

8th E-Mobility Power System Integration Symposium (EMOB 2024)

IET Conference Publications 890

Helsinki, Finland and Online
7-8 October 2024

ISBN: 979-8-3313-1779-9

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2024) by the Institution of Engineering and Technology
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact the Institution of Engineering and Technology
at the address below.

Institution of Engineering and Technology
Futures Place, Kings Way
Stevenage, Hertfordshire
U.K. SG1 2UA
United Kingdom

Phone: +44 (0)1438 313311

www.theiet.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Advancing Grid Integration of Electromobility: Insights from the Project unIT-e ²	1
<i>Michael Hinterstocker, Valerie Ziemsky, Patrick Vollmuth, Adrian Ostermann, Vincenz Regener, Nele Maas, Elisabeth Wendlinger, Kirstin Ganz, Daniela Wohlschlager, Jakob Zahler, Andreas Weiß, Simon Köppl</i>	
WattRoutes: Smart Planning for Electric HGV Charging Infrastructure	6
<i>Lewis C. Hunter, James Scobie, Connor McGarry, Stuart Galloway</i>	
Optimal Dispatching and Charging Plans in Electrified Bus Networks	12
<i>Kianoosh Keshavarzian, Ali M. Amani, Mahdi Jalili</i>	
Interdisciplinary Semantic Integration of Battery Electric Vehicle Charging Infrastructure Data.....	18
<i>Eugenio Salvador Arellano Ruiz, Carsten Hoyer-Klick, Fabia Miorelli, Hans Christian Gils, Patrick Jochem</i>	
unIT-e ² : Achieving System Interoperability - A Long and Rocky Road Ahead?	26
<i>Adrian Ostermann, Patrick Vollmuth, Jeremias Hawran, Louis Gugg</i>	
Transforming Electric Vehicles into Mobile Power Sources: A Strategy for Grid Resilience	31
<i>Pei Huang, Abadi G. Kidanemariam</i>	
Site Selection and Layout of Electric Heavy Truck Charging Stations in Chengdu, China	38
<i>Yunan Liu, Sanchari Deb</i>	
Research on the Demand and Layout of Electric Vehicle Charging Infrastructure - Taking Shenzhen, China as an Example.....	46
<i>Da He, Sanchari Deb</i>	
Understanding the Electric Vehicle Gender Gap	56
<i>Yushan Zhang, Sanchari Deb</i>	
Panacea Or Overload? – An Analysis of the Latest Legal Developments in the EU Network Tariff Regulation and Its Role in Supporting the Transformation to E-Mobility	69
<i>Tobias Klarmann</i>	
Conventional Cabin Heating in Electric Buses – The Scale of Pollution	75
<i>Joel Anttila, Rasmus Pettinen, Yancho Todorov</i>	
User Perspective on Connected E-Mobility – Insights from the Field Trial of the Research Project “unIT-e ² ”	83
<i>Corinna Braun, Jan H. Schumann</i>	
Leveraging EV Deployment with Dynamic Rating and Operational Envelopes.....	91
<i>Daniel V. Pombo</i>	
The Impact of Variable Grid Fee Tariffs on the Electricity Costs of EV Users in Germany	96
<i>Kirstin Ganz, Patrick Vollmuth, Michael Hinterstocker</i>	
unIT-e ² : The Future of Smart and Bidirectional Charging - Use Case Prospects from the User’s Perspective in Germany.....	104
<i>Patrick Vollmuth, Adrian Ostermann</i>	

Fuzzy Control to Dynamically Alleviate Bottlenecks in Low-Voltage Grids	110
<i>Till Neukamp, Ingo Jeromin</i>	
V2X Use-Case Combinations: A Comprehensive Breakdown	115
<i>Philipp Stedem, Vincenz Regener, Franziska Kellerer, Annika Kroos, Theo Haug, Louisa Wasmeier</i>	
Simulative Evaluation of High Temperature Versus Low Temperature Heating Networks to Utilise Waste Heat from Large Fuel Cells for Powering Districts	123
<i>Nachiket Gaikwad, Nies Reininghaus, Carlos Muñoz, Michael Kroener, Barbara Satola, Martin Vehse, Alexander Dyck</i>	
SekQuaSens ³ : Sector Integration Heat, Electricity and Mobility Demand in a District	130
<i>Nies Reininghaus, Carlos Muñoz, Peter Klement, María López Díaz, Kevin Waiz, Elif Turhan, Tobias Schneider, Yun-Pang Flötteröd, Sten Ruppe, Barbara Satola, Michael Kroener, Martin Vehse, Alexander Dyck</i>	
Charging Strategies for Electric Bus Fleets: A Pathway to Grid-Friendly and Cost-efficient Operation	137
<i>Julian Brendel, Paul Scheer</i>	
Sensitivity Analysis of the Electrical Power Demand of Heat Pump Systems	145
<i>Dominik J. Storch, Shannon S. Kunz, Christoph J. Steinhart, Simon Greif, Michael Kreißl, Christian Gutzmann, Michael Finkel, Rolf Witzmann</i>	
Spatio-Temporal Forecasting Model for EV Charging Demands	153
<i>Alexander Aushev, Joel Anttila, Mikko Pihlatie</i>	
The Influence of Electricity Storage on the Economic Viability of Truck Charging Infrastructure: An Investigation into the Challenges and Opportunities	167
<i>Anica Mertins, Jens Hinrich Prause, Ailin Joost, Sebastian Lahmann</i>	
Machine Learning Based Forecasting of EV Charging Load in a Parking Lot for Optimal Participation in Frequency Services	173
<i>Julian Marius Mittag, Mattia Secchi, Jan Martin Zepter, Anna Malkova, Mattia Marinelli</i>	
Optimization Model for Simultaneous Controlled Charging of Electric Vehicles in Distribution Grids in Rural, Suburban and Urban Areas	181
<i>Arnd J. Hofmann, Marco S. Breder, Florian Boehnke, Christoph Weber</i>	
Prototype-Based Demonstration for Automated Proofs of Flexibility Provision by Electric Vehicle Pools	189
<i>Rainer Enzenhoefer, Jens Griesing, Maximilian Hoedl, Ted Li Zeguang, Thomas Brenner</i>	
Evaluating the Impact of Control Algorithms on Cost Savings of AC Solar Charging: A Simulation- Based Study of Savings in Reference to Bidirectional Charging, Constraints and Options	196
<i>Florian F. Sehr, David Reiners, Andre Beblek, Viktor Grinewitschus</i>	
Enhancing Vehicle-To-Grid (V2G) Technologies: Interoperability in Electric Vehicles Within the Framework of the Car2Flex Project	208
<i>Gerhard Fritscher, Karthik Bhat, Yi Guo</i>	
Charging Electric Vehicles from the Perspective of System Operators and Grid Operators, Taking into Account the Grid-Regulating Effect of Legislation Law EnWG §14a	214
<i>Jens Eickelmann, Lukas Ebbert, Bernd Engel</i>	

Regenerative Test Bench for the Analysis of High Power Chargers.....	222
<i>Andreas Stadler, Florian Grumm, Lukas Baum, Jirko Tegeler, Felix Heider, Johannes Brombach, Dorothea Liebig, Detlef Schulz</i>	
Low Voltage Network Constraint Risk and CAPEX from Distributed Energy Resources	229
<i>Allan J. V. Miller, Scott M. Lemon</i>	
Smart Electric Vehicle Management Vs. Battery Storage for Energy Communities: A Case Study from Denmark	239
<i>Francesco Pastorelli, Tim Unterluggauer, Bjørn J. Höyer, Mikkel M. Wagner, Mattia Secchi, Mattia Marinelli</i>	
Analyzing Phase Imbalance in Smart Charging of Multiple EVs: An Experimental Approach	247
<i>I. Safak Bayram, Lewis Hunter, Murat Senol, Kristian Sevdari</i>	
Practical Implementation and Field Test Evaluation of a Decentralized Grid-Friendly Charging Algorithm for Electric Vehicles	252
<i>Niclas Rhein, Daniel Masendorf, Pia Henzel, Sabrina Hempel, Raad Alsayyed, Eckehard Tröster</i>	
Analysis of Electric Vehicle Charging Station Usage and Environmental Sustainability in the UK.....	261
<i>Kaustubh Kulkarni, Sanchari Deb, Colin Herron</i>	
Assessing Flexibility in Battery Electric Truck Charging Depots Considering Grid Impact	270
<i>Simon Decher, Hans Schäfers</i>	

Author Index