

”Energiewende” by Pushing a Button

Siemens/KIT Alliance Increases Quality and Reduces Costs of the Production of Lithium-Ion Batteries for Solar and Wind Power Storage and Electric Vehicles



Prof. Eberhard Umbach, KIT, and Klaus Helmrich, Siemens AG, signed the co-operation agreement. (Photo: Andreas Drollinger, KIT)

With the help of modern automation systems, even highly complex production plants can be operated easily and safely. The results: Products of highest quality, minimum scrap rates, and low costs. Also innovations like high-performance lithium-ion batteries for energy storage have to reach this level quickly in order to be competitive on the market. Karlsruhe Institute of Technology (KIT) and Siemens AG now plan to develop an integrated concept for the control and monitoring of the complete machinery of a battery factory.

Professor Eberhard Umbach, President of Karlsruhe Institute of Technology, and Klaus Helmrich, Member of the Managing Board of Siemens AG, signed a cooperation agreement on future cooperation.

“Siemens AG with its vast experience in drive, control, and automation technology is the ideal partner to translate our research and

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:**

Anja Kreuzer-Kurz
Siemens AG
Weissacher Str. 11
70499 Stuttgart, Germany
Phone: +49 711 137-3561
Fax: +49 711 137-2479
E-mail: anja.kreuzer-kurz@siemens.com

development results into globally marketable products and solutions for battery industry,” said Dr. Andreas Gutsch, coordinator of the Competence E project that pools all KIT activities relating to the storage of electrical energy for mobile and stationary applications. “We want to further develop industrial processes with respect to quality and costs.”

“The “Energiewende” is Germany’s project of the century. If we realize this change in a reasonable manner, opportunities for Germany and German enterprises will prevail. Resources and energy efficiency as well as technological progress are essential for a viable structural change. Close cooperation of universities, research institutions, and industry plays a crucial role, as does our partnership with Karlsruhe Institute of Technology,” emphasized Klaus Helmrich, CTO and Member of the Board of Siemens AG.

Lithium-ion cell manufacturing is characterized by many subsequent processes, such as the drying of coated electrodes, cell assembly in a dry room or cell formation. So far, these processes have mainly been controlled locally in the respective machine. Cooperation is now aimed at developing a superordinate system controlling all processes from a central computer workplace. The new data management system of the production plant will allow for an online analysis of the individual process steps. Parameter changes can be detected quickly and the process can be readjusted. By means of process-overlapping data management, factors influencing the complete chain of values added can be controlled by a single system, the objective being to ensure maximum process safety and minimum deviations.

Manufacturers of batteries are to be enabled to optimize their plants and to improve product quality more rapidly. Reduction of the scrap rate will lead to significant cost reductions that are urgently required for success on the market and for use of the batteries in electric vehicles as well as in stationary storage systems.

The cooperation extends discipline-overlapping close-to-industry research at KIT and strengthens innovation by testing new fabrication concepts in practice. The newly developed control system is planned to integrate the first lithium-ion cell fabrication systems of KIT in 2013 already and to demonstrate benefits in terms of product quality and cost reduction.

The Competence E project pools all KIT activities relating to the storage of electricity for mobile and stationary applications. This so far unique focus on the complete system allows for the development of cost-effective solutions for next-generation battery systems and electric drives that can be used in industry. New manufacturing methods for the cost-efficient production of these batteries will be developed parallel to prototyping innovative cells and batteries. Work is funded by the Federal Ministry of Economics based on a decision made by the German parliament.

The Siemens Industry Sector (Erlangen) is the world's leading supplier of innovative and environmentally friendly products and solutions for industry customers. With consistent automation technology and industry software, profound expertise, and technology-based services, the Industry Sector increases the productivity, efficiency, and flexibility of its customers. The Industry Sector has more than 100,000 employees worldwide and consists of the Divisions of Industry Automation, Drive Technologies, and Customer Services as well as of the Business Unit of Metals Technologies. Further information can be found on the internet at www.siemens.com/industry.

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. KIT focuses on a knowledge triangle that links the tasks of research, teaching, and innovation.

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