Bavarian Research Alliance

PRESS RELEASE

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The best of two systems

New EU project “HyFlow” to develop a smart hybrid energy storage system

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Landshut, Germany - Modern energy grids rely on renewable energies such as wind and solar power and are characterised by higher fluctuations in both power generation and energy consumption. In order to absorb resulting power peaks and to cope with the increased demand for renewable energies, modern energy grids need more dynamic storage systems. The task is to optimally dimension the capacity and power of such energy storage systems and to ensure a secure, affordable and environmentally friendly energy supply. Smart combinations of storage systems, so-called hybrid storage systems, offer a solution for this. The development of such an efficient, sustainable and cost-effective hybrid system is the objective of the European research project HyFlow, in which eleven partners from Germany, Italy, Spain, the Czech Republic, Austria, Portugal and Russia work together under the coordination of Landshut University of Applied Sciences. HyFlow is being funded by the EU until 2023 with EUR 4 million.

Renewable energy sources such as wind power and photovoltaics continuously contribute to electricity generation all over Europe – but their contribution varies as much as the electricity demand of private and public grids. The resulting production and load peaks are a challenge for Europe's energy grids. To meet these demands and reduce dependence on fossil fuels, flexible storage systems tailored to a wide range of applications are needed.

High storage capacity and high power

The HyFlow project addresses this challenge and develops a powerful model of **a hybrid energy storage system** that can meet high energy and power requirements. The project thus contributes to ensuring the effectiveness and stability of private and public energy grids in the future.

To this end, the researchers want to combine two different systems – **a high-performance vanadium redox flow battery** and **a supercapacitor**. "A redox flow battery has a large storage capacity, but can only be charged and discharged slowly. The supercapacitor, on the other hand, has short charging times with low energy density. The hybridisation is intended to create an energy storage system that combines the advantages of both systems: high storage capacity and high power", says Prof. Karl-Heinz Pettinger, Scientific Director of the Landshut University of Applied Sciences Technology Centre for Energy, who coordinates the project.

Powerful, sustainable and cost-effective

In future, the newly developed flexible storage system will be able to balance the power and energy demand flexibly during critical grid conditions, e.g. during high load or generation peaks, whether for seconds or entire days. In these demanding applications, hybridisation leads to more efficient storage systems, with longer lifetimes as well as higher adaptability and potentially lower costs. The new hybrid system works in the most environmentally friendly and sustainable way possible by not using critical resources. Researchers are developing strategies to recycle vanadium for redox flow batteries.

Increasing Europe's competitiveness in the battery sector

The use of optimised components for hybrid systems guarantees security of supply for energy grid systems - with increased current density, efficiency and lifetime. In addition, an innovative management system provides a high level of control and adaptability through computer analytics and control algorithms. The HyFlow project thus supports Europe's competitiveness in the battery sector for stationary storage applications.

Network enormously important

"That Landshut University of Applied Sciences is able to lead and coordinate this ambitious EU project is something very special for us," Pettinger proudly reports. The idea for the project came about in 2019 as part of a conference of the FSTORE research platform, where initial contacts with potential partners were made. The fact that the grant application has now been rated with the highest possible score is "a tribute to the entire team" and shows how important two things are for this success: "Perseverance and a good network."

About the Bavarian Research Alliance (BayFOR) GmbH

The Bavarian Research Alliance provided intensive support for the HyFlow project during the application process and advised on its strategic orientation. As a project partner, BayFOR now also supports the HyFlow consortium in project management and communication activities.

BayFOR is a private organisation promoting Bavaria as a location for science and innovation within the European Research Area. It supports and advises Bavarian scientists and stakeholders from the private sector on European research, development and innovation funds. The focus is directed at the EU's Framework Programme for Research and Innovation "Horizon Europe". As a partner in the network for SMEs "Enterprise Europe Network", BayFOR provides specific advice for SMEs which are interested in EU research and innovation projects. BayFOR is a partner institution in the Bavarian Research and Innovation Agency and is supported by the Bavarian State Ministry of Science and the Arts.

Project name:	HyFlow (Grant Agreement No. 963550) – Development of a sustainable hybrid storage system based on high power vanadium redox flow battery and supercapacitor – technology
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Project coordination:	Prof. Dr Karl-Heinz Pettinger (TZE), Landshut University of Applied Sciences
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Press Contacts:

Landshut University of Applied Sciences
Prof. Dr Karl-Heinz Pettinger
Scientific Director of the Landshut University of Applied Sciences Technology Centre for Energy
Phone: +49 (0)871 506 276
Email: karl-heinz.pettinger@haw-landshut.de

Thomas Kolbinger
PR Officer
Phone: +49 (0)871 506 191
Email: pressestelle@haw-landshut.de

Bavarian Research Alliance
Dr. Daniel Kießling
Scientific Officer
Phone: +49 (0)911 50715-920
Email: kiessling@bayfor.org

MBA Gabriela Blumberger
Scientific Officer and Project Manager
Phone: +49 (0)89 9901888-132
Email: blumberger@bayfor.org

Emmanuelle Rouard
Head of Public Relations
Phone: +49 (0)89 9901888-111
Email: rouard@bayfor.org

Picture material on this press release is available for download on our website: www.bayfor.org/hyflow-pm-english:

(from left to right)

Dr Reinhart Schwaiberger (General Manager TZE), Christina Zugschwert (project member HyFlow), Prof. Dr Fritz Pörnbacher (President, Landshut University of Applied Sciences) and Prof. Dr Karl-Heinz Pettinger (project coordinator, HyFlow)