

## Special Session 01

### Multi-agent Distributed Cooperative Control Technology for the Stable Operation of Microgrid Clusters Interconnected with the Power Grid

#### Introduction and Topics

Under the “dual-carbon” goals and the accelerated development of a new-type power system, the high penetration of renewable energy on the supply side and the continuous electrification on the demand side pose multiple challenges to grid operation, including strengthened carbon constraints, insufficient flexible regulating resources, and intensified spatiotemporal imbalances. Microgrid clusters centered on distributed renewables, energy storage, and controllable loads feature deep source-load-storage coordination and low-carbon, flexible operation, making them key units for ensuring grid stability and carbon reduction. However, microgrid clusters are characterized by structural heterogeneity, strong operational autonomy, and complex interactions, rendering traditional centralized control inadequate in terms of real-time performance, reliability, and scalability. To meet stability requirements under carbon constraints, it is imperative to develop multi-agent distributed cooperative control technologies. Through information exchange and coordinated decision-making, microgrid clusters can actively support the main grid: in frequency regulation, leveraging the fast power response of storage and adjustable loads to enhance system frequency support; in voltage regulation, coordinating inverter-based sources and flexible resources to improve voltage stability and reactive power support in weak grids; and in peak shaving, jointly optimizing source-load-storage scheduling and inter-microgrid coordination to reduce peak-valley differences and carbon intensity. Meanwhile, under imperfect communication, operational uncertainties, and coupled carbon constraints, key challenges remain in ensuring the stability, convergence, and engineering feasibility of distributed cooperative control, warranting systematic research and demonstration.

#### Special Session Chairs



**Prof. Peng Lu**  
China Agricultural University



**Prof. Bo Liu**  
Tianjin University

#### Paper Submission

##### Submission Method



- \* View paper submission instruction on website  
<https://www.ieee-icps.com/sub.html>
- \* Submit your paper through the website or QR code  
<https://easychair.org/conferences/?conf=ieeEICPSAsia2026>

##### Important Dates

Submission Deadline	April 30, 2026
Notification Deadline	May 31, 2026
Early-bird Registration Deadline	June 15, 2026
Author Registration Due	June 15, 2026

##### Publication

Submissions to IEEE I&CPS 2026 will be peer reviewed on the basis of technical quality, relevance to conference topics, originality, significance, clarity, etc. Accepted papers will be submitted for inclusion into IEEE Xplore subject to meeting IEEE Xplore's scope and quality requirements.

Excellent papers will be recommended for review by IEEE Trans on Industry Applications (proportion can reach up to 50%), Global Energy Interconnection and DeCarbon.