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Call for Papers for the Special Session on

Artificial Intelligence for Renewables, Storage, and Grid Performance

Organized and co-chaired by

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Technical Outline of the Session and Topics

The large-scale integration of renewable energy sources and energy storage systems is accelerating the transition toward net zero emissions and sustainable power systems, while posing significant challenges to grid performance, power quality, reliability, and operational flexibility. Artificial Intelligence (AI) has emerged as a transformative tool to address these challenges by enabling intelligent forecasting, real-time monitoring, adaptive control, and optimal energy management in complex and data-rich grid environments. This area is of particular interest as AI-driven solutions can effectively manage the uncertainty and variability associated with renewables and storage, enhance grid resilience, improve power quality, and support the reliable operation of future smart grids with high penetration of distributed energy resources and electric mobility.

Topics of the session include, but are not limited to:

- AI and machine learning techniques for renewable energy forecasting and optimization
- Intelligent control and management of energy storage systems
- AI-based power quality monitoring, event detection, and classification
- Grid performance enhancement using deep learning, reinforcement learning, and hybrid AI models
- Smart grid operation with high penetration of renewables and distributed energy resources
- AI-driven fault diagnosis, protection, and predictive maintenance in power systems
- Renewable- and storage-integrated EV charging infrastructure and grid impact mitigation
- Cyber-physical security and resilience enhancement using AI techniques
- AI-based design, optimization, and adaptive control of DC–DC converters and advanced inverter topologies for renewable energy systems

Timeline for Authors

All the instructions for paper submission are available on the conference website. Please visit www.iecon2026.org or scan the QR code for the timeline.