

# Living Labs for the Energy Transition: Partner network tests new battery technology

Led by High Performance Battery Technology and STEAG, eight partners are taking part in the ideas competition staged by the German Federal Ministry of Economic Affairs (BMWi)

**Essen.** In the context of the energy transition, the German government has set itself the aim of rapidly expanding generation from renewables. Of course, solar and wind power are subject to weather-related fluctuations, and do not follow demand and the requirements of the market. In order to compensate for those fluctuations and ensure a power supply in line with demand, storage battery pioneers are taking part in the “Living Labs for the Energy Transition” ideas competition organized by the Federal Ministry of Economic Affairs (BMWi) and are planning to replace conventional lithium-ion batteries with a new technology.

Bonn-based High Performance Battery Technology GmbH, STEAG GmbH of Essen, the Institute for Technology Assessment and Systems Analysis (ITAS) of the Karlsruhe Institute of Technology (KIT) and five other partners from science and industry have joined forces and submitted a project outline to the Federal Ministry for Economic Affairs and Energy. The German government is aiming to promote energy storage in the electricity sector by means of the “Living Labs for the Energy Transition” competition. These storage facilities are to be tested in a real environment and enable the integration of energy from renewable sources into the energy system.

## STEAG leads the way as storage operator

STEAG is already setting the pace as the operator of six large battery systems. As one of the largest storage operators in Europe, the energy company has been gathering important know-how since 2016. STEAG’s battery storage systems are already being used today to compensate for frequency fluctuations in the power grid caused by the increasing volatility of energy infeed from renewable sources. Within a few seconds, the large battery storage units can draw excess energy from the power grid or feed the required energy into the grid.

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The aim of the “Innovative Solid State Storage Battery” project is to develop and test a new battery technology that replaces the conventional lithium-ion battery. “The planned high-tech batteries are impressive in their unique combination of performance data,” says Günther Hambitzer, CEO and Chairman of the Board of Directors of High Performance Battery Holding AG, based in Switzerland. They are non-flammable, resistant to deep discharging, durable, and there is no shortage of raw materials. They also have an almost constant capacity with almost constant internal resistance, considerably better environmental impact than conventional lithium-ion batteries (50 percent less CO<sub>2</sub> equivalent over their life cycle).

The project results obtained flow into a broad spectrum of fields of application:

- Grid stabilization and flexibility options
- Stationary network buffering for electromobility as accompanying infrastructure for charging stations
- Home storage
- Uninterruptible power supply applications
- Power tools and consumer electronics

“The battery size can range from container storage units with a capacity of several megawatt hours (MWh) to small batteries in the range of fractions of a kilowatt hour (kWh),” Hambitzer concludes.

### **STEAG GmbH**

STEAG is one of the leading energy companies in Germany and is actively shaping the energy system transition at six power plant sites in Germany. For over 80 years, STEAG has stood nationally and internationally for efficient and reliable power generation. STEAG designs, develops, implements, operates and markets highly efficient power plants and storage facilities. As an experienced partner, STEAG supports its customers comprehensively, offers tailor-made solutions in the field of electricity and heat supply and a wide range of energy services. Since 2016, STEAG has been operating six large-scale battery systems with an installed capacity of 90 MW. STEAG is one of the world’s leading companies with experience in the operation of large-scale storage in commercial applications.

### **High Performance Battery Technology GmbH**

High Performance Battery Technology GmbH, based in Bonn, Germany, specializes in the research and development of high-tech batteries with a unique combination of performance data: non-flammable, deep-discharge resistant, long-lasting, almost constant capacity with almost constant internal resistance, without raw material bottlenecks and with considerably better environmental effects than conventional lithium-ion batteries, i.e. a 50 % better environmental balance (e.g. 50 % less CO<sub>2</sub> equivalent over the life cycle). In particular, they contain no cobalt. High Performance Battery Technology GmbH has gained experience in 30 years of basic research in the field of inorganic high-performance batteries, including the new solid state battery. The predecessor

technology, still based on a liquid electrolyte, has already completed 50,000 charging cycles in a container in the USA with a capacity of 1 megawatt hour and a power of 2 megawatts.

**Institute for Technology Assessment and Systems Analysis (ITAS) of the Karlsruhe Institute of Technology**

ITAS is one of the most prestigious research institutions for the analysis of the social embedding of new technologies and ensures intensive accompanying research, among other things for the successful scaling of the living laboratory.