to ensure quality and durability as well as to detect faults at an early stage and initiate countermeasures by comparison with databases. Investment volume in plant technology: Over €30 million.

Picture credits Page 1 and page 2: Photos: © Fraunhofer IWU
02/2024

Further information

Fraunhofer IWES secures investments in technological developments through validation, shortens innovation cycles, accelerates certification procedures, and increases planning accuracy by means of innovative measurement methods in the wind energy and hydrogen technology sectors. At present, there are more than 300 scientists and employees as well as more than 100 students employed at the nine sites: Bochum, Bremen, Bremerhaven, Leer, Görlitz, Hamburg, Hanover, Leuna, and Oldenburg.

As a leading institute for resource-efficient production, Fraunhofer IWU develops technologies and intelligent production systems in the field of hydrogen. The focus when doing so, in the spirit of regenerative systems and the circular economy, is on the entire process chain. The development of innovative lightweight structures and technologies for processing new materials, the transfer of functions in assemblies, the use of the extensive possibilities of generative manufacturing, and, last but not least, the economic use of electrolysis and fuel cell technologies are important factors for success.

www.hydrogen-lab.de

Supported by:

Federal Ministry for Economic Affairs and Climate Action

on the basis of a decision by the German Bundestag

Freistaat Sachsen

This measure is being funded on the basis of a decree by the German Federal Parliament and co-financed from tax funds on the basis of the budget passed by the Saxon State Parliament.

Contact

Dr.-Ing. Sebastian Schmidt
Fraunhofer IWU
Group Manager
Hydrogen Technologies
Phone: +49 3583 54086-4018
sebastian.schmidt@
iwu.fraunhofer.de

Theodor-Körner-Allee 6,
02763 Zittau, Germany
www.iwu.fraunhofer.de

Dr. Johannes Höflinger
Fraunhofer IWES
Group Manager
Hydrogen Lab Görlitz
Phone: +49 471 14290-657
johannes.hoeflinger@
iwes.fraunhofer.de

Am Haupttor 4310,
06237 Leuna, Germany
www.iwes.fraunhofer.de