

Press Release

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Keep cool – cooler batteries are safer and live longer

Fraunhofer ISE inaugurates its new location for battery system technology

The Fraunhofer Institute for Solar Energy Systems ISE is bundling its research activities in the field of battery systems in a new laboratory. Together with its partners, it offers the industry a unique array of services: from investigations of single battery cells through the development of complete battery systems up to the optimal integration of entire storage systems in different applications with respect to both power and communications technology. The researchers use the laboratory to investigate, among other things, the thermal behavior of battery cells and modules using a highly precise calorimeter. The results enable battery systems with maximum safety, long lifetime and high power efficiency to be developed.

“Whether stationary storage or electromobility, the aspects of system design and operation rather than the battery cell itself is becoming ever more important,” says Matthias Vetter, department head of Battery System Technology at Fraunhofer ISE. “For example, thermal management is crucial for the safety and lifetime of the battery. A cool battery is safer and has a longer lifetime.”

Battery storage systems are not only electrochemical systems, but also highly complex electrical systems showing specific thermal behavior. The total state of the battery cannot be measured directly, rather it can only be calculated with algorithms using measured parameters like current, voltage and temperature. Intelligent battery management performs this task by recording the internal state. Furthermore, it optimizes the charging and operating control strategies.

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An optimized operating strategy for vehicle batteries, for example, exactly determines not only the actual status based on measured parameters but also maximizes the range as a function of the actual environmental and operating conditions, without negatively influencing the safety or lifetime.

When the battery cells, layout and system technology are correctly qualified, then stationary PV batteries based on Li-ion technology can be operated reliably today. With high quality cells and the optimized interaction between battery management, thermal management, understanding of aging mechanisms as well as highly efficient and reliable power electronics, battery lifetimes of up to 20 years at system efficiencies (AC-AC) of over 90 percent are possible.

Issuing safety certificates is a sovereign function. Therefore, Fraunhofer ISE works together with established certifiers in this area. Since research institutes do not issue certifications and certifiers do not perform research, this cooperative approach is an ideal service for manufacturers and developers. "We master the test methods and therefore can develop our customers' systems to be ready for certification," explains Vetter on the benefits of the cooperative work.

Text of the PR and photos can be downloaded from our webpage: www.ise.fraunhofer.de

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Partial view of Fraunhofer ISE ServiceLab Batteries ©Fraunhofer ISE

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