

Call for Papers for the Special Session on

Advances in Energy Management and Hybrid Storage Systems for Electric Vehicle Applications and Renewable Systems Integration

Organizers and Co-chairs

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Technical Outline of the Session and Topics

Advances in energy management and hybrid energy storage systems (HESS) are driving innovation in electric vehicle (EV) applications and renewable systems integration. Energy management systems (EMS) can be improved based on advanced algorithms, AI, and predictive control to optimize battery performance, extend lifecycles, and enhance vehicle-to-grid (V2G) capabilities. Moreover, hybrid energy storage systems, which combine batteries with technologies like supercapacitors and flywheels, address trade-offs between energy density and power density, offering improved performance and flexibility for EVs and renewable energy systems. Furthermore, the integration with renewable sources like solar and wind is facilitated by real-time EMS for demand response, load balancing, and grid stabilization, supported by recent power electronics, IoT connectivity, and cloud-based platforms. While emerging technologies, such as solid-state batteries and blockchain-enabled energy trading, promise transformative benefits, challenges remain in cost, material sustainability, and regulatory frameworks. Unified strategies and interdisciplinary approaches are crucial to overcoming these barriers, paving the way for scalable, efficient, and sustainable energy solutions. This session provides a platform for the exchange of ideas, the presentation of recent research, and the discussion of emerging trends in these critical areas.

Topics of this Special Session Include but are not limited to

- Intelligent energy management strategies for renewable energy systems and EVs.
- Design, model, and optimize hybrid energy storage systems (e.g., batteries, supercapacitors, fuel cells).
- Integration of renewable energy sources into smart grids and microgrids.
- Advanced control techniques for energy distribution and storage optimization.
- Role of artificial intelligence and machine learning in energy management.
- Vehicle-to-grid (V2G) and grid-to-vehicle (G2V) technologies.
- Performance analysis and case studies of hybrid renewable and EV systems.

Timeline for Author

Deadline for submission of special session papers	March 15, 2025
Notification of acceptance	March 31, 2025
Deadline for submission of final manuscripts	April 15, 2025

All the instructions for paper submission are available on the conference website.

