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Large-scale battery storage system in field trial

Testing technology and business models

Ensuring the continuous stability of the electricity grid is posing increasing technical challenges for the grid operators. One possibility is to use large-scale battery storage systems to compensate for temporary fluctuations between the supply and demand. The new BINE-Projektinfo brochure entitled “Modular battery storage system supplies balancing energy” (12/2017) presents the large-capacity M5Bat storage system in Aachen. The interaction of five different battery systems based on lithium-ion or lead-acid is being investigated there on a large scale. The system participates in regular trading in the electricity market for system services. After one year of operation the initial results are now available.

The large-scale storage system has six strings in which various lithium-ion batteries are installed, and four strings with lead-acid batteries. The scientists are using this modular design to test the interaction of the different battery systems. Each of the strings can be individually controlled and regulated. Lithium-ion batteries are more suitable for short-term power storage and output, while those with lead-acid are more suitable for short and medium charging and discharging times. The research project is focussing on the ageing, technical reliability and service life of the systems as well as on optimised battery management. The large-scale storage system runs fully automatically and is controlled by an external control centre. It is certified for participation in the balancing energy market. In the event of a sudden power demand in the grid the storage system can immediately supply the required electricity for seconds or minutes in order to keep the grid frequency stable.

The storage system has an output of 5.8 MW with a storage capacity of 5.6 MWh. The output and capacity of the system are roughly equivalent to the electricity consumed by 10,000 households in an hour. The Institute for Power Electronics and Electrical Drives (ISEA) at RWTH Aachen University is conducting the research together with industrial partners.

The BINE-Projektinfo brochure, which can be obtained free of charge from the BINE Information Service at FIZ Karlsruhe, is available online at www.bine.info or by calling +49(0)228-92379-0. The brochure cover and additional images can also be downloaded from this web portal in the press section.

Contact
Uwe Milles
presse@bine.info

BINE information service
Kaiserstraße 185-197
53113 Bonn
www.bine.info

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