

## **DC ARCHITECTURES AND POWER ELECTRONICS FOR THE FUTURE HYBRID AC-DC SYSTEMS**

### **ORGANIZED BY**

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### **SCOPE AND MOTIVATION**

With an increasing share of distributed energy resources (DERs) inherently operating in DC, the question emerges: what if parts of the distribution grid evolved into DC systems, creating a hybrid AC-DC infrastructure?

This special session explores the potential of MVDC overlays in existing MVAC grids, aiming to define new architectures and power electronics converters (PECs) tailored for such hybrid systems. The session will focus on developing the grid topology and PEC modules, addressing key functionalities: DC-AC interfacing, renewable energy source (RES) integration, storage and EV integration, and grid-supporting services for enhanced sustainability and reliability.

### **TOPICS OF INTEREST**

The session welcomes contributions related, but not limited to:

- Operational principles of converters (DC/DC, DC/AC)
- New architecture of DC or DC/AC grids
- Grid-friendly PECs solutions for flexible and resilient
- Impact of PECs on dynamic grid stability
- Strategies for planning, energy management, and advanced control
- Strategies for protection and resilience
- Application of PECs for Interfaces and integrations of RES, EV, storage, electrolyzer, and full cell
- Case studies and applications
- Interoperability and standardization.