Special Session V

Special Session Basic Information:

专栏题目 Session Title	中文：面向新型电力系统的储能技术与应用 英文：Energy Storage Technologies and Applications for New Power Systems

专栏介绍和征稿主题
Introduction and topics

中文：随着新型电力系统的快速发展，以高比例可再生能源接入、高比例电力电子装备应用以及终端能源电气化程度不断提升为主要特征的现代电力系统，正在深刻改变电网的规划、运行与控制模式。作为新型电力系统的关键支撑技术，储能在实现供需平衡、提升系统灵活性、改善电能质量、保障电网安全稳定运行以及促进可再生能源大规模消纳等方面发挥着不可替代的重要作用。除传统的削峰填谷和频率调节功能外，先进储能技术正日益支撑多时间尺度能源管理、电力系统韧性提升、电力市场参与以及智能电网运行等新型应用。

本专栏重点关注（包括但不限于）以下研究方向：

1. 先进储能技术与混合储能系统；
2. 储能系统规划、容量配置与优化设计；
3. 储能系统运行优化与多时间尺度调度；
4. 储能在可再生能源消纳与电网灵活性提升中的应用；
5. 数字孪生、人工智能与数据驱动的储能管理技术；
6. 储能参与电力市场及辅助服务；
7. 分布式储能、虚拟电厂与源网荷储协同运行；
8. 储能系统安全、健康管理与全生命周期评估；
9. 面向新型电力系统的构网型储能与电力电子技术；
10. 新型电力系统中储能技术的示范工程与工程应用。

英文：The rapid evolution of new power systems, characterized by high penetration of renewable energy, extensive power electronic interfacing, and increasing electrification, has significantly transformed the operation and planning of modern power grids. As a key enabling technology, energy storage plays a pivotal role in balancing supply and demand, enhancing system flexibility, improving power quality, ensuring operational security, and facilitating the large-scale integration of renewable energy. Beyond conventional peak shaving and frequency regulation, advanced energy storage technologies are increasingly supporting multi-timescale energy management, resilience enhancement, market participation, and intelligent grid operation.

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

1. Advanced Energy Storage Technologies and Hybrid Energy Storage Systems;
2. Planning, Sizing, and Optimal Configuration of Energy Storage;
3. Operational Optimization and Multi-Timescale Scheduling of Energy Storage;
4. Energy Storage Applications in Renewable Energy Integration and Grid Flexibility Enhancement;
5. Digital Twin, Artificial Intelligence, and Data-Driven Energy Storage Management;
6. Energy Storage Participation in Electricity Markets and Ancillary Services;
7. Distributed Energy Storage, Virtual Power Plants, and Source–Grid–Load–Storage Coordination;
8. Energy Storage Safety, Health Management, and Lifecycle Assessment;
9. Grid-Forming Energy Storage and Power Electronics for New Power Systems;
10. Demonstration Projects and Practical Applications of Energy Storage in New Power Systems.

Special Session Chair(s):

姓名 **Name**	孟赫 He Meng
称谓 **Prefix**	讲师 Lecturer
部门 **Department**	电气工程学院 School of Electrical Engineering
单位 **Organization**	河北工业大学 Hebei University of Technology
城市/地区 **City/Region**	天津 Tianjin

Organizer's Brief Biography

中文：孟赫，博士，河北工业大学电气工程学院讲师、硕士生导师。主要研究方向涵盖配电网分布式储能规划与运行、移动储能路径规划、共享储能交易机制，以及虚拟电厂优化运行等领域。2023 年至 2024 年，赴英国卡迪夫大学工程学院访学，围绕移动储能与共享储能系统的运行优化及市场机制设计开展合作研究。

英文：Meng He received the Ph.D. degree in Electrical Engineering and is currently a Lecturer and Master's Supervisor with the School of Electrical Engineering, Hebei University of Technology, China. His research interests focus on distributed energy storage planning and operation in distribution networks, mobile energy storage routing optimization, shared energy storage market mechanisms, and optimal operation of virtual power plants. From 2023 to 2024, he was a visiting scholar at the School of Engineering, Cardiff University, UK, where he conducted collaborative research on the operational optimization and market mechanism design of mobile and shared energy storage systems.

姓名 **Name**	Zihan Lv 吕子含
称谓 **Prefix**	Lecturer 讲师
部门 **Department**	College of Mechanical and Electrical Engineering 机电系
单位 **Organization**	Chinese People's Liberation Army Naval Non commissioned Officer School 中国人民解放军海军士官学校
城市/地区 **City/Region**	Bengbu 蚌埠

Organizer's Brief Biography

中文：吕子含，2025 年毕业于天津大学电气工程专业，获工学博士学位。现任中国人民解放军海军士官学校机电系讲师，主要研究方向包括配电网规划、电力系统毁伤演化与抗毁伤分析等。

英文：Zihan Lv received the Ph.D. degree in electrical engineering from Tianjin University, Tianjin, China, in 2025. She is currently serving as a lecturer with the college of mechanical and electrical engineering, Chinese People's Liberation Army (PLA) Naval Non-Commissioned Officer School. Her main research interests include distribution network planning, power system damage evolution, and survivability analysis.

姓名 **Name**	Xihai Zhang 张羲海
称谓 **Prefix**	Lecturer 讲师
部门 **Department**	School of Electrical Engineering
单位 **Organization**	Hebei University of Technology
城市/地区 **City/Region**	Tianjin

Organizer's Brief Biography

中文：张羲海，工学博士，河北工业大学讲师。主要研究方向包括端对端电能交易、配电网状态估计与强化学习

英文：Xihai Zhang received his Ph.D. degree in the field of engineering. Now he is a lecture in power system with the School of Electrical Engineering, Hebei University of Technology, China. His research interests include peer-to-peer energy trading, distribution system state estimation, and reinforcement learning.

姓名 **Name**	Tianshuo Zhou 周天烁
称谓 **Prefix**	Lecturer 讲师
部门 **Department**	School of Energy and Materials (Institute of Bingtuan Energy Development Research)
单位 **Organization**	Shihezi University
城市/地区 **City/Region**	Xinjiang

Organizer's Brief Biography

中文：石河子大学能源与材料学院电气工程系讲师，兵团能源发展研究院电力系统所成员，本科生党支部书记。2025 年获天津大学电气工程博士学位，从事新型配电系统、综合能源系统、智能微电网等领域的研究工作，主持包括省级青年科学基金等科技项目 3 项，参与多项国家自然科学基金、国家电网、南方电网科技项目，发表 SCI/EI 检索论文 20 余篇，公开国家发明专利 14 项（授权 6 项），获 IEEE PES General Meeting Best Conference Paper、日内瓦国际发明展银奖等荣誉，参与制定中国电工技术学会团体标准 1 项。

英文：Tianshuo Zhou is a Lecturer in the Department of Electrical Engineering, College of Energy and Materials, Shihezi University, a member of the Power System Division at the Institute of Bingtuan Energy Development Research, and the Party Branch Secretary for undergraduate students. He received his Ph.D. in Electrical Engineering from Tianjin University in 2025. His research focuses on novel distribution systems, integrated energy systems, and smart microgrids. He has led three provincial-level scientific projects, including a Young Scientists Fund, and contributed to multiple National Natural Science Foundation projects as well as R&D programs funded by State Grid and China Southern Power Grid. He has published over 20 SCI/EI-indexed papers, holds 14 published national invention patents (6 granted), and received the Best Conference Paper Award at IEEE PES General Meeting and a Silver Medal at the International Exhibition of Inventions of Geneva. He also contributed to the development of one group standard issued by the China Electrotechnical Society.

姓名 **Name**	王科 Ke Wang
称谓 **Prefix**	工程师 Engineer
部门 **Department**	配（用）电技术所 Institute of Distribution and Utilization Technology
单位 **Organization**	国网天津市电力公司电力科学研究院 State Grid Tianjin Electric Power Research Institute
城市/地区 **City/Region**	天津 Tianjin

Organizer's Brief Biography

中文：王科，获批首批中国科协青年托举工程博士生专项，首届国网青年启航人才项目。2023 年至 2024 年赴英国卡迪夫大学工程学院访学，开展电-热耦合系统韧性提升相关合作研究。现任国网天津市电力公司电力科学研究院工程师。

英文：

Ke Wang has been selected for the inaugural Ph.D. Special Program of the Young Elite Scientists Sponsorship Program (YESS) by the China Association for Science and Technology (CAST), as well as the first State Grid Youth Sail-Ahead Talent Program. From 2023 to 2024, she was a visiting scholar at the School of Engineering, Cardiff University in the UK, where she conducted collaborative research on enhancing the resilience of coupled electro-thermal systems. She currently serves as an Engineer at the Electric Power Research Institute of State Grid Tianjin Electric Power Company.

姓名 **Name**	Chuanshen Wu 吴传申
称谓 **Prefix**	Associate Researcher 副研究员
部门 **Department**	College of Electrical and Power Engineering 电气与动力工程学院
单位 **Organization**	Hohai University 河海大学
城市/地区 **City/Region**	Nanjing 南京

Organizer's Brief Biography

中文：吴传申，2022 年毕业于东南大学电气工程专业，获工学博士学位。2022 年至 2025 年赴英国卡迪夫大学工程学院开展博士后研究工作。现任河海大学电气与动力工程学院副研究员。主要研究方向包括电动汽车与电网互动、分布式能源系统聚合控制等。

英文：Chuanshen Wu received the Ph.D. degree in electrical engineering from Southeast University in 2022. From 2022 to 2025, he conducted postdoctoral research at the School of Engineering, Cardiff University, U.K. He is currently an Associate Professor with the College of Electrical and Power Engineering, Hohai University. His research interests include vehicle-to-grid interaction and aggregation-based control of distributed energy systems.

姓名 **Name**	Kecheng He
称谓 **Prefix**	Dr.
部门 **Department**	School of Automation and Electrical Engineering
单位 **Organization**	Lanzhou Jiaotong University
城市/地区 **City/Region**	Lanzhou/Gansu

Organizer's Brief Biography

中文：何克成，博士，兰州交通大学副教授。2024 年至 2025 年，他曾担任英国卡迪夫大学工程学院的助理研究员。研究方向为电力-交通耦合系统建模、仿真、控制及优化，电算融合等。

英文：Kecheng He, Ph.D., Associate Professor at Lanzhou Jiaotong University. From 2024 to 2025, he was an Assistant Researcher at the School of Engineering, Cardiff University, Cardiff, U.K. His research interests include electric vehicle charging infrastructure planning, mobile energy supply systems, and the modeling and optimization of integrated transportation-energy networks.