

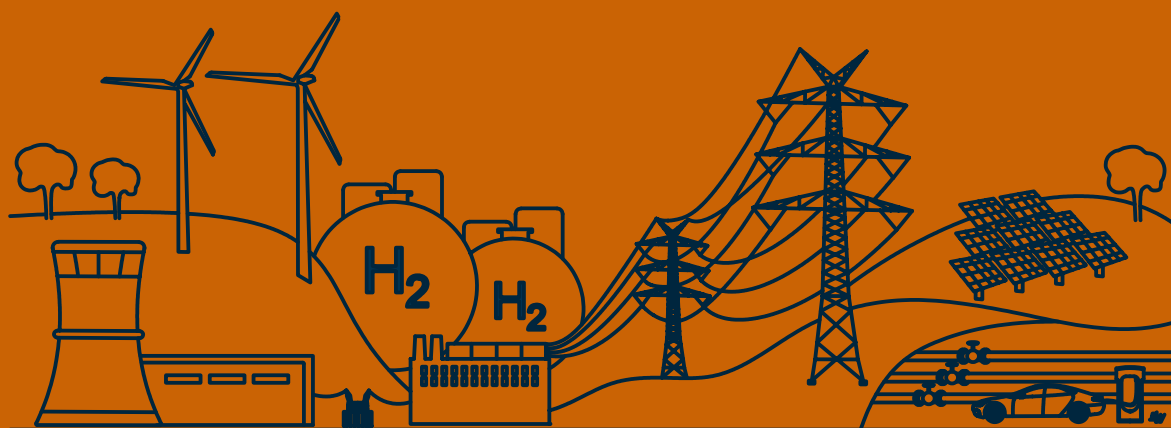


PROGRAM

10 YEARS OF **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 - September 26-27, 2022

Monday, September 26th 2022

Conference and Session Opening and Keynote Presentation 1

09:00 **Conference Opening**
Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University

09:45 **Smart Renewable Energy Systems and Decarbonisation**
Henrik Lund; Department of Planning, Aalborg University

Plenary Session 1: Power Systems Operation and Control

Session Chair: Thanh Trung Do; morEnergy GmbH

Impact of Grid Forming Inverters with Different Control Strategies on the Inter-area Oscillations

Hamed Naqhavi, Jens Paetzold; Institute of Energy Systems and Energy Management, Ruhr West University of Applied Sciences

Robust N-1 Secure HV Grid Flexibility Estimation for TSO-DSO Coordinated Congestion Management with Deep Reinforcement Learning

Zhenqi Wang^{1*}, Sebastian Wende-von Berg^{1,2}, Martin Braun^{1,2}; ¹Department of Energy Management and Power System Operation, University of Kassel, ²Fraunhofer Institute for Energy Economics and Energy System Technology IEE

Impact of Phase Feed-Forward Control of Grid-Forming Inverters on Frequency Behavior in Interconnected Power Systems

Maria Nuschke, Thomas Degner; Department System Stability and Grid Integration, Fraunhofer Institute for Energy Economics and Energy System Technology IEE

Transient Stability of Generator Groups: Factors of Influence and Countermeasures

Daniel Scheifele, Hendrik Lens; Institute of Combustion and Power Plant Technology, University of Stuttgart

Parallel Session 1

Session Room 1: Power Systems Operation and Control

Simulation of a Black Start Scenario Using Gas Turbine Power Plant To Start-Up Thermal Power Plant

Nico Brose¹, Dirk Lehmann¹, Thomas Meißner¹, Harald Schwarz¹, Klaus Pfeiffer², Marcel Kotte³; ¹Chair of Energy Distribution and High Voltage Engineering, BTU Cottbus-Senftenberg, ²Chair of Decentralised Energy Systems, BTU Cottbus-Senftenberg, ³LEAG Konferenzcenter, Lausitz Energie Kraftwerke AG

Long-Term Analysis of Industrial Reactive Power Potentials with Consideration of Plant-Internal Grid Restrictions Using the Example of an Industrial Plant In Distribution Grid

Philipp Schweiberer, Johannes Rauch, Oliver Brückl; Research Center for Power Grids and Energy Storage, OTH Regensburg

Voltage Angle Based Operation for Converter-Dominated Grids

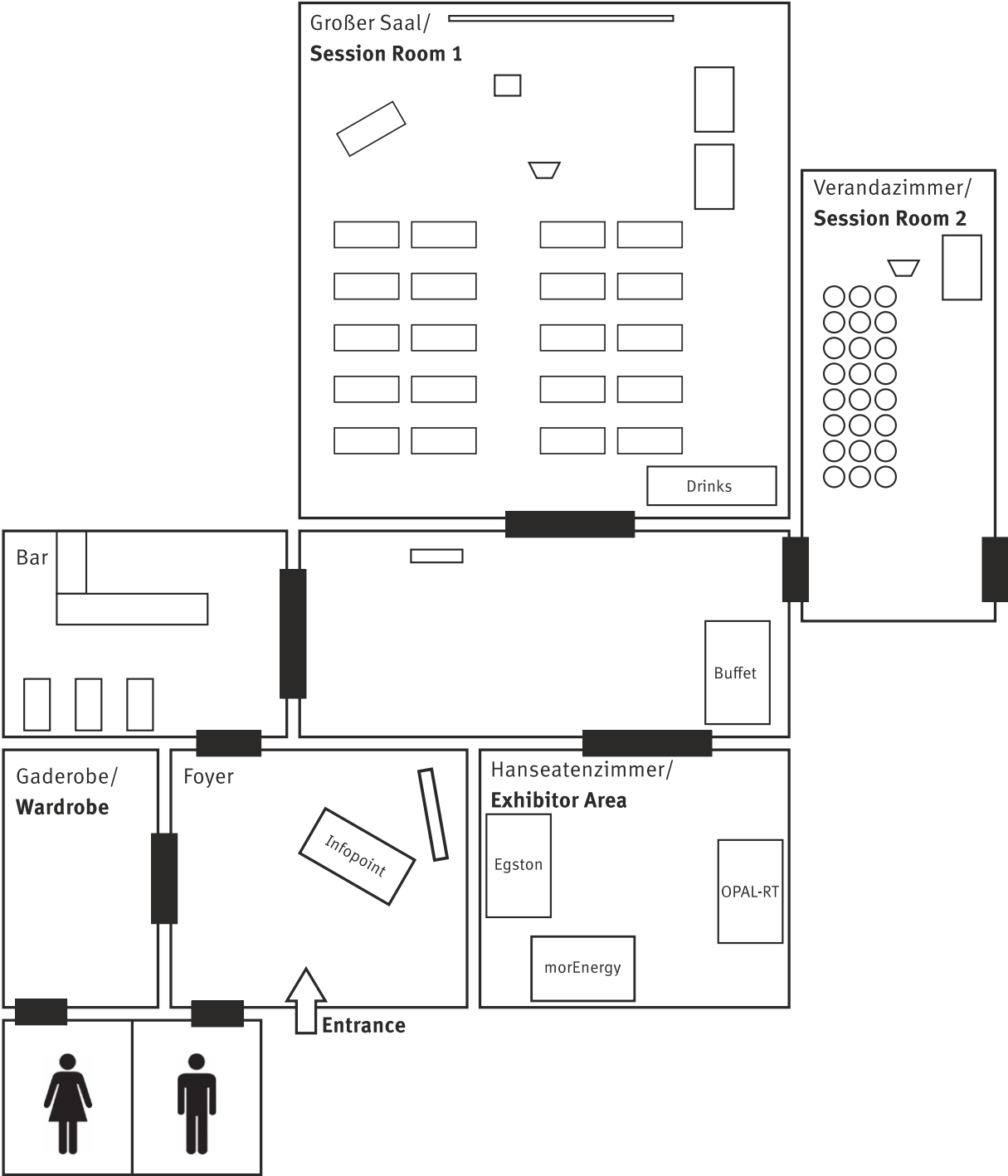
Hassan Alhomsj, Franz Linke, Dirk Westermann; Department of Electrical Power Supply, TU Ilmenau

Session Room 2: Power Systems Operation and Control	
11:25 -	Dynamic Modelling of Transmission Systems Based on Primary Energy Sources <u>Ilya Burlakin</u> ¹ , Johannes Porst ¹ , Elisabeth Scheiner ¹ , Ananya Kuri ^{1,2} , Gert Mehlmann ¹ , Uwe Kühnapfel ³ , Matthias Luther ¹ ; ¹ Institute of Electrical Energy Systems, Friedrich-Alexander University Erlangen-Nürnberg, ² Siemens AG, ³ Institute for Automation and Applied Informatics, Karlsruhe Institute of Technology
12:10	Transformation, Comparison and Co-Simulation of a RMS-EMT Multi-Domain Test Network <u>Bernd Schweinhaut</u> , Christian Scheibe, Gert Mehlmann, Matthias Luther; Institute of Electrical Energy Systems, Friedrich-Alexander University Erlangen-Nürnberg
	Implementation of a Model Predictive Control Algorithm for Distribution Grids and its Validation on a Real-Time Simulator Sebastian Raczka, Dominik Hilbrich, <u>Oleksii Molodchyk</u> , Christian Rehtanz; Institute for Energy Systems, Energy Efficiency and Energy Economics, TU Dortmund University
Lunch Break (12:10 to 13:15)	
12:10 -	Live Q&A with Exhibitors in Booth Area
13:15	EGSTON Power Electronics GmbH, morEnergy GmbH, OPAL-RT Germany GmbH
Afternoon Session Opening and Keynote Presentation 2	
13:15 -	Welcome and Session Opening Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University
13:50	New Optimization Paradigms for Sector-Coupled Industrial Energy Systems René Hofmann; Institute for Energy Systems and Thermodynamics, Vienna University of Technology
Plenary Session 2: Smart and Future Grids	
Chair: René Hofmann; Institute for Energy Systems and Thermodynamics, Vienna University of Technology	
	Decarbonization of a Multi-sectoral Energy System with Flexible Industrial Load Management using an Incentive Signal <u>Elisabeth Feldhoff</u> ¹ , Steffi Naumann ² , Steffen Schlegel ¹ , Peter Bretschneider ² , Dirk Westermann ¹ ; ¹ Department of Electrical Power Supply, TU Ilmenau, ² Advanced System Technology branch, Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB-AST
13:55 -	Simulation Tool for the Transient Temperature Behavior of Overhead Line Conductors <u>Charlotte Biele</u> , Martin Lindner, Svenja Mees, Christian Rehtanz; Institute of Energy Systems, Energy Efficiency and Energy Economics, TU Dortmund University
15:15	Continuous Grid-Forming Control with Transient Current Limitation Kai P. Fischbach ¹ , Nils Wiese ^{1,2} , <u>Yonggang Zhang</u> ¹ , Martin Braun ^{1,2} ; ¹ Department of Energy Management and Power System Operation, University of Kassel, ² Fraunhofer Institute for Energy Economics and Energy System Technology IEE
	Multi-Dimensional Model for Electrical, Thermal and Mechanical Simulation of a Lithium-Ion Cell <u>Alexander Fill</u> , Luis Bubeck, Diego Knauer, Jessica Hemmerling, Kai Peter Birke; Chair for Electrical Energy Storage Systems, Institute for Photovoltaics, University of Stuttgart

Parallel Session 2

Session Room 1 Grid Integration of E-Mobility / Smart and Future Grids	
	<p>Modeling of Demand Factors and Average Daily Load Profiles for Private and Public Charging Points in Urban Areas <u>Simon Kreutmayr</u>¹, Simon Niederle², Christoph J. Steinhart³, Christina Nußbaumer³, Michael Finkel¹, Rolf Witzmann²; ¹Augsburg University of Applied Sciences, ²Technical University of Munich, ³SWM Infrastruktur GmbH & Co. KG</p>
	<p>Electric Vehicle and Vehicle to Grid Technology Influence on Renewable Energy Supported Grid – A Case Study on Germany <u>Shemin Sagaria</u>, Tobias Boström; The Arctic Centre for Sustainable Energy, University of Tromsø – The Arctic University of Norway</p>
15:30 - 16:15	<p>Selection of Learning Algorithms to Improve Energy Prediction in a Photovoltaic System <u>Samer Rajah</u>, Alejandro Rodríguez-Gómez, Francisco J. Muñoz-Gutiérrez; Electrical Engineering Department, University of Málaga</p>
Session Room 2: Smart and Future Grids	
	<p>Integrated Planning of Multi-energy Grids Concepts and Challenges <u>Marwan Mostafa</u>¹, Daniela Vorwerk², Johannes Heise¹, Alex Povel³, Natalia Sanina⁴, Davood Babazadeh¹, Christian Töbermann⁴, Arne Speerforck³, Christian Becker¹, Detlef Schulz²; ¹Institute of Electrical Power and Energy Technology, TU Hamburg; ²Electrical Power Systems, Helmut Schmidt University; ³Institute of Engineering Thermodynamics, TU Hamburg; ⁴Technische Hochschule Lübeck</p>
	<p>Optimal Energy Scheduling for a Microgrid with Battery and Hydrogen Storage <u>Simon Sassen</u>, Andreas Fink; Institute of Computer Science, Helmut Schmidt University</p>
	<p>Influence on Capacitor Lifetime due to Reduction of Link Capacitance for Devices operating on an Open Industrial DC grid <u>Simon Puls</u>¹, Jan-Niklas Koch², Slavi Warkentin², Holger Borcharding²; ¹Lenze SE, ²OWL University of Applied Sciences and Arts</p>
Workshop	
16:30 - 17:00	<p>Power Hardware-in-the-Loop What it is and what to consider. A guide for setting up PHIL test beds. Sebastian Hubschneider; Opal-RT Germany GmbH</p>
Get Together	
17:00 - 18:15	<p>Get Together and Aperitif</p>
Dinner and Evening Program	
18:15 - 22:00	<p>BBQ Dinner and Evening Program</p>

Venue Overview



Tuesday, September 27th 2022

Morning Session Opening and Keynote Presentation 3

09:00 -	Welcoming and Session Opening Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University
09:35	Resilience Enhancement by Distributed Energy Resources Nikolaos Hatziargyriou; Devision of Electric Power, National Technical University of Athens

Plenary Session 3: Power systems measurement and identification

Chair: Nikolaos Hatziargyriou; Devision of Electric Power, National Technical University of Athens

09:40 -	Sensor Set Review and Application for a German residential Energy Management System <u>Edvard Avdevicius</u> , Felix Heider, Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University
10:40	Subgrid Identification and Islanding in Future Medium Voltage Smart Grids based on Container Virtualisation and Machine Learning <u>Frederik Puhe</u> ^{1,2} , <u>Thomas Schwierz</u> ² , Christian Rehtanz ² ; ¹ Westnetz GmbH, ² Institute of Energy Systems, Energy Efficiency and Energy Economics, TU Dortmund University
	Optimized Grid Reduction for State Estimation Algorithms in Under-Determined Distribution Grids Dominik Hilbrich, <u>Sebastian Raczka</u> , Christian Rehtanz; Institute of Energy Systems, Energy Efficiency and Energy Economics, TU Dortmund University

Parallel Session 3

Session Room 1: Power Systems Measurement and Identification	
10:55 -	Analysis and Optimization of the Steady State Voltage Deviation Demand for Reactive Power Planning Using Installed Reactive Power Sources <u>Johannes Rauch</u> ¹ , Oliver Brückl ¹ , Bernd Engel ² ; ¹ Research Center for Power Grids and Energy Storage, OTH Regensburg; ² elenia Institute for High Voltage Technology and Power Systems, TU Braunschweig
11:55	Generation of Realistic Smart Meter Data from Prosumers for Future Energy System Scenarios <u>Tom Steffen</u> ¹ , Béla Wiegel ¹ , Davood Babazadeh ¹ , Amine Youssfi ² , Christian Becker ¹ , Volker Turau ² ; ¹ Institute of Electrical Power and Energy Technology, Hamburg University of Technology, ² Institute of Telematics, Hamburg University of Technology
	Power Quality Measurement for Analysis of Highly Time-Variant and Short-Time Disturbances <u>Christoph Szymczyk</u> , Gerd Bumiller; Institute of Computer Science, Hochschule Ruhr West, University of Applied Sciences
	ConvLSTM based Real-time Power Flow Estimation of Smart Grid with High Penetration of Uncertain PV <u>Fanta Senesoulin</u> ¹ , Issarachai Ngamroo ² , Sanchai Dechanupaprittha ¹ ; ¹ Department of Electrical Engineering, Faculty of Engineering, Kasetsart University, ² Department of Electrical Engineering, Faculty of Engineering, King Mongkut's Institute of Technology Ladkrabang

Session Room 2: Smart and Future Grids	
10:55 - 11:55	<p>Availability and Costs of Flexibility Options for Grid Congestion Management <u>Tobias Müller</u>¹, Michael Becker¹, Gregor Peil^{1,2}, Markus Zdrallek¹; ¹Institute of Power Systems Engineering, University of Wuppertal; ²BayWa r.e. Solar Energy Systems GmbH</p>
	<p>Provision of Grid-Serving Flexibility by Agricultural Operations and Households in Rural Power Distribution Grids <u>Felix Klabunde</u>, Carsten Wegkamp, Bernd Engel; elenia Institute for High Voltage Technology and Power Systems, TU Braunschweig</p>
	<p>Integrated Energy Management Concept for Residential Areas using Energy Packages <u>Florian Mahr</u>, Johann Jaeger; Institute of Electrical Energy Systems, Friedrich-Alexander-University Erlangen-Nuremberg</p>
	<p>Analysis of an Automated Cross-Sectoral Renewal Planning of Electricity, Gas and Heat Grids <u>Bernd Bastian Wierzba</u>¹, Tobias Riedlinger¹, Markus Zdrallek¹, René Schmitz²; ¹Institute of Power Systems Engineering, University of Wuppertal, ²Regionetz GmbH</p>
Lunch (11:55 to 13:15)	
11:55 - 13:15	<p>Live Q&A with Exhibitors in Booth Area EGSTON Power Electronics GmbH, morEnergy GmbH, OPAL-RT Germany GmbH</p>
Afternoon Session Opening	
13:15 - 13:20	<p>Welcoming and Session Opening Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University</p>
Plenary Session 4: Grid Integration of E-Mobility Session Chair: Markus Dietmannsberger, Hamburger Hochbahn AG	
13:20 - 14:40	<p>Influence of Electric Vehicle AC-Chargers on the Resonance Behavior of Domestic Distribution Grids <u>Lukas Wieckhorst</u>, Manuel Wingenfelder, Lutz Hofmann; Institute of Electric Power Systems, Electric Power Engineering Section, Leibniz University Hannover</p>
	<p>AI-Based Charging Management for the Integration of Electric Vehicles Using a Reference Low Voltage Grid in Hamburg <u>Yuzhuo Fu</u>¹, Dennis Salvador Versen², Andreas Stadler¹, Edvard Avdevicus¹, Gazmend Mavraj¹, Meriam Jebali ep Samet¹, Nils Pinke¹, Oliver Schmalholz¹, Maik Plenz¹, Marcus Stiemer², Detlef Schulz¹; ¹Electrical Power Systems, Helmut Schmidt University, ²Theory of Electrical Engineering and Numerical Simulations, Helmut Schmidt University</p>
	<p>Technical Concept to Realize the Combination of Vehicle-to-Grid and Vehicle-to-Home for Usage in Smart Buildings <u>Andreas Freymann</u>¹, Florian Maier¹, Stefan Lösch², Alexander Wenzel², Luke Adam⁴, Paul Scheer³, Thomas Schrodi¹; ¹Anwendungszentrum KEIM, Fraunhofer Institute for Industrial Engineering IAO, ²Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, ³Fraunhofer Institute for Industrial Engineering IAO, ⁴ProNES automation GmbH</p>
	<p>Charging Infrastructure 2.0 – Statistical Analysis of Incentive-Based Charging Behavior in Low-Voltage Private Charging Infrastructure <u>Nils Alexander Müller</u>¹, Evamaria Zauner², Julia Gartner¹, Bernd Engel¹; ¹elenia Institute for High Voltage Technology and Power Systems, TU Braunschweig, ²Thüga AG</p>
Closing Address	
14:40 - 15:00	<p>Closing Address Detlef Schulz; Department of Electrical Power Systems, Helmut Schmidt University</p>



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

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