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Centre for Solar Energy and Hydrogen Research (ZSW)
in Baden-Württemberg (ZSW)

Location Ulm:
Helmholtzstr. 8, D-89081 Ulm, Germany

New fuel cells for cars: collectively setting up a European industry

At the Hannover Trade Fair, ZSW provides information on a multinational cluster project

Fuel cells enable emission-free electro mobility with long operating ranges and short refuelling times. In the "Auto-Stack CORE" network, nine European automobile manufacturers, system integrators and component suppliers, along with five research institutes, now want to develop a new generation of automotive fuel cells. With this network, the foundations are to be laid for mass production as well. The Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (Centre for Solar Energy and Hydrogen Research Baden-Württemberg, ZSW) is coordinating the project. From the 7th of April onwards, ZSW shall present these activities at the Hanover Trade Fair. In hall 27, at stand D50, the institute will also provide information on its latest projects in the fields of battery technology, electrolysis and solar power storage systems.

In this European cluster project, automotive fuel cells with optimised components are being developed. The project also encompasses a comprehensive test programme and ongoing cost analysis. One of the aims is also to set up the industrial core of a fuel cell industry in Europe. This cross-border project shall continue until 2016. The total project budget is 14.7 million euros and the EU is providing 7.7 million euros in funding.

The new fuel cells are to meet the vehicle requirements pertaining to performance, durability and safety, while also enabling a significant cost reduction. The network includes three automobile manufacturers, three system integrators and three component manufacturers, supported by five European research institutes. Bundling of European expertise is urgently required in order to be able to stand up to the Asian competition in the emerging fuel cells market: in Japan, large numbers of fuel cell cars will be coming onto the market from around 2015, and Korea has already begun production of fuel cell vehicles.

Sol-ion+: new, optimised solar power storage systems

Since the start of 2014, the research project Sol-ion+ has been looking into how self-consumption of solar power can be optimally increased with batteries. Seven partners from research and industry, including ZSW, are developing an efficient storage system for this purpose. Following this, the partners will spend twelve months testing the new development in field tests. This research project will run until 2017.

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It is financially supported by the German Federal Ministry for the Environment (BMUB).

The new development should also contribute to the stabilisation of electricity grids. Battery storage systems have the advantage of being able to absorb power fluctuations when used in supply grids, thus increasing the stability of the electricity supply. As the systems are scalable, they also create larger storage capacities.

Electrolysers for the megawatt performance class

ZSW is also active in electrolysis research. In a project that is currently underway, scientists are developing alkaline pressure electrolysis with a connected electrical load of 300 kilowatts. The corresponding cell stack can be increased to around 0.5 megawatts if enlarged accordingly. Numerous other technical innovations are being tested, including a 0.5 megawatt rectifier system, an innovative electrode coating and the modular structure of the overall system. At the same time, ways in which the costs of such electrolysers can be reduced are also to be demonstrated. The BMUB is providing this ongoing project with around 3.3 million euros in funding. This involvement in the field of electrolysis is meant to pave the way for a new, commercially utilisable generation of Power-to-Gas (P2G®) systems.

In addition, ZSW has set up an electrolysis test rig, where alkaline pressure electrolysis blocks with variable cell quantities and variable cell surface areas, as well as system components, can be tested and measured.

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 230 scientists, engineers and technicians employed at ZSW's three locations in Stuttgart, Ulm and Widderstall. In addition, there are 120 research and student assistants.

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ZSW scientists developing fuel cells.

Increasing self-consumption of solar power with battery storage systems.

Electrolysis pilot plant at ZSW.

Photos: Centre for Solar Energy and Hydrogen Research (ZSW) in Baden-Württemberg (ZSW).

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