IEEE EI² 2024

IEEE EI²

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

NOV. 29 - DEC. 02, 2024 | SHENYANG, CHINA

Conference Web: https://attend.ieee.org/ei2-2024

Panel Session 18

Innovative Approaches in Enhancing Flexibility and Resilience of Future Power Systems

INTRODUCTION AND TOPICS

The transformation toward renewable and resilient energy systems is imperative as we strive for adaptable and efficient power grids. This session, "Innovative Approaches in Enhancing Flexibility and Resilience of Future Power Systems," brings together experts to present cutting-edge research and practical insights on integrating advanced technologies into modern power systems. The session opens with a look into airborne wind energy, exploring how high-altitude systems could surpass traditional wind power limits to capture greater energy and add flexibility to the grid. Following this, a presentation on artificial intelligence (AI) delves into its application in the optimal dispatch and control of new power systems, where AI-driven methods enhance resource management and operational precision, offering promising avenues for more stable and responsive grid functions.

To address grid resilience on a larger scale, a network flow-based tri-level optimization approach is presented, demonstrating how this layered strategy strengthens grid reliability by creating a structured, hierarchical response to disruptions. Another key focus is on unlocking the potential of distributed energy resources, where innovative integration methods allow these resources to respond dynamically to shifting grid demands, bolstering overall system flexibility. In parallel, data-driven state awareness techniques are discussed, with a focus on managing asynchronous and intermittent measurements, which is essential for accurate, real-time decision-making and stable distribution system operations. Lastly, a presentation on utility-scale renewable power-to-hydrogen systems highlights their potential as a flexible storage solution, supporting grid independence and sustainability. Through strategic design and effective operational practices, these hydrogen systems can store renewable energy efficiently, making them a valuable component of a resilient power infrastructure.

Together, these topics provide a comprehensive exploration of technologies and methodologies poised to transform power systems, leading to a more resilient, adaptable, and intelligent energy future.

PANEL SESSION CHAIRS

Assoc. Prof. Yingjun Wu Hohai University, China ywu_ee@vip.163.com

Yingjun Wu is an Associate Professor at the College of Energy and Electrical Engineering at Hohai University. He received his Ph.D. from Politecnico di Torino (PoliTO) in 2013 and joined Hohai University in 2018. His research focuses on the stability and control of new energy systems, demand-side resource optimization, resilience in complex power systems, and security in cyber-physical power networks. Dr. Wu has led seven national and provincial projects and over 50 industry-funded projects. He has published 70+ papers in journals and holds eight national patents, with two commercialized and developed an intelligent power simulation system that won the First Prize for Management Innovation in Jiangsu Province. He serves as Secretary-General of the IEEE PES Nanjing Chapter on various IEEE PES committees.

Assoc. Prof. Shi Chen Sichuan University, China chenshi629@163.com

Shi Chen received a Ph.D. degree in electrical engineering from Sichuan University, Sichuan, China, in 2012. He is currently an associate professor and a doctoral supervisor at the College of Electrical Engineering, Sichuan University, as assistant dean of the College of Electrical Engineering. At present, his research focuses on power system planning, optimal dispatching, and operation. He has published more than 30 papers and 2 monographs and has obtained a number of authorized invention patents. As the principal and leading participant, he has completed a number of scientific research projects, including one key project of the National Natural Science Foundation of China and one Chinese National Programs for High Technology Research and Development (the 863 Program), with a total of more than 50 million scientific research funds. He also serves as the Director of the Power Grid Operation Control Technology Subcommittee of the IEEE PES China Power System Protection and Control Technology Committee and the Secretary of the IEEE PES China Education Committee.

PAPER SUBMISSION

For panel sessions, please contact panel chair through email before submission.

ORGANIZATIONS

IEEE PES Power & Energy Society

中国电机工程学会 CHINESE SOCIETY FOR ELECTRICAL ENGINEERING

沈阳工业大学 SHENYANG UNIVERSITY OF TECHNOLOGY

清华大学 Tsinghua University