GENERAL INFORMATION

TECHNICAL PROGRAM

The conference opens on Tuesday, June 24 and closes on Thursday, June 26, 2025. The contributions will be presented orally by the Authors (about 15 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 24, by Terna and on Wednesday, June 25, by ABB.

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 for Monday, June 23 at 19:00.
The Social Dinner is scheduled for Wednesday, June 25 at 20:00.

REGISTRATION DESK

The Registration Desk will operate according to the following schedule:

Monday, June 23	17:00 - 18:30
Tuesday, June 24	8:00 - 13:00 ; 14:30 - 16:30
Wednesday, June 25	8:30 - 13:00 ; 14:30 - 16:30
Thursday, June 26	8:30 - 13:00 ; 14:30 - 16:00

PROGRAM AT A GLANCE

TUESDAY 24th OF JUNE		
	Room A	**Room B**
9:00	Opening session	
9:15	Keynote speech (Terna)	
10:15	Exploring wide bandgap solutions in power electronics applications for renewable energy systems	Emerging trends in power electronics and drives for low- and zero-emission transport Integration of electric vehicles
11:15	*Coffee Break*	
11:30	Decarbonisation of buildings	Innovative methods and tools for urban district decarbonisation based on the energy community paradigm
13:00	*Lunch*	
14:30	Generators for renewable power sources	Power conversion systems for renewable power sources
Poster Area		
16:30	Poster Session 1	
WEDNESDAY 25th OF JUNE		
9:00	Keynote speech (ABB)	
10:00	Wind power generation and wind farms	Energy storage for renewable power sources
11:30	*Coffee Break*	
11:50	Advances in isolated power converters for renewable grid integration	Energy storage for renewable power sources
13:15	*Lunch*	
14:30	Round table on project funded by the EU on Clean Electrical Power	
Poster Area		
16:30	Poster Session 2	
THURSDAY 26th OF JUNE		
9:00	Solar photovoltaic power generation	Wind power generation and energy storage systems
11:00	*Coffee Break*	
11:30	Real-time monitoring and predictive maintenance for renewable energy generation systems	Artificial intelligence solutions for efficient conversion, storage and harvesting of photovoltaic energy
13:15	*Lunch*	
14:30	Control, components, and protections for power system's stability	Microgrids and energy storage systems
16:35	***Closing remarks and end of conference***	

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

9:15 **KEYNOTE SPEECH:**

Challenges and Solutions of Power Grids with significant penetration of renewable power sources.
Massimo Petrini, Chiara Vergine, Pierluigi Zanni (Terna)

10:15 *Coffee Break*

10:30 **EXPLORING WIDE BANDGAP SOLUTIONS IN POWER ELECTRONICS APPLICATIONS FOR RENEWABLE ENERGY SYSTEMS**
Chairpersons: S. Foti, University of Messina (Italy)
L. Vancini, University of Bologna (Italy)

Energy Purchase Optimization for Microgrid Systems Using Deep-Q Learning
Md. M. Rahman, Md M. Hasan, Y. Suleymanov, S. Dadon, S. Saha, T. T. Suki (USA, Bangladesh)

Estimation of Equivalent Capacitance in Three-Level NPC Inverter SiC-Based
L. Vancini, G. Rizzoli, M. Mengoni, S. Foti, A. Testa, L. Zarri (Italy)

A 36-kV 12-Mvar T-STATCOM Based on Mixed Si-WBG Open End Winding Multilevel Converter
S. Foti, G. Baia, H.H. Khan, A. Testa, M. Emanuele (Italy)

Performance Assessment of ISOP LLC with Buck-Boost Post-Regulation and ISOP LLC-DAB
A. Volpini, G. Tresca, F. Gemma, P. Zanchetta (Italy)

11:30 **DECARBONISATION OF BUILDINGS**
Chairpersons: A.Kuperman, Ben-Gurion University of the Negev (Israel)
R. Faranda, Politecnico di Milano (Italy)

Analysis of Strategies for the Optimization and Maintenance of the Geothermal Potential Resources in a Spa Hotel
P. Barandier, A. J. Marques Cardoso, V. Cavaleiro (Portugal)

Analysis of Greenhouse Gas Emissions Reduction Potential with Alternative Refrigerants for the Retrofit of Heat Pumps with Hydrofluorocarbons
P. Barandier, A. J. Marques Cardoso (Portugal)

Building energy retrofit: a multi-technology and low-impact renovation package
H. E. Huerto-Cardenas, N. Aste, C. Del Pero, F. Leonforte, F. Asvad (Italy)

Enhancing carbon accounting methods for energy efficiency measures in buildings— A case study
M. Manfren, F. Leonforte, N. Aste, H. Huerto, C. Del Pero, G. Paganin (Italy)

Decarbonisation and electrification of the building stock according to the EPBD IV: from expense to investment
N. Aste, C. Del Pero, F. Leonforte, H. E. Huerto-Cardenas (Italy)

13:00 *Lunch*

14:30 **GENERATORS FOR RENEWABLE POWER SOURCES**
Chairpersons: **A. J. Cardoso, University of Beira Interior (Portugal)**
R. Miceli, University of Palermo (Italy)

Cost-effective PMSM for Application in Small-Scale Wind Generators
G. Dajaku (Germany)

Development and analysis of the multi-phase brushless doubly-fed induction generator for wind generation system
R.Ryndzionek, F. Kutt, K.Blecharz, M. Michna, M. Morawiec (Poland)

A Novel Sliding Mode Control for the Speed Regulation in Permanent Magnet Synchronous Generators
L. P. Savastio, E. Brescia, P.R. Massenio, F. De Musso, M. Tipaldi, G. Maulà, G. Amato, F. Cupertino (Italy)

Design, Fabrication and Testing of an Axial Magnetic Coupler for High Speed Applications
A. Sahm, R. Hurt, G. Moreno, Z. Thelen, J.Florez-Arellano, Y. Baghzouz (USA)

The Damper Cage in Synchronous Generators with Hybrid Permanent Magnet for Hydropower Applications
E. Poskovic, A. Lucco Borlera, L. Ferraris, S. Vaschetto, A. Tenconi (Italy)

Power Extraction for Free Piston Linear Generator
E. Mostacciuolo, S. Baccari, L. Rubino, L.Iannelli, C. Beatrice, C. Capasso, F. Capuano, R. Saviano, O. Veneri, D. Liuzza, F. Vasca (Italy)

Variable Flux Reluctance Generator: Analysis, Design and Comparison
N. Bianchi (Italy)

10:30 **EMERGING TRENDS IN POWER ELECTRONICS AND DRIVES FOR LOW- AND ZERO-EMISSION TRANSPORT INTEGRATION OF ELECTRIC VEHICLES**
Chairpersons: K. Tanaka, University of Tokyo (Japan)
L. Cristaldi, Politecnico di Milano (Italy)

Regional Principal Component Analysis of BEV Uptake in Italy
F. Silvestri, M. Longo, D. Zaninelli (Italy)

Integrating Supercapacitors with Diesel Engines for Transient Power Delivery to Marine Propellers
O. Omotoso, A. Ashraf, P. Weston, P. Tricoli (UK)

A Review of Modular Converter Designs for MW Level Charging of Heavy-Duty Electric Vehicles
A. Topkil, M. Taha, A. Walker, A.H. Malik, J.O. Gonzalez (UK)

Probabilistic Assessment of Voltage Unbalance Caused by Single-phase Electric Vehicles
I. Mexis, E. Lavopa, G. Todeschini (UK)

11:30 **INNOVATIVE METHODS AND TOOLS FOR URBAN DISTRICT DECARBONISATION BASED ON THE ENERGY COMMUNITY PARADIGM**
Chairpersons: D. Gladwin, Sheffield University of Sheffield (UK)
L. Martirano, Sapienza University of Rome (Italy)

Power Purchase Agreements Portfolio Optimisation to address Residual Demand in Energy Communities
G. Taromboli, G. Iuculano, G. Bellone, A. Minieri, F.D. Minuto, C. Del Pero, V. Emiliani, F. Bovera (Italy)

User-Friendly Digital Solution for Charging Stations
S. Borgosano, M. Curatolo, F. Viola, R. Miceli, S. Leva, M. Longo (Italy)

The impacts of energy community members` willingness to adapt their energy behavior: economic, environmental and social perspectives
P. Lazzeroni, L. Giaccone, G. Lorenti, A. Canova, M. Repetto (Italy)

Investigating the Efficacy of Transmission-level Stochastic Hosting Capacity Assessment Methods
Richard A. Knipe, Chantelle Y. van Staden, Munyaradzi J. Chihota (South Africa)

Evaluating compensation for flexibility providers in the South African Wholesale Electricity Market
M.K. Mupazviriho, A. Dalton, B. Bekker (South Africa)

13:00 *Lunch*

14:30 **POWER CONVERSION SYSTEMS FOR RENEWABLE POWER SOURCES**
Chairpersons: H. Fechtner, University of Wuppertal (Germany)
A. Damiano, University of Cagliari (Italy)

Simplified average-dynamical models of a new family of modular multilevel Converters
N. Toscani, M. Benvenuti, M. Grandi, F. Castelli Dezza, V. Agnetta, M. Amatruda (Italy)

Performance Evaluation for Advanced Two-Phase Cooling for Power Electronic Converters
L. Bellomo, G. Marini, M. di Benedetto, A. Lidozzi, L. Solero (Italy)

Performance optimization of power MOSFETs in SMT top-side-cooling packages by system design
Severin Kampl (Austria)

Efficiency and Economic Analysis of Open-End Winding Converter for Renewable Energy Systems Using Hybrid Silicon-Wide Bandgap Devices
S. Foti, G. Baia, D. Campagna, A. Testa, S. De Caro (Italy)

Current Distortion Mitigation in Grid-Connected Three Phase NPC Converter in Presence of Grid Harmonic Voltage Pollution
M. Boi, G. Bossi, A. Damiano (Italy)

A 13-level Converter based on WBG devices for Electric Machine Emulation
S. Foti, G. Rizzoli, G. Ruggeri, G. Baia, S. De Caro, L. Vancini, A. Testa (Italy)

Improved Cross-Regulation for Multi-Output Flyback Converters
P. Granello, L. Schirone, F. Pellitteri, M. Caruso, R. Miceli (Italy)

A High Efficiency Si/SiC Inverter for PV Generators
S. Foti, G. Baia, D. Campagna, A. Testa, G. Scelba, L.D. Tornello (Italy)

16:30 **POSTER SESSION 1**

Low-Cost Electrochemical Impedance Spectroscopy (EIS) Using an Open-Loop DC-DC Converter for Fuel Cells Application
P. Andrade, A. N. Alcaso, A. J. Marques Cardoso (Portugal)

Energy audit of office buildings in remote areas of developing countries
F. Serra, C. Del Pero, F. Leonforte, G. Cavo, R. Del Citto (Italy)

Design and Energy Management of an Electric Marine Eco Unmanned Surface Vehicle
F. Scamardella, M. Penta, M. Acanfora, M. Altosole, F. Balsamo, A. Del Pizzo, N. Ianniello, D. Iannuzzi, P. Marsilia, G. Rufino, V. Sorrentino, L. Vitiello (Italy)

Optimized Control and Modeling of a Multi-Level Inverter with PSO MPPT for Enhanced Grid Integration of PV Systems
S. Youcef, M. Masafumi (Japan)

Rotary capacitive wireless power and signal transfers for sensing applications onboard trains
N. Toscani, M. Mauri, M.S. Carmeli, F. Castelli Dezza (Italy)

Residual Heat Recovery for Hydrogen and Oxygen Production
F. Ferreira de Souza Campos, E. Martins Leal, R. Rocha (Brazil)

Energy Efficient Management of Collaborative Robots using Data-Driven Models
V. Vodovozov, Z. Raud (Estonia)

Sensorless Control of a Stand-Alone Five-phase Doubly Fed Induction Generator
M. Morawiec, K. Blecharz, R. Ryndzionek (Poland)

Green Infrastructure Development in Azerbaijan (Karabakh)
I. Yagubova, S. Talishinskaya (Azerbaijan)

Optimizing Costs and Emissions in Electric Fleet Management
S. Borgosano, J. Brazzoduro, M. Longo (Italy)

Optimizing Rail System Costs with Electric Bus Integration and Carbon Management Strategies
B. Prencuva, E. Taş, S. Asadi, O. Erdinc (Turkey, USA)

Data-Driven Analysis of Wind Curtailment and Distributed Generation in Brazil
W. N. Silva, G.G.T. Vieira, L.F.C. Simone, L.F.N. Lourenço, M.B.C. Salles (Brazil)

Power Quality at Railway Traction Substations in Ukraine and Its Role in Power System Stability
D. Bosyi, A. Antonov, D. Zemskyi, M. Barresi, V. Mazorchuk (Ukraine, Italy)

Thermochemical Analysis of Maximizing Hydrogen Production from Biogas Through Thermal Decomposition
O. Zhevzyk, I. Potapchuk, D. Bosyi, L. Castro-Santos, A. Reznyk, D. Holenko, (Ukraine, Spain)

Analyzing the Relationship Between Minimum THD and Nearest Level Waveforms in Multilevel Inverters
A. Ghasemian, S. Mohamadian, C. Buccella, C. Cecati (Italy)

A Comprehensive Review of Driving Cycles for Electrical Light Duty Vehicles
A. Afass, B. Lamrani, S. Landini, M. A. Tankari, M. Karkri, T. Kousksou (Morocco, France, UK)

Battery excitation for impedance measurement through innovative DC-DC setup and related control technique for EVs
S. Foti, G. Baia, N. Nassik, S. De Caro, E. Vasta, F. Bonaccorso (Italy)

Simplified design of a stand-alone photovoltaic generation system in a sub-Saharan farm
N. Toscani, M. Benvenuti, A. Cavallo, G. Tomasini, F. Castelli Dezza (Italy)

Power Electronic Concept for Thermoelectric Energy Generation
R. Mecke, P. Kußmann (Germany)

Multi-Criteria Indicators for the Evaluation of Renewable Energy Community
A. Dimovski, C. M. Caminiti, G. Rancilio, M. Ricci, B. Di Pietra, M. Merlo (Italy)

Stochastic Load Simulations Depending on Bias-corrected Climate Projections
G. Ceresa, A. Trevisiol, M.R. Rapizza (Italy)

Performance Analysis of Back-to-Back Converter for Offshore Wind Energy Systems Using GaN-HEMTs
S. Ramasamy, A. Kumar, M. Losito, G. Gatto (Italy)

Generation of Household Electricity Demand Data Using Diffusion Models
D. Sagawa, K. Tanaka (Japan)

Comparative Analysis of PEM Cells Under Different Operating Conditions
N. Mellado, A. Benevieri, C. Carrasco, M. Marchesoni, L. Morán, L. Vaccaro (Italy)

Evaluating the Effectiveness of Brazil's Demand Response Program: Operational and Economic Insights
G. O. A. de Lima, G. T. T. Vieira, W.N. Silva, M.B.C. Salles (Brazil)

Methodology for Calculating DG Penetration Using Time Series Analysis
L.O. Martins, G.T.T. Vieira, W.N. Silva, L.N. Lourenco, M.B.C. Salles (Brazil)

Expansion of Distributed Generation and its Impacts on the Tariff Design of

Electricity Distribution
L.F.C. Simone, W.N. Silva, G.T.T. Vieira, M.B.C. Salles (Brazil)

Hybrid Energy Storage Systems for Plug-in Fuel Cell Electric Vehicle
S. Cosso, A. Benevieri, M. Passalacqua, L. Vaccaro, A. Formentini, M. Marchesoni (Italy)

Enhanced-NN Digital Twin for Parameters Identification of a DC-DC Boost Converter
G. Di Nezio, G. Marini, M. di Benedetto, A. Lidozzi, L. Solero (Italy)

Numerical analysis of a PEM fuel cell fed by a steam reformer integrated into an internal combustion engine
M. Palomba, M.C. Cameretti, L.P. Di Noia (Italy)

Users' and Prosumers' Baseline for Local Flexibility Markets: a Comparative Assessment of Traditional and Machine-learning Techniques Applied to Smart Meters Data
F. Leonardi, A. Bosisio, E. Daccò, A. Cirocco, A. Vannoni, D. Raggini (Italy)

Radial vs. Ring Configurations in the Electrical Design of the Merganser Offshore Solar Project
C. Fernández Blanco, D. Fernández Mira, L. Castro Santos, L. Piegari, A. Filgueira Vizoso (Spain, Italy)

A general view of floating offshore solar PV energy
D. Fernández Mira, C. Fernández Blanco, R. Doporto Regueiro, L. Piegari, A. Filgueira Vizoso (Spain, Italy)

Analysis of pro-rata versus a merit order aFRR activation approach for the Italian power system
S. Canevese, D. Cirio, A. Gatti (Italy)

Type-Z and Type-Y Representation of Grid-Forming Converters: a Preliminary Analysis
E. Fedele, A. Di Pasquale, M. Carpita, R. Rizzo (Italy, Switzerland)

Trade off procedure to Optimize Geometrical parameters of a Magnetic Gearbox
A. Amoresano, L.P. Di Noia, S. Roscioli, M. Barrasso (Italy)

Detailed versus aggregated modeling in energy community operation optimization
G. Lorenti, P. Lazzeroni, M. Repetto (Italy)

9:00 **KEYNOTE SPEECH:**
Enabling the Energy Transition: The Strategic Role of the Electric Network from an Industry Perspective
Paolo Perani (Sustainability Manager ELDS Division, ABB*)*

10:00 **WIND POWER GENERATION AND WIND FARMS**
Chairpersons: Y. Baghzouz, University of Nevada (USA)
R. Langella, University of Campania "Luigi Vanvitelli" (Italy)

Two Strategies for Reactive Power Partitioning in a Wind Farm to Satisfy the TSO Requirements and Assessment of Distribution Line Losses
A. Ciocia, G. Malgaroli, M. L. Travaglini, G. Chicco, F. Spertino (Italy)

Assessment of Constrained-Off in Renewable Energy Integration in Brazil
G.T.T. Vieira, W.N. Silva, M.B.C. Salles, L.F.N. Lourenço (Brazil)

On the Aggregated Emission of Large-Scale Wind Farms for Harmonic Studies
A. Bracale, P. Caramia, R. Langella, I. Natriello, P. Verde, P. Varilone (Italy)

Economic Modeling of Offshore Wind Farm Projects in Brazil's Energy Market
A. G. Rabelo de Almeida, M. B. C. Salles (Brazil)

Impact analysis of supplementing solar generation sites with additional wind generation considering grid connection delays
A. J. Hutchinson, D. T. Gladwin, S. Eardley, J. Radcliffe, T. S. Bryden, D. J. Rogers, A. Alahyari, S. Wang, C. Patsios, H. Yan, A. Forsyth (UK)

Grid Code Reactive Power Capability Requirement Achievement for Off-shore Wind Farms
G. Tricarico, F. Marasciuolo, G. Forte, F. Gonzalez-Longatt, M. Dicorato (Italy, UK)

11:30 *Coffee Break*

11:50 **ADVANCES IN ISOLATED POWER CONVERTERS FOR RENEWABLE GRID INTEGRATION**
Chairpersons: A. Chub, Tallin University of Technology (Estonia)
P. Zanchetta, University of Pavia (Italy)

Power Controllability of Active Magnetic Energy Harvesters Operating Under High Primary Currents
Y. Ditkovich, M. Shvartsas, A. Kuperman (Israel)

Analysis of a Capacitively Isolated Inverter
P. Granello, L. Schirone, F. Frequente, F. Pellitteri, R. Miceli (Italy)

Power Factor Correction for DC-Powered Buildings Using an Isolated AC-DC Interlinking Converter: Experimental Validation and Comparative Analysis
E.L. Carvalho, R. Mandrioli, A. Chub, D. Vinnikov, (Estonia, Italy)

Enabling Talkative Power Conversion in Asymmetrical Bidirectional DC/DC using Cycle Skipping Technique
L.K. Pittala, J. Geng, E. L. Carvalho, A. Chub, S. N. Banavath, D. Vinnikov, M. Ricco, R. Mandrioli (Italy, Estonia, India)

Modular Multilevel Converter with Interleaved Submodule based on Current-Fed Dual Active Bridge
M. Barresi, R. Mandrioli, M. Ricco, S. Grillo (Italy)

13:15 *Lunch*

14:30 **ROUND TABLE ON PROJECT FUNDED BY THE EU ON CLEAN ELECTRICAL POWER**

Laura Castro Santos – European energy efficiency towards mutually reinforcing partnership with Georgia, Azerbaijan and Ukraine (3E Partnership) ERASMUS-EDU-2023-CBHE-STRAND-2 – Project number: 101128576

Marco Raugi – Network for energy sustainable transition (NEST) Spoke 8 "Optimization, sustainability & resilience in energy supply chain" National Recovery and Resilience Plan (NRRP), Mission 4, Component 2, Investment 1.3 – Project number: PE0000021

Niccolò Aste – Renewable and environmental-sustainable kit for building integration (RE-SKIN) HORIZON-CL5-2021-D4-02 – Project number: 101079957

Pietro Tricoli – Vessel advanced clustered and coordinated energy storage systems (V-ACCESS) HORIZON-CL5-2022-D5-01-02 – Project number: 101096831

Pietro Tricoli – Scalable, plug & play and modular dc power systems for low emission large vessels (ALL-DC-SHIPS) HORIZON-CL5-2024-D5-01-14 – Project number: 101192732

Samuele Grillo – AI-informed holistic electric vehicles (AHEAD) HORIZON-CL5-2023-D3-03 – Project number: 101160665

Andrii Chub – Shift to Direct Current (SHIFT2DC) HORIZON-CL5-2023-D3-01-11 – Project number: 101136131

10:00 **ENERGY STORAGE FOR RENEWABLE POWER SOURCES**
Chairpersons: D. Vinnikov, Tallin University of Technology (Estonia)
N. Bianchi, University of Padova (Italy)

Seasonal Energy Storage to Support South Africa's Energy Transition
T. Vivier, C. Auret, B. Bekker (South Africa)

Second Life Batteries for Grid Decarbonization: a Data Analysis for Their Future Availability
E. Strianese, V. Calderaro, V. Galdi, G. Graber, S. Sabatino, L. Ippolito (Italy)

Battery Arbitrage to mitigate Brazilian Curtailment due to electrical reasons
G.T.T. Vieira, W.N. Silva, M.B.C. Salles, L.F.N. Lourenco, R.M. Monaro (Brazil)

Optimizing the Size of Second-Life Batteries for Grid Storage Applications Using a Residual Load Tool
M. Boya, K. Tekaya, A. Popp, H. Fechtner, B. Schmuelling (Germany)

A Scenario-Based Analysis of the Availability, Demand, and Application of Second-Life Batteries in Germany for 2030 and 2035
H. Fechtner, J. Martini, B. Schmuelling (Germany)

Energy Storage Requirements for Achieving Climate Neutrality: An Italian Case Study
A. Barisione, S. Colnago, S.A. Cordieri (Italy)

11:30 *Coffee Break*

11:50 **ENERGY STORAGE FOR RENEWABLE POWER SOURCES**
Chairpersons: J. Bird, Portland State University (USA)
P. De Falco, University Parthenope (Italy)

Characterization of LTO Batteries and Active Balancing Modes for Energy Storage Systems of Rolling Stock Operating Non-Electrified Lines
S. Sabatino, G. Graber, V. Calderaro, V. Galdi (Italy)

An Innovative Transformer-Based Approach for State of Health Trajectory Prediction and Remaining Useful Life Estimation in Lithium-Ion Batteries
M. Bellomo, F. Grimaccia, A. Dolara (Italy)

A Framework for Energy Storage Modelling in Real-Time Applications
T.S. Bryden, D.J. Rogers, A.J. Hutchinson, D.T. Gladwin, S. Eardley, J. Radcliffe, A.Alahyari, S. Wang, H. Yan, A. J. Forsyth (UK)

State of health assessment of Li-ion batteries using a multiple linear regression Model
R. Merolla, W. Zamboni (Italy)

13:15 *Lunch*

16:20 **POSTER SESSION 2**

A Comprehensive Energy Management Tool for Renewable Energy Communities: Modeling PV Production, Building Demand, and Shiftable DHW Scenarios
A. Minieri, C. Di Tuccio, L. Caravetta, G. Taromboli, V. Emiliani, F. Bovera, C. Del Pero, F.D. Minuto (Italy)

Long-term scenario generation of heterogeneous random variables based on Markov chains for smart road tunnels planning
A. Bracale, P. Caramia, E. Carpaneto, P. De Falco, A. Russo (Italy)

An overview of floating solar PV energy in onshore waters
R. Doporto Regueiro, D.F. Mira, C. Fernández Blanco, M.Á. Graña López, A. Filgueira Vizoso (Spain)

Economic feasibility of floating solar PV energy in the Canary Islands
D. Cordal Iglesias, C. Fernández Blanco, A. I. García Diez, L. Castro Santos (Spain)

Three-phase unbalanced power flow to deploy line voltage regulators in RES-rich distribution feeders: a real case study in Milano, Italy
MD R. Islam, Alessandro Bosisio, C. Bovo, A. Cirocco, A. Ruffini, C. Malinverno (Italy)

A Contra-Rotating Magnetically Geared Thruster
C. Bruce, Ho-Yin D. Wong, W. Baker, J. Bird, B. Dechant, P. Emami (USA)

Exploring The Methods and Future Directions of Direct Electrical Energy Storage Systems: A Systematic Review
M. Boya, K. Tekaya, U. Spaeth, B. Schmuelling (Germany)

Reevaluating Converter Control Functionality through a Unified Integral Control Framework
E. Enge, V. Førland, C. Shah, M. Molinas, S. Føyen (Norway)

Techno-Environmental Assessment of Photovoltaic-Powered Charging Stations for Light Electric Vehicles
M. Pasetti, A. Vasile, D. Astolfi, S. Dello Iacono, E. Sisinni, M. Gaffurini, P. Ferrari, S. Rinaldi (Italy)

Comparative Analysis of Three-Winding High-Frequency Transformer Parameter Estimation Methodologies
G. Bossi, A. Arshad, A. Damiano (Italy)

Biomass Energy: A Sustainable Pathway to Energy Independence
M.S. Alshammari (Saudi Arabia)

Cost allocation of reactive power considering generator consumption
M. Chiandone, M Olivo, A.A. Tavagnutti, M. Dalle Feste, R. Vergine, G. Sulligoi (Italy)

Gradient Boosting Algorithms for Day-ahead Residential Load Forecasting of Individual Household
M. Saleptsis, M. Mussetta, S. Leva (Italy)

Parallel Connection of Low-Voltage GaN FET for High-Current Power Converters
S. Musumeci, V. Barba, F. Stella, M. Palma (Italy)

Optimal Sizing and Management of Hybrid Storage System for an Electric Urban Bus Under Real Operating Conditions
N. Campagna, C. Capasso, R. Miceli, I. Falco, A. Ur Rahman, B.M. Vaglieco, O. Veneri (Italy)

Analyzing Failure Severity and Trends in Italian Power Grid Transmission Lines
L. Martiri, A. Moschetti, C. Laurano, L. Cristaldi, S. Toscani, M. Faifer (Italy)

A Data Preparation Pipeline for the Analysis of the Italian Power Grid Reliability
A. Moschetti, L. Martiri, C. Laurano, L. Cristaldi, D. Martinenghi, M. Faifer (Italy)

Power-Based Indices with Single Metering Sections for Responsibility Assessment of Disturbing Loads
P. Kuwalek, A. Bracale, P. Caramia, G. Carpinelli (Italy, Poland)

Performance analysis of a novel agrivoltaics system with bifacial PV and solar Tracking
A. Riccobono, G. Buffa, C. Chiaruzzi, V. Di Dio, S. Guarino, V. Lo Brano (Italy)

Inverse Open Circuit Voltage Curve Modeling for Lithium Cobalt Oxide Batteries at Different Cycle Aging Levels
S. Barcellona, S. Colnago, L. Codecasa (Italy)

Experimental Setup for Tensile Characterization of Magnetoelastic Samples for Energy Harvesting
M. Balato, A. Liccardo, C. Petrarca, C. Visone (Italy)

A Comparative Analysis of Modulation Strategies for Electrical Drives Fed by Asymmetrical Multilevel Inverters
G. Frequente, M. Caruso, L. Curcio, P. Granello, F. Pellitteri, G. Scaglione, G. Schettino, L. Schirone, R. Miceli (Italy)

Fault-Tolerant Control Strategy for Multiphase Induction Motor Drives under Open-Phase Fault Conditions
S. Pollaccia, M. Caruso, A.O. Di Tommaso, P. Granello, L. Schirone, R. Miceli (Italy)

The Value of Information of the transition to sustainable mobility systems
C. Muriana, R. Miceli, G. Aiello (Italy)

A Novel Algorithm for Finite Control Set Motion Predictive Control of PMSM
C. Attaianese, A. Dannier, G. Brando (Italy)

A Practical and Feasible Procedure for Synchronous Machine Parameters Estimation
G.M. Giannuzzi, G. Giannoccaro, D. Lauria (Italy)

Public Perception and Acceptance of Floating Offshore Wind Energy in Sardinia
G. Mereu, G. Mura, M. Scano, C. Sechi, D. Tendas, E. Ghiani (Italy)

Implementing Smart Readiness in existing buildings: the RE-SKIN project case Study
N. Aste, C. Del Pero, F. Leonforte, H. E. Huerto Cardenas (Italy)

Renewable hydrogen production from reverse power flows in the Maltese medium voltage distribution network
P. Gallo, J. Licari, F. Massaro, A. Micallef, S. Ruffino, C. Spiteri Staines (Malta, Italy)

A Power Sharing Model Prototype for PV Splitting Power in a Residential Building
R. Loggia, C. Moscatiello, L. Martirano (Italy)

Fault-Tolerant Control of a Single-Phase Bidirectional Dual Active Bridge DC–DC Converter
P. Kumar, A. Arzani, S.M. Mahajan (USA)

Renewable Energy Communities in Italy: proposal and optimisation of a case Study
M. Buzzetti, F. Leonforte, R.S. Adhikari, S. Tolazzi, C. Del Pero (Italy)

Internal Power Exchange for Harmonic Reduction in Modular Multilevel Current Source Converters
M. Barresi, R. Scalabrin, L. Piegari, A. Possa (Italy)

Supercapacitor Modeling from Cell to Module Level via Robust Single-Test Parameter Identification
C. Terlizzi, D. De Simone, A. Aleksic, S. Marín-Coca, J. González-Monge (Italy, Spain)

A Forecast-Driven Energy Management Methodology for Microgrids under Seasonal Variability
H. Noriega, R. Lazzari, A. Benigni, L. Piegari (Italy, Germany)

Detailed small–signal stability analysis of the Cigré high–voltage network penetrated by grid–following inverter–based resources
F. Conte, F. Mancilla-David, A. Sagar, C. Li, F. Silvestro, S. Grillo (Italy)

9:00 **SOLAR PHOTOVOLTAIC POWER GENERATION**

Chairpersons: P. Janik, Wrocław University of Science and Technology (Poland)
V. Di Dio, University of Palermo (Italy)

Short-Term Solar PV Power Forecasting: A Comparative Analysis of Neural Network Optimization Techniques
S. Dhingra, G. Gruosso, G. Storti Gajani, (Italy)

Energy Performance Analysis Of Crystalline and Thin-film Solar Modules: A UK Case Study
O. Olayiwola, S.O. EnochOghene (UK, Nigeria)

Parametric Identification of the Dynamic Photovoltaic Model by a Physics-Informed Neural Network
N. Shamsmohammadi, G. Spagnuolo (Italy)

Developing Digital Twins for Photovoltaic Systems: A Roadmap for Integration and Optimization
D.K.M. Idris, C. S. Martis, R. Birasa (Romania)

Visualising the Effect of Degradation within a Utility-Scale Photovoltaic Plant
N. Bekker, R. Strydom, A. J. Rix (South Africa)

Multiplicative Seasonality Prophet Model for PV Energy Forecasting and Anomaly Detection
S. Guarino, A. Buscemi, V. Di Dio, V. Lo Brano (Italy)

A Novel ML Approach for Real-Time Prediction of PV Production: Detection and Impact of Shading
A. Buscemi, S. Guarino, V. Di Dio, V. Lo Brano, M. Bonomolo, C. Baglivo (Italy)

Hot Spot Mitigation in PV Modules Using an Enhanced Zener-Based Dynamic Bypass Circuit
G. Saggese, M. De Riso, P. Guerriero, S. Daliento (Italy)

11:00 *Coffee Break*

11:30 **REAL-TIME MONITORING AND PREDICTIVE MAINTENANCE FOR RENEWABLE ENERGY GENERATION SYSTEMS**

Chairpersons: M.B.C. Salles, University of San Paulo (Brazil)
R. V. Rocha, Federal University of Mato Grosso (Brazil)

Detection and Phase Identification of Interturn Faults in the Stator and Rotor of Doubly-Fed Induction Generators Using Negative-Sequence Currents

R. V. Rocha, R.N. Tominaga, S. L. Avila, B. S. Carmo, R. M. Monaro, M.B.C. Salles (Brazil)

Simulation-Based Neural Network for Robust Short-Circuit Detection in Wind Turbines
R.N. Tominaga, R. V. Rocha, S. L. Avila, R. M. Monaro, M.B.C. Salles, B. S. Carmo (Brazil)

Short-Circuit Phase Detection in Wind Turbines Using Subtle Neural Network Learning
R.N. Tominaga, R. V. Rocha, S. L. Avila, R. M. Monaro, M.B.C. Salles, B. S. Carmo (Brazil)

Detection of Series Resistance Degradation in PV Modules Using Measured Current-Voltage and Frequency-Domain Impedance
L.E. Garcia-Marrero, G. Petrone, E. Monmasson, (Italy, France)

Conceptualization of a Hydro-System Digital Twin for Operational Efficiency Maximization and Predictive Maintenance Support in a RoR Hydro Power Plant
A. Machalski, P. Szulc, D. Błoński, A. Nycz, M. Nemś, J. Skrzypacz, Z. Satława, P. Janik (Poland)

Multiphase Interleaved DC-DC Converters for Impedance Spectroscopy in Photovoltaic Diagnostics: Findings from SPICE Simulations
C. Pavon-Vargas, Y.E. Bouvier, A. Rodriguez-Lorente, J. Vaquero Lopez, G. Petrone (Spain,Italy)

On the shaft voltage to detect faults in wind generators
L. Mantione, F. Muzio, G. De Boni, M. Trombetta, L. Frosini (Italy)

13:15 *Lunch*

14:30 **CONTROL, COMPONENTS, AND PROTECTIONS FOR POWER SYSTEM'S STABILITY**
Chairpersons: G. Todeschini, King's College London (UK)
S. Grillo, Politecnico di Milano (Italy)

Sensitivity Analysis of Resonant Stability in Low-Voltage Distribution Systems with Inverter-Based Resources and Capacitor Banks
Giancarlo C. Prezotto, F. E. N. Morais, Luis F. N. Lourenco, R. M. Monaro (Brazil)

Unveiling Stability Insights of Model Predictive Current Control in Voltage Source Converter through Impedance Analysis
C.R. Shah, M. Molinas, P. R. Bana, S. Føyen, R. Nilsen (Norway, Sweden)

Comparison of Virtual Inertia Support in GFM Inverter-Based Resources with Different DC Sources
M. Cardenas, M. Saviozzi, F. Silvestro, F. Conte, C. Gandolfi, M. Rapizza, (Italy)

Real-time simulation of Grid-Forming inverters as DC/AC interfaces for DC-nanoGrid in grid-connected and islanded AC Microgrids
G. Brusco, D. Menniti, N. Sorrentino, A. Pinnarelli, G. Barone, G. Spena (Italy)

Synchronization Techniques Effect on Series Power Electronic Converter
M.S. Nasiri, A. Fioravanti, F. Oliva, J. Valbuena, A. Prudenzi, R. Faranda (Italy)

Study of the impact of the increasing penetration of renewable energy sources on voltage sags in HV networks
S. Quaia, C. Boscolo, M. Chiandone, A. Vicenzutti, G. Sulligoi (Italy)

DC Microgrids Protection Strategies in Collective Self-Consumption Context
F. Oliva, Julian Valbuena Godoy, Dongmeng Ye, S. Negri, R. Faranda (Italy, China)

16:35 ***Closing Remarks***

9:00 **WIND POWER GENERATION AND ENERGY STORAGE SYSTEMS**
Chairpersons: A. Rix, Stellenbosch University (South Africa)
G. Tricarico, Polytechnic University of Bari (Italy)

Implementation and Evaluation of a Limited-Area Artificial Intelligence Wind Speed Forecasting Model
D. van der Bank, A. Dalton, B. Bekker (South Africa)

Mitigating Wind Power Energy Curtailment through Hydrogen Energy Storage Systems
S. N. Shah, I. B. Renolphi, G. G. T. T. Vieira, Wa. N. Silva, M. B. C. Salles, L. F. N. Lourenço, F. C. Silva, R. C. Perez (Brazil)

Cost-Optimal Operation of Dynamic Wireless Charging Stations for Electric Vehicles Through Predictive Energy Trading and Storage Scheduling
M. Garau, M. Löschenbrand, B.N. Torsæter (Norway)

Coordinated Voltage Control in Distribution Grids Leveraging Local Flexibility and Direct Control of a Large Battery Storage
E. De Din, D. Carta, A. Benigni (Germany)

Frequency Support with Wind Turbines: a Constant Deloading Approach
M. S. A. Alsunjury, B. Ali, A. Ashraf, P. Tricoli (UK)

Analysis of Spatial Aggregation Methods for Representing Regional Wind Power
L.M. Prinsloo, C. Y. van Staden (South Africa)

A Context-Aware Method For Estimating The Performance Decline With Age of A Fleet of Wind Turbines
D. Astolfi, S. Iuliano, A. Vaccaro, A. Vasile, M. Pasetti, D. Vasenin, S. Rinaldi, A. Flammini (Italy)

A Data-Driven Methodology for Strategic Siting of Offshore Wind Farms in South Africa
C. Ridout, C.Y. van Staden, L.M. Prinsloo (South Africa)

11:00 *Coffee Break*

11:30 **ARTIFICIAL INTELLIGENCE SOLUTIONS FOR EFFICIENT CONVERSION, STORAGE AND HARVESTING OF PHOTOVOLTAIC ENERGY**
Chairpersons: E. Belloni, University of Perugia (Italy)
M. Quercio, Roma Tre University (Italy)

State of Charge Estimation Using a Neural Network for a Battery-Powered DC-DC Converter System
F. Corti, M. Intravaia, M. Bindi, G.M. Lozito, L. Becchi, A. Reatti (Italy)

A Two-Level Machine Learning Framework for Managing EV Charging and Renewable Energy Curtailment in Smart Grids
F. N. Esfahani, N. Suri, X. Ma (UK)
Optimization of Wireless Power Transfer Systems in Microsatellites Using Genetic Algorithms
D. Profeta, D. Milillo, L. Sabino, F. Crescimbini, F.Riganti Fulginei (Italy)

Experimental tests and numerical analysis of a bifacial solar PV module for different albedo conditions
E. Belloni, A. Tumiati, J.M. Ul Hassan, A. Faba (Italy)

Regulation of a LCCs resonant converter for photovoltaic applications combining ANN and PI controllers
V. Bertolini, M. Stella, A. Faba, E. Cardelli (Italy)

Smart Energy Management for Industrial Buildings: A Solar and EV Charging Case Study in Malta
M. Quercio, D. Milillo, A. Micallef, F. Riganti Fulginei, J. Licari (Italy, Malta)

Improving the 11-Parameter Model for Photovoltaic Modules via Technology-Driven Refinements
M.J. Ul Hassan, M. Huerta, A. Angulo, E. Belloni, F. Mancilla-David (Italy, Chile, USA)

13:15 *Lunch*

14:30 **MICROGRIDS AND ENERGY STORAGE SYSTEMS**
Chairpersons: C. Heising, Avasition GmbH (Germany)
G. Sulligoi, University of Trieste (Italy)

Enhancing Resilience and Security in Future Networks? A New Strategy for Smart Microgrids
G. Amato, L.P. Savastio, G. Maulà, A. Abdollahi, E.E. De Tuglie, E. Brescia (Italy)

Enhancing Microgrids' Planning: A Decision Support System to Address Unsolved Challenges in Existing Software
N. Musfiq, B.K. Sugumar, N. Anglani (Italy)

Holistic approach for 100% converter-based offgrid hydrogen plant with propietary converter control
J.P. Jacoiste, I. Gude, V. Del Rio, D. Meyer, R. Bartelt, C. Heising (Spain, Germany)

Vehicle-to-Grid and Vehicle-to-Building Systems Integrated in Smart Infrastructures: A Comprehensive Review of Technologies, Challenges and Opportunities.
L. Frattale Mascioli, A. Golino, R. Loggia, A. Bonfiglio, M. Minetti, A.L. Palma, C. Moscatiello, M. C. Falvo, L. Martirano (Italy)

Enhancing the control of aggregated battery storage systems for assisting voltage regulation services on LV feeders with high PV penetration
C. Caruana, M. Hussnain, R. Raute (Malta)

Novel Spatially-Aware LV Electrical Design Tool to support electrification initiatives in urban contexts
A. Dimovski, C.M. Caminiti, E. Ragaini, J. Barbieri, D. Fratelli, M. Merlo (Italy)

Derisking and system stability through consistent automated conformity assessment for software-based, HIL and operational testing
C. Heising, R. Bartelt, D. Meyer, J. Brodmann, C. Heck (Germany)

16:35 ***Closing Remarks***