Special Session III

Special Session Basic Information:

专栏题目 Session Title	中文：可再生能源高渗透率电力系统的规划运行与市场机制 英文：Planning, Operation, and Market Mechanisms for Power Systems with High Renewable Penetration

专栏介绍和征稿主题
Introduction and topics

中文：为实现"双碳"目标、构建新型电力系统，可再生能源的大规模接入正深刻重塑现代电力系统的运行模式，在为低碳发展提供重要机遇的同时，也为系统规划、运行和市场机制带来了前所未有的挑战。高比例可再生能源接入显著增加了系统的不确定性和复杂性，对经济性规划运行、灵活资源协调和适应性市场设计提出了更高要求。

在此背景下，本专栏旨在深度探讨现代电力系统规划、运行和市场机制的创新策略与前沿技术。会议致力于为专家学者和行业从业人员搭建高水平的学术交流平台，分享在大规模可再生能源接入背景下提升电网运行安全性、经济性和弹性的最新理论进展和实践解决方案，为构建安全、高效、绿色的现代电力系统提供重要的理论指导和技术支撑。

本专栏感兴趣的主题包括但不限于：

1. 现代电力系统协同规划与弹性提升
   - ✓ 多类型资源协同规划技术与方法
   - ✓ 系统弹性评估理论与提升策略
   - ✓ 多能源系统集成规划与运行优化
   - ✓ 电碳市场耦合机制与协同发展路径
2. 灵活资源优化运行与智能控制
   - ✓ 灵活资源最优运行控制策略与算法
   - ✓ 人工智能驱动的电力系统运行优化技术
   - ✓ 数据中心算力-电力协同关键技术
   - ✓ 分布式能源资源聚合与需求响应机制
3. 现代电力市场机制设计与评估
   - ✓ 适应高比例可再生能源的市场机制创新设计
   - ✓ 电力现货市场优化设计与定价机制研究
   - ✓ 需求响应市场机制设计与实施策略
   - ✓ 分布式能源资源市场参与机制与商业模式

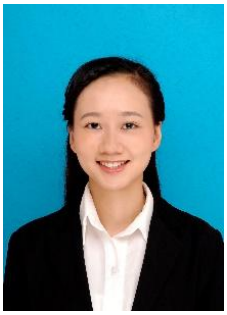
英文：To achieve carbon peak and carbon neutrality goals and construct a new-type power system, the rapid integration of renewable energy sources is profoundly reshaping the operational paradigms of modern power systems. While providing significant opportunities for low-carbon development, this transformation also brings unprecedented challenges for system planning, operation, and market mechanisms. High renewable penetration substantially increases system uncertainty and complexity, imposing higher requirements for economic planning and operation, flexible resource coordination, and adaptive market design.

Given this background, this session aims to comprehensively explore innovative strategies and cutting-edge technologies for the planning, operation, and market mechanisms of modern power systems. The session is dedicated to establishing a high-level academic exchange platform for experts, scholars, and industry practitioners to share the latest theoretical advances and practical solutions that enhance the security, efficiency, and resilience of grid operations in the context of large-scale renewable integration, providing essential theoretical guidance and technical support for building secure, efficient, and green modern power systems.

Topics of this special session include, but are not limited to:

1. Coordinated Planning and Resilience Enhancement of Modern Power Systems
   - ✓ Coordinated planning techniques and methodologies for multi-type resources
   - ✓ System resilience assessment theories and enhancement strategies
   - ✓ Integrated planning and operation optimization of multi-energy systems
   - ✓ Carbon-electricity market coupling mechanisms and synergistic development pathways
2. Optimal Operation and Intelligent Control of Flexible Resources
   - ✓ Optimal operation and control strategies and algorithms for flexible resources
   - ✓ AI-driven optimization technologies for power system operations
   - ✓ Power-computing synergy key technologies for data centers
   - ✓ Aggregation mechanisms of distributed energy resources and demand response
3. Market Mechanism Design and Evaluation for Modern Power Systems
   - ✓ Innovative market mechanism design adapted to high renewable penetration
   - ✓ Spot market optimization design and pricing mechanism research
   - ✓ Demand response market mechanisms design and implementation strategies
   - ✓ Market participation mechanisms and business models for distributed energy resources

Special Session Chair(s):



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Organizer's Brief Biography

中文：马愿谦，浙江理工大学信息科学与工程学院讲师，博士，硕士生导师。2019 年，博士毕业于四川大学电气工程学院，并于 2017 年-2019 年赴加拿大阿尔伯塔大学联合培养。2022 年 9 月-2023 年 7 月，作为访问学者于浙江大学电气工程学院进行交流访问。近五年以来，发表 SCI/EI 论文 30 余篇(一作/通讯 20 余篇)。先后主持国家自然科学基金青年项目 1 项、浙江省自然科学基金探索项目 1 项、浙江省教育厅一般项目 1 项。研究方向包括电力市场、需求响应、电力套餐设计与推荐、电碳市场耦合机制等。

英文：Dr. Yuanqian Ma is a Lecturer and Master's Supervisor at the College of Information Science and Engineering, Zhejiang Sci-Tech University. She received her Ph.D. degree from the College of Electrical Engineering, Sichuan University in 2019, and was a joint Ph.D. student at the University of Alberta, Canada from 2017 to 2019. From September 2022 to July 2023, she served as a visiting scholar at the School of Electrical Engineering, Zhejiang University. Over the past five years, she has published over 30 SCI/EI papers, including more than 20 as the first or corresponding author. She has presided over one National Natural Science Foundation of China (NSFC) Youth Project, one Zhejiang Provincial Natural Science Foundation Exploration Project, and one General Project of Zhejiang Provincial Department of Education. Her research interests include electricity markets, demand response, electricity package design and recommendation, and carbon-electricity market coupling mechanisms.

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Organizer's Brief Biography

中文：陈昌铭，IEEE 会员，福州大学电气工程与自动化学院校聘副研究员，硕士生导师。2019 年毕业于福州大学电气工程及自动化学院，获电气工程学士学位；2024 年毕业于浙江大学电气工程学院，获电气工程博士学位。近年来主持国家自然科学基金青年（C 类）项目、福建省自然科学基金青年项目，发表 SCI/EI 论文 50 余篇（一作/通讯 30 余篇）。主要研究方向包括电力系统恢复、共享储能、多能数据中心优化等。

英文：Changming Chen (Member, IEEE) is currently an Associate Research Fellow and Master's Supervisor at the College of Electrical Engineering and Automation, Fuzhou University, Fuzhou, China. He received the B.E. degree in electrical engineering from the College of Electrical Engineering and Automation, Fuzhou University, Fuzhou, China, in 2019, and the Ph.D. degree in electrical engineering from the College of Electrical Engineering, Zhejiang University, Hangzhou, China, in 2024. In recent years, he has led projects funded by the National Natural Science Foundation of China (Youth Program, Category C) and the Fujian Provincial Natural Science Foundation (Youth Program). He has published over 50 SCI/EI papers, including more than 30 as the first or corresponding author. His main research interests include power system restoration, shared energy storage, and multi-energy data center optimization.

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Organizer's Brief Biography

中文：燕磊，男，博士，浙江大学副研究员。2012 年 6 月本科毕业于华北电力大学热能与动力工程专业，2017 年 8 月、2018 年 3 月硕士分别毕业于美国伊利诺伊理工大学和华北电力大学电气工程专业，2021 年 5 月博士毕业于美国伊利诺伊理工大学，同时被聘为伊利诺伊理工大学加尔文电力创新中心高级副研究员。2022 年 9 月，加入浙江大学电气工程学院，被聘为副研究员。截至 2023 年 1 月，发表 SCI 学术论文 20 余篇。主持和参与国家自然科学基金 2 项，国家重点研发计划/国家重大科技创新 3 项。

英文：Dr. Lei Yan is currently serving as an associate researcher at Zhejiang University. Dr. Yan completed his doctoral studies at the Illinois Institute of Technology, receiving his Ph.D. in May 2021, and was appointed as senior research associate at the Calvin Center of t Illinois Institute of Technology. In September 2022, he joined the School of Electrical Engineering at Zhejiang University as an associate researcher. As of August 2025, Dr. Yan has authored more than 20 papers indexed by the Science Citation Index (SCI) and has contributed to two projects funded by the National Natural Science Foundation of China, as well as three projects under the National Key Research and Development Program.

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Organizer's Brief Biography

中文：林振智（IEEE 高级会员），于 2008 年在华南理工大学获得电气工程博士学位。2007 年-2008 年，他曾前往香港理工大学电气工程学院担任科研助理；2010 年-2011 年，他在美国田纳西大学电气与计算科学系担任访问学者；2013 年-2014 年，他在英国杜伦大学电气与计算科学系担任研究助理。

他目前是浙江大学电气工程学院教授，研究方向包括电力系统态势感知、电力系统恢复、电力经济、数据挖掘和人工智能技术在电力系统中的应用等。他还是 IEEE Transactions on Power Systems 和 IEEE Power Engineering Letters 的副主编，Energy Conversion and Economics 的主题编辑，以及 Journal of Modern Power Systems and Clean Energy、Protection and Control of Modern Power Systems 和电力系统自动化等期刊的编委。

英文：Zhenzhi Lin (Senior Member, IEEE) received the Ph.D. degree in electrical engineering from the South China University of Technology, Guangzhou, China, in 2008. From 2007 to 2008, he was a Research Assistant with the Department of Electrical Engineering, The Hong Kong Polytechnic University, Hong Kong, Research Scholar with the Department of Electrical Engineering and Computer Science, University of Tennessee, Knoxville, TN, USA, from 2010 to 2011, and Research Associate with the College of Engineering and Computing Sciences, Durham University, Durham, U.K., from 2013 to 2014.

He is currently a Professor at the College of Electrical Engineering, Zhejiang University, Hangzhou, China. His research interests include power system situational awareness, power system restoration, power system economics, data mining, and artificial intelligence applications in power systems. He was an Associate Editor for IEEE Transactions on Power Systems and IEEE Power Engineering Letters, Subject Editor of Energy Conversion and Economics (IET), and the editorial board member of Journal of Modern Power Systems and Clean Energy, Protection and Control of Modern Power Systems, and Automation of Electric Power Systems.