

An innovative response to the challenge of storing renewable energy

October 26 2015, by Emmanuel Barraud



A system for managing and storing energy, developed by EPFL's Distributed Electrical Systems Laboratory, has been inaugurated on the school's campus. The system, which received extensive co-financing from the Canton of Vaud, is built around an industrial-capacity battery developed by Vaud-based company Leclanché. It is now connected to the Romande Energie-EPFL solar park and will be used to conduct real-

world tests on the behavior of a power grid that is fed electricity from solar panels.

The experimental storage system was inaugurated today and is now connected to the Romande Energie-EPFL solar park, one of the largest in French-speaking Switzerland. Researchers will use it to study new, industrial-scale solutions for using renewable energies (especially solar energy) and feeding them into the power distribution grid, as part of the 'EPFL Smart Grid' project.

Useful life far above average

The system, which is the size of a shipping container, is unique for its underlying technology: it is based on high-performance lithium-ion titanate cells manufactured by Vaud-based company Leclanché. The life of these cells is around 15,000 charge-discharge cycles, while 3,000 is more common. In addition, the cells come with ceramic separators, patented by Leclanché, which are meant to maximize safety. It is a fully integrated solution comprising storage and energy-conversion modules as well as software for the battery to communicate with the EPFL engineers.

Real-world testing

The system will be used to test the research being carried out by Professor Mario Paolone, the Head of EPFL's Distributed Electrical Systems Laboratory. It will be able to hold up to 500 kWh, which is the equivalent of the average energy consumed by fifty Swiss households over the course of one day, while managing variations in power as a function of the sunshine. "The ability to connect reliable energy storage solutions to the grid is key for incorporating [renewable energy](#) sources in our energy mix," said Dr. Paolone. "Because of the system's high

capacity, we will be able for the first time to carry out real-world tests on the new control methods offered by the smart grids developed at EPFL."

A project co-financed by Canton of Vaud

This project received extensive financial support from the Canton of Vaud. As part of its "100 million for renewable energies and energy efficiency" program, the Canton allocated some two million francs to Dr. Paolone's team. These funds are from the R&D component of that program, which, in addition to EPFL, is providing support to the School of Business and Engineering in Yverdon-les-Bains and the University of Lausanne. "This project represents an important milestone in the implementation of our energy policy, one of the objectives of which is to develop renewable [energy](#) resources at the local level," said Jacqueline de Quattro, State Councilor and Head of the Department of Territorial Planning and the Environment.

The research involving the new system is set to last 23 months and will optimize the functioning of the various components of the new system, its management and its interoperability with an integrated electricity production and distribution network (i.e., a smart grid).

Provided by Ecole Polytechnique Federale de Lausanne

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