GENERAL INFORMATION

TECHNICAL PROGRAM

The conference opens on Tuesday, June 27 and closes on Thursday, June 29, 2023. The contributions will be presented orally by the Authors (about 20 minutes each including question time), poster sessions are scheduled. The presence of the authors (at least one per paper) is necessary.

Two keynote speeches will be presented on Tuesday, June 27, by GE Renewable Energy and on Wednesday, June 28, by Hilti AG.

WORKING LANGUAGE

The working language of the Conference, for both presentations and discussions, will be English. Simultaneous translation will not be provided.

CONFERENCE PROCEEDINGS

Each registrant will receive a copy of the Conference Proceedings containing the text of the contributions.

REFRESHMENTS

Refreshments will be served each day at the time indicated in the program.

The Welcome Cocktail is scheduled on Monday, June 26 at 19:00.

The Social Dinner is scheduled on Wednesday, June 28 at 20:00.

SECRETARY DESK

The Secretary Desk will operate according to the following schedule:

Monday, June 26	17:00 - 18:30
Tuesday, June 27	8:00 - 13:00 ; 14:00 - 16:30
Wednesday, June 28	8:30 - 13:00 ; 14:00 - 16:30
Thursday, June 29	8:30 - 13:00

PROGRAM AT A GLANCE

TUESDAY 27th		
	Room A	**Room B**
9:00	Opening session	
9:20	Keynote speech (GE Renewable Energy)	
10:15	*Coffee Break*	
10:30	Condition Monitoring of Lithium-Ion Batteries	Wave Energy and Offshore Renewable Power Plants
11:50	Electrical Load Profile Characterization	Electrical Generators for Renewable Sources
13:10	*Lunch*	
14:30	Transport Electrification	Battery Management Systems
Poster Area		
16:30	Poster Session 1	
WEDNESDAY 28th		
9:00	Keynote speech (Hilti AG)	
10:00	Grid Impedance and Topology Estimation	Economic Dispatch of Renewable Sources
11:20	*Coffee Break*	
11:40	Power Converters and Control	Solar Photovoltaic Technologies
13:20	*Lunch*	
14:40	Energy storage for Flexibility Services	Isolated Power Converters for Transport Electrification and Grid Integration
Poster Area		
16:20	Poster Session 2	
THURSDAY 29th		
9:00	Secure and Resilient Energy Management of Smart Grids	Grid Integration of Renewable Sources
10:40	*Coffee Break*	
11:00	Innovative Power Conversion Systems for PV and Battery Integration	Grid Integration of Renewable Sources (Sponsored by IEEE Italy Section PES Chapter PE31)
13:00	**Closing Remarks**	
	End of Conference	
13:10	*Lunch*	

9:00 ***WELCOME ADDRESSES, OPENING SESSION***

9:20 **KEYNOTE SPEECH:**

Modelling of HVDC and grids with high penetration of renewables: recent developments and future trends.
Elisabetta Lavopa (GE Renewable Energy, United Kingdom)

10:15 *Coffee Break*

10:30 **CONDITION MONITORING OF LITHIUM-ION BATTERIES**
Chairmen: A. Damiano, University of Cagliari (Italy)
G. Gruosso, Politecnico di Milano (Italy)

DRT-based SoC estimation for commercial Li-ion battery pack
P. Iurilli, N. Koch, R. E. Carrillo, C. Brivio (Switzerland)

Thermo-Electrochemical Simulations in SPICE of Li-Ion Batteries under Active Charge Balancing
P. Guerriero, A.P. Catalano, C. Scognamillo, M. Dhimish, S. Daliento, V. d'Alessandro (Italy)

Li-ion Battery Internal Temperature Estimation using Electrochemical Impedance Spectroscopy
S. Bhoir, G. Thenaisie, M.Paolone (Switzerland)

Quantum Chemical Investigation of Thermotropic Ionic Liquid Crystals to Predict Phase Transition Temperatures
E. Makara (Finland)

11:50 **ELECTRICAL LOAD PROFILE CHARACTERIZATION**
Chairmen: R. Faranda, Politecnico di Milano (Italy)
P. Janik, Tauron Ekoenergia (Poland)

Climate change and building energy systems: Implications and mitigation strategy for Somalia
J. Litardo, C. Del Pero, F. Leonforte, N. Aste (Italy)

Cluster Data Organization for Decentralized Grid Operation based on Clustering Power System Approach
A. Schmelter, E. Ortjohann, D. Holtschulte, J. Andreas, T. Premgamone, S. Loanka, J. Kortenbruck, D. Morton (Germany, United Kingdom)

Grid node-orientated State Estimation for Dynamic Power System Operation at Distribution Networks with Clustering Power Systems Approach
D. Holtschulte, E. Ortjohann, A. Schmelter, J. Kortenbruck, T. Premgamone, S. Loanka, J. Andreas (Germany)

Interpretable data-driven methods from building design to operation - HEART project case study
M. Manfren, C. Del Pero, F. Leonforte, N. Aste, R. S. Adhikari (United Kingdom, Italy)

13:10 *Lunch*

14:30 **TRANSPORT ELECTRIFICATION**
Chairmen: P. Tricoli, University of Birmingham (UK)
V. Vodovozov, Tallinn University of Technology (Estonia)

Online Battery Pack Electrochemical Impedance Spectroscopy Measurement Using a Three-Phase Neutral Point Clamped Converter
K. Liu, G. I. Orfanoudakis, S. M. Sharkh, A. J. Cruden (United Kingdom, Greece)

Management and control of short-term energy storage systems in electric ship
F. Hardan, P. Tricoli (United Kingdom)

Design of a Battery Pack for the Power System of an All-Electric Aircraft by Cell Characterization
G. Bossi, A. Floris, N. Campagna, R. Miceli, A. Damiano (Italy)

A techno-economic analysis of a hybrid energy storage system for EV off-grid charging
A. Dascalu, E. J. Fraser, Y. Al-Wreikat, S. M. Sharkh, R. G. A. Wills, A. J. Cruden (United Kingdom)

DC Microgrid Based Power System for Marine Vessels
G. Mirzaeva, D. Miller, S. Mitchell, D. Carter, A. Steber (Australia)

Analyzing the Impact of Coordinated Charging of Electric Vehicles on the Power System
H. Palahalli, C. Diaz-Londono, P. Maffezzoni, G. Gruosso (Italy)

10:30 **WAVE ENERGY AND OFFSHORE RENEWABLE POWER PLANTS**
Chairmen: A. Filgueira, University of La Coruna (Spain)
C. Del Pero, Politecnico di Milano (Italy)

A new resource index for tidal stream farm sizing in estuarine areas
D.M. Fouz, R. Carballo, I. López, B. Álvarez, G. Iglesias (Spain, Ireland, United Kingdom)

Multi-criteria analysis for the determination of the best locations for the wave energy exploitation in the Ria of Pontevedra
B. Álvarez, D. M. Fouz, I. López, R. Carballo (Spain)

Numerical model of the heat transfer in an offshore photovoltaic panel. Application to the Galician cost (northwest Spain)
P. Rubial Yáñez, M.I. Lamas Galdo, L. Castro Santos, A. Filgueira Vizoso (Spain)

Dynamic Model of the Seawater Low-Head Turbine for Wave Energy Conversion
L. Rubino, P. Contestabile, R. Langella, D. Vicinanza (Italy)

11:50 **ELECTRICAL GENERATORS FOR RENEWABLE SOURCES**
Chairmen: C. Martis, University of Cluj-Napoca (Romania)
A. Rix, Stellenbosch University (South Africa)

Power Control Structure of Doubly-fed Induction Generator Supplied by Current Source Converter
M. Morawiec, P. Kroplewski, K. Blecharz, R. Ryndzionek (Poland)

Winding function approach based design of novel five-phase brushless doubly fed induction generator
R. Ryndzionek, K. Blecharz, F. Kutt, G. Kostro, M. Michna, M. Morawiec (Poland)

A New Turbine-Generator Integrated Concept Design for Screw-Turbine-Based Small Hydropower Plants
K. Mansour, M. Mezzarobba, M. De Martin, A. Tessarolo (Italy)

Hybrid Excited PM Synchronous Generators: Analysis, Design and Comparison
L. Cinti, N. Bianchi (Italy)

13:10 *Lunch*

14:30 **BATTERY MANAGEMENT SYSTEMS**
Chairmen: V. Musolino, Hilti AG (Liechtenstein)
C. Brivio, CSEM (Switzerland)

Modular Battery System Management for Waterborne Transport Applications
M. Pastorelli, F. Mandrile, S. Musumeci, M. P. Martino (Italy)

Dynamic Multi-Scale Dual Kalman Filtering for State of Charge and Capacity Estimation on Lithium Titanium Oxide Cells for Traction Applications
L. Tiberi, M. Baur (Switzerland)

Online State of Health Estimation of Lithium-Ion Battery for Electric Vehicle
S. Barcellona, L. Codecasa, S. Colnago, L. Piegari (Italy)

Advanced modular battery management system for next generation of research platforms
J. A. Romero, P. Paradell, L. Trilla (Spain)

EIS-based hysteresis modelling of LFP cells
G. Thenaisie, C. Brivio (Switzerland)

Simulation model to predict thermal runaway propagation of Li-Ion batteries in power tool applications
J. Marin-Goncalves, V. Musolino, M. Dippon (Liechtenstein)

16:30 **POSTER SESSION 1**

Smart Framework to Study Energy Transition in the Electric Grid
H. Palahalli, M. Hemmati, F. Rossi, G. Storti Gajani, G. Gruosso (Italy)

Management of Braking Energy in Electric Vehicles using Reinforcement Learning
V. Vodovozov, Z. Raud, E. Petlenkov (Estonia)

Global Positioning System Based Dual Axis Tracker for Solar Car
Z. S. Almajali, S. A. Aldmour (Jordan)

Optimal distributed control of hybrid AC/DC grids
R. Lazzari, A. La Bella (Italy)

Sizing of BESS to Support Primary Frequency Control in a O&G FPSO with Wind Power Integration
C. B. M. Mufalo, B. C. Lima, L. Otremba, R. M. Monaro, M. B. C. Salles (Brazil)

Study of failures in Wind Turbines with Permanent Magnet Synchronous Generator
J. M. Pérez-García, P. Eguia-López, E. Perea-Olabarria, A. Pujana-Goitia (Spain)

Control Design of a Single-Phase Bi-Directional Active Front End Converter
R. Tagliaretti, A. Polastri, N. Toscani, M. Sposito, A. Grittini, M. Rossi, F. Castelli Dezza (Italy, Finland)

Experimental Characterization of Rotary Transformer Prototypes for Wireless Power Transfer on Helicopters
N. Toscani, M. Brunetti, F. Bainotti, F. Galimberti, M. Mauri, M. S. Carmeli, F. Castelli Dezza (Italy)

Optimal location of distributed generation to reduce power losses
P. Barbecho, I. Albizu, M. T. Bedialauneta, E. Fernandez, P. Castillo (Spain)

The economic feasibility of a floating offshore wind energy farm considering different steel prices. The case of study of the Canary Islands
L. Castro-Santos, P. Rubial-Yáñez, I. Lamas-Galdo, D. Cordal Iglesias, L. Piegari, P. Tricoli, A. Filgueira-Vizoso (Spain, Italy, United Kingdom)

Coil-to-Coil Efficiency of ISS-Compensated Inductive Wireless Power Transfer Links Operating with Load-Independent Output Voltage at Fixed Frequency
A. Belenky, A. Chub, A. Kuperman (Israel, Estonia)

Potential of electrical cells: the Effect of the Experimental Design on the Results
L. Jäntschi (Romania)

Battery and Supercapacitor-in-the-Loop testing using a hybrid power supply system and Typhoon HIL tools
P. Șerban, S. Ursache, M. Ruba, C. Marțiș (Romania)

Electrical Load Profiles for Residential Buildings: Enhanced Bottom-Up Model (EBM)
R. Loggia, A. Flamini, A. Massaccesi, C. Moscatiello, A. Galasso, L. Martirano (Italy)

Defect Recognition based on Radon Transform in Pentacene organic thin-film Archimedean interdigitated spirals transistor
G. Lo Sciuto, S. Linde, R. Shikler, P. Kowol, S. Coco, G. Capizzi (Poland, Israel, Italy)

Analytic, structural, and experimental testing of permanent magnet synchronous machine controller using Typhoon HIL
S. Ursache, P. Șerban, M. Ruba, C. Marțiș (Romania)

Class-E^2 Capacitive Wireless Power Transfer DC-DC Converter for LED Lighting Applications
L. Solimene, F. Corti, S. Musumeci, A. Reatti, C. S. Ragusa (Italy)

Design and testing of a demonstrative BIPV façade manufactured with novel Glass-free colored Lightweight PV modules
F. Lisco, G. Cattaneo, A. Virtuani, N. Aste, C. Del Pero, F. Leonforte, M. Despeisse, C. Ballif, A. Miglioli (Switzerland, Italy)

The role of storage and flexible demand in coordinated network planning
I. Faifer, M. Rossi, M. Rossini, G. Lattanzio, D. Siface, G. Migliavacca (Italy)

Severity Factor and Reliability Trend Evaluation of the Italian Transmission Lines
L. Cristaldi, M. Faifer, C. Laurano, R. Ottoboni, S. Toscani, M. Zanoni (Italy)

Prediction and Analysis of Power Consumption and Power Loss at Industrial Facilities
E. I. Gracheva, I. E. Elsovich, T. Sinyukova, S. Valtchev, R. Miceli, N. Campagna (Russia, Portugal, Italy)

Reliability and Overload Capacity of Power Transformers
E. I. Gracheva, R. M. Petrova, T. Sinyukova, S. Valtchev, R. Miceli, M. Caruso (Russia, Portugal, Italy)

Simulation of the Functional Characteristics of Low-Voltage Switching Devices, Based on the Example of Automatic Circuit Breakers
A. R. Petrov, E. I. Gracheva, T. Sinyukova, S. Valtchev, R. Miceli, A. Ur Rahman (Russia, Portugal, Italy)

Power Production by Gravitomagnetic Effect on a Rotating Mass
A. Iadicicco, G. Langella, L. Verolino (Italy)

Methods for Increasing the Technical Resource of Electrical Equipment of Powerful Irrigation Pump Stations of the First Lift
S. Dadabaev, E. Gracheva, I. Ismoilov, S. Valtchev, R. Miceli (Tajikistan, Russia, Portugal, Italy)

Comparison between Voltage Oriented Control and Synchronous Power Control for Grid-Connected Inverter Applications
R. Miceli, C. Nevoloso, G. Scaglione, G. Schettino, G. Sorrentino, F. Viola (Italy)

Potential and Methods of Integrating Solar Cells into Vehicles
H. Samadi, G. Ala, V. Lo Brano, P. Romano, F. Viola (Italy)

Single-phase Resonant DC Link Inverter with integrated isolation for PV generators
S. Foti, S. De Caro, A. Oteri, T. Scimone, A. Testa (Italy)

Implementation of a switching matrix operating PV field-storage interconnection
G. Cipriani, C. Sefora D'Amaro, V. Di Dio, R. Miceli, F. Pellitteri (Italy)

Numerical analysis of magnetic gearbox for small wind turbine
A. Amoresano, L. P. Di Noia, R. Rizzo, S. Roscioli (Italy)

9:00 **KEYNOTE SPEECH:**
Corporate Research & Technology at Hilti AG: focus on battery research
Vincenzo Musolino (Hilti AG, Liechtenstein)

10:00 **GRID IMPEDANCE AND TOPOLOGY ESTIMATION**
Chairmen: B. Hammer, ABB AG (Germany)
A. Berizzi, Politenico di Milano (Italy)

Genetic algorithm for the identification of the equivalent interconnected European power grid
G. M. Tina, C. F. Nicolosi, A. Augello, D. Stefanelli (ITALY)

Grid Impedance Measurement for Distribution Networks with Three phase Untransposed Model Parameters
T. Premgamone, E. Ortjohann, J. Kortenbruck, A. Schmelter, D. Holtschulte, S. Loanka, J. Andreas (Germany)

Simplified FPGA Implementation of Synchrophasor Measurement for PMUs in Distribution Networks
T. Premgamone, E. Ortjohann, A. Schmelter, J. Kortenbruck, D. Holtschulte, S. Loanka, J. Andreas (Germany)

Distribution Network Topology Identification by PMU-based State Estimation
F. Conte, F. D'Agostino, B. Gabriele, S. Massucco, F. Silvestro (Italy)

11:20 *Coffee Break*

11:40 **POWER CONVERTERS AND CONTROL**
Chairmen: A. Cardoso, University of Beira Interior (Portugal)
R. A. Mastromauro, University of Florence (Italy)

Output Current Control for Two-Switch Boost Buck Converters in Fuel Cell Applications for DC Microgrids
P. Andrade, F. Bento, A. N. Alcaso, A. J. M. Cardoso (Portugal)

3-Phase 7-Level Multiplexed Converter for Medium-Voltage AC Applications
P. P. Bambich, M. di Benedetto, A. Lidozzi, L. Solero, T. Meynard (Italy, France)

Optimization of the Bidirectional DC-DC Buck-Boost Converter with Non-ideal Magnetic Coupling
A. Rodríguez-Lorente, A. Barrado (Spain)

An improved modulation strategy for a Four- Switch Buck-Boost converter with reduced current ripple
V. Díaz, A. Barrado, A. Lázaro, P. Zumel (Spain)

Evaluation of Triple Active Bridge for Power System of an All-Electric Aircraft
G. Bossi, M. Boi, N. Campagna, R. Miceli, A. Damiano (Italy)

13:20 *Lunch*

14:40 **ENERGY STORAGE FOR FLEXIBILITY SERVICES**
Chairmen: F. Bovera, Politecnico di Milano (Italy)
M. Salles, University of Sao Paulo (Brazil)

A feasibility study of using MV and LV distributed energy resources flexibility in a TSO/DSO coordination perspective: the case study of Milan, Italy
A. Bosisio, A. Berizzi, C. Mosca, C. Vergine, D. Castiglioni, A. Morotti (Italy)

Optimal end-users electrification management: a BESS-based DSO approach to support distribution grid planning and delay network reinforcement
B. Greco, A. Bosisio, A. Cirocco, G. Iannarelli, C. Boccaletti, L. Cavalletto (Italy)

Effects of flexibility provision from Power-to-Hydrogen technology: a 2030 scenario analysis applied to the Italian case
I. Serra, D. Siface (Italy)

Buildings as Batteries - Unlocking Grid Flexibility from Smart Management of Domestic Heating
A. S. Hedar, M. Zatti, F. Bovera (Italy)

Potential Arbitrage Revenue of Energy Storage System for MISO Energy Markets
M. Zubair, T. N. Gadotti, M. B. C. Salles (Brazil)

10:00 **ECONOMIC DISPATCH OF RENEWABLE SOURCES**
Chairman: P. Caramia, University Parthenope (Italy)
N. Aste, Politecnico di Milano (Italy)

Demand Response Analysis of Industrial Consumers: A Brazilian Case
L. F. Massimo, M. B. C. Salles (Brazil)

Review on local market flexibility projects, main characteristics and barriers
G. Viganò, G. Lattanzio, M. Rossi (Italy)

Investigating the Impact of High Penetration of Variable Renewable Generation on Electricity Prices of the Brazilian Power System
G. R. Oliveira, M. B. C. Salles (Brazil)

Self-consumption Configurations Analysis
F. Oliva, E. Gallo, M. Moretti, C. Moscatiello, L. Martirano, R. Faranda (Italy)

11:20 *Coffee Break*

11:40 **SOLAR PHOTOVOLTAIC TECHNOLOGIES**
Chairmen: A. Benigni, Julich FZV (Germany)
M. Ricco, University of Bologna (Italy)

PV ratio for deep renovation
N. Aste, C. Del Pero, F. Leonforte, R. S. Adhikari (Italy)

Support Vector Classifiers with Different Kernel Functions to Detect Mismatching Conditions Affecting Photovoltaic Arrays
M. Piliougine, G. Spagnuolo (Italy)

Dynamic Modeling of Si-based Photovoltaic Modules using Impedance Spectroscopy Technique
M. De Riso, I. Matacena, P. Guerriero, S. Daliento, L. E. Garcia-Marrero, G. Petrone (Italy)

Challenges in photovoltaic parameter identification under mismatching conditions
L. E. Garcia–Marrero, M. Piliougine, G. Petrone, M. De Riso, P. Guerriero, E. Monmasson (Italy, France)

Numerical and Experimental Study of a Photovoltaic-Thermal (PVT) Solar Collector
C. A. Figueiredo Ramos, A. Alcaso, A. J. M. Cardoso (Portugal)

13:20 *Lunch*

14:40 **ISOLATED POWER CONVERTERS FOR TRANSPORT ELECTRIFICATION AND GRID INTEGRATION**

Chairmen: A. Chub, TalTech (Estonia)

R. Mandrioli, University of Bologna (ITALY)

Design considerations on modular WPT charging systems for drones in civil applications
V. Cirimele, R. Mandrioli, R. Torchio, G. Gentile, F. Giulietti, G. Grandi (Italy)

Insights on DAB Converter with Auxiliary Inductors
L. K. Pittala, R. Barbone, R. Mandrioli, V. Cirimele, M. Ricco, G. Grandi (Italy)

Automotive Battery Charging based on Efficient Capacitive Power Transfer
F. Pellitteri, N. Campagna, P. Granello, R. Miceli, L. Schirone (Italy)

Comparison of (N+1) Redundancy and Fault Tolerance Approaches in Single- Stage Series-Connected Isolated MVAC to LVDC Converters
A. Bakeer, A. Chub, A. Blinov, S. Bayhan, D. Vinnikov (Estonia, Qatar)

Dual Active Bridge converter performance optimization depending on the main inductance value
M. Carrasco, V. Díaz, M. Ferrigno, A. Barrado (Spain, Italy)

16:20 **POSTER SESSION 2**

Impacts of the Energy Transition on Voltage Dips in the Medium Voltage Networks
R. Torkzadeh, V. Ćuk, S. Bhattacharyya, S. Cobben (The Netherlands)

Hydrogen Concentration Tracking in a Dynamic Hydrogen-Enriched Natural Gas System Based on Electrical Analogy
Y. Lu, T. Pesch, A. Benigni (Germany)

3-Phase Boost Rectifier Condition Health Monitoring based on Digital Twin Technique
G. Di Nezio, M. di Benedetto, A. Lidozzi, L. Solero (Italy)

Evaluation of CO_2 emissions reduction in diesel-electric trains with advanced batteries
A. H. Batista, D. F. Pereira, G. G. T. T. Vieira, M. B. C. Salles, J. S. Naturesa (Brazil)

Control of a Solid Oxide Electrolysis system for hydrogen generation from solar power and thermal energy storage
E. Crespi, D. Ragaglia, F. Panaccione, M. Testi (Italy)

Digital Low-Voltage Distribution Platform for Dynamic System Operation based on the Clustering Power Systems Approach
E. Ortjohann, D. Holtschulte, T. Premgamone, A. Schmelter, J. Kortenbruck, S. Loanka, J. Andreas (Germany)

Design and Sizing of Power Conversion System with Energy Storage for improved PV-Electrolyzer Energy Coupling
L. Palma, B. Molina, A. Díaz (Chile)

Literature Review - Mobile Electric Storage System (MESS): Use Cases and Applications
A. Saldarini, M. Longo, M. Brenna, S. M. Miraftabzadeh (Italy)

Fair Reinforcement Learning Algorithm for PV Active Control in LV Distribution Networks
M. Vassallo, A. Benzerga, A. Bahmanyar, D. Ernst (Belgium, France)

Distributed Generation Photovoltaic: Diffusion Modeling and Economic Impacts on the Utilities' Revenues in Brazil
A. N. Queiroz Netto, L. F. C. Simone, M. B. C. Salles (Brazil)

Methanol fuelled hybrid propulsion system for a charter yacht
M. Altosole, F. Balsamo, L. Mocerino, F. Scamardella (Italy)

Energy Recovering from Regenerative Braking in DC Railway System
A. Delle Femine, D. Gallo, C. Landi, M. Luiso (Italy)

Integration and management of Renewable Energy Sources in an Electric Vehicle Charging Station using a DC nanoGrid
D. Menniti, A. Pinnarelli, N. Sorrentino, P. Vizza, G. Brusco (Italy)

Wind and Temperature Effects on Long-Term Degradation Within a Utility Scale PV Plant in a Semi-Arid Region
F.M. Daniel-Durandt, A. J. Rix (South-Africa)

On the Use of Spectral Clustering for Coherent Areas Estimation
F. Bonavolontà, G. M. Giannuzzi, D. Lauria, A. Liccardo, C. Pisani, S. Tessitore (Italy)

State of the art Surge Protection Device Research and its Application to Photovoltaic Plants
H. C. Smit, A. J. Rix (South-Africa)

Tackling risks in the supply chain of rare earth-based permanent magnets used in electrical generators
P. A. Jula, B. Mákszem, T. Gaidamac, D.-C. Popa, L. Szabó (Romania)

On the Global Harmonic and Supraharmonic Emission of an Electric Vehicle Charging Station: Investigation of Aggregation and Diversity
A. Bracale, P. Caramia, G. M. Casolino, P. De Falco, I. Hussain, P. Varilone, P. Verde (Italy)

Investigating a fuel cell as a combined heat and power for a house in Sweden
T. S. Andrade, S. K. N. Ramakrishna, T. Thiringer (Sweden)

Incipient fault detection in Wind Turbine Induction Generators based on Low Frequency Current Injection
S. Foti, A. Testa, C. Caruana, C. Spiteri Staines, H. H. Khan (Italy, Malta)

Viable approaches for the electrification of a ferry operating in the Strait of Messina
G. Baia, S. Foti, A. Testa, H. H. Khan, S. De Caro, M. Vecchio (Italy)

Harmonic and Supraharmonic Emissions of the Electric Vehicle Chargers in Distribution Networks
A. Bracale, P. Caramia, G. M. Casolino, P. De Falco, I. Hussain, P. Varilone, P. Verde (Italy)

Resonance Active Damping Methods for Grid- Connected Inverters: Robustness Assessment Based on Sensitivity Function
R. A. Mastromauro (Italy)
DFIG Capability under Weak Grid Connection and Different Reactive Power Control Modes
E. Fedele, D. Lauria, R. Rizzo (Italy)

Photovoltaics in Circular Economy: Future PV Waste Projections for Different Scenarios
R. S. Adhikari, N. Aste, C. Del Pero, F. Leonforte, F. Sfolcini, K. Diab (Italy)

Consequences of propeller failure on multiphase synchronous motors in clean aircraft propulsion
G. Brando, A. Dannier, A. Del Pizzo, L. P. Di Noia (Italy)

Cluster Data Communication for Decentralized Grid Operation based on Clustering Power System Approach
A. Schmelter, E. Ortjohann, D. Holtschulte, T. Premgamone, J. Andreas, S. Loanka, J. Kortenbruck, D. Morton (Germany, United Kingdom)

Determining the shunt resistance of individual subcell in Tandem Perovskite solar cells
I. Matacena, L. Lancellotti, P. Delli Veneri, S. Daliento, P. Guerriero (Italy)

Energy Profile Characterization of Electric Vehicle Charging Stations Based on Clustering Techniques
A. Bracale, P. Caramia, P. De Falco, L. P. Di Noia, R. Rizzo (Italy)

9:00 **SECURE AND RESILIENT ENERGY MANAGEMENT OF SMART GRIDS**
Chairmen: G. Adinolfi, ENEA (Italy)
S. Fabozzi, ENEA (Italy)

Techno-economic feasibility of photovoltaic, BESS, diesel and hybrid electrification for off-grid rural systems in Algeria
S. Fabozzi, G. Adinolfi, M. Valenti, G. Graditi, S. De Iuliis (Italy)

Combined Machine Learning and weather models for photovoltaic production forecasting in microgrid systems
A. Buonanno, G. Caputo, I. Balog, G. Adinolfi, F. Pascarella, G. Leanza, S. Fabozzi, G. Graditi, M. Valenti (Italy)

The role of protection systems in Smart Grids: the Protection Automation and Control application
G. Ferruzzi, V. Palladino, G. Adinolfi, M. Valenti, G. Graditi (Italy)

Secure short-term load forecasting for smart grids with transformer based federated learning
J. Sievers, T. Blank (Germany)

Multivariate Multi-step Forecasting for Cable Pooling Applications
F. Aksanb, P. Janika, V. Suresh (Poland)

10:40 *Coffee Break*

11:00 **INNOVATIVE POWER CONVERSION SYSTEMS FOR PV AND BATTERY INTEGRATION**
Chairmen: A. Barrado, University Carlos III of Madrid (Spain)
L. Palma, University of Concepción (Chile)

Harmonic current control in symmetrical components for electronic grid regulator
J. Kortenbruck, T. Premgamone, E. Ortjohann, D. Holtschulte, A. Schmelter, S. Loanka, J. Andreas (Germany)

Comparative Analysis of Three Phase Hybrid Transformerless Inverters for PV applications
A. Kumar, S. Ramasamy, M. Losito, G. Gatto (Italy, India)

An Open-End Winding Wind Generator with Integrated Energy Storage
S. Foti, A. Testa, R. Testa, O. Giordano, G. Baia (Italy)

Advanced Control Analysis of Single Inductor Four Switch Non-Inverting Buck-Boost Converter for Energy Storage Units
A. Ur Rahman, N. Campagna, A. O. Di Tommaso, R. Miceli, A. Damiano, A. Floris (Italy)

Voltage and Current Source Modular Multilevel Converters Comparison for PV Integration
M. Barresi, L. Piegari, R. Scalabrin (Italy)

An Efficiency-based Assessment Study to Allocate Second Life Battery Packs in a Grid-connected Modular Multilevel Converter
M. Barresi, D. del Giudice, D. De Simone, R. Souza Baquero (Italy)

13:00 ***Closing Remarks***

13:10 *Lunch*

9:00 **GRID INTEGRATION OF RENEWABLE SOURCES**
Chairmen: J. Jatskevich, University of British Columbia (Canada)
E. Ortjohann, University of South Westfalia (Germany)

Revisiting the Synchronous Reference Frame Phase-Locked Loop from a System Theory Point of View
B. Hammer (Germany)

Cable Pooling for Extending the Share of Renewable PV and Wind Generation - a Regional Perspective
Y. Li, P. Janik, H. Schwarz (Germany, Poland)

Experimental Assessment of Data-driven Methods for Detecting Wind Power Ramps
F. De Caro, D. Astolfi, A. Vaccaro (Italy)

Performance estimation of voltage control with distributed generation
C. Ventura, G. M. Tina, G. Maione, G. Jiménez Castillo (Italy, Spain)

Comparison of Frequency Domain Modelling Techniques for Assessing the Harmonic Emissions of Low Voltage Photovoltaic Plants
A. Bracale, A. J. Collin, M. Ishaq, R. Langella (Italy)

10:40 *Coffee Break*

11:00 **GRID INTEGRATION OF RENEWABLE SOURCES**
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Chairmen: S. Grillo, Politecnico di Milano (Italy)
R. Langella, Università della Campania "Luigi Vanvitelli" (Italy)

Admittance-Based Modeling of Grid-Following Converters for Time-Domain Simulations of Multi-Converter Electrical Power Systems
A. Safavizadeh, T. Vahabzadeh, S.Ebrahimi, J. Jatskevich (Canada)

Multifunctional Energy and Power Server
J. Kortenbruck, E. Ortjohann, T. Premgamone, D. Holtschulte, A. Schmelter, S. Loanka, J. Andreas (Germany)

Impact of DC power on the small signal characteristics of single-phase photovoltaic inverters in frequency domain
E. Kaufhold, S. Müller, J. Meyer, J. Myrzik, P. Schegner (Germany)

DC Microgrid for Power Sharing Model: Control Techniques Analysis
F. Oliva, S. Negri, C. Moscatiello, L. Martirano, R. Faranda (Italy)

Dynamic Analysis of Future Scenarios of Power Systems Dominated by Inverter-Based Renewable Resources
G. Maione, P. Morey, M. Carpita, M. Bozorg, G. M. Tina (Italy, Switzerland)

The role of digitalization in planning and operation of microgrids in emerging countries
A. Dimovski, E. Ragaini, J. Barbieri, I. Sangiorgio, L.M.F. Albertini, M. Aghahadi, M. Mauri, R. Mereu, M. Merlo (Italy, Uganda)

13:10 *Lunch*