

THE 8TH IEEE CONFERENCE ON ENERGY INTERNET AND ENERGY SYSTEM INTEGRATION

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Special Session 19

Optimization, Carbon Trading, and Grid Flexibility in New Power Systems

INTRODUCTION AND TOPICS

The energy sector is undergoing significant change, driven by the increasing integration of renewable energy sources, carbon reduction initiatives and the demand for more flexible and resilient power systems. As we move towards a more decentralized and sustainable energy landscape, optimizing the operation of power systems, enhancing grid flexibility and ensuring system resilience are becoming critical challenges. This special session aims to explore innovative solutions that address these challenges, focusing on the intersection of optimization techniques, carbon trading and advanced control strategies for new power systems.

In the context of carbon trading, the efficient operation of energy systems, including Virtual Power Plants (VPPs) and other aggregated energy resources, is essential to balancing economic and environmental objectives. The optimisation of these systems requires the development of sophisticated algorithms that can manage the complexities of energy trading while maintaining grid stability and meeting regulatory requirements. In addition, as the energy landscape becomes more dynamic, there is a growing need for strategies that enhance grid flexibility, allowing power systems to respond effectively to changing demands and integrate diverse energy resources.

This special session welcomes contributions that address these and related topics, with a particular focus on innovative optimization approaches, advanced control methodologies and strategies to enhance system resilience. The session aims to bring together researchers and practitioners from different fields to share the latest research results and practical experiences, fostering a collaborative environment for the development of new power systems that are not only sustainable, but also robust and adaptable to future challenges. The key areas of interest include, but are not limited to:

- Innovative optimization techniques for power systems, including decentralized and distributed approaches
- Carbon trading mechanisms and their integration into power system operations
- Advanced strategies for enhancing grid flexibility and stability in modern power networks
- Design and operation of Virtual Power Plants and other aggregated energy resources
- Comprehensive evaluation frameworks for evaluating the performance and resilience of new power systems
- Intelligent control algorithms for voltage regulation, load management, and system stability
- Cooperative optimization for fault recovery, and emergency response in power distribution networks
- Integration of renewable energy sources and their impact on power system operations and trades
- Technological advancements in demand-side management and load aggregation
- Cross-disciplinary approaches to improving the sustainability and reliability of new power systems

SPECIAL SESSION CHAIRS



Assoc. Prof. Leijiao Ge

Tianjin University,
China



Lec. Liying Wang

North China Electric Power University,
China



Dr. Wenlong Liao

Ecole Polytechnique Fédérale de Lausanne,
Switzerland

PUBLICATION & SUBMISSION

Submissions will be reviewed by the conference technical committees, and accepted papers will be published in IEEE EI² 2024 International Conference Proceedings, which will be submitted for inclusion in the **IEEE Xplore Digital Library**, and submitted for indexing by **El compendex** and **Scopus**.



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• Submission link: <https://easychair.org/conferences/?conf=ei22024>

Submission Deadline: 15 October, 2024

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For any questions, please contact the conference secretary, Ms. Joyce Zhong, via EI2_2024@outlook.com.