

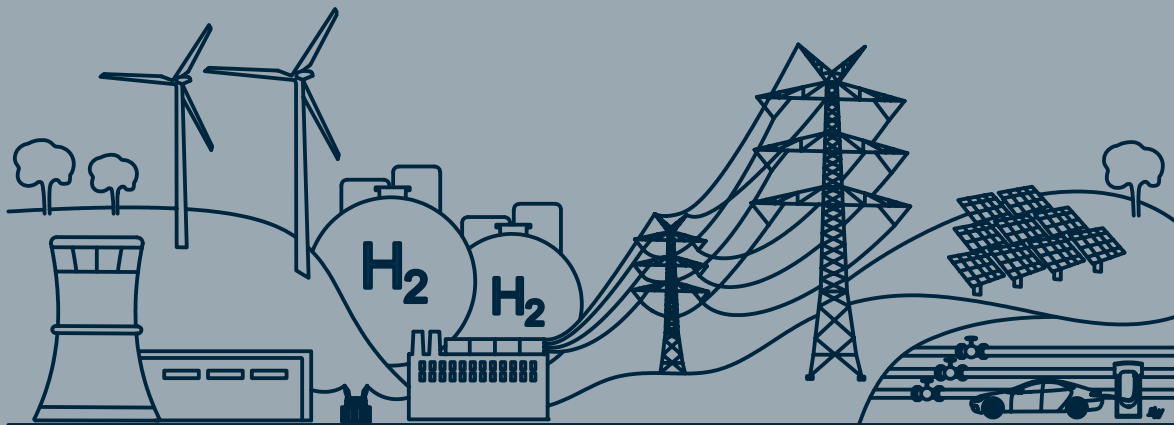


PROGRAM

NEIS CONFERENCE

on Sustainable Energy Supply
and Energy Storage Systems

since 2013



Officers Home Society of the University of the Bundeswehr Hamburg e.V.
Rodigallee 98, 22043 Hamburg

Monday, September 4th 2023

Conference and Session Opening and Keynote Presentation 1

09:00 - 09:45	<p>Conference Opening Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University</p> <p>Challenges of operation and control of net-zero power systems Jovica Milanovic, Department of Electrical and Electronic Engineering, University of Manchester, UK</p>
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Plenary Session 1: Power system measurement and identification/ Power system operation and control

Session Chair: Volker Staudt; Department of Power Systems Technology and Power Mechatronics, Ruhr-University Bochum

9:50 - 11:10	<p>Towards a Set of Bus-Splitting Topologies for Congestion Management <u>Mariano Dominguez Librandi</u>^{1,*}, Daniel Stenzel¹, Rolf Witzmann¹, Helmuth Hitzeroth², Nicolas Käs², Siew Bopp²; ¹Professorship Power Transmission Systems, Technical University of Munich, Munich, Germany; ²Asset Management-Grid Planning, TenneT TSO GmbH, Bayreuth, Germany</p> <p>Frequency-Dependent Grid Impedance Measurement on Low-, Medium- and High-Voltage Level <u>Sebastian Kaiser</u>^{1,*}, Florian Heupel², Johannes Gilsdorf¹, Steffen Eyhorn¹, Soenke Rogalla¹; ¹Fraunhofer Institute for Solar Energy Systems ISE, Freiburg, Germany, ²badenovaNETZE GmbH, Freiburg, Germany</p> <p>Possibilities and Limitations of Frequency-Domain Power Definitions <u>Daniel Vahle</u>^{1,*}, Volker Staudt¹; ¹Institute for Power Systems Technology and Power Mechatronics, ¹Ruhr-Universität Bochum, Germany</p> <p>Advanced Testing Strategy for Impedance Based Stability Investigation Using Novel Impedance Replication Method <u>Christoph Klie</u>, M.Sc. ^{1,*}, Thanh Trung Do², Christian Becker¹; ¹Institute of Electrical Power and Energy Technology, Hamburg University of Technology, Hamburg, Germany, ²morEnergy GmbH, Hamburg, Germany</p>
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Parallel Session 1

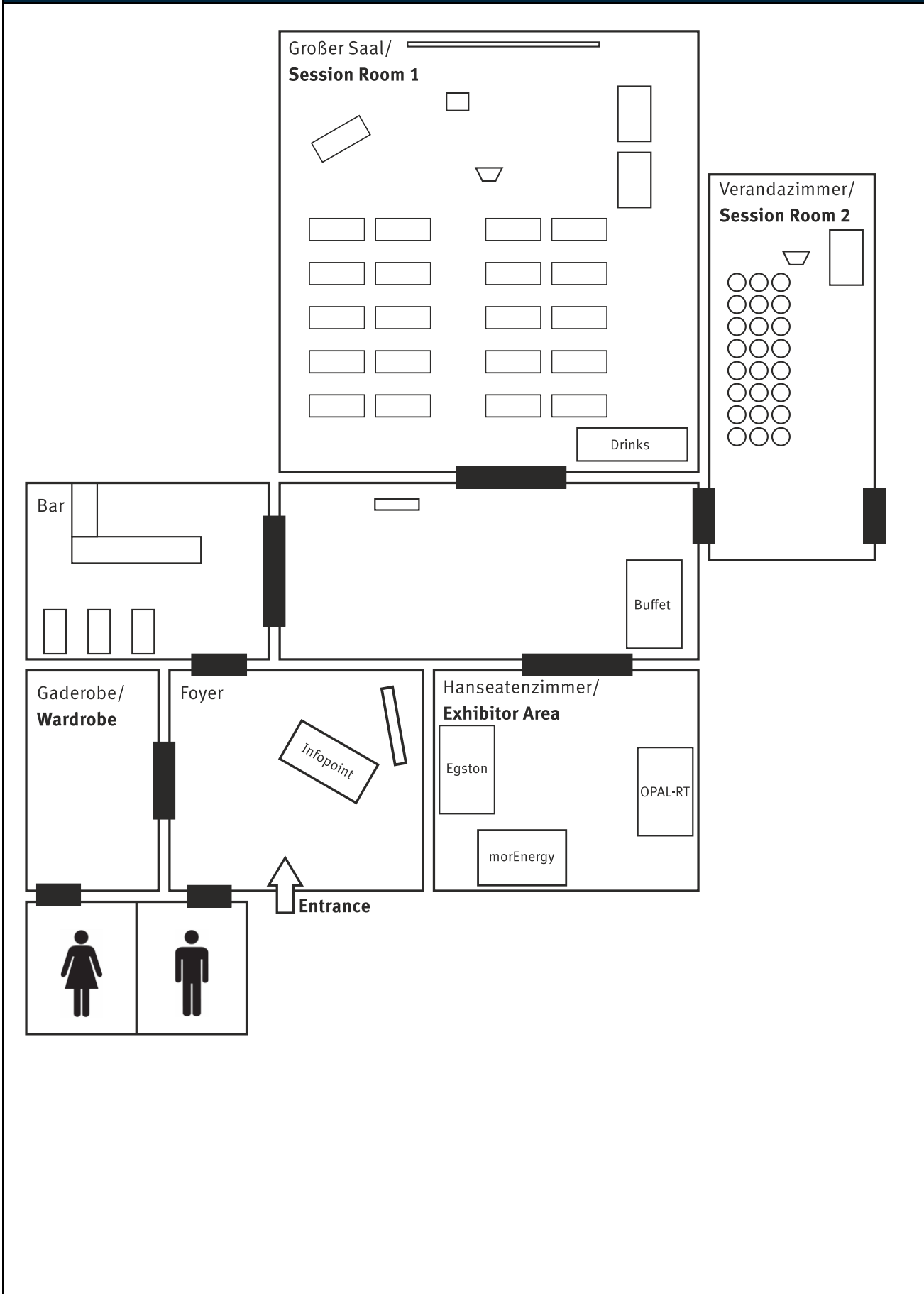
Session Room 1: Power system measurement and identification	
11:25 - 12:10	<p>Identification of the frequency behaviour of a power plant during a load step in a microgrid <u>Maximilian Mütterig</u>^{1,*}, Giuseppe Puleo¹, Markus Zdrallek¹, Andrea Schönbauer²; ¹University of Wuppertal, Wuppertal, Germany, ²RheinEnergie AG, Cologne, Germany</p> <p>Bibliographic Review on Power Oscillation Detection Methods <u>Marta Bernal-Sancho</u>^{1,*}, Maria Paz Comech², Noemí Galán-Hernández¹; ¹Electrical Systems Department, CIRCE Technology Centre, Zaragoza, Spain, ²CIRCE Mixed Research Institute (CIRCE Technology Centre and University of Zaragoza), Zaragoza, Spain</p>

	<p>Methodology for identification of controller parameters of a diesel generator in islanded grid operation <u>Claudia Bernecker-Castro</u>^{1,*}, Johanna Timmermann¹, Drinor Mecinaj¹, Rolf Witzmann¹, Tobias Lechner², Sebastian Seifried², Michael Finkel², Kathrin Schaarschmidt³, Steffen Herrmann⁴; ¹Technical University of Munich, Munich, Germany, ²Augsburg University of Applied Sciences, Augsburg, Germany, ³LEW Distribution network operator, Augsburg, Germany, ⁴AVS Aggregate Construction, Ehingen, Germany</p>
	<p>Session Room 2: Energy storage applications</p>
	<p>Optimal Design of Energy Storage System for Peak-Shaving in Industrial Production <u>Lixin Li</u>^{1,*}, Anna Sina Starosta¹, Bernhard Schwarz¹, Nina Munzke¹, Hanns-Martin Strehle², Mark Richter², Marc Hiller¹; ¹Electrotechnical Institute, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany, ²Fraunhofer Institute for Machine Tools and Forming Technology (IWU), Chemnitz, Germany</p>
11:25 -	<p>Facing the energy crisis: implementing short-term measures to reduce costs and emissions at industrial manufacturing sites</p>
12:10	<p><u>Jonas van Ouwerkerk</u>^{1,2,3,*}, Jonas Brucksch^{1,2,3}, Christian Bußar^{1,2,3}, Dirk Uwe Sauer^{1,2,3,4}; ¹Institute for Power Electronics and Electrical Drives (ISEA), RWTH Aachen University, Aachen, Germany, ²Institute for Power Generation and Storage Systems (PGS), RWTH Aachen University, Aachen, Germany, ³Juelich Aachen Research Alliance, JARA-Energy, Germany, ⁴Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research Helmholtz-Institute Münster: Ionics in Energy Storage (IEK-12)), Jülich, Germany</p>
	<p>Hybrid Uninterruptible Power Supply in Industrial Microgrids <u>Johanna Klocke</u>¹, Thorsten Vogt¹, Timo Rüwald²; ¹AEG Power Solutions, Warstein, Emil-Siepmann-Straße 32, Germany, ²BatterieIngenieure GmbH, Germany, Aachen, Germany</p>
<p>Lunch Break (12:10 to 13:15)</p>	
12:10 -	<p>Live Q&A with Exhibitors in Booth Area EGSTON Power Electronics GmbH, morEnergy GmbH, OPAL-RT Germany GmbH</p>
13:15	
<p>Afternoon Session Opening and Keynote Presentation 2</p>	
13:15 -	<p>Welcome and Session Opening Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University</p>
13:20	
<p>Plenary Session 2: Energy storage applications / Grid integration of e-Mobility Session Chair: Mirco Alpen; Department of Control Engineering, Helmut Schmidt University</p>	
13:20 -	<p>Modelling the Required State of Charge of a Battery Emergency Power Supply for Temporary Islanded Grid Sections with Decentralized Generation <u>Imke Hebbeln</u>^{1,2,*}, Maximilian Rose¹, Michael Hübner¹, Lutz Hofmann^{2,3}; ¹Schleswig-Holstein Netz AG, Quickborn, Germany, ²Institute of Electric Power Systems (IfES), Leibniz University Hanover (LUH), Hanover, Germany, ³Fraunhofer Institute for Energy Economics and Energy System Technology (IEE), Kassel, Germany</p>
14:40	<p>Decarbonizing Heavy Industry by Using Green Electricity and Hydrogen – A Case Study of a Glass Production Site <u>Jonas Brucksch</u>^{1,2,3,*}, Jonas van Ouwerkerk^{1,2,3}, Christian Bußar^{1,2,3}, Dirk Uwe Sauer^{1,2,3,4}; ¹Institute for Power Electronics and Electrical Drives (ISEA), RWTH Aachen University, Aachen, Germany, ²Institute for Power Generation and Storage Systems (PGS), RWTH Aachen University, Aachen, Germany, ³Juelich Aachen Research Alliance, JARA-Energy, Germany, ⁴Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research Helmholtz-Institute Münster: Ionics in Energy Storage (IEK-12)), 52425 Jülich, Germany</p>

13:20 -	Simulation-aided evaluation of regulatory requirements for control in the low-voltage grid <u>Nils Alexander Müller</u> ^{1,*} , Nils Reinköster ¹ , Merten Schuster ¹ , Bernd Engel ¹ ; ¹ Technische Universität Braunschweig, elenia Institute for High Voltage Technology and Power Systems, Braunschweig, Germany
14:40	Charging Load and Flexibility Assessment of Electric Last-Mile Delivery Van Fleets based on Semi-Synthetic Mobility Profiles <u>Andres F. Londono M.</u> ^{1,2,*} , Krzysztof Rudion ¹ ; ¹ University of Stuttgart, Institute of Power Transmission and High Voltage Technology (IEH), Stuttgart, Germany, ² Mercedes-Benz AG, Stuttgart, Germany
Parallel Session 2	
14:45 - 16:15	Session Room 1: Grid Integration of E-Mobility / Load management in smart grids
	Geo-referenced Synthetic Medium-voltage Distribution Networks: A Data-Driven Approach <u>Abhilash Bandam</u> ^{1,2,*} , Theresa Gross ¹ , Jochen Linssen ¹ , Detlef Stolten ^{1,2} ; ¹ Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research - Techno-economic Systems Analysis (IEK-3), Jülich, Germany, ² RWTH Aachen University, Chair for Fuel Cells, Faculty of Mechanical Engineering, Aachen, Germany
	Bidirectional Electric Vehicles Field Trial Data Set <u>Adrian Ostermann</u> ^{1,2,*} , Theodor Haug ¹ , Helena Hahne ^{1,3} , Michael Hinterstocker ¹ ; ¹ FfE, Munich, Germany, ² School of Engineering and Design, Technical University of Munich (TUM), München, Germany, ³ School of Computation, Information, and Technology, TUM, München, Germany
	Methodology for Impact Analysis of Electric Vehicles on Distribution Networks <u>Pedro Henrique Eisenkraemer</u> ¹ , <u>Mauro dos Santos Ortiz</u> ^{1,*} , Daniel Pinheiro Bernardon ¹ , Martin Wolter ² ; ¹ Universidade Federal de Santa Maria, Santa Maria, Brazil, ² Otto-von-Guericke-Universität Magdeburg, Magdeburg, Germany
	Cross-Market Optimal Flexibility Scheduling for Local Energy and Flexibility Aggregators in the Residential Sector <u>Tariq Almomani</u> [*] , Julian Achatz, Rolf Witzmann; Technical University of Munich, Associate Professorship Power Transmission Systems, Munich, Germany
	Concept for a cloud-based holistic energy management of domestic appliances to stabilize the energy supply and the power grid <u>Stephan Stieren</u> ^{1,*} , Moritz Wichtrup ¹ , Christian Henke ¹ , Ansgar Trächtler ² ; ¹ Fraunhofer-Institute for Mechatronic Systems Design, Paderborn, Germany, ² Heinz-Nixdorf-Institute University of Paderborn, Paderborn, Germany
	Honey Badger Algorithm for Estimating the Parameters of Li-ion Battery 3rd Order ECM <u>Walid Merrouche</u> ^{1,*} , Badis Lekouaghet ² , Elouahab Bouguenna ¹ ; ¹ Center for Renewable Energies Development, Bouzareah, Algeria, ² Research Center in Industrial Technologies, Cheraga, Algeria
	Session Room 2: innovative monitoring and protection methods/ Operation of DC grids and future grids
Real-Time Simulation of Hybrid AC/DC Grids <u>Marija Stevic</u> , Sebastian Hubschneider, Ravinder Venugopal; Opal-RT Germany GmbH, Germany	

	<p>Investigation of DC circuit breaker with extinguishing chamber at reduced ambient pressure for an application in avionics <u>Fanke Zeng</u>^{1,*}, Tobias Kopp¹, Dirk Bösche¹, Lars Claaßen¹, Patrick Vieth¹, Michael Terörde², Michael Kurrat¹; ¹elenia Institute for High Voltage Technology and Power Systems, TU Braunschweig, Germany, ²Institute for Electromagnetic Compatibility, TU Braunschweig, Germany</p>
	<p>Adaptive Distance Protection Scheme for HV Grids with High Share of Distributed Energy Resources <u>Gourab Banerjee</u>^{1,2,*}, Pawel Lytaev², Martin Braun^{1,2}; ¹Fraunhofer IEE, Institute for Energy Economics and Energy System Technology, Kassel, Germany, ²University of Kassel, Energy Management and Power System Operation, Kassel, Germany</p>
<p>14:45 - 16:15</p>	<p>Development of an Adaptive MAV Platform for Autonomous Inspection of High Voltage Power Lines <u>Batbayar Battseren</u>^{1,*}, Uranchimeg Tudevtagva¹, Wolfram Hardt¹, Dashdavaa Bilegt²; ¹Chemnitz University of Technology, Chemnitz, Germany, ²National Power Transmission Grid State Owned Joint Stock Company, Ulaanbaatar, Mongolia</p>
	<p>A computer-assisted Faulted Phase Selection Algorithm for dealing with the effects of Renewable Resources in Smart grids <u>Maria Teresa Villen</u>^{1,*}, Maria Paz Comech², Eduardo Martinez¹, Roberto Matute¹, M.A. Oliván¹, Anibal Prada¹, Jose Saldana¹; ¹Infrastructure of Electric Grids Group, CIRCE Research Centre, Zaragoza, Spain, ²Instituto Universitario de Investigación CIRCE, Fundación CIRCE - Universidad de Zaragoza, Zaragoza, Spain</p>
Workshop	
<p>16:30 - 17:00</p>	<p>Hardware-In-the-Loop testing for flexible electrical networks Marija Stevic; Opal-RT Germany GmbH</p>
Get Together	
<p>17:00 - 18:30</p>	<p>Get Together and Aperitif</p>
Dinner and Evening Program	
<p>18:30 - 22:00</p>	<p>Dinner and Evening Program</p>

Venue Overview



Tuesday, September 5th 2023

Morning Session Opening and Keynote Presentation 3

09:00 - 09:35	Welcoming and Session Opening Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University
	The digital transformation of power systems with its pros and cons Peter Palensky; Department of Intelligent Electrical Power Grids, Delft University of Technology, Netherlands

Plenary Session 3: Operation of DC grids and future grids

Session Chair: Markus Dietmannsberger; Schleswig-Holstein Netz AG

09:40 - 10:40	Analysis of Weight Advantages in Superconducting DC Power Distribution Systems for All Electric Aircraft <u>Philip Senkpiel</u> [*] , Michael Terörde; Technische Universität Braunschweig, Braunschweig, Germany
	Role of stationary energy storage systems in large-scale bus depots in the case of atypical grid usage <u>Mina Eskander</u> ^{1*} , Amra Jahic ¹ , Edvard Avdevicus ¹ , Ramy Soliman ² , Detlef Schulz ¹ ; ¹ Electrical Power Systems, Helmut Schmidt University Hamburg / University of Bundeswehr, Hamburg, Germany, ² Hamburger Hochbahn AG, Hamburg, Germany
	Optimal Power Flow for Multi-Use Case Operation of Integrated DC Sections in Distribution Systems <u>Merlin Engel</u> ^{1*} , Hannes Neue ¹ , Sebastian Deters ¹ , Christian Becker ² ; ¹ Stromnetz Hamburg GmbH, Hamburg, Germany, ² Hamburg University of Technology, Hamburg, Germany

Parallel Session 3

10:55 - 11:55	Session Room 1: Power system operation and control/Fuel Cell in electrical power systems
	Optimal Reactive Power Planning by covering deficient voltage demands with additional reactive power sources using a sensitivity approach <u>Johannes Rauch</u> ^{1*} , Oliver Brückl ¹ , Bernd Engel ² ; ¹ Ostbayerische Technische Hochschule Regensburg, Regensburg, Germany, ² Technische Universität Braunschweig, Braunschweig, Germany
	Reactive Power Planning in Transmission Grid considering Short Term Voltage Stability – STATCOM or SYNCON? <u>Soupayan Bose</u> ^{1*} , Mariano Dominguez Librandi ¹ , Rolf Witzmann ¹ , Spyridon Iason Dizes ² , Jörg Michael Schmidt ² Mojtaba Momeni ² ; ¹ Professorship Power Transmission Systems – Technical University of Munich, Munich, Germany, ² Energy System Planning - Grid Analysis – TenneT TSO GmbH, Bayreuth, Germany
	Baseload Concepts for Increasing Fuel Cell Durability in Aircraft Multi-Powertrain Operation <u>Ben Bahe</u> , Lukas Baum [*] , Florian Grumm, Detlef Schulz; Chair of Electrical Power Systems, Helmut Schmidt University/University of the Bundeswehr Hamburg, Hamburg, Germany
	A Multi-Energy Fuel Cell Model in the Extended Node Method <u>Daniela Vorwerk</u> [*] , Marc Schumann, Detlef Schulz; Helmut Schmidt University / University of the Bundeswehr, Hamburg, Germany

Session Room 2: Energy storage applications	
10:55 - 11:55	Integrating Battery Energy Storage Systems in Hot Desert Regions <u>Kenza Maher*</u> , Pierre Kubiak ⁺ , Zhaohui Cen ⁺⁺ ; Qatar Environment and Energy Research Institute (QEERI), Hamad Bin Khalifa University (HBKU), Qatar Foundation (QF), Doha, Qatar
	Analysis and Characterization of the Energy Consumption in an Electric Bus Fleet <u>Sammy Jablonski*</u> , Benedikt Tepe, Yuqing Zhao, Andreas Jossen; Chair of Electrical Energy Storage Technology, Department of Energy and Process Engineering, School of Engineering and Design, Technical University of Munich (TUM), Munich, Germany
	State of health estimation of Lithium-ion batteries using operational data based on approximate weighted total least squares method <u>Aditya Madhav Vaidya^{1,2}</u> , Firas Alhaider ^{1,3} ; ¹ Vattenfall Solar GmbH, Hamburg, Germany, ² HAW Hamburg Fakultät Life Sciences, 21033 Hamburg, Germany, ³ Helmut-Schmidt-Universität, Fakultät für Elektrotechnik, 22043 Hamburg, Germany
Lunch (11:55 to 13:15)	
11:55 - 13:15	Live Q&A with Exhibitors in Booth Area EGSTON Power Electronics GmbH, morEnergy GmbH, OPAL-RT Germany GmbH
Afternoon Session Opening	
13:15 - 13:20	Welcoming and Session Opening Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University
Plenary Session 4: Grid integration of e-Mobility	
Session Chair: Marc Schumann; Department of Electrical Power Systems, Helmut Schmidt University	
13:20 - 14:40	Smart e-mobility: user potential in Germany today and in the future <u>Patrick Dossow^{1,2,*}</u> , Kirstin Ganz ^{1,2} , Timo Kern ¹ ; ¹ FfE (Forschungsgesellschaft für Energiewirtschaft mbH), Munich, Germany, Technical University of Munich (TUM), School of Engineering and Design, Munich, Germany
	Prioritized EV Charging – Enhanced Smart Meter Gateway infrastructure enabling an event driven flexibility tariff <u>Matthias Grandel^{1,*}</u> , Claudius Kübler ¹ , Eike Niehs ² , Volker Wachenfeld ¹ , Bernd Engel ² ; ¹ University of Applied Science Biberach, Biberach/Riss, Germany, ² Technical University Braunschweig, Braunschweig, Germany
	Amplification and Compensation Effects with regard to Harmonics due to Integration of Electric Vehicles into an Existing Industrial Grid <u>Julia Gartner^{1,*}</u> , Sebastian Lindemann ² , Nils Alexander Müller ² , Bernd Engel ² ; ¹ Volkswagen AG, Wolfsburg, Germany, ² Technische Universität Braunschweig, elenia Institute for High Voltage Technology and Power Systems, Braunschweig, Germany
	Improving Distribution System Operation and Planning Using Data from a Charge Point Management System <u>Hannes Newe^{1,*}</u> , Merlin Engel ¹ , Jan Voelkel ¹ ; Stromnetz Hamburg GmbH, Hamburg, Germany
Closing Address	
14:40 - 15:00	Closing Address Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University



Conference on Sustainable Energy Supply and Energy Storage Systems (NEIS)

Conference Chair:

Prof. Dr.-Ing. habil. Detlef Schulz

Chair of Electrical Power Systems

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