



To the Media

Stuttgart, Germany, August 19, 2020

HyFaB – a Research Fab for Hydrogen and Fuel Cells

ZSW to explore industrial fuel-cell stack manufacturing and commissioning

Hydrogen-performance fuel cells could be the ticket to tomorrow's climate-neutral and emission-free trucks, buses, ocean-going vessels and trains. Ready for the market today, German fuel-cell technology offers great potential for added value. The Centre for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW) has set out to develop automated manufacturing and quality assurance processes for fuel-cell stacks. Called HyFaB, this project goes to ramp up this technology to a scale typical for mass automotive manufacturing. It will also look into related topics such as factory acceptance tests, commissioning and qualification of skilled workers. Automotive and fuel cell suppliers are on board for the HyFaB project, as are mechanical and plant engineering companies. The Ministry of Economic Affairs, Labor and Housing Baden-Wuerttemberg is supporting efforts to develop the infrastructure by funding a 3,600 m² facility to be built at ZSW's Ulm location and slated to opened in early 2022. On August 19, 2020, Minister of Economic Affairs Dr. Nicole Hoffmeister-Kraut presented the ZSW with the notice of award for a 10.5 million-euro grant.

"Fuel cells offer great potential for reducing traffic-induced CO₂ emissions and creating national value. We have to continue honing the skills in this state. The HyFaB project will make a major contribution to help ensure our companies in Baden-Württemberg benefit from this vital future technology and are best situation to tap its potential. There are also opportunities for the state's many small and medium-sized companies to participate as suppliers," says Minister of Economic Affairs Hoffmeister-Kraut.

"HyFaB will create an open, flexible research platform for the production of high-performance fuel- cells," says Dr. Ludwig Jörissen, who heads up the Fuel Cell Research Department at ZSW. "The possibilities range from the qualification of materials, components and fuel-cell stacks to automated manufacturing processes and the testing and quality assurance procedures required for mass automotive manufacturing on a scale of 200,000 vehicles. Not least of all, this also entails developing concepts for the training and further education of skilled personnel."

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A modular platform for multiple industries

High-performance fuel-cell stacks are complex constructs. They consist of hundreds of individual cells with membrane electrode assemblies (MEAs). At just ten micrometers, these membranes are very thin. To build a fuel-cell stack, the cells have to be matched, tested and assembled with painstaking precision using bipolar plates with an overall height of nearly one millimeter and finely wrought gas distribution structures and gas diffusion layers made of porous carbon fiber fleece. Doing this on a large scale in factories will require entirely new manufacturing processes.

The HyFaB project will create a research platform unlike any other in the world. Its modular design will be flexible enough to accommodate many formats and components, thereby enabling engineers to develop individual steps of the process independently of one another to manufacture different designs of fuel-cell stacks. ZSW scientists are focusing their efforts on developing individual processes to qualify, handle, manufacture and assure the quality of materials, components and fuel-cell stacks. HyFaB staff will guide companies seeking to explore fuel-cell technology and help them rapidly roll out products. The first phase of the project calls for ZSW to erect a 3,600-m² building at its Ulm site. This facility will house the equipment for automated material and component qualification and labs to research methods of constructing membrane electrode assemblies (MEAs). Expected to open in early 2022, the HyFaB facility will be built on a site adjacent to the existing building of the ZSW at Lise-Meitner-Straße 24.

Opportunities for the automotive industry and mechanical and plant engineering companies

The HyFaB initiative centers on the joint efforts of ZSW and partner companies – leaders in the component and supplier industry – to research the prerequisites for mass-manufacturing fuel-cell stacks. The goal is to establish large-volume fuel-cell production capabilities in Baden-Württemberg. HyFaB will provide the foundation for tapping the potential of a field that is sure to figure prominently in the automotive industry's future. This platform is open to automotive and fuel-cell suppliers and to mechanical and plant engineering companies.

The "HyFaB Baden-Württemberg – A Research Fab for Hydrogen and Fuel Cells" is a strategic venture aimed to pool the skills of science and industry as part of the policy dialog between Baden-Württemberg's state government and the automotive industry. ZSW is pursuing the HyFaB project in collaboration with the Fraunhofer Institute for Solar Energy Systems (ISE) at Freiburg.



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Hydrogen and fuel cells rather than diesel

Electric vehicles powered by hydrogen and fuel cells offer silent means of travel with zero local emissions. Ranges are long, refueling is fast. This technology could be deployed wherever diesel dominates the market today — in anything from trucks to ocean-going vessels. The number of hydrogen-powered fuel-cell vehicles had increased to around 19,000 worldwide by January 2020. Toyota has been selling commercial models of cars and trucks in Germany since 2014; Hyundai launched its offering a year earlier in 2013. The GLC F-CELL has been part of the Mercedes Benz test fleet since 2018. A number of automotive supplier and automakers such as BMW and Audi are looking into fuel cells. IVECO aims to start making the Nikola TRE, a truck powered by electricity and fuel cells, at its Ulm plant in 2021, and expects to roll out the first models by 2023. Hyundai Hydrogen Mobility (HHM) is planning to have 1,600 heavy-duty trucks rolling on Swiss roads by 2025. Hydrogen-powered buses and the first local trains are in regular service in several cities.

About ZSW

The Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (Centre for Solar Energy and Hydrogen Research Baden-Württemberg, ZSW) is one of the leading institutes for applied research in the areas of photovoltaics, renewable fuels, battery technology, fuel cells and energy system analysis. There are currently around 280 scientists, engineers and technicians employed at ZSW's three locations in Stuttgart, Ulm and Widderstall. In addition, there are 100 research and student assistants.

Media contacts ZSW

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The HyFaB project is pushing the mass production of fuel cells. The Baden-Württemberg Ministry of Economics is funding the expansion of the ZSW with 10.5 million euros. ©ZSW/FVV, Dirk Lässig



Logo HyFaB

Pictures of the grant presentation ceremony with Minister Dr. Nicole Hoffmeister-Kraut will be available as of 2 pm via this link:
<https://www.zsw-bw.de/nc/presse/presseinformationen.html>

Images are available from Solar Consulting or at
<https://energie.themendesk.net/zsw/>.