Special Session 39: Artificial Intelligence-aided Operational and Market Strategies for Demand Side Resources in Support of the New Power Systems

Session Organizer:

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Brief Description of the Session Thematic:

The rapid development of global renewable energy has effectively improved the energy structure and promoted the cleaner consumption of energy. However, the intermittency, uncertainty and low inertia of renewable energy sources have brought new challenges to the stability and control of power systems. At the same time, the increasing electrification of industrial loads, public buildings, and electric vehicles presents challenges and opportunities for grid operations. As demand side resources, these flexible loads have the potential to increase grid flexibility and support optimal grid operation. Therefore, in the era of rapid development of artificial intelligence (AI), it is crucial to explore how demand side resources can participate in coordinated operation and control of the grid, while ensuring economic efficiency and system stability through AI techniques. This special session will focus on the latest advancements in the regulation of demand side resources and market mechanisms for promoting their integration into the grid in the context of AI. It will highlight the role of industrial loads, public buildings, and electric vehicles in support of the new power systems.

Topics and Keywords:

Topics of interest include, but are not limited to:

1. Artificial intelligence-driven modeling and analysis of demand side resources
2. Artificial intelligence-based optimal energy management of demand side resources
3. Multi-timescale interaction techniques for demand side resources to participate in grid operation
4. Artificial intelligence-based market trading decision-making strategies for demand side resources
5. Adaptive incentive mechanisms for demand-side resources participating in grid interactions

Keywords: Demand side resources, Interactive Operations, Energy Management, Market Trading, Artificial Intelligence