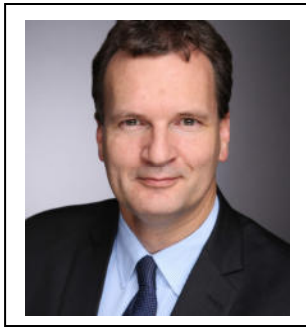


CURRICULUM VITAE – DIRK UWE SAUER



Prof. Dr. rer.nat. Dirk Uwe Sauer

Date 03/2022

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Professor for Electrochemical Energy Conversion and Storage Systems
Institute for Power Electronics and Electrical Drives (ISEA) &
Institute for Power Generation and Storage Systems (PGS) @ E.ON ERC
RWTH Aachen University

Principle Investigator at Helmholtz Institute Münster „Ionics in Energy Storage“ (HI MS) at location Aachen of Research Center Jülich

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- 1989 – 1994 Studied physics at University of Darmstadt / Germany
- 1994 – 2003 Scientist, project coordinator and head of group at Fraunhofer Institute for Solar Energy Systems ISE in Freiburg / Germany
- 2000 – 2003 Head of group for storage systems, incl. responsibilities for decentralised power generators in grids
- 2001 – 2003 Head of group of the interdisciplinary team for off-grid and remote power supply systems (including technical, social and economic aspects)
- 2001 – 2003 Managing director of Club for Rural Electrification (business association for small and medium sized companies for rural electrification in developing and emerging countries)
- 2003 Dissertation „Optimisation of the use of lead-acid batteries in photovoltaic-hybrid systems taking into account battery ageing“, University of Ulm, supervisor Prof. Garche (electrochemistry)
- Oktober 2003 Juniorprofessor for “Electrochemical Energy Conversion and Storage Systems” at RWTH Aachen University, Faculty for Electrical Engineering and Informationtechnology
- 2009 Appointment as Professor (W2) at RWTH Aachen University
- 2010 Founding partner of “P3 energy & storage”, company for testing services and consultancy on battery cells, battery system designs and power grids
- 2012 Full Professor (W3) for "Electrochemical energy conversion and storage systems" at RWTH Aachen University, Working group with about 70 full time scientists and engineers and more than 70 students
- 2013 – Member of the project “Energy Systems of the Future (ESYS)” of the three national science academies Leopoldina, Union of the German Academies of Sciences and Humanities, and National academy of Science and Engineering acatech for counseling politics and society on all aspects of the „Energiewende“
- 2014 – 2020 Director of section Energy of Jülich-Aachen Research Alliance (JARA-Energy)
- 2015 Member of the National academy of Science and Engineering acatech
- 2015 Founding partner of “BatterieIngenieure GmbH”, company for testing services, consultancy on batteries, and battery system designs
- 2015 Founding partner of “eBusplan GmbH”, company for planning and organizing electric public transport with busses
- 2016 – 2023 Member of the Review Board of the German Research Foundation (DFG)
- 2017 – Chariman of the board of “Energy Systems of the Future (ESYS)”
- 2018 – 2022 Presidium member of National academy of Science and Engineering acatech
- 2019 Co-founder of Safion GmbH, Company for development of battery management systems, sensor technology and quality control of batteries
- 2019 Appointed Coordinator of the Cluster of Excellenz “Battery use concepts” of the National Ministry for Education and Research (BMBF)
- 2020 Co-founder of Accure GmbH, Venture to analyse safety, reliability and battery life through cloud services
- 2021 Member of the Berlin-Brandenburg Academy of Sciences and Humanities (BBAW) - three-hundred-year-old tradition of uniting outstanding scholars and scientists across national and disciplinary boundaries

Selected key activities:

- Energy storage systems for electrical energy in mobile and stationary applications
- Focus on all type of batteries with lithium, lead-acid, or nickel, redox-flow batteries, and supercaps
- Investigation of ageing processes and modelling of the dynamic performance of batteries
- Prognosis of lifetime and electrical performance of batteries in applications
- Online diagnosis for batteries (hardware, software, algorithms)
- Battery and energy management systems (BMS & EMS, including hardware platforms)
- Testing and characterisation of battery cells and battery packs
- Battery test center with more than 2,000 test systems for commercial battery cells and battery packs
- Operation of a post-mortem laboratory for in-depth analysis of ageing processes in batteries
- Design, operation and investigation of a 5 MW/5MWh battery system in the power market
- Main applications: conventional, hybrid and full electric vehicles, uninterruptible power supply, autonomous power supplies, integration of storage systems in grids with high share of renewable
- Energy system analysis – Concepts and consequence of a CO₂-free energy supply
- Integration of electric vehicles into the grid
- Concepts for electrified coaches for public transport
- Design and development of battery packs and grid-connected battery storage systems
- Consultancy on energy storage systems and and battery management systems for the automotive industry, utilities, telecommunication, public transport, etc.

Additional selected activities:

- Member of the National Platform Mobility of the German government
- Member of the advisory board “Battery Research Germany” for Ministry for Education & Research (BMBF)
- Counseling of the government on market introduction of PV home storage systems
- Scientific chairman “Annual International Renewable Energy Storage Conference (IRES)”, 2006 - 2018
- Scientific chairman (jointly with Prof. Martin Winter) of the annual Conference „Advanced Battery Technologies for Automobiles and Their Electric Power Grid Integration”, since 2009
- Founding editor in chief for the new Elsevier “Journal of Energy Storage”, launched May 2014
- Spokesman of CARL - Center on Ageing, Reliability and Lifetime Prediction for Electrochemical and Power Electronics systems. Total investment ~ 120 Mill. Euro for the building and scientific instrumentation until 2022, awarded by the National Government and the State Government of NRW
- Member of the board of directors of the E.ON Energy Research Center @ RWTH Aachen University
- Member of the board of directors of the Center of Mobile Propulsion @ RWTH Aachen University
- Member of the board of directors of the Elektromobilitätslabor (elab) @ RWTH Aachen University
- Member of the board of directors of the Railway Research Center (RRC) @ RWTH Aachen University
- Member of the Steering Committees of the profile area „Energy & Chemical Process Engineering“ (ECPE) @ RWTH Aachen University
- Member of the VDE – Association for Electrical, Electronic & Information Technologies and ETG – The Power Engineering Society
- Member of the DPG – Deutsche Physikalische Gesellschaft
- In-house trainer for several German automotive OEM and tier-one suppliers (since 2005)
- Expert witness at law courts and court of arbitration (ICC)
- eBUS-Award 2017 for personal merits on the development of electrification of busses in public transport
- FAMOS for Families – Award of RWTH Aachen University 2017 & 2020
- Teaching award of RWTH Aachen University 2020

Publications (as author or co-author)

- ORCID number: 0000-0002-5622-3591
- Web of Science ResearcherID: A-7414-2012
- Google Scholar Profile: “Dirk Uwe Sauer”
- More than 280 peer reviewed papers
- More than 700 publication in journals, books, conferences, seminars and workshops;
List of publications available on https://www.researchgate.net/profile/Dirk_Sauer/contributions
- More than 10 patents
- Co-founder of four spin-off companies
- Citations: > 11,000 with h-index 53 (Web of Science), > 20,000 with h-index 69 (Google Scholar)

5 most cited and 5 new publications

- W Waag, C Fleischer, DU Sauer, *Critical review of the methods for monitoring of lithium-ion batteries in electric and hybrid vehicles*, Journal of Power Sources 258 (2014) 321-339
- W Waag, S Käbitz, DU Sauer, *Experimental investigation of the lithium-ion battery impedance characteristic at various conditions and aging states and its influence on the application*, Applied Energy 102 (2013) 885-897
- M Ecker, N Nieto, S Käbitz, J Schmalstieg, H Blanke, A Warnecke, DU Sauer, *Calendar and cycle life study of Li(NiMnCo)O₂-based 18650 lithium-ion batteries*, Journal of Power Sources 248 (2014) 839-851
- D Andre, M Meiler, K Steiner, C Wimmer, T Soczka-Guth, DU Sauer, *Characterization of high-power lithium-ion batteries by electrochemical impedance spectroscopy. I. Experimental investigation*, Journal of Power Sources 196 (2011) 5334-5341
- M Ecker, JB Gerschler, J Vogel, S Käbitz, F Hust, P Dechent, DU Sauer, *Development of a lifetime prediction model for lithium-ion batteries based on extended accelerated aging test data*, Journal of Power Sources 215 (2012) 248-257

- A Chahbaz, F Meishner, W Li, C Ünlübayırl, DU Sauer, *Non-Invasive Identification of Calendar and Cyclic Ageing Mechanisms for Lithium-Titanate-Oxide Batteries*, Energy Storage Materials 42 (2021) 794-805
- W Li, DW Limoge, J Zhang, DU Sauer, AM Annaswamy, *Estimation of potentials in lithium-ion batteries using machine learning models*, IEEE Transactions on Control Systems Technology, 2021
- W Li, N Sengupta, P Dechent, D Howey, A Annaswamy, DU Sauer, *Online capacity estimation of lithium-ion batteries with deep long short-term memory networks*, Journal of Power Sources 482 (2021) 228863
- P Dechent, A Epp, D Jöst, Y Preger, PM Attia, W Li, DU Sauer, *ENPOLITE: Comparing Lithium-Ion Cells across Energy, Power, Lifetime, and Temperature*, ACS Energy Letters 6 (2021) 2351-2355
- J Figgenger, P Stenzel, KP Kairies, J Linßen, D Haberschusz, O Wessels, M Robinius, D Stolten, DU Sauer, *The development of stationary battery storage systems in Germany–status 2020*, Journal of Energy Storage 33 (2021) 101982