

**Call for Papers for the Special Session on**

**Control of Grid-Forming and Grid-Supporting Power Converters for RES-Based Hybrid AC/DC Critical Energy Infrastructures**

**Organized and co-chaired by**

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**Technical Outline of the Session and Topics**

Critical infrastructures (utility edge networks, data centres, hospitals, defence sites, ports/rail) are rapidly adopting RES-based hybrid AC/DC architectures to improve efficiency, electrify loads, and enhance resilience. Yet their converter-dominated nature makes stability, protection, and power quality challenging, especially under weak grids, islanded operation, fast load steps, and contingencies. This Special Session addresses advanced control of grid-forming and grid-supporting converters, enabling islanded operation and seamless transitions. Emphasis is placed on implementation-ready methods, cyber-physical resilience, and experimental validations.

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

**A. Grid-forming (GFM) and grid-supporting control**

- Advanced and coordinated control for converter-dominated hybrid AC/DC infrastructures
- Frequency response, voltage support, fault ride-through; grid-code-aligned GFM behavior
- Cyber-physical resilience of converter controls (e.g., FDIA/DoS-aware control architectures)

**B. Hybrid AC/DC critical infrastructure operation**

- AC/DC bus control, power sharing, SoC-aware dispatch, and multiport converter coordination
- Impedance-based design, passivity, impedance shaping, and stability margins in weak grids
- Power Quality under dynamic/transient load conditions

**C. Protection, current limiting, and resilience**

- Protection coordination for hybrid AC/DC (DC faults, selective isolation, CC limiting)
- Black-start and restoration strategies; N-1 contingencies and grid-split operation
- Seamless transitions: grid-connected to island, synchronization, reconnection stability

**Timeline for Authors**

All the instructions for paper submission are available on the conference website. Please visit [www.iecon2026.org](http://www.iecon2026.org) or scan the QR code for the timeline.

