

# Special Session III

## Special Session Basic Information:

专栏题目  
Session Title

中文：新型电力系统能量管理与风险防控  
英文：Energy Management and Risk Mitigation in New Power Systems

专栏介绍和征稿主题  
Introduction and topics

中文：  
在全球能源转型与"双碳"目标驱动下，构建新型电力系统已成为国际共识。为应对高比例可再生能源接入带来的强不确定性、多时间尺度耦合及复杂风险传播等挑战，本专题聚焦新型电力系统能量管理与风险防控，搭建交流平台，重点探讨：新能源电力预测与多源协同优化调度技术，涵盖风光功率预测、虚拟电厂聚合调控、源网荷储动态匹配等前沿方向；新型电力系统多维度风险评估方法，研究极端天气、市场波动、网络安全等复合风险的情景构建与量化分析；人工智能与数字孪生等新方法、新技术应用，探索基于深度强化学习等新方法、新技术的实时决策系统与全息仿真平台构建。为此，我们设立此专题，征集和探讨新型电力系统能量管理与风险防控的最新进展和应用，推动能源、信息、系统工程等领域的深度交叉融合，为构建安全、经济、低碳的新型电力系统提供理论支撑与实践参考。  
征稿主题包括但不限于：  
1. 新能源电力预测与多源协同优化调度技术  
2. 新型电力系统能量管理方法  
3. 新型电力系统可靠性建模方法  
4. 新型电力系统风险评估与防控方法  
英文：  
Driven by the global energy transition and the "Dual-Carbon" goals, the construction of new power systems has become an international consensus. To address challenges posed by high-penetration renewable energy integration—including strong uncertainties, multi-timescale coupling, and complex risk propagation—this special session focuses on energy management and risk mitigation for new power systems. It aims to foster interdisciplinary dialogue and explore: Renewable Energy Forecasting and Multi-Source Collaborative Optimization Technologies, covering cutting-edge areas such as wind/solar power prediction, virtual power plant (VPP) aggregation control, and dynamic coordination of "source-grid-load-storage" systems; Multi-Dimensional Risk Assessment Methodologies, including scenario construction and quantitative analysis of compound risks (e.g., extreme weather, market volatility, and cyber threats); Applications of Emerging Technologies, such as artificial intelligence (AI) and digital twins, to develop real-time decision-making systems (e.g., deep reinforcement learning-based frameworks) and holographic simulation platforms.  
This session calls for contributions on the latest advances in energy management and risk mitigation for new power systems, promoting cross-disciplinary integration among energy, informatics, and systems engineering. It seeks to provide theoretical foundations and practical insights for building secure, economical, and low-carbon power systems.  
The topics of interest include, but are not limited to:  
1) 1.Renewable Energy Forecasting and Multi-Source Collaborative Optimization Technologies  
2) 2.Energy Management Methodologies for New Power Systems  
3) 3.Reliability Modeling for New Power Systems  
4) 4.Risk Evaluation and Mitigation Methodologies for New Power Systems

Special Session Chair(s):

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