



Battery building blocks for the storage challenge

Project details	
Project title	HERMES - Highly Efficient and Reliable Modular Battery Energy Storage Systems
Participants	E.ON Energy Research Center, RWTH Aachen University, Germany, Aalborg University, Denmark

A new energy storage concept using batteries as building blocks in a modular system is being pioneered under the E.ON International Research Initiative (IRI).

The project aims to develop the ideal size and design of battery which can be linked together to store energy as power networks change to meet future demands.

Among the factors driving the need for reliable storage systems are growth in intermittent renewable generation, an increased demand for network support services and expansion of distributed generation.

The project has been drawn up by four leading academics from universities in Germany and Denmark.

Three of the experts are based at the RWTH Aachen University: Professor Rik De Doncker is Director of the E.ON

Energy Research Center (E.ON ERC). Together with Professor Dirk Uwe Sauer he heads the Institute for Power Generation and Storage Systems at E.ON ERC as well as the Institute for Power Electronics and Electrical Drives. The third expert from RWTH Aachen University is Professor Armin Schnettler, who heads the Institute for High Voltage Technology. The fourth academic is Professor Frede Blaabjerg from the Institute of Energy Technology at Aalborg University .

The proposed battery energy storage system (BESS) will offer fast response times and provide large volumes of energy, potentially up to 100MW.

The project's main objective is to identify an optimized design for a battery building block of 1MW to 5MW to be used in storage systems with energy capacities ranging from 1 second to 12 hours.

A range of different storage technologies are being analyzed including conventional batteries using lead-acid, nickel-cadmium and lithium-ion, super-capacitors, high temperature batteries and re-dox flow cell systems.

For the first time ever, a test facility for batteries up to 6kV is being created at a university test centre.

The completed project will provide a detailed specification for a modular BESS. The technology is intended to



become a standard, low cost, storage facility that is widely available and easy to integrate into future networks.

Using BESS will help stabilize networks, improve power quality, reduce energy losses and control increasingly complex distribution systems. The ability to provide direct current (DC) may also create a role for BESS as part of future transmission and distribution systems which may move away from alternating current and make more use of DC grids.

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