



IEEE Conference on Industrial Cyber-Physical Systems (ICPS)

Perth, Australia, 11-14 May 2026

<https://icps2026.ieee-ies.org/>

Proposal for an ICPS 2026 Special Session

- **Title of the proposed Special Session:**

Power Electronics and Energy Systems for Industrial Cyber-Physical Systems

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- **Technical outline and topics of the special session:**

Industrial Cyber-Physical Systems (ICPS) are reshaping modern industry through the tight integration of energy systems, power electronics, sensing, control, communication, and intelligence. Power electronics and energy technologies are fundamental enablers of electrification, efficiency, resilience, and intelligence in applications such as smart manufacturing, electrified transportation, microgrids, and industrial energy management. This special session focuses on recent advances in power electronics and energy systems within industrial cyber-physical architectures, emphasizing system-level design, control, optimization, intelligent functions, and real-world deployment challenges.

Topics:

- Power electronic converters for industrial CPS
 - Cyber-physical modeling and control of power and energy systems
 - Power electronics for smart factories and Industry 4.0 / 5.0
 - Energy management and optimization in industrial CPS
 - Digital twins for power electronics and energy systems
 - AI-assisted control, diagnostics, and prognostics for power converters
 - Power electronics for electrified transportation and industrial EV infrastructure
 - Microgrids, DC grids, and hybrid AC/DC systems for industrial applications
 - Cybersecurity, reliability, and resilience of energy-centric CPS
 - Wide-bandgap devices (SiC/GaN) in industrial energy systems
 - Wireless power transfer and contactless energy solutions for industrial CPS
 - Standards, validation, and large-scale deployment of industrial energy CPS
- **Technical track(s) with similar topics (clearly point out difference to the Track scope)**

T05 - ICPS Energy: Cyber-Physical Energy System Design and Operation, Renewable Energy, Energy Storage, Power Trains, Electric Vehicles, Microgrid, Smart Grid.
 - **IES Technical Committees supporting the special session (if any)**
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 - The proposers have read and adhere to the overall IEEE IES Special session conditions as shown on the website https://icps2026.ieee-ies.org/for_authors/index.html#call-for-special-sessions: YES