Enhancing Safety of Domestic Solar Power Storage

At the Intersolar, Munich, KIT Researchers Will Present Results Relating to the Safety and Service Life of Battery-based Domestic Storage Systems for Private Photovoltaics Facilities

Power from solar parks can be stored in batteries. Balancing of production and demand is one element of the energy turnaround. (Photo: KIT)

Monika Landgraf
Chief Press Officer

Kaiserstraße 12
76131 Karlsruhe, Germany
Phone: +49 721 608-47414
Fax: +49 721 608-43658
E-mail: presse@kit.edu

For further information, please contact:

Kosta Schinarakis
PKM – Science Scout
Phone: +49 721 608 41956
Fax: +49 721 608 43658
E-mail: schinarakis@kit.edu

Lithium-ion battery-based energy storage systems have already demonstrated how efficient, reliable, and safe they can be in commercial electric vehicles. These high safety standards now also have to be transferred to battery-based storage systems for private photovoltaics facilities. At the Intersolar leading trade fair in Munich that will start on June 04, 2014, KIT will present solutions for the design of safe and long-lived PV domestic storage systems.

“Lithium-ion batteries can reach a very high operational reliability, if the manufacturer possesses the necessary know-how and observes some “golden rules”,” explains Dr. Olaf Wollersheim of the Competence E project of Karlsruhe Institute of Technology (KIT). He and his team analyzed the transport safety and operational reliability of stationary batteries and formulated corresponding guidelines. “These guidelines may serve as a checklist to help laymen separate the wheat from the chaff.” Stationary batteries store solar power and, in this way, eliminate the production peak at noon. This power is then released again in the evening, during the night or in the

morning when it is needed. Area-wide balancing of power production and power demand would be an important element for the energy turnaround.

Unfortunately, not all manufacturers on the young market of domestic storage systems apply the “golden rules” for battery safety. These include the UN38.3 certificates on the battery and cell levels, the draft DIN EN 62619, and functional safety checks according to the ISO safety integrity level (SIL). “The branch is obliged to ensure safety for its customers and to actively promote observation of the standards.” Reports of fire brigades reveal that there are black sheep in the branch. In some cases, defective battery storage systems were found to be the cause of fires. Recent own tests of commercial stationary battery storage systems by the Competence E project demonstrated that some of these systems do not correspond to the safety standards.

Yet, stationary energy storage systems can be constructed and operated reliably by using comparably simple measures. “Automotive industry that develops and produces lithium-ion batteries with extraordinary care shows how this can be done. The standards used there have to be transferred to domestic storage systems for the black sheep to disappear,” Dr. Andreas Gutsch, the coordinator of the Competence E project, explains. By all-pole battery shutdown, for instance, i.e. the disconnection of both battery poles from the mains, overcharging due to excess voltage may be prevented when switches are activated by independent safety systems. “The necessary know-how has to be developed by every company that wishes to produce domestic storage systems. Citizens, who want to support the energy turnaround by installing a domestic storage system, are entitled to a maximum safety.” Current research focuses on this issue.

At the Intersolar, Munich, from June 04 to 06, 2014, the KIT experts can be found at booth B1.239 ees. In addition, Olaf Wollersheim will speak at the electrical energy storage (ees) forum on Friday, June 05 (hall B1, booth B1.150). The title of his speech is “Safety First – More Safety for Lithium-ion Batteries”.

For the checklist, click:

http://www.kit.edu/downloads/KIT_Li-Ionen_Checkliste.pdf

More information on the tests executed by the Competence E project can be found at:

http://www.kit.edu/kit/15184.php

The Competence E project covers all research aspects from the battery materials to the stationary energy system in a way that is unique in Germany. With an open technology platform for battery-electric vehicle drives and stationary energy storage systems, the systemic approach is aimed at developing industrially applicable solutions and their production methods. Thanks to integration along the chain of values added, battery systems with an energy density of 250 Watt-hours/kg are to be manufactured at costs of EUR 250 per kilowatt-hour by 2018. This will be an important step towards the energy turnaround and reaching climate objectives: Increased storage capacity or stationary storage systems to compensate the fluctuation of renewable energy and enhance the range of electric vehicles for increased acceptance.

Find more on the Competence E project at:

http://www.competence-e.kit.edu/

Karlsruhe Institute of Technology (KIT) is a public corporation according to the legislation of the state of Baden-Württemberg. It fulfills the mission of a university and the mission of a national research center of the Helmholtz Association. Research activities focus on energy, the natural and built environment as well as on society and technology and cover the whole range extending from fundamental aspects to application. With about 9400 employees, including more than 6000 staff members in the science and education sector, and 24500 students, KIT is one of the biggest research and education institutions in Europe. Work of KIT is based on the knowledge triangle of research, teaching, and innovation.

This press release is available on the internet at www.kit.edu.

The photo of printing quality may be downloaded under www.kit.edu or requested by mail to presse@kit.edu or phone +49 721 608-4 7414. The photo may be used in the context given above exclusively.