



2022 Second International Conference on
Sustainable Mobility Applications, Renewables
and Technology (SMART) **November 23-25, 2022**



SMART2022 Final Program

(The schedule considers Italy time=GMT+1H)

Wednesday, November 23

November 23 9H00-10H00 Room A	Opening Alessandro Silvestri President of ALACLAM and General Chairman of SMART'22 University of Cassino and Southern Lazio, Italy Marco Dell'Isola President of the University of Cassino and Southern Lazio, Italy Sergio Rapuano IEEE Italy Section Chair University of Sannio, Italy Ahmed Masmoudi Technical Program and Publication Committees Chairman of SMART'22 University of Sfax, Tunisia Fabrizio Marignetti Organizing Committee Chairman of SMART'22 University of Cassino and Southern Lazio, Italy
10H00-10H30	Coffee break
November 23 10H30-11H30 Room A	Plenary Session 1 Chairs: Nicola Bianchi (Italy), Michael Schier (Germany), and Rajesh P. Deodhar (UK) SMART22-PS1: <i>Recent Advances in Innovative Field Modulation and Magnetic Geared Permanent Magnet Machines</i> Zi Q. Zhu University of Sheffield, UK

<p>11H30-13H30</p>	<p>Lunch</p>
<p>November 23 13H30-15H30 Room A</p>	<p>LS1: Lecture Session on Machine Analysis and Control Chairs: Zi Q. Zhu (UK) and Rajesh P. Deodhar (UK)</p> <p>SMART22-40: <i>Calculation of Roughness Effects in Cooling Channels for Thermal Conduction of an Air Cooled Electrical Excited Synchronous Machine</i> Hagen Spielmann and Joffre Nasr German Aerospace Center (DLR), Germany</p> <p>SMART22-76: <i>Speed Sensorless Control based on Luenberger Observer for DC Motors</i> Guido Rubino, Giovanni Tomassi, Luca Ciprini, Salman Ali, and Fabrizio Marignetti University of Cassino and South Lazio, Italy</p> <p>SMART22-84: <i>Electric Vehicle Candidature based on Electromagnetic Evaluation Comparison of the Double-Stator Wound-Field Flux Modulation Machines</i> Hillary C. Idoko, Udochukwu B. Akuru, and Olawale Popoola Tshwane University of Technology, South Africa Wasiq Ullah and Faisal Khan COMSATS University Islamabad, Pakistan Lilian L. Amuhaya Botswana International University of Science and Technology, Botswana</p> <p>SMART22-85: <i>Effect of Armature Reaction on Asymmetric PM Loss and Temperature Distributions in V-shape Interior Permanent Magnet Synchronous Machines</i> Yinzhao Zheng, Dawei Liang, and Zi Qiang Zhu University of Sheffield, UK Hailong Liu and Yanjian Zhou Midea Group, China</p> <p>SMART22-87: <i>Improved Pulsating Signal Injection Based Sensorless Control of Dual Three Phase IPMSMs Considering Inductance Asymmetry</i> Yang Chen, Ximeng Wu, and Zi Qiang Zhu University of Sheffield, UK Chaohui Liu Beijing National New Energy Vehicle Technology Innovation Center, China</p>

	<p>SMART22-88: <i>A Novel DC-link Voltage Observer with Time Delay Compensation for Small DC-link Capacitor-based IPMSM with EEMF Based Sensorless Control</i></p> <p>Jun Yan, Ximeng Wu, and Zi Qiang Zhu University of Sheffield, UK</p> <p>Chaohui Liu Beijing National New Energy Vehicle Technology Innovation Center, China</p>
<p>November 23 13H30-15H30 Room B</p>	<p>LS2: Lecture Session on Power Electronic Converters for Sustainable Applications (Part 1)</p> <p>Chairs: Fabrizio Marignetti (Italy) and Mathias Diazd (Chile)</p> <p>SMART22-06: <i>Comparative Study of Single-Switch and Double-Switch Converter Topologies, Working on Dead-Zone Mode, for Fuel Cell Applications</i></p> <p>Pedro Andrade, Fernando Bento, Adérito Neto Alcaso, and Antonio J. Marques Cardoso University of Beira Interior, Portugal</p> <p>SMART22-11: <i>A Streamlined Start-Up Procedure for Grid-Connected Photovoltaic System with DC Power Optimizers</i></p> <p>Trung Hieu Uong and Leonardo Callegaro Macquarie University, Australia</p> <p>SMART22-47: <i>Enhanced modulation strategy for 7-level voltage waveform in asymmetrical 5-level Cascaded H-Bridge Inverters</i></p> <p>A.O. Di Tommaso, R. Miceli, C. Nevoloso, G. Scaglione, G. Schettino and F. Viola University of Napoli, Italy</p> <p>C. Buccella, C. Cecati and G. Cimatoroni University of L'Aquila, Italy</p> <p>SMART22-55: <i>Highly Compact Partial Power Converter for a Highly Efficient PV-BESS Stacked Generation System</i></p> <p>Pierpaolo Granello and Luigi Schirone Sapienza University of Rome, Italy</p> <p>Rosario Miceli and Filippo Pellitteri University of Palermo, Italy</p> <p>Pavol Bauer Delft University of Technology, the Netherlands</p>

	<p>SMART22-56: <i>Design and Simulation of a Grid-Connected Two-Stage Bidirectional Converter for a Combined PV-Stationary Energy Storage System</i> Md Mahamudul Hasan, Shahid Jaman, Thomas Geury, and Omar Hegazy Vrije Universiteit Brussel, Belgium</p> <p>SMART22-78: <i>Integrated Boost-Converter for 400 V - 800 V Fast-Charging Compatibility</i> Gabriele Rizzoli, Michele Mengoni, Luca Vancini, Giacomo Sala, Angelo Tani, and Luca Zarri University of Bologna, Italy</p>
15H50-16H00	Coffee break
November 23 16H00-18H20 Room A	<p>LS3: Lecture Session on Batteries, Inductive and Conductive Charging Infrastructures Chairs: Nejila Parspour (Germany) and Benedikt Schmuelling (Germany)</p> <p>SMART22-03: <i>On the Efficiency of LFP Lithium-ion Batteries</i> Eduardo Redondo-Iglesias and Serge Pelissier University of Lyon, France</p> <p>SMART22-08: <i>An Optimized Design of T-Compensation Network for Wireless Power Transfer System with Full-Bridge Active Rectifier</i> Siyuan Lu and Mike Bottigheimer MAHLE International GmbH, Germany Nejila Parspour University of Stuttgart, Germany</p> <p>SMART22-10: <i>Design and Validation of a Dynamic Inductive Power Transfer System for EV Battery Charging</i> Alessandro Busacca, Antonino Oscar Di Tommaso, Nicola Campagna, Rosario Miceli, and Vincenzo Castiglia University of Palermo, Italy</p> <p>SMART22-13: <i>Optimal Charging of Electric Vehicle Fleets: Minimizing Battery Degradation and Grid Congestion Using Battery Storage Systems</i> David Geerts and Wilfried van Sark Utrecht University, the Netherlands Robinson Medina and Steven Wilkins Netherlands Organization for Applied Scientific Research, the Netherlands</p>

	<p>SMART22-42: <i>Electromagnetic Compatibility Evaluation of Wireless Charging Systems for Public Spaces</i> A. David, M. Tiemann, B. Schmuelling, N. Haussmann, S. Stroka, and M. Clemens University of Wuppertal, Germany</p> <p>SMART22-74: <i>Literature Review on Wireless Charging Technologies: Future Trend for Electric Vehicle?</i> Cristian Giovanni Colombo, Seyed Mahdi Miraftebzadeh, Alessandro Saldarini, Michela Longo, and Morris Brenna Politecnico di Milano, Italy</p> <p>SMART22-114: <i>Design of Controlled Charging Strategy for Parallel Operation of Multiple Modular Lithium-ion Battery Packs</i> Biplov Jha, Apsara Adhikari, and Ram Prasad Pandey Tribhuvan University, Nepal</p>
<p>November 23 16H00-18H20 Room B</p>	<p>LS4: Lecture Session on Sustainable Mobility Systems and Techniques Chairs: Shiori Idaka (Germany) and Rosario Miceli (Italy)</p> <p>SMART22-02: <i>Energy Management of Autonomous Electric Vehicles by Reinforcement Learning Techniques</i> Monica Alonso, Hortensia Amaris, David Martin, and Arturo de la Escalera University Carlos III, Spain</p> <p>SMART22-09: <i>Model-Based Investigation and Evaluation of a Hydrogen Expansion Engine by Determining System Efficiency as Well as Market Development for Heavy-Duty Hydrogen Vehicles</i> Nicolas Muck, Steffen Wieser, and Özcan Deniz German Aerospace Center (DLR), Germany</p> <p>SMART22-39: <i>New Exterior Design Options for Improving the Efficiency of Fully Autonomous Heavy Duty Vehicles</i> Robert Hahn German Aerospace Center (DLR), Germany</p> <p>SMART22-46: <i>Development and Testing of a Zero Emission Drive Unit for Battery Electric Vehicles</i> Steffen Wieser, Sven Reiland, Linda Bondorf, Manuel Löber, Tobias Schripp, and Franz Philipps German Aerospace Center (DLR), Germany</p>

SMART22-48: *Energy Consumption Comparison of Current Powertrain Options in Autonomous Heavy Duty Vehicles (HDV)*

Sebastian Sigle and Robert Hahn

German Aerospace Center (DLR), Germany

SMART22-89: *Experimental Examination of the Heat Transfer in a High Power Eddy Current Brake with a Magneto-isotropic Material Structure*

Christoph Kohler and Christoph Holtmann

German Aerospace Center (DLR), Germany

Lukas Arens

Trier University of Applied Sciences, Germany

SMART22-119: *Analysis of the Thermal Limits of Conventional Eddy Current Brakes based on a Thermal 1D-Model*

Christoph Holtmann and Andreas Möckel

German Aerospace Center (DLR), Germany

Thursday, November 24

November 24 9H00-10H00 Room A	Plenary Session 2 Chairs: Steven Wilkins (the Netherlands), Stephan Frei (Germany), and Alberto Bellini (Italy) SMART22-PS2: <i>Offshore Energy Systems: Key Assets Towards Carbon Neutrality</i> Elisabetta Tedeschi Norwegian University of Science and Technology, Norway University of Trento, Italy
10H00-10H30	Coffee break
November 24 10H30-12H30 Room A	LS5: Lecture session on Sustainable Energies Harvesting Chairs: Elisabetta Tedeschi (Norway and Italy) and Andrea Tortella (Italy) SMART22-15: <i>Wind Turbine Cost Reduction: A Detailed LCOE Surface Model of a Wind System</i> Khadija El Kinani, Sandrine Le Ballois, and Lionel Vido CY Cergy Paris University, France SMART22-37: <i>Wave Loading of a Half Ellipsis Array Type Offshore Structure Supporting a Wind Turbine</i> Thomas P. Mazarakos University of West Attica, Greece SMART22-44: <i>Evaluation of Different Francis Turbine Modelling Techniques for Real Time Digital Simulator Applications</i> Hasan Akbari and Robert Schürhuber Graz University of Technology, Austria Juan I. Pérez-Díaz and José-Ignacio Sarasúa Universidad Politécnica de Madrid, Spain SMART22-45: <i>Evaluation of Different Waterway Modelling Techniques for Real Time Digital Simulator Applications</i> Hasan Akbari and Robert Schürhuber Graz University of Technology, Austria Juan I. Pérez-Díaz and José-Ignacio Sarasúa Universidad Politécnica de Madrid, Spain SMART22-61: <i>Control Strategy for the Maximum Power Extraction of a Wave Attenuator</i> Mauro Andriollo, Emanuele Lax, and Andrea Tortella University of Padova, Italy

	<p>SMART22-72: <i>High-power SiC Module in Wind Turbine Full Scale Frequency Converter: Efficiency Comparison with IGBT-based Converter</i> Jelena Loncarski and Alberto Bellini University of Bologna, Italy Hussain A. Hussain Kuwait University, Kuwait</p>
<p>November 24 10H30-12H50 Room B</p>	<p>LS6: Lecture session on Distributed Energy Systems Chairs: Alberto Bellini (Italy) and Stephan Frei (Germany)</p> <p>SMART22-14: <i>Optimal Sizing and Placement of Droop-based Converters in DC Microgrids with ZIP Loads</i> Spyridon Chapaloglou and Babak Abdolmaleki Norwegian University of Science and Technology, Norway Elisabetta Tedeschi Norwegian University of Science and Technology, Norway University of Trento, Italy</p> <p>SMART22-18: <i>Fast Evaluation of the Transient Voltage Stability of Highly Reliable Automotive Power Supply Systems</i> Michael Gerten, Anika Henke, and Stephan Frei TU Dortmund University, Germany</p> <p>SMART22-19: <i>Analyzing Critical Resonances Within Automotive Power Supply Systems Affecting the Transient Voltage Stability</i> Michael Gerten and Stephan Frei TU Dortmund University, Germany</p> <p>SMART22-51: <i>A New Test System for the Simulation-Based Emulation of Highly Dynamic Power Supply Faults</i> Marvin Rübartsch and Stephan Frei TU Dortmund University, Germany</p> <p>SMART22-65: <i>Networked Control of Distributed Energy Systems in Dispatchable Microgrids: System Modeling and Stability Considerations</i> Augusto Matheus dos Santos Alonso University of Sao Paulo, Brazil Joao Bosco Ribeiro do Val University of Campinas, Brazil</p> <p>SMART22-66: <i>Voltage Regulation in Distribution Networks in the Presence of Distributed Generation: LVR and E-OLTC with a Machine Learning Approach</i> Alessandro Bosisio, Alberto Berizzi, and Durim Musiqi Politecnico di Milano, Italy</p>

	<p>SMART22-101: <i>Robust Operation and Control of Smart Distribution Grid Under Cyber Threats</i></p> <p>Jishnu Sankar V C, Sriharan R, and Manjula G Nair Amrita Vishwa Vidyapeetham, India</p> <p>Carlos Alvarez Bel Universidad Politécnic de Valencia, Spain</p>
12H30-14H30	Lunch
<p>November 24 14H30-15H30 Room A</p>	<p>Plenary Session 3</p> <p>Chairs: Zi Q. Zhu (UK), Fabrizio Marignetti (Italy), and Ahmed Masmoudi (Tunisia)</p> <p>SMART22-PS3: <i>Energy Conversion for a Sustainable Future Role of Electrical Machines and Drives</i></p> <p>Ayman M. El-Refaie Marquette University, USA</p>
15H30-16H00	Coffee break
<p>November 24 16H00-18H20 Room A</p>	<p>LS7: Lecture Session on Power Electronic Converters for Sustainable Applications (Part 2)</p> <p>Chairs: Michela Longo (Italy) and Omar Hegazy (Belgium)</p> <p>SMART22-54: <i>Development of Reference Current Calculation Scheme for Grid-Side Converter during Unbalanced Faults</i></p> <p>Muhammad Abubakar, Hasan Akbari, and Herwig Renner Graz University of Technology, Austria</p> <p>SMART22-80: <i>Bi-directional Single-Phase Grid-Connected Converter with Built-in Redundancy in Integrated Solar PV System for Electric Vehicle Charging</i></p> <p>Anup kumar, Mohan V. Aware, B. S. Umre, and Manoj A. Waghmare Visvesvaraya National Institute of Technology, India</p> <p>SMART22-102: <i>Control of an Ultrafast Electric Vehicle Charger based on a Series-Parallel Modular Multilevel Converter</i></p> <p>Cristobal Rodriguez, Claudio Vidal, Ricardo Barros, and Matias Diaz University of Santiago of Chile, Chile</p> <p>SMART22-103: <i>Real-time Simulation of an AC-DC Matrix Converter for Vehicle-to-Grid Applications</i></p> <p>Claudio Vidal, Cristobal Rodriguez, Kevin Rios, Saravanakumar Rajendran, and Matias Diaz University of Santiago of Chile, Chile</p>

	<p>SMART22-104: <i>Control of a Shunt-Series Modular Multilevel Converter for Low-Frequency AC Transmission Systems</i> Patricio Pizarro, Saravanakumar Rajendran, Anastasia Grolleau, and Matias Diaz University of Santiago of Chile, Chile</p> <p>SMART22-116: <i>A Six-Phase Interleaved Buck-Boost Converter using Adaptive Delta Modulation Control Loop for Renewable Energy Applications</i> Farag S. Alargt The Centre for Solar Energy Research and Studies, Libya Ahmed S. Ashur University of Tripoli, Libya Ahmad H. Kharaz University of Derby, UK</p> <p>SMART22-117: <i>Multiphase Interleaved SEPIC Converter Using ADM Control loop Suitable for Hybrid Energy Source Integration</i> Farag S. Alargt The Centre for Solar Energy Research and Studies, Libya Ahmed S. Ashur University of Tripoli, Libya Ahmad H. Kharaz University of Derby, UK</p>
<p>November 24 16H00-18H00 Room B</p>	<p>LS8: Lecture Session on Electric Machine Design Chairs: Ayman M. El-Refaie (USA) and Rosario Miceli (Italy)</p> <p>SMART22-57: <i>Torque Enhancement of Surface-mounted Permanent Magnet Synchronous Machines via Axial Assisted Magnets</i> Jinya Chen, Kan Liu, Shichao Zhou, and Huaqiang Cai Hunan University, China Yongdan Chen China North Vehicle Research Institute, China Chao Huang and Dinghua Zhang China Railway Rolling Stock Corporation, China</p> <p>SMART22-59: <i>Analytical Based Design of PM Machines: A Comparison Between Surface-Mounted PMs and Consequent-Pole Topologies</i> Hajer Jmal, Amal Souissi, and Imen Abdennadher University of Sfax, Tunisia</p>

SMART22-75: *Comparative Study between Different Rotor Topologies of Axial Flux Permanent Magnet Machines*

Salman Ali, Guido Rubino, Luca Ciprini, and Fabrizio Marignetti

University of Cassino and Southern Lazio, Italy

Rafat Ali

University of Engineering and Technology, Pakistan

SMART22-77: *Design of a PM Vernier Machine with Concentrated Winding Aimed at a Direct Drive in Wheel Operating for Electric Bus*

Walid Guendouz and Abdelmounaim Tounzi

University of Lille France

Toufik Rekioua

University of Bejaia, Algeria

SMART22-82: *Influence of Magnet Tolerances and Rotor Eccentricities on Cogging Torque of 12-slot/10-pole PM Machines*

D. Xiang and Z. Q. Zhu

University of Sheffield, UK

Y. H. Wu, F. Xu, and Y. F. Cheng

Midea Group Corporate Research Center, China

SMART22-83: *Optimization of Torque Performance of FSPM Machines by Rotor Pole Shaping using FEA and Genetic Algorithm*

Emrah Cetin

Yozgat Bozok University, Turkey

Zi Q. Zhu

University of Sheffield, UK

Friday, November 25

November 25 9H00-10H00 Room A	Plenary Session 4 Chairs: Nejila Parspour (Germany), Rosario Miceli (Italy), and Imen Abdennadher (Tunisia) SMART22-PS2: <i>Alternative Permanent Magnet Motor in Automotive Applications</i> Nicola Bianchi University of Padova, Italy
10H00-10H30	Coffee break
November 25 10H30-12H10 Room A	LS9: Lecture Session on Special Machines Chairs: Nejila Parspour (Germany) and Antonino Oscar Di Tommaso (Italy) SMART22-32: <i>Design Features and Benefits of Advanced Multiphase Inverter-Fed Electric Drives</i> Jörg Kammermann, Igor Bolvashenkov, and Hans-Georg Herzog Technical University of Munich, Germany Andrey V. Brazhnikov Siberian Federal University, Russia SMART22-81: <i>High Frequency Flux Modulation for Electric Machines</i> Ravi Raju and Jesse Leonard Fastwatt LLC, USA SMART22-95: <i>Analytical Investigation of Flux Switching PM Machines: Air Gap Flux Density Formulation</i> Anis Abdelkefi, Amal Souissi, and Imen Abdennadher University of Sfax, Tunisia SMART22-109: <i>An Aid for Introducing Transverse Flux PM Machines to MS Students: BLI Law-based Assessment of the Torque Production</i> Ahmed Masmoudi University of Sfax, Tunisia SMART22-111: <i>Performance Analysis of PM Assisted Synchronous Reluctance Motor with Optimized Novel Design for Electric Vehicular Application</i> Jitendra G. Jamnani and Swapnil Jani Pandit Deendayal Energy University, India

<p>November 25 10H30-12H10 Room B</p>	<p>LS10: Lecture Session on National Sustainability-Oriented Programs Chairs: Alessandro Silvestri (Italy) and Shiori Idaka (Germany)</p> <p>SMART22-34: <i>Potential Environmental Impact of Introduction of Electric Vehicles in Private and Public Fleets: A Case Study in Cassino</i> Mauro D’Apuzzo, Azzurra Evangelisti, Alessandro Silvestri, and Giuseppe Cappelli University of Cassino and Southern Lazio, Italy Vittorio Nicolosi University of Rome Tor Vergata, Italy</p> <p>SMART22-35: <i>Smart Urban Mobility Management Project: A Concrete Step Towards More Sustainable and Connected Communities</i> Mauro D’Apuzzo, Azzurra Evangelisti, Giuseppe Cappelli, and Stefano Buzzi University of Cassino and Southern Lazio, Italy Vittorio Nicolosi University of Rome Tor Vergata, Italy</p> <p>SMART22-36: <i>An Introductory Step to Develop Distance Decay Functions in the Italian Context to Assess the Modal Split to E-bike and E-scooter</i> Mauro D’Apuzzo, Giuseppe Cappelli, and Azzurra Evangelisti University of Cassino and Southern Lazio, Italy Vittorio Nicolosi University of Rome Tor Vergata, Italy</p> <p>SMART22-67: <i>A Feasibility Study of Using Renewable-Based Hydrogen in Off-Grid Domestic Energy Systems: A Case Study in Italy</i> Alessandro Bosisio, Stefano Penati, and Alberto Berizzi Politecnico di Milano, Italy Andrea Morotti and Caterina Pasetti Unareti S.p.A, Italy Gaetano Iannarelli Sapienza University of Rome, Italy</p> <p>SMART22-71: <i>Analysis of the Wind Energy Supply and Integration in South Africa</i> Stefan Karamanski and Gareth Erfort Council for Scientific and Industrial Research, South Africa</p>
<p>12H10-14H30</p>	<p>Lunch</p>

<p>November 25 14H30-15H30 Room A</p>	<p>Plenary Session 5</p> <p>Chairs: Nicola Bianchi (Italy), Ayman M. El-Refaie (USA), and Michael Schier (Germany)</p> <p>SMART22-PS3: <i>Modern Innovations in Electric Machine Design and Applications for Sustainable Mobility</i></p> <p>Rajesh P. Deodhar IMRA Europe S.A.S. UK Research Centre, UK</p>
<p>15H30-16H00</p>	<p>Coffee break</p>
<p>November 25 16H00-17H00 Room A</p>	<p>LS11: Lecture session on Green Buildings</p> <p>Chairs: Mamadou Lamine Doumbia (Canada) and Angelo Farina (Italy)</p> <p>SMART22-43: <i>An Open IoT Platform: Lessons Learned from a District Energy System</i> Thomas Schranz, Qamar Alfalouji, Thomas Hirsch, and Gerald Schweiger Graz University of Technology, Austria</p> <p>SMART22-64: <i>Low-cost Structural Health Monitoring System for Smart Buildings</i> Andrea Toscani, Nicholas Rocchi, Daniel Pinardi, Marco Binelli, Leonardo Saccenti, Angelo Farina, Stefano Pavoni, and Marcello Vanali University of Parma, Italy</p> <p>SMART22-100: <i>Smart Buildings Energy Management Strategy Based on Consumer Budget: Experimental Implementation Perspective</i> Khaled Khezzane and Mamadou Lamine Doumbia Université du Québec à Trois-Rivières, Canada Farid Khoucha Ecole Militaire Polytechnique Alger, Algeria</p>
<p>November 25 16H00-17H40 Room B</p>	<p>LS12: Lecture session on Sustainability in Academia and Industry Chairs: Alessandro Silvestri (Italy) and Ahmed Masmoudi (Tunisia)</p> <p>SMART22-05: <i>Experience-Based Course on Three-Phase Electrical Power Conversion</i> Giacomo Galli, Gilles Perusot, and Matthieu Berranger Institut Supérieur de l'Aéronautique et de l'Espace, France Noemi Lanciotti Institut Universitaire de Technologie de Blagnac, France</p>

SMART22-12: *Hydraulics Decentralization on a Mobile Crane*

Matteo Beligoj and Luigi Alberti

University of Padova, Italy

Marco Zava and Alessandro Termini

Jekko Innovation Center, Italy

SMART22-79: *Requirements Determination and Development of Variants for Drive Trains of Hybrid-powered Rail Vehicles*

Julian Franzen

Cologne University of Applied Science, Germany

Jannis Sinnemann and Udo Pinders

Westfälische-Lokomotiv-Fabrik Reuschling GmbH & Co. KG, Germany

SMART22-107: *Resilience and Sustainability Function Deployment for SMART Companies*

Mauro D'Apuzzo and Alessandro Silvestri

University of Cassino and Southern Lazio, Italy

SMART22-108: *Reliability Analysis and Allocation for Electric and Hybrid Vehicles*

Alessandro Silvestri, Fabrizio Marignetti, Domenico Falcone, and Luca Ciprini

University of Cassino and Southern Lazio, Italy