THE SMART-GRID-DEMONSTRATOR: SMART GRIDS IN SIMPLE TERMS

The idea

Future energy grids face the challenge of transporting an ever-increasing share of fluctuating supplies using renewable energy from wind and sun to the end consumer in a reliable and efficient way. But how do these energy grids could look like? What is the purpose of a low-voltage or a medium-voltage grid level? Which kind of storage facilities are conceivable in the future and what technologies are behind it? Plus, who organizes the communication between power generation, transport, storage and consumption in the end? The »Smart-Grid-Demonstrator« is a flexible exhibit, created by the Fraunhofer AST in order to introduce the topic of smart and linked energy supply even to young people and laypersons. Thereby the »Smart-Grid-Demonstrator« illustrates not only the current grid topology, that is for different power grid levels of low, medium, high and extra-high voltage. It also takes into account different storage technologies like a redox-flow battery or a gyrating mass storage and future developments such as electromobility, smart metering or demand-side management.

The key highlight: Through an interactive software solution the user could have a try at managing the entire energy infrastructure via a touch screen application. In this way the user gets a first and simple impression of the complexity of the electrical energy supply.
Consideration of the hierarchical structure of the German power supply systems, which is divided in different levels (low, medium, high and extra-high voltage)

Presentation of typical power generators and consumers of the particular grid level, within the main focus is on renewable energy

Integration of storage technologies (redox-flow battery, gyrating mass storage, electromobility)

Interactive energy management system with the objective of regulating the electricity generation and consumption through the energy storage

Integrated online help gives further information about the producers, power and distribution grids, consumers and storages

Controllable via a touch screen, Ranking of the best in the game about energy data management

Previous locations of exhibition

- 17th March 2010: Fraunhofer IOSB, Karlsruhe
- 19th April 2010: HANNOVER MESSE, Hannover
- 18th May - 7th October 2010: MS Wissenschaft, deutschlandweit
- 4th April 2011: HANNOVER MESSE, Hannover
- 24th - 26th October 2011: UrbanTec, koelnmesse

AST staff member Falk Schaller explains the structure of the Smart-Grid-Demonstrator. The picture shows the dialogue between Prof. Dr. Christine Windbichler, Vice president of the German Research Foundation, Thomas Rachel, Parliamentary State Secretary at the Federal Ministry of Education and Research, Prof. Dr. Ernst Theodor Rietschel, President of the Leibniz Association, and Prof. Dr. Gerold Wefer, Chairperson of the Steering Committee of science. (from left to right) Source: Ilja C. Hendel/ Wissenschaft im Dialog