

Dr. Dirk Uwe Sauer works on batteries and renewable energy systems since 1992. After 11 years at the Fraunhofer Institute for Solar Energy Systems ISE he became a Professor for “Electrochemical Energy Conversion and Storage Systems” at RWTH Aachen University, the first chair of its kind at German Universities. His research focus is on storage systems in electric vehicles of any kind, and in grids with a high penetration of renewable energies. He has a holistic view on batteries including post-mortem analysis, ageing and lifetime prediction, modelling and diagnostics, impedance spectroscopy and impedance based modelling, and energy system analysis including sector coupling. He was founding editor in chief of the “Journal of Energy Storage” (2015 – 2022). He is also Chair of the Board of Directors of the interdisciplinary policy advisory project of the national science academies "Energy Systems of the Future" on all aspects of the "Energiewende".

Abstract

Title (proposed by organisers): Electricity storage and generation support for standby, support for renewables generation

Title (proposed by author): Electricity storage and flexibilities for supporting renewable power generation

Author:

Prof. Dr. Dirk Uwe Sauer

Member of acatech and BBAW, Germany

Director of the board of the academy project “Energy systems of the future” by acatech, Leopoldina & Union of the German Science Academies

About 80% renewable power generation in 2030 in Germany and high or higher penetration in many European countries will require significant actions for reliable and affordable operation of the power system. A combination of electricity, heat and gas storage systems accompanied by flexible loads in all areas of energy consumption will allow an efficient balancing of the fluctuating power generation especially from wind power and photovoltaic generators. A clear distinction can be made among “short term” storage, which supports balancing on a 24 hours basis and the “long term” storage, which must be available for periods of up to 3 weeks with low solar radiation and low wind speed at a time. The state of the art of the storage and flexibility technologies will be discussed as well as main technical requirements and problems regarding the market integration.