

Siemens starts new energy transition research project in Germany

Siemens has started a new project – IREN2 (Future Viable Networks for Integration of Renewable Energy systems) – in Wildpoldsried in the Allgäu region in connection with Germany's transition to a new energy mix. Siemens is working on this project as part of a consortium consisting of Hochschule Kempten (Kempten University), RWTH Aachen, Allgäuer Überlandwerke utility, and IT company ID.KOM. The project will investigate innovative power grid structures and their operational management based on technical and economic criteria. The goal is to discover how energy systems with distributed power generation and additional components like battery storage devices, block district heating power plants, biogas plants, and diesel generators can be technically and economically optimized. Over the project period of three years, the research consortium also plans to test microgrids – regional, self-contained, smart power distribution grids – as island networks, and they will also assess the use and operation of microgrids as so-called topological power plants. The smart grid infrastructure already installed in Wildpoldsried will be used in the project as will the results and experiences acquired in the pilot project IRENE (Integration of Renewable Energies and Electromobility), which was successfully concluded there at the end of 2013.

The pilot installation in the district of Wildpoldsried in the network region of Allgäuer Überlandwerke will serve as the foundation for the project but will be expanded during the project in order to implement, study, and analyze the planned concepts. The existing smart power supply grid already in place in the Allgäu is especially well suited as a platform for ongoing investigations into the reliable and stable operation of island networks and topological power plants. Island networks are supply areas that are not connected to other networks and therefore have special requirements in terms of the operational management system. "Topological power plant" is the term

used to describe network sections in which loads and power generators can be controlled jointly like a conventional power plant.

Siemens and the partner companies are researching network structures of this kind according to economic and technical criteria. The studies based on economic criteria are aimed first and foremost at finding the most cost-effective development variant among the diverse grid structures and analyzing different operating strategies. The technical analyses include the interactions between the power generators and loads, measurement and control technology, stability studies, development of protection concepts, and the implementation of intelligent network structures for applying information and communication technology.

Today the volume of electrical power generated from renewable energy sources in Wildpoldsried is five times higher than the community's own requirement. During the predecessor project IRENE, which ran from mid-2011 to the end of 2013, a smart grid was created in this Allgäu community in order to balance power generation and consumption and so keep the network stable. Two controllable distribution transformers and a stationary battery storage system were installed for this purpose. The smart grid is also equipped with an elaborate measurement system, a modern communications infrastructure, and renewable distributed power generators including photovoltaic and biogas plants. This creates the essential basis for scientifically investigating the optimal operation of independent island networks and topological power plants and testing them in practice. Wildpoldsried offers ideal conditions for allowing theoretical results to be verified on an actual intelligent energy system. The IREN2 research project will provide lay the foundation for a future renewable energy system that balances the conflicting interests of regulation and the energy market.

Energy-efficient, eco-friendly solutions for setting up intelligent power supply networks (smart grids) and the associated service are part of Siemens' Environmental Portfolio. Approximately 43 percent of its total revenue stems from green products and solutions. That makes Siemens one of the world's leading providers of eco-friendly technology.

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