

Special Session 05

Frontier Technologies and Applications of Intelligent Interaction

Between Demand-Side Energy Resources and the Power Grid in Spot Market Environments

Introduction and Topics

The rapid liberalization of electricity markets and the proliferation of distributed energy resources have necessitated a shift from passive consumption to active, market-driven demand response. Under the volatile price signals of spot market conditions, the ability of demand-side resources to interact intelligently with the grid is critical for maintaining system balance and enhancing economic efficiency. This special session focuses on the mechanisms and technologies that enable seamless coordination between the grid and various edge-side assets.

Central to this discussion is the emergence of New Energy Sites and the transformation of telecommunication infrastructure, where 5G Base Stations act as flexible thermal and electrical loads capable of providing large-scale frequency regulation. To manage these dispersed assets, the session explores the integration of Power-Computing Coordination, leveraging data centers and edge computing to synchronize energy flow with information flow in real-time. Furthermore, the role of Virtual Power Plants (VPPs) is highlighted as a primary aggregator to bridge the gap between small-scale flexibility and wholesale market participation. By addressing challenges in real-time sensing, bidding strategies, and multi-resource optimization, this session aims to foster a more resilient and cost-effective power ecosystem in the era of market-driven intelligence.

Topics including but not limited to:

1. Bidirectional Interaction Mechanisms Under Spot Market Price Signals
2. Optimal Scheduling and Trading Strategies for Virtual Power Plants
3. Energy-Saving and Grid-Support Potential of 5G Base Stations
4. Theory and Practice of Power-Computing Coordination in Smart Grids
5. Design and Operation Strategies for New Energy Sites
6. Demand-Side Flexibility Assessment and Market Bidding Models
7. AI-Driven Real-time Demand Response and Edge Computing Applications
8. Peer-to-Peer (P2P) Energy Trading and Blockchain for Demand Resources
9. Stability Analysis of Grid-Resource Interaction Under High Volatility
10. Integrated Management of Multi-Energy Microgrids and Demand-Side Assets
11. Coordinated Management and Aggregation of VPP Comprising Diverse Flexible Resources and Novel Digital Loads

Special Session Chairs



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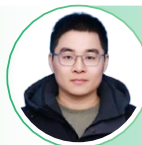
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Paper Submission

Submission Method



* View paper submission instruction on website
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* 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.