IEEE EI²
2023

The 7th IEEE Conference on Energy Internet and Energy System Integration

第七届能源互联网与能源系统集成国际会议

Secure, Economic and Low-Carbon
Energy Internet and Integrated Energy System

杭州
Hangzhou
China

Dec. 15-18
2023

CONFERENCE PROGRAM

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GENERAL INFORMATION

Conference Venue

The 7th IEEE Conference on Energy Internet and Energy System Integration (EI^2 2023) will be held at **Hangzhou Baoding Kaiyuan Wonderful Capital Grand Hotel.**

Location: *Building 1 of Baoding Mansion, Linping District, Hangzhou City, Zhejiang Province.*

Time Zone

UTC/GMT+8, also known as Beijing Time.

Sign-in

All attendees of the conference must sign in at the conference.

Sign-in Hours

1F, Lobby

Dec.15	10:00-18:00
Dec.16	08:00-18:00
Dec.17	08:00-18:00
Dec.18	08:00-12:00

Meals

Lunches will be served at 12:00-13:30 and dinner will be served at 18:00-20:00. **The banquet on Dec.16 (18:45-20:00) is available to all registered attendees as well.**

Dec.15

- Dinner @Cafe Mediterranean

Dec.16

- Lunch @Cafe Mediterranean, Baoding Mingdu Hall
- EI^2 2023 Banquet @Kaiyuan Hall

Dec.17

- Lunch @Cafe Mediterranean, Kaiyuan Hall 2
- Dinner @Cafe Mediterranean, Kaiyuan Hall 2

Dec.18

- Lunch @Cafe Mediterranean, Kaiyuan Hall 2

Conference Room

Mingdu Hall (1F)	名都厅(1 楼)
Baoding Hall (1F)	宝鼎厅(1 楼)
Sihui Hall (1F)	思慧厅(1 楼)
Sixin Hall (1F)	思信厅(1 楼)
Siyi Hall (1F)	思义厅(1 楼)
Sixian Hall (1F)	思贤厅(1 楼)
Side Hall (1F)	思德厅(1 楼)
Sile Hall (1F)	思乐厅(1 楼)
Kaiyuan Hall 1 (2F)	开元1厅(2 楼)
Kaiyuan Hall 2 (2F)	开元2厅(2 楼)
Kaiyuan Hall 3 (2F)	开元3厅(2 楼)
Cafe Mediterranean (2F)	地中海咖啡厅(2 楼)

Presenter Information

Oral Presenters

Laptops, projector & screen, laser sticks will be provided by the conference organizer.

The allotted time for the presentation is 12 minutes. Please plan for a 10-minute presentation, leaving approximately 2 minutes for questions from the audience.

Poster Presenters

The poster session will be displayed from December 16-18. Presenters are kindly requested to paste their posters 20 minutes prior to the start of the session.

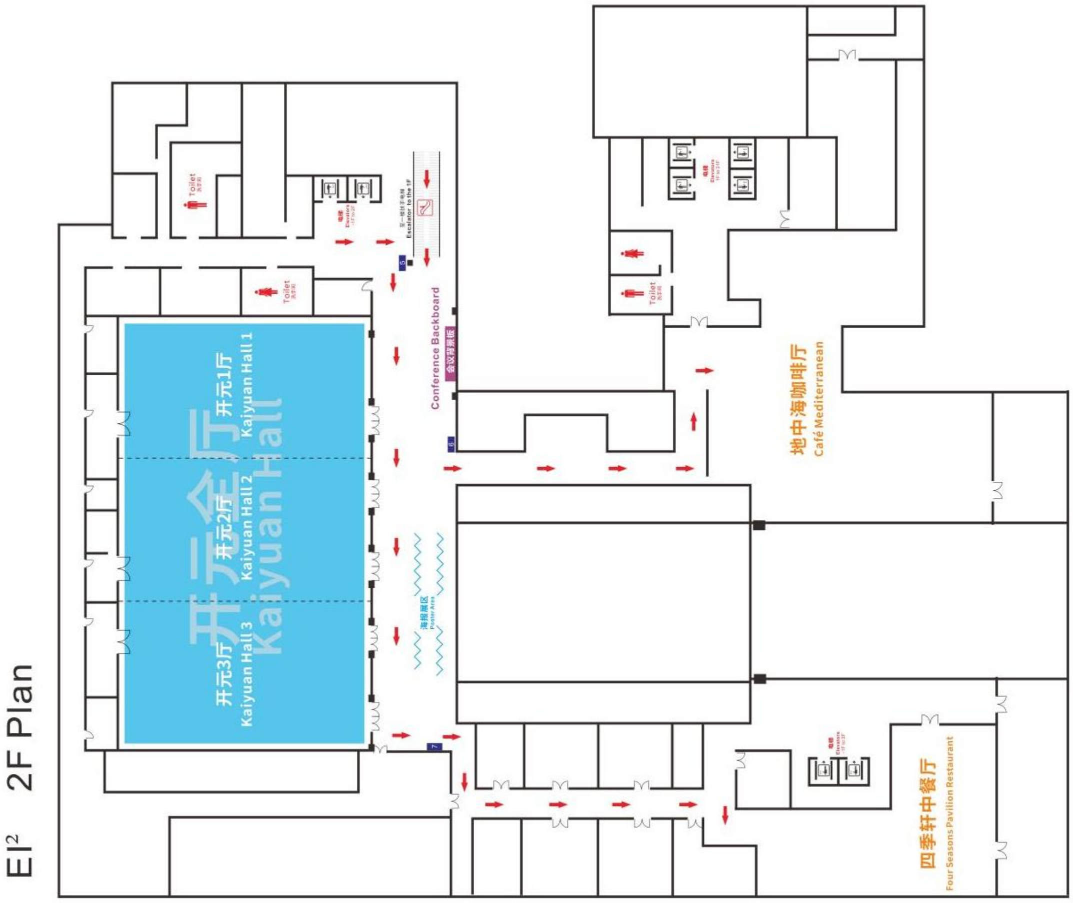
Security

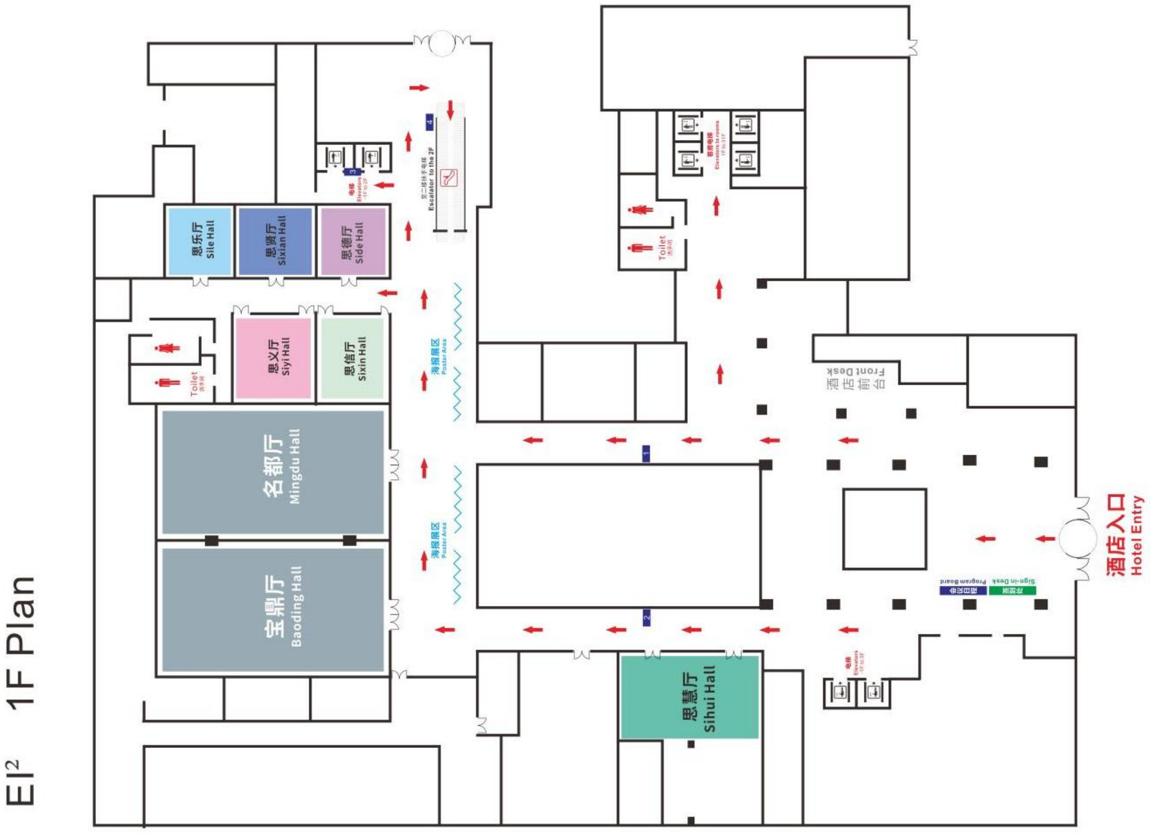
Please remember to take your belongings with you whenever you leave a room. Do not leave bags or laptops unattended.

Name Badge

For security purposes, delegates, speakers, exhibitors and staff are required to wear their name badge to all sessions and social functions. Entrance into sessions is restricted to registered delegates only. If you misplace your name badge, please replace at the registration counter.

Floor Plan


EI² 2F Plan
Toilet 洗手间
电梯 Elevators
至一楼扶手电梯 Escalator to the 1F
5
Conference Backboard
会议背景板
开元1厅 Kaiyuan Hall 1
开元2厅 Kaiyuan Hall 2
开元3厅 Kaiyuan Hall 3
开元全厅 Kaiyuan Hall
6
7
海报展区 Poster Area
地中海咖啡厅 Café Mediterranean
四季轩中餐厅 Four Seasons Pavilion Restaurant


EI² 1F Plan
思乐厅 Sile Hall
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思德厅 Side Hall
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宝鼎厅 Baoding Hall
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Toilet 洗手间
电梯 Elevators
至二楼扶手电梯 Escalator to the 2F
1
2
3
4
海报展区 Poster Area
客房电梯 Elevators to rooms 1F to 31F
酒店前台 Front Desk
Program Board
Sign-in Desk
酒店入口 Hotel Entry

PROGRAM AT A GLANCE

	Dec. 15
All Day	**Sign-in**
Evening	***Dinner***

	Dec. 16	Dec. 17	Dec. 18
All Day	**Sign-in**	**Sign-in**	**Sign-in**
Morning	**Opening Ceremony & Plenary Speech**	**Forum Session** SG-2-1 to SG-2-12	**Special Session** 03, 08, 11
		Special Session 01, 02, 06, 10	**Panel Session** 04, 05
		/	**Technical Session** 12 to 18
	Poster Session 01	**Poster Session 03**	**Poster Session 05**
Lunch			
Afternoon	**Plenary Speech**	**Forum Session** SG-3-1 to SG-3-4	/
	ECE Forum		
	Forum Session SG-1-1 to SG-1-4	**Panel Session** 06, 11	
	Special Session 04, 05, 07		
	Panel Session 01, 02, 03, 07, 08, 09, 10	**Technical Session** 02 to 11	
	Technical Session 01		
	Poster Session 02	**Poster Session 04**	
Evening	***EI^2 2023 Banquet***	***Dinner***	

SESSION INDEX

Forum Session

	Topics
SG-1-1	Digitalization and Interoperability of Smart Distribution Networks
SG-1-2	Virtual Power Plant Pilot: Resources Coordination and Multi-dimensional Interaction
SG-1-3	Response-driven Intelligent Enhanced Analysis and Control for Bulk Power System Stability
SG-1-4	Resilient Power Grid and Resilient City
SG-2-1	Key Techniques On Stable Operation of Renewable Energy Clusters Above 10Gw Capacity with HVDC Links
SG-2-2	Rapid Active Support Technologies of Wind/Photovoltaic Power Plants
SG-2-3	Multi-timescale Forecast Technology for Large-scale Wind/Photovoltaic Power Supply Capability
SG-2-4	Coordinated Dispatch and Control for Urban Integrated Energy Systems
SG-2-5	Adaptive Grid Integration and Active Synchronization Technologies for Extremely High Penetration Distributed Photovoltaics
SG-2-6	Key Technology of High-Capacity Generator Circuit Breaker
SG-2-7	Substation Secondary System under New-type Power System
SG-2-8	Collaborative Operation Technology and Market of Coal Electricity and New Energy
SG-2-9	Key Technologies of Intelligent Dispatching for Power Grid with High Proportion of Renewable Energy Integration
SG-2-10	Core Software and Hardware Platform for Substation Secondary System
SG-2-11	Advanced Computing Technology in Electric Power
SG-2-12	CSEE JPES Forum: The Structure and Transformation Pathway for New Type Power System
SG-3-1	Complementary Operation and Intelligent Dispatching of High-Proportion Hydro-Wind-Solar Power Systems
SG-3-2	Gate Driver IC for Power Electronic Devices
SG-3-3	The Technology of GWh-scale Lithium-ion Battery Energy Storage System
SG-3-4	New Application and Challenge for Power Distribution IoT
ECE Forum	The 3rd Energy Conversion and Economics Annual Forum: Opportunities and Challenges in Modern Smart Distribution Systems

Special Session

	Topics
SS01	Local Energy Systems with Flexible Resources and Energy Transaction
SS02	Enhancing Grid Resilience Through DERs and Active Distribution Networks
SS03	Theory and Application of Rural Energy Internet
SS04	Coordination in Operating High-penetration Renewable Power Systems
SS05	Applications of Artificial Intelligence and Big Data Technologies in Smart Grids
SS06	Situation Awareness of Power Distribution Systems
SS07	Key Technologies of AC/DC Hybrid Distribution Networks
SS08	Low-carbon Smart Grid Transformation and Its Cyber-physical Security
SS10	Coordinated Operation, Control and Cyber-physical Security of Smart Grid Considering Supply-and Demand-Side Resources
SS11	Intelligent Interactions Between Electric Vehicles and Power Grid

Panel Session

	Topics
P01	Coordinated Dispatch and Market Trading Strategies for New Type Power Distribution and Utilization Systems
P02	Mitigation Strategies and Technological Support for Cyber-Physical Network Attacks in Power System
P03	Resilience Assessment and Defense Mechanism of New Power Systems
P04	Planning and Control Methods for HVDC/HVAC Hybrid Power Systems with Growing Penetration of Renewable Energy
P05	Floating Offshore Wind Turbine and Island Multi-Energy Complementary Technology
P06	Virtual Power Plant Construction and Operation Development
P07	The Key Technology of Flexible DC Distribution in Load-intensive Areas
P08	Advanced Planning, Operation and Control of Energy Internet
P09	Key Technologies and Applications about Smart Energy Utilization
P10	Economic and Low-carbon Operation Mechanism of Energy Internet
P11	Multi-agent and Multi-market Trading Mechanism in Energy Internet

Technical Session

Topics	
T01	Energy Forecasting, Peer-to-peer Energy Trading and Transactive Energy Management
T02	Renewable Generation and Distributed Energy Resources
T03	Computational Intelligence, Big Data, ICT and Blockchain Applications in Smart Grids
T04	Grid Resiliency, Security, Reliability, Stability and Protection
T05	Grid Planning, Operation and Management
T06	Renewable Generation and Distributed Energy Resources
T07	Key Equipment in Energy Internet & Smart Condition Monitoring and Fault Diagnosis Techniques
T08	Integrated Energy System
T09	Microgrids, Standalone Power Systems and Virtual Power Plants
T10	High Voltage Technology & Active Distribution Networks and DC Distribution Networks & Grid Planning, Operation and Management
T11	Integrated Energy System
T12	Energy Forecasting, Peer-to-peer Energy Trading and Transactive Energy Management & Emerging Technologies and End-user Systems
T13	HVDC Transmission
T14	Smart Homes, Buildings and Cities and Cyber Security & Renewable Generation and Distributed Energy Resources
T15	Renewable Generation and Distributed Energy Resources
T16	Grid Resiliency, Security, Reliability, Stability and Protection
T17	Integrated Energy System & FACTs
T18	Policy, Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects

Poster Session

Topics	
Poster Session 1	Renewable Generation and Distributed Energy Resources & MicroGrids, Standalone Power Systems and Virtual Power Plants
Poster Session 2	Planning, Operation and Control of Energy Internets & Active Distribution Networks and DC Distribution Networks & High Voltage Technology & Key Equipment in Energy Internet & Energy and Environment
Poster Session 3	Grid Planning, Operation and Management & Computational Intelligence, Big Data, ICT and Blockchain Applications in Smart Grids & Emerging Technologies and End-user Systems & IoT Enabled Energy Systems
Poster Session 4	HVDC Transmission & Grid Resiliency, Security, Reliability, Stability and Protection & Smart Homes, Buildings and Cities and Cyber Security & Smart Condition Monitoring and Fault Diagnosis Techniques
Poster Session 5	Integrated Energy System & Policy, Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects & Energy Forecasting, Peer-to-peer Energy Trading and Transactive Energy Management

AGENDA ON DEC. 16

Venue	Time	Activities
Kaiyuan Hall	**08:30-09:00**	**Opening Ceremony** Host: **Jianbin Fan,** *Vice Secretary of Chinese Society for Electrical Engineering*
	09:00-09:20	Plenary Speech I **Yinbiao Shu,** *Academician of the Chinese Academy of Engineering*
	09:20-09:50	Plenary Speech II **Yixin Yu,** *Academician of the Chinese Academy of Engineering*
	09:50-10:20	Plenary Speech III **Zhizhen Ye,** *Academician of the Chinese Academy of Science*
10:20-10:50 | Coffee Break		
Kaiyuan Hall	10:50-11:20	Plenary Speech IV **Hong Rao,** *Academician of the Chinese Academy of Engineering*
	11:20-11:50	Plenary Speech V **C.Y. Chung,** *Fellow of the Canadian Academy of Engineering*
10:00-11:00 | Poster Session 01		
12:00-13:30 | Lunch		
Kaiyuan Hall 1&2	14:00-14:30	Plenary Speech VI **Wen Ling,** *Academician of the Chinese Academy of Engineering*
	14:30-15:00	Plenary Speech VII **Zhonglin Wang,** *Foreign Member of the Chinese Academy of Sciences*

AGENDA ON DEC. 16

Venue	*Starts at 13:30*	*Starts at 15:45*
Kaiyuan Hall 1&2	***Plenary speech starts at 14:00 and details are on the previous page***	
Kaiyuan Hall 3	The 3rd Energy Conversion and Economics Annual Forum: Opportunities and Challenges in Modern Smart Distribution Systems (ECE Forum)	
Sihui Hall	Panel Session 02: Mitigation Strategies and Technological Support for Cyber-Physical Network Attacks in Power System	Special Session 07: Key Technologies of AC/DC Hybrid Distribution Networks
Sixin Hall	SG-1-1: Digitalization and Interoperability of Smart Distribution Networks	Panel Session 01: Coordinated Dispatch and Market Trading Strategies for New Type Power Distribution and Utilization Systems
Siyi Hall	Panel Session 07: The Key Technology of Flexible DC Distribution in Load-intensive Areas	Special Session 04: Coordination in Operating High-penetration Renewable Power Systems
Sixian Hall	SG-1-3: Response-driven Intelligent Enhanced Analysis and Control for Bulk Power System Stability	Panel Session 10: Economic and Low-carbon Operation Mechanism of Energy Internet
Side Hall	SG-1-2: Virtual Power Plant Pilot: Resources Coordination and Multi-dimensional Interaction	SG-1-4: Resilient Power Grid and Resilient City
Sile Hall	Panel Session 03: Resilience Assessment and Defense Mechanism of New Power Systems	Panel Session 09: Key Technologies and Applications about Smart Energy Utilization
	Starts at 14:00	*Starts at 16:15*
Mingdu Hall	SG-2-9: Key Technologies of Intelligent Dispatching for Power Grid with High Proportion of Renewable Energy Integration *(invited only)*	Panel Session 08: Advanced Planning, Operation and Control of Energy Internet
Baoding Hall	Special Session 05: Applications of Artificial Intelligence and Big Data Technologies in Smart Grids	Technical Session 01: Energy Forecasting, Peer-to-peer Energy Trading and Transactive Energy Management

15:30-15:45 | Coffee Break

17:00-18:00 | Poster Session 02

18:45-20:00 | EI² 2023 Banquet @Kaiyuan Hall

PLENARY SPEECH

Time: 09:00-09:20 **Venue: Kaiyuan Hall**

Yinbiao Shu

Academician of the Chinese Academy of Engineering

Biography

Yinbiao Shu, Academician of the Chinese Academy of Engineering, Chairman of the China Society for Electrical Engineering, and the 36th President of the International Electrotechnical Commission (IEC). Engaged in long-term strategic development of energy and power, power grid operation and power system planning, as well as major engineering construction and key technology research and development in ultra-high voltage and extra-high voltage transmission. His research achievements have promoted the implementation of the "West-East Electricity Transmission" strategy and the interconnection of the national power grid, facilitating the large-scale development and utilization of clean energy. He has been awarded the National Science and Technology Progress Special Award twice, as well as one first prize, and received the 2018 Guanghua Engineering Science and Technology Award.

Speech Title & Abstract

Advancing the Construction of a New Type of Power System under the "Dual Carbon" Goal

The new power system is the core of the energy internet and serves as a pivotal platform for achieving the "dual carbon" goals. It undertakes two important tasks: first, to achieve its own secure, clean, low-carbon, and efficient transformation, becoming a zero-carbon power system; second, to promote deep decarbonization in energy-consuming sectors such as industry, construction, and transportation through the substitution of electric power, thereby assisting the entire society in achieving carbon neutrality goals. The construction of a new power system requires strengthening the development of four major systems: a complementary clean energy supply system, a modernized power grid system, an intelligent energy use system, and an institutional guarantee system.

PLENARY SPEECH

Time: 09:20-09:50 **Venue: Kaiyuan Hall**

Yixin Yu

Academician of the Chinese Academy of Engineering

Biography

Professor Yixin Yu is an academician of Chinese Academy of Engineering, and a professor of Electrical Engineering in Tianjin University. He is an expert on the simulation, analysis and planning of power systems.

He has been teaching and researching in the area of Power System Stability Analysis over several decades. Especially in the security region methodology of power system, he has achieved systematically significant original accomplishments both in theory and practical applications, and for the first time, implemented them into real bulk power grids. At the same time, Prof. Yu and his team have developed a comprehensive set of theory, models and methods for urban power distribution system expansion planning. Based on that, they developed a fully functional Urban Power Grid Planning System software with independent intellectual property rights, which has been used in more than 1000 power grid planning projects in China. The amount of money involved has already be more than 500 billion RMB and huge economic and social benefits are made. As the initiator and active promoter of Smart Grid in China, Prof. Yu has clarified the basic ideas, the necessity and the most important challenges of Smart Grid, undertook many Smart Grid related consulting projects of Chinese Academy of Engineering, hosted the first China Smart Grid forum, and made an important contribution to promote the scientific development of Smart Grid and the implementation of the Smart Grid project in China. Recent years, he has developed a new field of Non-Intrusive Load Disaggregation and Monitoring in China and actively promotes its application into Smart Grid.

He has won the Second Prize of National Scientific and Technological Progress Award, the Second Prize of National Technological Innovation Award, the Ten Colleges and Universities Scientific and Technological Achievement Award, and 5 provincial first prizes. He has published 6 books and more than 300 papers.

Speech Title & Abstract

Layered and Clustered Architecture of Power Grid

The extreme complexity of the future power grid makes the research on the grid architecture very important. It is the topmost level description (model) of the entire grid. Compared with other aspects, the grid architecture comes first.

Firstly, the theory of Interconnected Transmission System will be reviewed in this report. Then, the framework of Layered and Clustered Architecture of power grid will introduced in detail. The third part will focus on the mathematical basis of layered and clustered grid architecture and the core idea of “Future grid as smart as the internet” will also be presented. A brief summary is given at the last part.

PLENARY SPEECH

Time: 09:50-10:20 **Venue: Kaiyuan Hall**

Zhizhen Ye

Academician of the Chinese Academy of Science

Biography

Ye Zhizhen, an academician of the Chinese Academy of Sciences, a specially appointed professor at Zhejiang University, and a special-grade expert in Zhejiang Province, is an expert in advanced semiconductor optoelectronic thin film materials. He was admitted to Zhejiang University in 1977, received his Ph.D. from Zhejiang University in 1987, and joined the State Key Laboratory of Silicon Materials at Zhejiang University in 1988. From 1990 to 1992, he was a visiting scholar at MIT in the United States. He currently serves as the director of the Academic Committee of the School of Materials Science and Engineering at Zhejiang University, the dean of the Wenzhou Institute of Zhejiang University, a council member and director of the Electronic Materials Branch of the China Electronics Society, and an executive director of the 8th Council of the China Society for Materials Research.

His main research focuses on new material technologies such as semiconductor light-emitting displays and energy storage batteries. He proposed the principle of co-doping of p-type zinc oxide and invented the technology, achieving room temperature electroluminescence for the first time and leading in quantum well light efficiency internationally. He was the first in China to develop zinc oxide transparent conductive film technology, which has been well applied in high-efficiency LED devices. He invented new technologies to improve LED efficiency, breaking the world record for perovskite LED efficiency four times. Research and development achievements such as perovskite luminescent materials and zinc-based liquid flow batteries have gradually been industrialized at the Wenzhou Institute of Zhejiang University, contributing to the development of China's optoelectronic and energy storage industries.

He has won more than 10 science and technology awards, including a national second prize for natural science and five first prizes at the provincial and ministerial levels. He holds more than 150 authorized invention patents, has published five books, and received the second prize for national textbooks. He has published over 600 SCI papers with more than 20,000 total citations and has been selected as a "Highly Cited Researcher in China" by Elsevier for eight consecutive years.

Speech Title & Abstract

The New Energy Industry Needs New Technologies for Safe and Long-duration Energy Storage

Under the guidance of the "dual carbon" goal, new energy storage has become a crucial anchor for the development of the new energy industry. Energy storage systems can help mitigate energy fluctuations, achieve smooth energy output, and stabilize energy supply. They serve as an important means to address the current shortcomings of mainstream zero-carbon new energy technologies. Accelerating the large-scale application of new energy storage technologies has been included in the "14th Five-Year Plan" and is a long-term goal for 2035.

The energy storage industry imposes strict requirements on batteries in terms of safety, cost-effectiveness, and independent intellectual property rights. Zinc-bromine liquid flow batteries, with their characteristics of zero explosion risk, low cost, long lifespan, easy integration, and maintenance, are considered to be highly competitive for large-scale, long-duration energy storage applications. However, related technologies are still in the developmental stage internationally and face various technical challenges such as zinc dendrite formation, zinc passivation, and bromine shuttle. Additionally, in large-scale battery scenarios, the stack system also encounters issues such as high voltage drop, high efficiency loss, and poor mass transfer within the electrodes.

Addressing these challenges, the team led by Zhizhen Ye has developed five core technologies for zinc-bromine liquid flow batteries: precision-controlled energizing bipolar plate technology, ultrafine pore bromine-resistant membrane technology, solid bromine strong electrolyte activation technology, unique flow field pipeline stack design, and integrated sealing technology for preventing blockage and leakage. These advancements mark a solid step towards the industrialization of zinc-bromine liquid flow batteries.

PLENARY SPEECH

Time: 10:50-11:20 **Venue: Kaiyuan Hall**

Hong Rao

Academician of the Chinese Academy of Engineering

Biography

Rao Hong, an expert in power system engineering technology, is an academician of the Chinese Academy of Engineering, and the chief technical expert and chairman of the Science Research Institute of the Southern Power Grid Company. He graduated from Huazhong University of Science and Technology with a major in power systems and their automation in 1983. In 2011, he was recognized as a national outstanding science and technology worker. In 2016, he received the Ho Leung Ho Lee Foundation Science and Technology Progress Award. In 2017, he was selected as an outstanding talent in the "Guangdong Special Support Plan." In 2020, he received the Second National Innovation First Award, and in 2021, he was elected as an academician of the Chinese Academy of Engineering.

Speech Title & Abstract

Development and Prospects of the Main Grid Structure of the Southern Power Grid

Introducing the three historic transformations of the main grid of the Southern Power Grid, including the Yunnan asynchronous interconnection, the Kunliulong hybrid multi-terminal flexible direct current application for multi-DC grid feeding, and the Guangdong East-West partition flexible interconnection. Looking ahead, it showcases the support of flexible direct current for high-proportion new energy access in the new power system and demonstrates the experience and innovative development concept of the main grid layout of the Southern Power Grid.

PLENARY SPEECH

Time: 11:20-11:50 **Venue: Kaiyuan Hall**

C.Y. Chung

Fellow of the Canadian Academy of Engineering

Biography

Prof. C.Y. Chung is the Head of Department and Chair Professor of Power Systems Engineering in the Department of Electrical and Electronic Engineering at the Hong Kong Polytechnic University (HKPolyU), Hong Kong, China. Before re-joining the department, Prof. Chung was the NSERC/SaskPower Senior Industrial Research Chair in Smart Grid Technologies, and the SaskPower Chair in Power Systems Engineering at the University of Saskatchewan, Canada. He was a prominent leader for advancing academic activities and applied research in power systems engineering development in the province. He led a research team, supported by SaskPower and NSERC of Canada, to conduct cutting-edge and long-term smart grid research for SaskPower and address critical technical issues associated with smart grid technologies and their applications to real power systems.

Prof. Chung has been very active in professional societies. He is the 2014-2015 IEEE PES President-Elect. He was the Member-at-Large (Smart Grid) and Member-at-Large (Global Outreach) of IEEE PES Governing Board, the IEEE PES Region 10 North Chapter Representative, and a member of IEEE PES Fellow Evaluation Committee. He has been a Senior Editor of "IEEE Transactions on Power Systems", a Consulting Editor of "IEEE Transactions on Sustainable Energy", a Vice Editor-in-Chief of "Journal of Modern Power Systems and Clean Energy", and a Subject Editor of "IET Generation, Transmission & Distribution".

Prof. Chung is a Fellow of the Canadian Academy of Engineering, a Fellow of IEEE, EIC, IET, HKIE, and AAIA, and an IEEE PES Distinguished Lecturer. He is also the recipient of the 2021 IEEE Canada P. Ziogas Electric Power Award and 2021 Saskatoon Engineering Society (SES) Educator of the Year Award.

Speech Title & Abstract

Advanced Prediction Techniques Applied to Smart Grids With High Penetration of Renewables

In 2015, countries around the world reached the Paris Agreement and began reducing emissions as soon as possible to deal with the increasingly prominent issue of climate change and achieve the goal of carbon neutrality. Many countries, including China and the USA, have proposed national strategies to strengthen power grids to facilitate major government initiatives, such as increasing the penetration of renewable energy and electrifying transportation and other industrial and commercial sectors. At the same time, power system industry is shifting towards a new digital era to better manage risks in volatile energy commodities, increase customer engagement, and enhance efficiency through grid optimization. Data analytics plays a vital role in this transformation and, therefore, different measurement architectures have been used and implemented to facilitate the data capturing process and supervisory control at the generation, transmission, and distribution levels. Based on the massive measurement data, advanced prediction techniques driven by artificial intelligence will bring revolutionary changes to the power industry. This speech will briefly introduce advanced prediction techniques and review the recent results on some smart grid challenges addressed by novel prediction techniques.

PLENARY SPEECH

Time: 14:00-14:30 **Venue: Kaiyuan Hall 1&2**

Wen Ling

Academician of the Chinese Academy of Engineering

Biography

Professor. Ling is currently a member of the Party Leadership Group of Shandong Provincial People’s Government, President of Shandong Association for Science & Technology, Chair Professor of Shanghai Jiao Tong University, Chairman of the Committee on Engineering and Environment of World Federation of Engineering Organizations (WFEO), Director of the Management Consulting Committee of China Enterprise Confederation.

Professor. Ling has previously served as the President and Chairman of China Shenhua Energy Company Limited; Deputy Secretary of the Party Group of the Communist Party of China in Shenhua Group and General Manager of Shenhua Group; Vice Governor of Shandong Province; Delegate to the 19th Congress of the Communist Party of China; Member of the 13th Political Consultative Conference of the People's Republic of China; Deputy to the 12th Congress of the Communist Party of China in Shandong Province; Delegate to the 13th and 14th People's Congresses of Shandong Province; Vice President of the systems Engineering Society of China (SESC) and Vice President of the Chinese Energy Society (CES) , etc. Professor. Ling is a pioneer among China’s first generation of doctoral and postdoctoral scholars in systems engineering, and has been committed to applying system engineering theories to solve major engineering problems. He has been awarded National Prize for Progress in Science and Technology several times, the Gold Medal of the China Excellent Industrial Design, and the National Award for Outstanding Contribution to Industry-University-Research Cooperation. He is the chairman of the China Hydrogen Energy Alliance (CHEA) and the first chairman of the board of directors. Professor. Ling has also won the National model worker, National Financial Model Worker and National Outstanding Postdoctoral Fellow of China.

Speech Title & Abstract

Exploration and Practice of Zero-carbon Intelligent Highway

PLENARY SPEECH

Time: 14:30-15:00 **Venue: Kaiyuan Hall 1&2**

Zhonglin Wang

Foreign Member of the Chinese Academy of Sciences

Biography

Dr. Zhonglin Wang is the Director of the Beijing Institute of Nanoenergy and Nanosystems, Dean of College of Nanoscience and Technology, University of Chinese Academy of Sciences, and Regents' Professor and Hightower Chair at Georgia Institute of Technology. Dr. Wang pioneered the nanogenerators field for distributed energy, self-powered sensors and large-scale blue energy. He coined the fields of piezotronics and piezo-phototronics for the third generation semiconductors. Among 100,000 scientists across all fields worldwide, he is ranked #1 for single year scientific impact continuously for 2019-2022, , #2 in career scientific impact; and #1 in Materials Science. His google scholar citation is over 400,000 with an h-index of over 300.

Dr. Wang has received the Global Energy Prize (2023); The Albert Einstein World Award of Science (2019); Diels-Planck lecture award (2019); ENI award in Energy Frontiers (2018); The James C. McGroddy Prize in New Materials from American Physical Society (2014); and MRS Medal from Materials Research Soci. (2011). Dr. Wang was elected as a fellow of the US National Academy of Inventors in 2022, foreign member of the Chinese Academy of Sciences in 2009, member of European Academy of Sciences in 2002, academician of Academia of Sinica 2018, International fellow of Canadian Academy of Engineering 2019. Dr. Wang is the founding editor and chief editor of an international journal *Nano Energy*.

Speech Title & Abstract

Triboelectric Nanogenerators for Energy and Self-powered Sensors

Triboelectric nanogenerator (TENG) was invented by us in 2012, which is based on coupling of triboelectrification and electrostatic induction effects for converting mechanical energy into electric power. TENG is playing a vitally important role in the distributed energy and self-powered systems, with applications in internet of things, environmental/infrastructural monitoring, medical science, environmental science, and security. In this talk, we first present the physics mechanism of triboelectrification for general materials. Our model is extended to liquid-solid contact electrification, reviving the classical understanding about the formation of electric double layers. Secondly, the fundamental theory of the TENGs is explored based on expanded Maxwell equations for a mechano-driven system. We will present the applications of the TENGs for harvesting all kind mechanical energy that is available but wasted in our daily life, such as human motion, walking, vibration, mechanical triggering, rotating tire, wind, flowing water and more. Then, we will illustrate the networks based on triboelectric TENGs for harvesting ocean water wave energy, for exploring its possibility as a sustainable large-scale blue energy for humankind. Lastly, we will show that TENGs as self-powered sensors for actively detecting the static and dynamic processes arising from mechanical agitation using the voltage and current output signals.

ECE FORUM

The 3rd Energy Conversion and Economics Annual Forum: Opportunities and Challenges in Modern Smart Distribution Systems

13:30-17:45 @Kaiyuan Hall 3

SESSION INTRODUCTION

The 3rd Energy Conversion and Economics(ECE) Annual Forum aims to promote in-depth communication among industry and academia in the field of modern smart distribution systems by sharing the latest research advances. Besides the 6 keynote speeches, a round table discussion shall be held to discuss the opportunities and challenges in the development of modern smart distribution systems. The ECE Series Forum was established in October 2021, focusing on key technological areas in power and energy industry. Since its establishment, the ECE Series Forum has organized several thematic and annual forums every year, which attacts tens of thousands of online participants from power grid companies, power generation groups, universities, research institutes, financial investment institutions, as well as enterprises such as Huawei, Siemens, and ABB.

SESSION CHAIRS

Name	Affiliation
Fushuan Wen	Zhejiang University
Weihong Yang	State Grid Economic and Technological Research Institute Co., Ltd.

SESSION SPEECHES

Name	Affiliation	Title
Wenchuan Wu	Tsinghua University	Operation and Control of Active Distribution Networks：From Model-Driven to Measurement-Driven
Zuyi Li	Zhejiang University	Challenges and Opportunities in Microgrid Development
Zongxiang Lu	Tsinghua University	Low-Carbon Planning of Distribution System Integrated with Distributed "Hydro-PV-Charging-Storage" Multiple Elements
Bo Wang	Wuhan University	New Challenges in Data Modeling for Modern Smart Distribution Grids: From Standardization to Semanticization
Yi Song	State Grid Economic and Technological Research Institute Co., Ltd.	Development Trends and Countermeasures of New-type Energy Storage
Weihong Hou	State Grid Zhejiang Electric Power Co., Ltd.	Exploration and Reflection on the Development of Modern Smart Distribution Network in Zhejiang Province

FORUM SESSION

SG-1-1: Digitalization and Interoperability of Smart Distribution Networks

13:30-15:30 @Sixin Hall

SESSION INTRODUCTION

A large number of intermittent and random distributed power supplies, charging piles and other user-side devices are connected to the distribution network, which increases the complexity of the distribution network and the difficulty of operation control. Therefore, it is urgent to establish a new type of distribution system with an open structure, data sharing, plug-and-play, and resource synergy. This sub-forum focuses on the digitalization and interoperability of the smart distribution network, with an emphasis on key technologies such as data interoperability, flexible device access, and efficient business collaboration, aiming to meet the massive data sharing and application needs of the distribution network for a large number of charging piles and distributed power sources. From the aspect of data interoperability, we will discuss the quantum security communication scheme of distribution network and the uncertainty and semantic development of distribution domain data model. From the aspect of device access, we will discuss the secure access mechanism and communication protocol to support plug-and-play. From the aspect of efficient business collaboration, we will discuss the kernel technology of autonomous operating system and the key technology of distribution digital cloud platform.

SESSION CHAIR

Name	Affiliation
Bo Wang	School of Electrical Engineering and Automation, Wuhan University

SESSION SPEECHES

Name	Affiliation	Title
Haipeng Xie	Xi'an Jiaotong University	Quantum Secure Communication Scheme for Distribution Network Based on Multi-Resource Hybrid QKD
Bo Wang	Wuhan University	Development for Power Distribution Interoperability: Data Model Uncertainty and Semantics
Qiang Yang	Zhejiang University	Artificial Intelligence Driven Smart Energy Systems: Technical Challenges and Case Studies
Jitang Lei	HUAWEI Technologies Co, Ltd.	Research on Kernel Technology of Autonomous Operating System
Tao Han	NARI Technology Co, Ltd.	Key Technologies of Distribution Digital Cloud Platform

SG-1-2: Virtual Power Plant Pilot: Resources Coordination and Multi-dimensional Interaction

13:30-15:30 @Side Hall

SESSION INTRODUCTION

As a typical technical configuration of energy internet, virtual power plants (VPP) can enhance grid balance and regulation capabilities, promote renewable energy integration, ensure power supply security, and expedite the achievement of "dual carbon" goal. It is emerging as a crucial element and a key initiative in the development of new power systems. How to mine and utilize massive, dispersed, integrated, and heterogeneous distributed resources to support the safe and economic operation of power systems has become an important task. Confronted with issues such as increased scale, smaller individual granularity, more dispersed deployed nodes, and more diverse operational characteristics, there is a need to investigate and study the scientific issues, theoretical methods, and key technical systems of large-scale flexible VPPs. However, VPPs currently face many technical challenges, and issues related to market-oriented operation and business models also require further refinement. These factors hinder the full utilization of distributed flexible resources, necessitating targeted research and practical initiatives. This forum will discuss the aggregation and quantification of VPPs, as well as multi-dimensional interactive issues of value-energy-information, thus providing reference for the development of VPPs.

SESSION CHAIR

Name	Affiliation
Qixin Chen	Tsinghua University

SESSION SPEECHES

Name	Affiliation	Title
Tao Xu	Tianjin University	Revenue Allocation of Scaled DERs under the Framework of Cloud-Edge-End Collaboration
Hongchao Gao	Tsinghua University	Dynamic Construction and Credible Quantification of VPPs in New Power System
Ying Xu	Harbin Institute of Technology	Data-Driven Scheduling Approach for Multi-VPPs: Safety, Generalization, and Acceleration
Hongxun Hui	University of Macau	Distributed Control and Hardware-in-the-loop of Flexible Demand-side Resources in VPP
Xuguang Hu	Northeastern University	Research on Intelligent Processing Technology of Multi Energy Data for Collaborative Operation of VPPs

SG-1-3: Response-driven Intelligent Enhanced Analysis and Control for Bulk Power System Stability

13:30-15:30 @Sixian Hall

SESSION INTRODUCTION

The special forum focuses on Response-Driven Intelligent Enhanced Analysis and Control for Bulk Power System Stability, two major scientific issues are emphasized: the quantification of high dimensional time-varying response information and system stability and the deep integration of stability quantification mechanism analysis and data correlation analysis. This project emphatically discusses the correlation between the fault electrical quantities and stability characteristics of the AC/DC hybrid system, the stability discrimination technology of the large power grid based on key response characteristics, the hybrid intelligent enhanced analysis technology to enhance the credibility of response-driven stability discrimination, the non-scripted autonomous and coordinated stability control technology of the power system, and the intelligent enhanced imaging analysis and decision-making technology for the large power grid security and stability. The research findings effectively reduce the risk of instability caused by the mismatch of existing security and stability control system strategies, thereby preventing widespread power outages. This approach robustly ensures the safe and reliable transmission of a high proportion of new energy, enhancing the secure operation of hybrid AC/DC grids with a significant share of renewable energy sources. The contributions ensure social stability and economic development.

SESSION CHAIR

Name	Affiliation
Bing Zhao	China Electric Power Research Institute

SESSION SPEECHES

Name	Affiliation	Title
Gengyin Li	North China Electric Power University	Quantitative Mapping Analysis of Electrical Quantities and Stability Characteristics of AC/DC Hybrid Power Systems
Cheng Liu	Northeast Electric Power University	Research on New Type Power System Polymorphic Stability Identification Technology Based on Network Response Data
Shiyun Xu	China Electric Power Research Institute	Hybrid Intelligent Enhanced Analysis Technology of Improving the Reliability of Response-driven Stability Discrimination
Chen Shen	Tsinghua University	Technology of Non-preplanned Stability Control for AC/DC Hybrid Power Grid
Bing Zhao	China Electric Power Research Institute	Research on Operation Mapping Model and Its Key Technology in Large Power Grid

SG-1-4: Resilient Power Grid and Resilient City

15:45-17:45 @Side Hall

SESSION INTRODUCTION

Large cities have a high population density and a large number of important electricity customers. Furthermore, the critical infrastructures are coupled and interacted with each other. Once a power outage occurs, the negative impact could be very serious. In recent years, large-scale power outages have occurred in major international cities, e.g., Tokyo, London and New York. Some large cities in China have also experienced large-scale power outages due to floods, earthquakes, typhoons, icing and other reasons. This has posed a significant challenge to the disaster prevention of large cities. Therefore, it is urgent to enhance the resilience of large urban power grids and further build resilient cities. This forum focuses on the resilient power grid and resilient city. Six experts will be invited to give presentations about the resilience assessment, planning and enhancement of urban distribution networks, microgrid (clusters), integrated energy systems and urban infrastructure systems.

SESSION CHAIRS

Name	Affiliation
Yin Xu	Beijing Jiaotong University

SESSION SPEECHES

Name	Affiliation	Title
Naiyu Wang	Zhejiang University	A Framework to Real-Time Power System Risk Forecasting During Typhoon Evolution-Towards Resilient Coastal Power Grids
Min Ouyang	Huazhong University of Science and Technology	Resilience Assessment and Enhancement of Urban Infrastructure Systems: Methodology, Validation, and Platform
Chen Chen	Xi'an Jiaotong University	Enhancing Distribution System Resilience Through Cyber-Physical Coordination
Rufeng Zhang	Northeast Electric Power University	Resilience Evaluation and Enhancement for Integrated Energy Systems Under Extreme Disasters
Shengjun Huang	National University of Defense Technology	Large-Scale Binary Matrix Optimization for Multi-Microgrid Network Planning with Nodal Invulnerability Requirements
Xiangyu Wu	Beijing Jiaotong University	Operation and Control of Microgrids Towards Extreme Survival

SPECIAL SESSION

SS04 / Coordination in Operating High-penetration Renewable Power Systems

15:45-17:45 @Siyi Hall

SESSION INTRODUCTION

In the past decades, the burning of fossil fuels has sparked worldwide apprehension regarding climate change, with carbon emissions from the electricity sector which reached approximately 14.6 Gt in 2021. Numerous countries have put forth national strategies to decarbonize power systems by promoting high-penetration energy shares of renewable resources.

Establishing high-penetration renewable power systems brings significant changes in the electricity sector. For example, the device level observed more and more diversified inverter-based resources (e.g., electric vehicles and hydrogen) had been incorporated, and the system level observed the structure of long-distance renewable power delivery and regional receiving-end power systems. These changes open up more opportunities for coordination in operating high-penetration renewable power systems at different levels (particularly at device-device levels, device-system levels, and system-system levels). Such coordination facilitates making full use of different resources and systems to promote renewable accommodations. However, the implementation of the coordinated operation should be careful and efficient to ensure operational security and economy of high-penetration renewable power systems. Unfortunately, the coordination task is essentially complex, particularly with the significant renewable uncertainties, the computation challenge of the increasing heterogeneous coordination participants, and the deregulation of the electricity sector. To this end, this special session will focus on advanced techniques for coordination in operating high-penetration renewable power systems.

SESSION CHAIRS

Name	Affiliation
Chongyu Wang	The Hong Kong Polytechnic University
Wei Lin	The Hong Kong Polytechnic University
Tao Qian	Southeast University

SESSION SPEECHES

Time	ID	Presenter	Paper Title
15:45-15:57	1224	Yuxiang Chu	Multi-type Energy Storage System Operation Strategy Based on Grouping State of Charge Regulation
15:57-16:09	1903	Zhigang Xie	A Hierarchical Backtracking Search Algorithm with Heuristic Pruning for Transmission Maintenance
16:09-16:21	2412	Jianan Duan	Calculation Model of Firm Generation Capacity for Wind-Solar-Hydro Complementary Generation System with Hybrid Pumped Storage Stations
16:21-16:33	2597	Leidong Yuan	Research on a Rapid Active Power Control Method for Wind Farms Based on Dynamic Operating Points

16:33-16:45	2978	Maosheng Gao	An Intelligent Operational Reliability Assessment Approach Considering Sample Imbalance
16:45-16:57	4165	Yue Chen	Real-time Wholesale Electricity Pricing For Power Systems with Energy Storage
16:57-17:09	5197	Sheng Liu	Formation of Operating Reserve Component in Locational Marginal Prices Considering Controllability of Wind Power
17:09-17:21	5873	Hongyi Li	Consensus-based Coordination of Battery Energy Storage Systems for Frequency Regulation Service
17:21-17:33	4443	Menghan Zhang	A Model-based Parameter Space in Monte Carlo Simulations for European Short-term Adequacy Assessments
17:33-17:45	7661	Fengqi Lyu	Flexible Microgrids with Dynamic Boundaries for Voltage Volatility Reduction

SS05 / Applications of Artificial Intelligence and Big Data Technologies in Smart Grids

14:00-16:00 @Baoding Hall

SESSION INTRODUCTION

With the development of the modern smart grid, an increasing number of components such as smart meters, smart appliances, distributed renewable energy resources, multi-energy systems, and electric vehicles have been deeply integrated into the power system. Furthermore, the advanced capabilities of data awareness, collection, and storage have endowed the modern smart grid with abundant data reserves. This data wealth offers researchers the opportunity to leverage Artificial Intelligence (AI) and Big Data Technologies, allowing them to tackle challenges that traditional modeling, optimization, and control approaches might struggle to address. This special session aims to gather high-quality research papers for various aspects of smart grid applications based on Artificial Intelligence and Big Data Technologies . The goal is to advance the state-of-the-art in smart grid technology and enable more efficient, reliable, and sustainable power systems.

SESSION CHAIRS

Name	Affiliation
Chaojie Li	The University of New South Wales
Xiangyu Li	The University of New South Wales
Bo Wang	Hohai University

SESSION SPEECHES

Time	ID	Presenter	Paper Title
14:00-14:12	3510	Hongsheng Xu	Optimal Joint Bidding and Pricing of Electricity Retailers Using Multi-Agent Deep Reinforcement Learning
14:12-14:24	4953	Hao Wang	Deep Reinforcement Learning for Community Battery Scheduling under Uncertainties of Load, PV Generation, and Energy Prices

14:24-14:36	5232	Ruipeng Xu	Data-Driven Two-Stage Voltage/VAR Control Using PV Inverters in Network Recove
14:36-14:48	5486	Yuou Chen	Lithium-ion Battery Degradation Curve Prediction Based on Multipartite Gaussian Process Regression
14:48-15:00	6173	Shaocong Wang	A DQN-based Coordination Method of HVAC and Energy Storage for Building Energy Management
15:00-15:12	6625	Yu Huang	The Application of the New Generation of Artificial Intelligence Technology In Modern Electrical Power Systems: Models, Algorithms, And Challenges
15:12-15:24	6691	Yangyi Hu	An Electric Taxi Charging Guidance Approach for Transactive Energy Sharing with Energy Community
15:24-15:36	9119	Wanjun Huang	A Scenario-Based Transfer Learning Approach for Stable Distribution Network Structure Identification
15:36-15:48	9176	Hao Wang	Non-Intrusive Load Monitoring for Feeder-Level EV Charging Detection: Sliding Window-based Approaches to Offline and Online Detection
15:48-16:00	9354	Jiacheng Liu	Post-fault Transient Stability Assessment with LTD Compressed Power Angle Trajectories Considering Limitation of Transient Response Observations

SS07 / Key Technologies of AC/DC Hybrid Distribution Networks

15:45-18:09 @Sihui Hall

SESSION INTRODUCTION

Hybrid AC/DC distribution networks encounter challenges ranging from seamless integration of AC and DC components, coordination of control strategies, voltage and power quality management across modes, designing fault protection schemes for both AC and DC scenarios, ensuring reliable energy management and optimization, addressing interoperability and standardization concerns, managing transitions during faults and extreme weather, and safeguarding against cyber threats to ensure data integrity, collectively necessitating innovative solutions for efficient and resilient operation.

SESSION CHAIRS

Name	Affiliation
Lu Zhang	China Agricultural University
Gen Li	Technical University of Denmark
Yue Zhou	Cardiff University
Bo Zhang	North China Electric Power University

SESSION SPEECHES

Time	ID	Presenter	Paper Title
15:45-15:57	2559	Yongxiang Cai	An Integrate Sensitivity Calculation Method for Cross Voltage Levels of Unbalanced Medium- and Low-Voltage Distribution Network
15:57-16:09	3809	Yuhang Huang	Probability Assessment of Open-loop Mode Resonance in Grid-connected Wind Power Systems
16:09-16:21	4348	Yujing Zhang	Optimal Scheduling Method of PV-hydrogen Energy Storage for Distribution Network Power Supply Reliability Improvement
16:21-16:33	7233	Zhiqing Ren	Overview of the Development of Direct Current Transmission Technology
16:33-16:45	8779	Zhiyang Yao	Cause Identification Method of Power Quality Problems in Rural Low voltage Distribution Network Driven by Mechanism Data Combination
16:45-16:57	9633	Hong Zeng	Power Supply System Design for IGCT Gate Unit in Series Application
17:57-18:09	9189	Yuguang Zheng	A Method for Identifying Weak Links in Medium Voltage Distribution Networks Based on the Value at Risk of Customer Blackout

PANEL SESSION

P01 / Coordinated Dispatch and Market Trading Strategies for New Type Power Distribution and Utilization Systems

15:45-17:45 @Sixin Hall

PANEL INTRODUCTION

Significant initiatives have been taken from the governments around the world towards deep decarbonization on the power distribution and utilization systems, through wide integration of renewable energy sources and significant electrification around the transport and heat sectors. Challenges and opportunities emerge at the same time alongside these initiatives. On the one hand, critical techno-economic challenges to distribution systems' operation since distribute renewable energy sources are characterized by high variability and limited controllability while electric transport and heat loads are expected to aggravate the variability of the demand side and increase demand peaks. On the other hand, significant flexibility resided in massive number of distributed energy resources owned by heterogenous energy prosumers could contributed significantly towards social welfare maximization at the distribution and local level, as well as delivering a variety of ancillary services to both distribution and transmission systems. This penal session is dedicated to effective coordinated dispatch and market mechanism designs for the new type power distribution and utilization systems which could unravel the significant techno-economic benefits of the distributed energy resources, and thereby facilitating the construction of new type power systems and the overall decarbonization target at the globe level.

PANEL CHAIRS

Name	Affiliation
Yujian Ye	Southeast University
Yu Wang	Chongqing University

PANELISTS

Name	Affiliation	Title
Jiajia Yang	James Cook University	Localized Electricity Market and Its Operational Strategies
Sijie Chen	Shanghai Jiao Tong University	A Trusted Coordinated Optimization Framework for New Type Power Systems
Yingying Zheng	China Agricultural University	Dynamic Incentive Pricing Menu Differentiated EV Real-Time Charging Schedule
Chenye Wu	Chinese University of Hong Kong (Shenzhen)	Decision-Making Towards an Active Distribution Network
Meng Song	Southeast University	Two-stage Stochastic Scheduling of Virtual Power Plant Based on Transactive Control

P02 / Mitigation Strategies and Technological Support for Cyber-Physical Network Attacks in Power System

13:30-15:30 @Sihui Hall

PANEL INTRODUCTION

Aligned with carbon peak and neutrality objectives, the transition to renewable energy-centric next-gen power systems triggers structural, operational, and risk transformations. This shift introduces security challenges, amplified by digitization's integration in power systems (e.g., SCADA, WAMS). Increased integration of generation, power grid, load, and storage elevates susceptibility to external manipulation. Digital integration raises cybersecurity concerns, increasing the risk of large-scale outages. Open communication protocols ease attacker access. Security gaps in intelligent sensing and control devices enhance potential attack vectors for Power Grid Cyber-Physical Systems (PGCPS). Pervasive cyberattacks on power grids, such as the 2017 WannaCry ransomware incident and the 2019 NPCIL breach, underscore the imperative for robust defenses. This panel delves into cyber risks, presenting research on abnormal state identification, cyberattacks, defense strategies, intelligent information technology, and cyber-physical-social systems supporting low-carbon power systems.

PANEL CHAIRS

Name	Affiliation
Yingjun Wu	Hohai University
Qiang Yang	Zhejiang University

PANELISTS

Name	Affiliation	Title
Yu Wang	Chongqing University	Resilient Control of Cyber-physical Microgrids
Gang Li	North China Electric Power University	Exploration of Data-Model-Knowledge Hybrid Driving Method in Health Management of Power Equipment
Zhengcheng Dong	Wuhan University of Technology	Resilience Improvement for Cyber-physical Power Systems Before Extreme Events
Ting Yang	Tianjin University	Research on New Method of Detecting Abnormal Transmission Behavior in Power Cyber-physical System

P03 / Resilience Assessment and Defense Mechanism of New Power Systems

13:30-15:30 @Sile Hall

PANEL INTRODUCTION

In recent years, significant power outages frequently occur worldwide due to extreme natural disasters, deliberate attacks, accidents, etc. The relationship between power supply guarantee and climate conditions will become increasingly close. Therefore, there is a consensus on the power system's resilience to address extreme climate risks and ensure power supply. Currently, many scholars have devoted themselves to establishing a universal defense mechanism that responds to changes with immutability to improve the power grid's security and resilience support system.

This panel session mainly focuses on enhancing the autonomous operation capability of local power grids at all levels through resource decentralization, exploring flexibility to increase the types and volumes of resources that can participate in system regulation, and enhancing multi-agent collaboration to expand the complementary and mutually beneficial space between multiple energy systems.

PANEL CHAIRS

Name	Affiliation
Lei Xi	China Three Gorges University
Ning Wang	Technical University of Denmark

PANELISTS

Name	Affiliation	Title
Biyun Chen	Guangxi University	Resilience Enhancement Planning of Weak-link Distribution Network
Kaishun Xiahou	South China University of Technology	Security Assessment and Defense of Cyber-physical Power Systems Under Malicious Cyber Attacks
Meng Tian	Wuhan University of Technology	Coordinated Repair Crew Dispatch Problem for Cyber-physical Distribution System
Sheng Su	Changsha University of Science and Technology	Risk Map of Rainstorm Induced Outage of Distribution System
Qi Wang	Southeast University	Endogenous Security Defense Method of Power System Against Cross-domain Cyber Attacks
Wenping Qin	Taiyuan University of Technology	Resilience Enhancement and Restoration Strategies for Urban Energy Systems Considering Malicious Attacks
Youbing Zhang	Zhejiang University of Technology	Intelligent Control Method of Power Balance in Flexible Microgrid
Yun Liu	South China University of Technology	Grid Strength Based Resilient Cooperative Control of New Power Systems

P07 / The Key Technology of Flexible DC Distribution in Load-intensive Areas

13:30-15:30 @Siyi Hall

PANEL INTRODUCTION

Load-intensive areas play a pivotal role in achieving carbon peaking and carbon neutrality goals. The development of smart grids serves as a crucial catalyst for the widespread implementation of carbon peaking and neutrality strategies. This significance is exemplified in the National Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area, which envisions the establishment of a world-class city cluster. Currently, the Greater Bay Area is witnessing a surge in interconnectivity and power grid expansion to meet the escalating electricity demand. For instance, regions like Macao and Guangdong face challenges in load-intensive zone, including limited grid capacity expansion, and the need for network losses optimization. One promising solution involves the integration of DC technology into existing AC systems. However, existing flexible distribution equipment exhibits drawbacks such as large physical size and high costs. Furthermore, the imperatives of green and low-carbon standards also demands the adoption of more environmentally-friendly equipment. This panel session investigates recent developments in compact, efficient, and eco-friendly flexible distribution systems, aiming to address the challenges faced in load-intensive areas and contribute to the advancement of sustainable power grids.

PANEL CHAIRS

Name	Affiliation
Ying Huang	Zhejiang University
NingYi Dai	University of Macau

PANELISTS

Name	Affiliation	Title
Yuebin Zhou	CSG Electric Power Research Institute Co., Ltd.	Embeded VSC Technology and Compact Environment-friendly Equipment in Urban MV Distribution System
Shuai Shao	Zhejiang University	Flexible DC Distribution Equipment Based on Series-connected SiC MOSFETs
Hongcai Zhang	University of Macau	Optimal Power Flow in Distribution Network Based on Constraint Learning
RuiHuang Liu	Jiangsu Eletrical Power Research Institute	Efficient and Flexible AC/DC Power Distribution Technology in Multi-scenarios
Yi Lu	EPRI of State Grid Zhejiang Electric Power CO., LTD.	The Flexible Multi-state Switch Technology and Application

P08 / Advanced Planning, Operation and Control of Energy Internet

16:15-18:15 @Mingdu Hall

PANEL INTRODUCTION

The equipments and the integrated system of Energy Internet are the physical basis of energy Internet planning, construction, operation and policy / business model formulation. They are also the precondition of demonstration and business operation of Energy Internet. This panel focuses on relevant technologies in the areas of the advanced planning operation and control of Energy Internet.

PANEL CHAIR

Name	Affiliation
Tao Lin	Wuhan University

PANELISTS

Name	Affiliation	Title
Ming Wu	State Grid Shanghai Energy Interconnection Research Institute	Key Technologies and Equipment for Medium and Low Voltage Flexible Interconnection
Jian Qiu	Zhejiang University	AI and Digital Twin Model Fusion-based Smart Energy System Control and Optimization Techniques
Yang Gao	Shanghai Jiao Tong University	Research on Swarm Intelligent Regulation Strategy of Multi-energy Microgrids Considering Carbon Trading Mechanism
Guoqiang Sun	Hohai University	Pricing Mechanism for Coordinating Urban Power-traffic Networks
Tao Lin	Wuhan University	Natural Gas Network Dynamic Security Region for Gas-fired Units Peak Regulation

P09 / Key Technologies and Applications about Smart Energy Utilization

15:45-17:45 @Sile Hall

PANEL INTRODUCTION

In order to promote the construction of New Power System, and further enhance the level of user side smart energy technology, it is planned to hold seminars in the fields of flexible interaction of demand-side resources, efficient utilization of comprehensive energy, and intelligent analysis and prediction of electric power, and invite well-known scholars and experts at home and abroad to give keynote speeches about development status, technology research and practical application of smart energy consumption, and actively carry out the advanced concepts, technologies and methods in the field of smart energy consumption.

PANEL CHAIR

Name	Affiliation
Songsong Chen	China Electric Power Research Institute

PANELISTS

Name	Affiliation	Title
Bin Li	North China Electric Power University	Optimization of Information and Communication Technology for Large-scale Demand Response Resource Interaction
Feng Zhang	State Grid Zhejiang Electric Power Company	Application Scenarios, Key Technologies and National Standard of Virtual Power Plant
Li Xue	Beijing State Grid Pratt High Voltage Transmission Technology Co., Ltd	Key Technologies, Devices and Practical Applications for Demand-Side Resource Interaction in Electricity
Yang Liu	Hebei Xiong’an Xuji-Dianke Integrated Energy Technology Co., Ltd	Key Technology of Distributed Resources' Active Support for Source-load Interaction under the New Electric Power System
Chaoliang Wang	State Grid Zhejiang Marketing Service Centre	The Topological Relationship Identification in Transformer District Based on Characteristic Current
Ying Zhou	China Electric Power Research Institute	Analysis and Prediction Of Customer Side Electricity Load Under New Circumstances

P10 / Economic and Low-carbon Operation Mechanism of Energy Internet

15:45-17:45 @Sixian Hall

PANEL INTRODUCTION

In order to achieve the goal of carbon neutrality, Energy Internet focuses on building a clean, low-carbon, safe and efficient energy system by using "Internet +" as a means. We should promote the deep integration of energy and information and realize the development of new technologies, new models and new business forms of the Energy Internet. Meanwhile, we should promote the constriction of energy market and industrial upgrading to form new economic growth points for achieving the carbon neutrality. This session focuses on the economic and low-carbon operation mechanism of Energy Internet. Experts in the field of Energy Internet are invited to discuss the operation mechanism and business model towards an economic and low-carbon Energy Internet.

PANEL CHAIRS

Name	Affiliation
Heping Jia	North China Electric Power University
Dunnan Liu	North China Electric Power University

PANELISTS

Name	Affiliation	Title
Minglei Bao	Zhejiang University	Flexibility Evaluation of Multi-energy Industrial Loads for Renewable Energy Consumption
Yibao Jiang	Shandong University	Development of Digital Platform for Low-carbon Integrated Energy Systems
Hang Fan	North China Electric Power University	Designing of Electricity Futures Trading System Tailored to China's Electricity Market
Tao Wu	Southern Methodist University	Reliability Evaluation for Integrated Electricity-Gas Systems Considering Hydrogen
Chao Guo	Hangzhou City University	Research on Optimization and Control of Active and Passive Participation of Demand Side Resources in Power Grid Interaction
Dunjian Xie	Nanyang Technological University/ Singapore ETH Center	Stability-constrained Load Restoration Considering Complex Load Behaviors

■ TECHNICAL SESSION

T01 / Energy Forecasting, Peer-to-peer Energy Trading and Transactive Energy Management

16:15-18:15 @Baoding Hall

Chair: Zhenyuan Zhang, University of Electronic Science and Technology of China

Time	ID	Presenter	Paper Title
16:15-16:27	178	Yunfeng Guo	Short-term Prediction of Wind Farm Cluster Power Based on Load Risk Scenarios and Improved Weighted Loss During Peak and Valley Load Periods
16:27-16:39	272	Qing Lou	Optimal Scheduling and Sharing Model for Electric Vehicle Battery Swapping
16:39-16:51	278	Jiajiong Song	Wind Power Output Limitation Pattern Recognition Under Cold Wave Weather Conditions Based on Spatiotemporal Characteristics and GoogLeNet
16:51-17:03	361	Shihua Liu	Multi-dimensional Wind Power Low-power Event Identification Based on Variational Mode Decomposition
17:03-17:15	842	Haolan Hu	Urban Electricity Consumption Forecasts Under Abnormal Conditions
17:15-17:27	1308	Zhida Qu	Short-Term Wind Power Prediction Based on DTW Error Diagnosis and Transformer Optimization Model
17:27-17:39	2201	Peipei You	The Levelized Cost of Thermal Power Based on Coal Price Prediction
17:39-17:51	3073	Jinhao Liang	Few-shot Residential Load Forecasting Boosted by Learning to Ensemble
17:51-18:03	3310	Ning Zhang	Cooling Load Prediction for Data Center Based on Re-LSTM
18:03-18:15	5424	Yuxin Zhou	Hybrid Neural Network based Power Generation Prediction of Photovoltaic Farms

POSTER SESSION

Poster Session 01 / Renewable Generation and Distributed Energy Resources & MicroGrids, Standalone Power Systems and Virtual Power Plants

10:00-11:00 @Foyer

Order	ID	Presenter	Paper Title
001	123	Hong Qu	Comprehensive Economic Evaluation of Energy Storage Projects Based on DEA Model
002	164	Tianqi Yang	Equivalent Modeling of PMSG Based Wind Farm for Subsynchronous Oscillation Analysis
003	203	Xuechang Yu	A Cluster Control Method for High Penetration Distributed Photovoltaic Power Plants
004	293	Yuanyuan Wang	Evaluation Strategy for the Complementary Characteristics of Renewable Generation at Sending and Load Demand at Receiving Ends
005	446	Ping Huang	Green Hydrogen Production and Consumption Method for Offshore Wind Power Based On Electric Hydrogen Coupling
006	458	Rongkang Zhao	Trans-Regional Dispatch of Large-Scale Wind and Solar Power Generation Base
007	485	Xinyu Yin	Bidding Model for Shared Energy Storage Participation in Multi-Market Considering Multi-Timescale Demand
008	568	Hongbo Du	An Optimization Method for Renewable Energy and Energy Storage Capacity Allocation Based on Temporal Production Simulation
009	576	Qiang Bi	Single Current Sensor Based Flexible Power Point Tracking Algorithm of PV Inverter
010	665	Kaiyuan He	Evaluation Method for Weak Links in Power Supply of New Distribution Systems
011	720	Yan Li	Two-Level Scheduling Model For Air-Conditioning Load Aggregators Considering User Conditioning Behavior
012	815	Shuangning Ding	Robust Optimization of A CCS-P2G Virtual Power Plant Accounting for Penalized Carbon Price
013	829	Guoteng Wang	Condenser Configuration Method for Receiving-End Power Systems Considering Security and Stability Constraints
014	862	Weixu Tian	A Scenario-Based and Model-supported Analysis of Economic Benefit for Virtual Power Plant
015	942	Linni Jian	Conceptual Design of Inflatable Savonius Wind Turbine and Performance Investigation of Varying Thickness and Arc Angle of Blade

016	1021	Shuang Li	Small-Signal Modeling and Stability Mechanism Analysis of Grid-Connected Converter Based on PLL Synchronization-Dominated Loop
017	1032	Yongzan Zhen	Adaptability Study of Damping Control Strategies for Low-Frequency Oscillation in Power Grid with High Penetration of Photovoltaic
018	1072	Bingchen Wang	An Accelerated Algorithm for Estimating Wake Interactions Between Wind Turbines with FLORIDyn
019	1092	Zhuo Liu	An Improved Segmented Control Strategy for Inertial Response
020	1114	Li Bin	Modeling of Distributed Photovoltaic Interactive Communication Based on OPNET
021	1150	Chenyu Hu	Optimal Scheduling of Virtual Power Plants Considering Load Demand Response Under Ladder-Type Carbon Trading Mechanism
022	1306	Tieyi Chen	Real-Time Control of Optimal Voltage in Distribution Networks Based on Deep Deterministic Policy Gradient Algorithm
023	1415	Sijia Tang	Distribution System Recovery Method Based on Virtual Synchronous Generator Technology of Distributed New Energy Generator After Natural Disasters
024	1538	Xuchen Yang	Virtual Inertia Strategy of Doubly-Fed Induction Generator Participating in Power Grid Primary Frequency Modulation
025	1800	Fan Hua	A Multi-Period Analysis Method for Dispatch Potential of Electric Buses
026	1923	Shaoyuan Yu	Application Research of Blockchain Technology in Virtual Power Plant Dispatching and Trading
027	1953	Yajun Mo	A Projection-Based Clustering of Flexibility Resources for Peak Load Shaving
028	1958	Yanzhuo Jiang	Optimal Scheduling of Power System with Flexible Carbon Capture Power Plants Based on Fuzzy Chance Constrained Planning
029	2021	Ziming Qiu	Stability Analysis of Hybrid Wind Farms Considering Wake Effect
030	2109	Zhiwei Wang	Application Analysis of Energy Storage System in Wind Turbine Frequency Modulation
031	2212	Jingxian Yan	An Adaptive LVRT Control Strategy for DFIG Considering the Risk of Voltage and Frequency Drop
032	2242	Xumin Duan	Stochastic Distribution Network Reconfiguration Exploiting the Flexibilities of Data Center
033	2295	Decai Li	Generic EMT Modelling of DFIG Wind Turbines for Large Grid Simulation
034	2393	Kaiyuan He	Cross Domain and Cross Application Architecture for Sharing Operational Data in Distribution Networks

035	2701	Xiaohui Ma	Optimal Dispatch of Distribution Networks Based on Multi-node Interaction of Controllable PV and Supporting Storage-load
036	2751	Weiguo Xia	Stochastic Scenario Analysis of Photovoltaic Acceptance Capacity Considering Overvoltage Risk
037	2780	Shuqi Chen	Source-Load Uncertainty and Correlation Scenarios Generation Considering Typical Climate Risks
038	2942	Yu Lei	Impedance Modeling and Characteristics Analysis of Grid-Forming Converter
039	2976	Jianwei Dai	Multi-Objective Optimization Game Scheduling Method for Distributed Shared Energy Storage in Active Distribution Network
040	3005	Jiaxin Liu	Stability analysis of Fan-Synchronizer interconnected Power system Based on Shapelet algorithm
041	3039	Qiufan Yang	Distributed Adaptive Inertia-Droop Control for Multiple VSGs to Suppress Power Oscillation
042	3059	Chutong Wang	A Review of Different Shared Energy Storage Models
043	3086	Hongliang Chen	Optimal Placement of Hybrid Energy Storage for Mitigating Renewable Energy Generation Fluctuations
044	3229	Xin Hu	A Scenario Generation Method for Wind, PV and Load Uncertainty Based on DFKM
045	3465	Xiaotong Ji	Robust Optimization Planning for Shared Energy Storage Systems in Multi-Microgrid Distribution Networks
046	3476	Zeyu Liang	A Low Carbon Demand Response Approach via Road Tolls in Traffic-Power Coupled Systems
047	3632	Huihong Mo	Distributed Operational Scheduling of Virtual Power Plant in Peak-Regulation Ancillary Service Market Considering Uncertainty
048	3747	Youmei Liu	Wind-Solar Coordinated Optimization of Port Microgrids
049	3768	Dongwei Wang	Research on the Effect of Renewable Energy Reactive Output on the Voltage Support of the Power Grid
050	3907	Jingwen Dong	Frequency Regulation Strategy for User-Side BESS Based on Estimated and Corrected Droop Coefficient
051	3970	Chaoping Liu	Energy Storage Regulation Strategy for 5G Base Stations Considering Power Supply Reliability
052	3988	Haotian Ma	Study on Complex-LSTM Photovoltaic Output Prediction Model Considering Reactive Power Distribution
053	3996	Houlei Li	Hybrid Storage Capacity Configuration Based on SG Filter and VMD
054	4105	Zhikun Hu	Modeling and Strategic Design of Multi-Layered Aggregation and Control for Flexible Loads
055	4112	Pengjiang Ge	Research on the Proportion of New Energy Included into Power System Balance Based on Statistical Characteristics

056	4133	Min Hang	Research on Power Supply Strategy of DC Microgrid with Diesel Rectifier Generator and Hybrid Energy Storage System
057	4135	Kexin Xu	Aggregation Mechanism between Virtual Power Plants and Distributed Energy Resources
058	4401	Yawen Zheng	Multi-Resources Joint Power Dispatch with Coordinated Consideration of Deep Peak and Frequency Regulation Requirements
059	4604	Qi Liu	Cooperative Demand-Side Local Energy Trading Among PV Prosumers in Distribution Systems Considering Voltage Regulation
060	4698	Yukai Zeng	A PI Consensus-Based Second Control for P/V Droop-Controlled Converters in Low-Voltage Resistive Network
061	4803	Jiaming Li	Optimal Power Dispatch of Wind Farms for Short-Term Power Overproduction Capability Maximizing
062	4804	Canjuan Du	Evaluation Method of Static Voltage Stability of Renewable Energy Farm Based on Sufficient Conditions of Power Flow Insolvability
063	4872	Hailun Wang	Capacity Optimization of Wind Generation Considering Complementary Operation With Pumped Storage
064	4989	YanHan	Research on Fine New Energy Consumption Analysis Technology Based on Multi-Stage Cross Section Nesting
065	5253	Kang Yin	Fault Characterization and Optimal Control of Crowbar Circuits for Doubly-Fed Induction Generators
066	5330	Wenjun Liang	Explore the Correlation of Key Influence Factors on the Performance of Offshore Floating PV Power System Using Bifacial PV Modules and Their Optimization Method
067	5527	Yaping Li	Self-organizing Aggregation of Massive Distributed Flexible Resources
068	5530	Wenyuan Zheng	A Flexibility Assessment Method for Active Distribution System considering Time-Coupling-Constraints
069	5610	Xuewei Wang	Triple-Vector Model Predictive Control for High-Voltage Islanded Microgrids Based on Two-Step Accelerated Prediction
070	5657	Annie Lin	Towards Zero Emissions: Coordinated Energy Management and Flexible Voyage Scheduling for Hydrogen-Based Multi-Energy Vessels
071	5798	Lili Yuan	An Accurate Power Balance Analysis and Improved Design Method of the High Orbit Communication Satellites
072	5848	Jinbing Liang	Short-Term Balance Operation Model Considering Flexible Loads in Power Systems with High Penetration Renewable Energy
073	5855	Yi Li	Levelized Cost of Energy Modeling of Wind Farms Based on Wind Turbine Reliability

074	5884	Jingtian Bi	Adaptive Variable Step Size Photovoltaic MPPT Algorithm Based on Light Intensity Prediction
075	5894	Kaixin Liu	A New Energy Consumption Capacity Improvement Method Based on Layout Optimization
076	6007	Siyi Xu	Optimization of Photovoltaic Power Plant Design Scheme Based on Power Generation Model
077	6247	Zheng Xu	A BRP-VPP Coordination Framework for Risk Management in Electricity Markets
078	6381	Hong Lu	A Novel Modular Multilevel Converter-Based Hybrid Photovoltaic and Battery Storage System
079	6536	Boyu Ao	Frequency Control Strategy of Deloaded WTG With Coordinated Utilization of Rotor Kinetic Energy and Pitch Angle Reserve
080	6586	Zhimin Xu	Dynamic Coordination Control of Voltage for Multiple Energy Storage Converters in DC Microgrid
081	6624	Linyang Han	Evaluating Reserve Capacity for Electric Vehicles Based on User-Intention Uncertainty
082	6727	Shoude Jiang	Research on Control Strategy of Power Grid Analog Device for Voltage Adaptability Test of New Energy Transmission Terminal
083	6776	Zhouhong Lin	Adaptive Energy Balance Control for DC-DC Converter with Auxiliary Current Module in Microgrids
084	6811	Tong Xu	Vertex-Scenario Robust P2P Energy Trading for Multi-Energy VPPs
085	6907	Wang Zuo	Analysis Method of Grid-Connected Capability of Distributed PV Based on Multi-Data Source Fusion
086	6920	Hongen Li	Equivalent Inertia Evaluation and Optimal Configuration of PMSG with Virtual Inertia Control
087	7026	Xiangqing Hu	Coordinated Dispatch of Flexible Resources and Thermal Generation Based on Variable Wind Power Consumption Region
088	7090	Yuerong Zhu	Optimal Integration of Wind+BESS and Solar+BESS Hybrid Microgrids Based on Cooperative Transactions
089	7240	Mohammadreza Shafiee	Socio-Economic Oriented Microgrid Energy Management System with Islanding Capability During Adverse Weather Conditions
090	7318	Ping He	Design and Application of A Noval distributed Photovoltaic Grid-Connected Box
091	7324	Jian Du	Power Control Strategy of Energy Storage System in Substation
092	7399	Wenwen He	Temporal Decomposition Strategy for SCUC with Cascaded Hydro-Station Systems
093	7443	Peng Lu	Review on Modeling of Impact of Extreme Weather on Source-Grid-Load-Storage
094	7562	Zhenhai Zhang	A Stable Speed Recovery Strategy for DFIG Considering Secondary Frequency Drop

095	7924	Ning Feng	Resonance Participation Factor Evaluation for Renewable Energy Systems Based on Impedance Scanning
096	7938	Tian Jin	Transmission and Distribution Cooperative Congestion Scheduling Strategy Based on Dynamic Integration of Flexible Resources in Distribution Network
097	7970	Yixin Li	A Comprehensive AHP-Based Evaluation Method for the Schedulable Capacity of New Market Entities
098	7975	Hongyi Zhang	Distributed Photovoltaic Operating Status Assessment Based on DBN Feature Extraction
099	8026	Lingcong Meng	A Frequency Limitation Controller Optimization Method for MTDC Considering Frequency Regulation Reserve
100	8257	Jichen Li	Research on Distributed Photovoltaic Clustering Method Based on Improved K-Medoids Algorithm
101	8322	Yi Lu	Fault-Current Limiting Strategy for Grid-Forming Converters With Virtual Impedance From Both Inner CCL and Outer VCL
102	8323	Weixian Zhou	Comprehensive Evaluation of Key Parameters of Wind Power Grid-Connected System Small Disturbance Stability Based on Correlation Analysis and Fuzzy Rough Set Theory
103	8358	Chen Li	Research on Modeling Method of New Energy Generation about Randomness
104	8405	Caihao Liang	Integrated LVRT Technology Based on Stator-Side Series Impedance
105	8459	Mengfei Wu	A Low-Carbon Economic Operation Method of Green Virtual Power Plant
106	8599	Yan Li	Economy Analysis of Demand Response Combined With Different Energy Storage Configuration Modes in Data Centers
107	8744	Zhaochen Yang	Economic Analysis of Energy Storage System for Peak Shaving Considering Its Participation Sequence
108	8872	Shaoxian Wei	Research on Multi-Objective Control Strategy for Improving Power Quality Under Asymmetrical Faults
109	9011	Jiashi Wang	The SOC Balance Scheme of Multiple Grid-Forming Converters Connected to The Storage System
110	9025	Minhui Qian	High Share Distributed PV Interactive Coordination Fast Frequency Response Control Strategy
111	9132	Bowen Zheng	Optimal Operation of Adjustable Load via Intelligent Energy Terminals for Renewable Energy Consumption
112	9230	Guoteng Wang	Sequential Coordination Method of Multiple HVDC Commutation Failures Based on Voltage Stiffness
113	9258	Xujie Fu	Power Fluctuations Smoothing Control Based on PCH Model of D-PMSG Wind Power System
114	9279	Wenbo Zhang	Multi-Objective Optimization Scheduling Strategy for Virtual Power Plants Considering Green Certificate Trading and Carbon Trading

115	9297	Yipu Liao	A Novel Hybrid Model for Medium-Term Wind Power Forecast Using WDlinear, LightGBM, and Kalman Filtering
116	9343	Manqi Xu	Optimal Bidding Strategy of Electric Vehicle Aggregators in Energy, Frequency Regulation and Demand Response Market
117	9625	Guanming Zeng	Research on Active Support Control Strategy and Its Performance of Renewable Energy Power Station with Multiple Energy Sources
118	9656	Xinna Pan	Static Voltage Stability Assessment of Distribution Grids With Massive Inverter Interfaced DGs Considering Transmission Grid Coupling
119	9680	Bo Hu	The Optimal Ratio of GFM-Converters to GFL-Converters for Transient Voltage Regulation with Weak Grid Condition
120	9751	Yuyang Zhu	A Complex-Based High Bandwidth Current Control Design for LCL Grid-Connected Inverter
121	9851	Shuqin Zhang	Day-ahead Source-Load Co-Optimization Scheduling Considering Multiple Types of Demand Response Resources
122	9874	Xi Chen	Impact of Identical Aggregated LC Output Filters on High-Frequency Oscillation Stability in DC Microgrids
123	9906	Pengcheng Ye	Industrial Adjustable Resources Analysis And Control Boundary Research with Large Capacity
124	9983	Fangyuan Li	A Staged Strategy for MMC Offshore Converter Station Under Asymmetric AC Fault
125	4967	Jiapei Zhou	A Hybrid Cascaded UHVDC Transmission System at Sending End for High Proportion of Renewable Energy Delivery
126	256	Lyuxuan Ding	Unit Commitment Based Optimal Aggregation and Control Method for Energy Storage Systems
127	7566	Wei Zeng	Distributed Power Generation Aggregation Regulation Method Considering Different Time Scales
128	7000	Caimao Xu	Coordinated Control Method for Multiple Reactive Power Sources in New Energy Power Stations with Energy Storage
129	5698	Haohan Cui	Integrated Identification Method for Parameters of Doubly-Fed Wind Turbine Based on Frequency Domain Universal Modeling
130	7974	Jiehao Chen	Optimal Joint Operation between Wind Power Plants and Pumped Storage Power Stations

Poster Session 02 / Planning, Operation and Control of Energy Internets & Active Distribution Networks and DC Distribution Networks & High Voltage Technology & Key Equipment in Energy Internet & Energy and Environment

17:00-18:00
@Foyer

Order	ID	Presenter	Paper Title
001	205	Zhe Zhou	Joint Rebalancing and Vehicle-to-Grid Coordination of Electric Vehicles Through An Aggregative Game Model
002	206	Ning Liu	Standard System of Medium and Low Voltage DC Distribution System in Regional Energy Internet
003	251	Lu Zhang	Experimental Analysis of Withstanding Direct Current for Power Transformers
004	303	Yan Liang	Two Stage Scheduling Optimization Model for Micro Energy Grid Considering The Uncertainty of Demand Response
005	378	Zhaoying Ren	Analysis and Verification of Arc Characteristics in Low Voltage DC Systems
006	386	Xinyu Xu	Multi-Type Flexible Resources Combination Configuration Method for Different Scenarios
007	421	Amin Zhang	Study on Energy Storage Configuration Suitable for Rural Distributed Photovoltaic Power Generation
008	613	Zelin Hong	Investigation on Thermal Aging and Degradation of XLPE for High Voltage Cable Applications
009	642	Ruilin Wang	Optimization of Energy Storage in Distribution Networks Based on Voltage Sensitivity Offset
010	682	Manwei Li	A Two-Stage Voltage Coordination Control Strategy for Distribution Networks Based on GWO-AP Partitioning Algorithm
011	716	Hanting Li	Risk-Cost Integrated Assessment Based Overhaul Strategies for Transformers
012	777	Xiangrui Zeng	Simulation Analysis of The Material Morphology Influence on Dielectric Measurement
013	804	Cheng Li	Demand Side Load Forecasting Method Based on STL-RFE and Deep AR Model
014	811	Yinfeng Han	Modular and Optimal Combination Strategy for Microgrids
015	1029	Liming Liu	Study on the Effect of Metal Vapor on the Post-Arc Medium Recovery Process in Vacuum Arc with High di/dt Condition
016	1064	Quanfeng Gou	Research on Market Trading Mechanism of Energy Storage Participation in Peak Shaving Considering Concentrated Solar Power Plant

017	1238	Zelin Guo	A Review of Data-Physical Fusion Methods for Lithium-ion Battery State Estimation
018	1246	Lei Zhang	A Quantitative Calculation Method for the Flexibility Demand of Provincial Power Grid
019	1386	Fumin Chen	Correlation Analysis Between Electrification and Energy Efficiency of Park-Level Integrated Energy System Considering Operational Optimization
020	1511	Zhenyang Wu	Saturated Load Forecasting Based on Attention-LSTM Correction Model
021	1557	Bowen Wang	Impact of Material Efficiency Strategies on Demand for Basic Industrial Goods and Carbon Neutral Pathways of China
022	1713	Yonghui Song	An Modulation Method for Improving Output Characteristics of Medium-Low-Voltage MMCs
023	1883	Shudong Lv	Demand-Responsive Data Center Energy Supply Optimized Scheduling
024	2041	Chen Fan	The Optimization Design Scheme About Parameter of Process Layer Network Packet in Smart Substation
025	2047	Hualiang Zhou	Protection and Control Device Platform and Key Technologies for Adaptive Multifunctional Integration
026	2161	Zewen Li	Design and Implementation of Shared Energy Storage System Based on TTU in Low Voltage Distribution Networks
027	2339	Jian Lan	Research on the Influence of Stray Inductance on the Breaking Performance of DC Circuit Breakers
028	2420	Hao Wang	Soft Open Point Planning Method for Active Distribution Network Based on Generative Adversarial Network
029	2603	Xinyu Zhu	Critical Line Identification Method Considering Horizontal and Vertical Two-Way Volatility Adapted to Medium and Long-Term Transactions
030	2609	Beisi Huang	Numerical Modeling and Analysis for Thermal Damage of OGW Caused by Lightning Strikes
031	2623	Hu Xudong	Cluster-Based Hierarchical Coordination Planning and Control Strategy for Distribution Network Generation-Load-Storage
032	2632	Wenjuan Niu	Forecast the Development Scale of Key Industries Based on the Improved GM(1,N) Model and the Research on High-quality Synergistic Development
033	2656	Hanxing Zhang	A Technology Maturity Assessment Model Modified by Mutation Theory
034	2688	Guoying Wang	Loss Reduction and Voltage Regulation Strategy of Active Distribution Network with High Proportion Distributed Photovoltaic Resources

035	2805	Shengqin Xu	Contact Pressure Calculation Based on Vacuum Contact Materials and Operating Conditions
036	2866	Siqi Du	Optimization Study of GIS Grounding Grid Under Disconnecting Switch Operation Based on ATP-EMTP
037	2933	Jun Wang	User Adjustable Load Potential Analysis Method Based on Two-Level Clustering and SA-TCN Prediction
038	2986	Yao Wang	Demand-Side Flexibility Resources Planning Optimization Model Considering Multi-Objective Constraints
039	3015	Peng Li	Optimization Model of Micro Grid Cluster Considering Response to Superior Power Grid
040	3120	Yurong Luo	Electric Field Simulation of 120 kV Hybrid Commutation Converter Valve
041	3127	Xiaoyan Qi	Data-Driven Cluster Method for Photovoltaic Power Stations
042	3189	Zixiang Wang	Research on a Novel Multi-port Hybrid Circuit Breaker
043	3242	Zhihai Gao	Optimal Configuration Method of Power Grid Resources Considering Extreme Scenarios and Optimal Construction Time Sequence
044	3253	Shudong Lv	Advantages of Synchronous Line Loss Checking Based on Multi-Source Data Fusion Theory
045	3325	Shuai Wang	Parameter Design Method for Surge Arrester Coordinating Action in 66 KV Power Grid Based on Intermittent Arc Overvoltage
046	3373	Haoqing Wang	Research on the Characteristics of Transferred DC Interruption Topology Based on Fuse
047	3984	Maojie Xie	Ampacity Analysis of Power Cables Based on Polypropylene Insulation
048	4020	Yizhulin Li	A Multi-Stage Resilient Optimization Method for Coupled Electric-Gas System Based on Silo Division
049	4140	Chenhuan	Operation Strategy of Integrated Wind-Solar-Hydrogen-Storage Project as Virtual Power Plant in Electricity Market
050	4149	Zhengyang Jin	Exploring the Resistance Factors in the Low-Carbon Transformation of the Energy and Power System Based on the Analytic Hierarchy Process (AHP).
051	4200	Yuntong Jiang	Small-Signal Stability Analysis of Offshore Wind Farm Integrated Grid-Forming VSC-HVDC System
052	4212	Zhonghua Zou	Information Fusion Model Based Improved Multi-Scale Convolutional Neural Network for Fault Diagnosis in EV V2G Charging Pile
053	4308	Mingxin Wang	A Study on the Influence of Contamination and Wear on the Surface Discharge Characteristics of Insulated Blankets Used in Live Operations

054	4416	Ze Bai	Real-time Perception Approach of Power Supply Capacity of Active Distribution Network Driven by Hybrid Data-Model
055	4588	Fuqiang Zhang	A Capacity Planning Methodology for Power System Flexibility Resources Considering Flexibility Demand
056	4654	Xiao Xu	A Three-Phase Hybrid Transformer Topology and Its Control Strategy for Active Distribution Networks
057	4789	Lizhuo Peng	3D-CNN-Based Spatial Load Forecasting Method Considering the Spatial-Temporal Influences of Multi-Source Data on Loads Among Adjacent Cells
058	4792	Baixun Zheng	Dynamic Performance of 6.5kV/400A SiC MOSFET Module and its Gate Driver
059	4948	Zhaoguang Pan	Quaternary System of New Power System: Concept and Practice
060	5010	Sitong Zhu	Analysis of the 500kV Line Arrester Exploion Accident
061	5024	Penghua Li	A Data-Driven Linear Robust Optimal Power Flow Model
062	5051	Qiuyang Li	Effect of Incorporation of Air Gap to Depress DC Components in Current Transformers
063	5056	Zeyu Wang	Impact of Climate Change on China's Future Electricity Demand and Supply
064	5285	Xiangyan Wang	Optimal Allocation of Energy Storage Resources for New Energy Accommodation
065	5300	Jinwei Jia	Research on AHP-EW Based Comprehensive Capacity Evaluation of Electricity Selling Companies
066	5311	Yuanhao Gao	Research on the Reliable Capacity of New Energy in the Distribution Grid Considering Uncertainty
067	5383	Weitao Tan	Typical Load Identification-Based Calculation for Air-Conditioning Load
068	5399	Chen Wang	Optimal Scheduling of Rural Virtual Power Plant Under Photovoltaic-Biogas Complementarity
069	5418	Linsong Liu	Hybrid Energy Storage Location and Capacity Planning Considering Frequency Safety
070	5421	Yingzhuo Li	Prediction of Contact Terminal Temperature of Vacuum Circuit Breaker Under Complex and Unknown Boundary Conditions
071	5425	Yinghui He	Characterization of Lorentz Force Distribution in Electromagnetic Repulsion Mechanism of Multiple Parallel Circuit Breakers
072	5491	Wenjuan Niu	Comprehensive Evaluation and Selection Application of Flexibility Transformation Technology for Thermal Power Units
073	5562	Hanchen Mao	Distribution Network Fault Recovery Method Considering Demand-Side Response Participation

074	5596	Dexiang Li	Modeling of Rural Multi-Industries via the Virtual Energy Storage of Carbon Cycles
075	5732	Gejirifu De	Benefit Allocation Model of Multi-Energy Cooperation Considering Improved Shapley's Value Method
076	5767	Xuerui Liu	Short-Term Load Forecasting Method Based on VMD-MLP-TCN
077	5778	Zebin Weng	Simulation Analysis of Thermoelectric Power Generation System Considering Multiple Optimization Algorithms
078	5942	Kaipeng Ye	Recognition and Grasping Technology of High-Voltage Transmission Lines Based on the Humanoid Robot Arm
079	6045	Jingyi Lin	Research on Operation Strategy of User-side Energy System Based on Data Driving
080	6057	Jun Zhou	Self-Adaptive Step Size Adjustment Method of Digital Analog Hybrid Simulation Towards Urban Energy Internet
081	6099	Xin Huang	FTU/PMU Placement Method Considering Fault Section Localization in Distribution Networks
082	6200	Lulu Ma	Voltage Control Strategy of New Flexible Distribution Transformer
083	6202	Hanming Zhong	Day-Ahead Optimal Dispatch in Active Distribution Network Based on Deep Reinforcement Learning with Improved Feature Extraction Network
084	6208	Shurui Wang	Resilience Improvement of Active Distribution Network with Electric-Hydrogen Hybrid Energy Storage Microgrids Under Ice Disaster
085	6244	Ruikang Dong	Multi-Physical Field Coupled Method for Temperature Rise of Winding in Oil-Immersed Power Transformer
086	6415	Peng Zhang	Modeling of Carbon Emission Features of Electric Energy Substitution Users with Demand Response
087	6425	Yanhao Feng	A Novel Two-Level Multi-Dimensional Operating Evaluation System for Building Integrated Energy Systems
088	6558	Bei Qi	Market Interaction Model of Demand-Side Adjustable Resources Based on Aggregator
089	6592	Ping Mei	The Impact of Disruptive Technologies on the Evolution of New Power Systems Under the Double Carbon Targets
090	6609	Nan Gu	Higher Renewable Generation Utilization via the Energy Trading Mechanism in Electricity Market
091	6620	Luxin Zhan	Fuzzy Multi-Objective Optimization Considering the Uncertainty of Distributed Generation
092	6649	Xiangdong Meng	Research on Charging Control of Electric Vehicle Charging Station Based on New Energy Consumption
093	6712	Weiye Zheng	Mechanism-Aware Distribution Network Reconfiguration with Transient Voltage Stability Enhancement

094	6943	Shudong Lv	Research on the Dynamic Power Distribution of One-Machine, Dual-gun Charging Pile
095	7140	Yan Li	Review on Carbon Measurement Techniques and Carbon Certification Systems
096	7183	Rui Liu	Distribution Pattern and Differentiation Thresholds of Gas Content in Large Oil-filled Equipment
097	7297	Xiaowen Dai	Analysis and Measurement Methods of Transformer Vibration and Noise Characteristics
098	7472	Shanhua Hu	Research on the Stage Division Standard for the Transient Response in Active Distribution Networks
099	7476	Yingying Su	Dynamic Equivalent Model of Active Distribution Network Using Hierarchical Double Deep Q Network
100	7489	Beisi Huang	Identification of the Ground Wire-Suspension Clamp Damage Under the Effect of Lightning Current
101	7495	Lulu Ma	Optimization Control Strategy for Power Flow in Distribution Network Based on New Flexible Distribution Transformer
102	7509	Boyu Yi	Collaborative Post-Disaster Fault Recovery Strategy of Main-Distribution Networks for Resilience Enhancement
103	7594	Zhaoyang Wang	Analysis on the Importance of the Factors Affecting the Comprehensive Capacity of Power Selling Companies Based on Weight Calculation
104	7716	Wenping Dou	Study on Falling Force of Disc Suspension Porcelain Insulator Based on ANSYS FEM
105	7827	Wengang Xie	Analysis of the Voltage Imbalance Mechanism in Cascaded H-Bridge STATCOM
106	7856	Linni Jian	Integrating Electric Vehicles into Distribution Networks: A Low-Carbon Optimization Approach Using Vehicle-to-Grid Technology
107	7862	Yantao Zhao	Power Frequency Breakdown Characteristics of C6F12O/Air Mixture
108	7910	Shini Peng	Distribution Network Fault Recovery Strategy Considering Hierarchical Division and Convergence of Islands
109	7943	Dexuan Cai	Study on Interface Performance of Fiber Optic Hard Composite Insulator
110	8094	Shudong Lv	Non-Invasive Power Load Identification Technology Based on MFCC and SVM
111	8208	Jianyu Lang	Study on Nano-Al2O3/Epoxy Composite Coatings to Enhance Surface Flashover
112	8261	Jiani Lu	Research on Resilience Enhancement Oriented Recovery Strategies of Cyber-Physical Distribution Network

113	8338	YuxuanLiu	Topology of Generator Outlet Circuit Breaker and Short Circuit Fault Breaking Characteristics
114	8342	Lu Yan	Cooperative Operation Strategy of Optical Storage Network Based on Cooperative and Non-Cooperative Game
115	8356	Jingjing Ye	Different Temperature Distributions During the Formation of Cathode Spot Crater in Vacuum Arcs
116	8360	Ziwei Wang	Dynamic State Estimation of Distribution Network Considering Distributed PV Access
117	8416	Yun Su	Distribution Network Reconfiguration Based on Hybrid Particle Swarm Optimization and Grey Wolf Optimization
118	8534	Jing Wu	Design and Implementation of Power Spot Market Boundary Data Management System Considering Data Approval and Intelligent Data Verification
119	8637	Shan Liu	Dynamic Characteristics of Cathode Spots and Its Effects on Plasma Parameters in Vacuum Arc
120	8648	Wenping Dou	Material Parameters Optimization of Suspension Porcelain Insulators with Cylindrical Head
121	8824	Yanxin Tu	Simulation-Based Analysis of Active Infrared Thermography for Detecting Internal Void Defects in Silicone Rubber
122	9040	Chang Chen	Multi-Objective Ordered Charging Strategy for Electric Vehicle Guided by NSGA-II Algorithm Based on Real-Time State of Traffic Network
123	9420	Junhui Liu	Analysis on the Impact of Large-Scale Development of New Energy Storage on the Operation of Provincial Power Grid Enterprises
124	9486	Xiaowei Huang	Analysis on the Impact for Mechanical Performance of Submarine Cable During the Rock-Dumping Deburial When Repaired
125	9507	Zhiyong Wen	A Novel High-Gain Converter Based on Three-Winding Coupled Inductor
126	9739	Pan Zhang	Fault Recovery Strategies for Active Distribution Substation with Distributed Photovoltaic Integration
127	9863	Zheng Shi	Assessment of Emergency Control Strategy and Aided Decision Scheme for AC/DC Hybrid Power Systems
128	3326	Ziyang Zeng	A Electricity Price Prediction Method Based on Improved Long Short Term Memory for High Proportion New Energy Electricity Markets

AGENDA ON DEC. 17

VENUE	*Starts at 08:00*	*Starts at 10:15*
Kaiyuan Hall 1	SG-2-4: Coordinated Dispatch and Control for Urban Integrated Energy Systems	SG-2-4: Coordinated Dispatch and Control for Urban Integrated Energy Systems *(invited only)*
Kaiyuan Hall 3	SG-2-1: Key Techniques on Stable Operation of Renewable Energy Clusters Above 10Gw Capacity with HVDC Links	/
Mingdu Hall	SG-2-9: Key Technologies of Intelligent Dispatching for Power Grid with High Proportion of Renewable Energy Integration	Special Session 01: Local Energy Systems with Flexible Resources and Energy Transactions
Baoding Hall	SG-2-5: Adaptive Grid Integration and Active Synchronization Technologies for Extremely High Penetration Distributed Photovoltaics	SG-2-5: Adaptive Grid Integration and Active Synchronization Technologies for Extremely High Penetration Distributed Photovoltaics *(invited only)*
Sihui Hall	SG-2-6: Key Technology of High-Capacity Generator Circuit Breaker	SG-2-11: Advanced Computing Technology in Electric Power
Sixin Hall	SG-2-7: Substation Secondary System under New-type Power System	SG-2-10: Core Software and Hardware Platform for Substation Secondary System
Siyi Hall	SG-2-8: Collaborative Operation Technology and Market of Coal Electricity and New Energy	SG-2-12: CSEE JPES Forum: The Structure and Transformation Pathway for New Type Power System
Sixian Hall	SG-2-3: Multi-timescale Forecast Technology for Large-scale Wind/Photovoltaic Power Supply Capability	SG-1-3: Response-driven Intelligent Enhanced Analysis and Control for Bulk Power System Stability *(invited only)*
Side Hall	SG-2-2: Rapid Active Support Technologies of Wind/Photovoltaic Power Plants	Special Session 02: Enhancing Grid Resilience through DERs and Active Distribution Networks
Sile Hall	Special Session 10: Coordinated Operation, Control and Cyber-physical Security of Smart Grid Considering Supply-and Demand-Side Resources	Special Session 06: Situation Awareness of Power Distribution Systems
10:00-11:00 | Poster Session 03		
10:00-10:15 | Coffee Break		
12:00-13:30 | Lunch		

AGENDA ON DEC. 17

VENUE	*Starts at 13:30*	*Starts at 15:45*
Kaiyuan Hall 1	SG-3-4: New Application and Challenge for Power Distribution IoT	Technical Session 05: Grid Planning, Operation and Management
Kaiyuan Hall 3	SG-2-1: Key Techniques on Stable Operation of Renewable Energy Clusters Above 10Gw Capacity with HVDC Links *(invited only)*	
Mingdu Hall	SG-3-1: Complementary Operation and Intelligent Dispatching of High-Proportion Hydro-Wind-Solar Power Systems	SG-3-1: Complementary Operation and Intelligent Dispatching of High-Proportion Hydro-Wind-Solar Power Systems *(invited only)*
Baoding Hall	Technical Session 02: Renewable Generation and Distributed Energy Resources	Technical Session 06: Renewable Generation and Distributed Energy Resources
Sihui Hall	Panel Session 11: Multi-agent and Multi-market Trading Mechanism in Energy Internet	Technical Session 07: Key Equipment in Energy Internet & Smart Condition Monitoring and Fault Diagnosis Techniques
Sixin Hall	Technical Session 03: Computational Intelligence, Big Data, ICT and Blockchain Applications in Smart Grids	Technical Session 08: Integrated Energy System
Siyi Hall	SG-3-2: Gate Driver IC for Power Electronic Devices	SG-3-2: Gate Driver IC for Power Electronic Devices *(invited only)*
Sixian Hall	SG-3-3: The Technology of GWh-scale Lithium-ion Battery Energy Storage System	Technical Session 09: Microgrids, Standalone Power Systems and Virtual Power Plants
Side Hall	Technical Session 04: Grid Resiliency, Security, Reliability, Stability and Protection	Technical Session 10: High Voltage Technology & Active Distribution Networks and DC Distribution Networks & Grid Planning, Operation and Management
Sile Hall	Panel Session 06: Virtual Power Plant Construction and Operation Development	Technical Session 11: Integrated Energy System

17:00-18:00 | Poster Session 04

15:30-15:45 | Coffee Break

18:00-20:00 | Dinner

FORUM SESSION

SG-2-1: Key Techniques On Stable Operation of Renewable Energy Clusters Above 10Gw Capacity with HVDC Links

08:00-10:00 @Kaiyuan Hall 3

SESSION INTRODUCTION

Renewable energy farm (REF) planning and constructions in remote areas, e.g. desert and hinterland, is a strategic action for implementing the "carbon peaking & carbon neutral" policy. Large-scale wind and solar power transmission through DC is the main mode of large-scale development of renewable energy. This forum focuses on the challenges faced by the stable operation and efficient transmission of the REF. The research status and development trend of key technologies such as stabilization mechanism, optimal configuration, and operation control will be discussed, providing technical and equipment support for the stable operation and delivery of 10Gw of renewable energy.

SESSION CHAIR

Name	Affiliation
Wei Wang	Deputy director and chief engineer of NARI Research Institute Nari Technology Co.,Ltd.

SESSION SPEECHES

Name	Affiliation	Title
Yutian Liu	Shandong University	Security Risk Assessment and Early Warning of Renewable Generation Center with HVDC Transmission System
Chongru Liu	North China Electric Power University	Coordinated Stability Control of Renewable Energy Power Generation Units/Station and HVDC System
Yuehui Huang	China Electrical Power Research Institute	Research on the Integrated Configuration Method of Large Scale Renewable Energy Bases
Wei He	Huazhong University of Science and Technology	Relationship for Electric Network Between Internal Voltage Amplitude/Frequency Stimulation and Active/Reactive Power Response and Its Characteristics Analysis
Wei Wang	NARI Research Institute	Exploration of Renewable Energy Grid-forming Technologies for Enhancing System Stability

SG-2-2: Rapid Active Support Technologies of Wind/Photovoltaic Power Plants

08:00-10:00 @Side Hall

SESSION INTRODUCTION

Building a new power system is critical for carbon peaking and carbon neutrality. As the proportion of renewable energy generation gradually increases, the capability of renewable energy power plants to provide rapid active support has become an inevitable requirement. This panel includes six thematic reports. Report 1 discusses the indices system and evaluation method for describing the transient frequency/voltage support capability of renewable energy power plants. Report 2 introduces a new strategy for emergency active power control of wind farms considering the DC chopper capacity of doubly-fed induction generator. Report 3 discusses the voltage transient coordinating control strategy for renewable generation system with HVDC. Report 4 introduces the virtual node voltage feedback control scheme for inverter in weak grid. Report 5 discusses the technologies of millisecond level sensing and lean control for renewable energy stations. Report 6 analyzes the optimal ratio of grid forming inverters and grid following inverters for transient voltage regulation with weak power grid condition.

SESSION CHAIR

Name	Affiliation
Weisheng Wang	China Electric Power Research Institute

SESSION SPEECHES

Name	Affiliation	Title
Zongxiang Lu	Tsinghua University	Transient Voltage and Frequency Support Capability Evaluation of Renewable Energy Stations - Indices System and Method
Bingtuan Gao	Southeast University	Emergency Power Reduction Control Strategy of Wind Farm Considering DC Chopper of Doubly-fed Induction Generator
Wenhao Du	North China Electric Power University	Voltage Transient Coordinating Control Strategy for Renewable Generation System with HVDC
Luming Ge	China Electric Power Research Institute	Virtual Node Voltage Feedback Control Scheme for Inverter in Weak Grid
Xiong Chen	NARI Technology Co., Ltd.	Technologies of Millisecond Level Sensing and Lean Control for New Energy Stations
Wu Cao	Southeast University	The Optimal Ratio of GFM-Inverters to GFL-Inverters for Transient Voltage Regulation with Weak Power Grid Condition

SG-2-3:
Multi-timescale Forecast Technology for Large-scale Wind/Photovoltaic Power Supply Capability

08:00-10:00 @Sixian Hall

SESSION INTRODUCTION

With the continuous promotion and boosting development of the construction of New Type Power System （NTPS） under the goal of “Carbon peak and carbon neutrality”, the proportion of renewable energy electricity will continue to increase, wind/photovoltaic power generation has a prominent supporting role in the balance of power and electricity. Thus the randomness and volatility of wind/photovoltaic power brings double challenges to "power supply guarantee" and "consumption protection". Accurate wind/photovoltaic power and its supply capacity prediction is the decision-making basis for ensuring power supply. It is urgent to carry out research on large-scale wind power/photovoltaic power supply capacity forecasting technology on multiple time scales.

SESSION CHAIR

Name	Affiliation
Chun Liu	China Electric Power Research Institute

SESSION SPEECHES

Name	Affiliation	Title
Minglei Bao	Zhejiang University	A Clearing Framework of Inter-provincial and Intra-provincial Market for the Improvement of Power Supply Ability
Shiji Pan	China Agricultural University	Intraday Wind Power Forecasting Based on Spatial-temporal Correlation and High-frequency Updating of NWP
Menglin Li	Shandong University	Adaptive Combination Forecast for Wind Power: Methodology, Implementation and Application
Shihua Liu	North China Electric Power University	Multi-dimensional Wind Power Low-power Event Identification Based on Variational Mode Decomposition
Yuchen Xie	Zhejiang University	Photovoltaic Cluster Forecasting Based on Spatial Correlation-Informed Deep Learning
Weijie Gong	Shandong University	An Approach for Extracting Key Weather Processes Affecting Power Supply Driven by Meteorological Data

SG-2-4: Coordinated Dispatch and Control for Urban Integrated Energy Systems

08:00-10:00 @Kaiyuan Hall 1

SESSION INTRODUCTION

Under the carbon neutralization goal, urban power grids are confronted with substantial challenges in renewable energy consumption and power supply security. Insufficient regulation capacity caused by the lack of flexibility is the key challenge. Consequently, developing an urban integrated energy system that integrates electricity, gas, heat, and storage, and enhancing power system flexibility through multi-energy cooperation, is an effective way to solve the aforementioned problems. Urban integrated energy systems, with their larger scale and numerous equipment, exhibit prominent multi-temporal and spatial scale and multi-agent characteristics. The coordinated dispatch and control of electricity, gas, heat, and storage in these urban integrated energy systems faces significant challenges and is currently a focal point of research. Based on the existing research hotspots, this panel focuses on the issue of "coordinated dispatch and control for urban integrated energy systems", conducts relevant research and academic exchanges, and explores a low-cost technological approach to improve the delivery capacity of new energy.

SESSION CHAIR

Name	Affiliation
Qinglai Guo	Tsinghua University

SESSION SPEECHES

Name	Affiliation	Title
Shuai Lu	Southeast University	Physics-informed Data-driven Modeling and Simulation of Multi-energy Networks
Zuyi Li	Zhejiang University	Flexibility in Integrated Energy System
Suhan Zhang	Southeast University	Security Region Analysis and Calculations of Integrated Energy System: A Time Domain Decoupling Technique
Wei Li	NARI Group	Multi-fault Screening and Rapid Risk Warning Technology

SG-2-5: Adaptive Grid Integration and Active Synchronization Technologies for Extremely High Penetration Distributed Photovoltaics

08:00-10:00 @Baoding Hall

SESSION INTRODUCTION

Distributed photovoltaic power generation is playing an increasingly important role in building a "clean, low-carbon, safe, and efficient" energy system. The installed capacity of distributed photovoltaic power in China has exceeded 100 million kilowatts. The high penetration rate of distributed photovoltaic power generation into the grid has led to a significant change in the operational characteristics and interaction mechanism between the regional grid and the power source. In this forum, we will discuss the following technical directions in the context of high penetration distributed photovoltaic power generation and its adaptive integration with the grid.

(1) Intelligent sensing, edge computing, and secure and trustworthy transmission technologies to support massive distributed photovoltaic data access. (2) Regional distributed photovoltaic power generation cluster power forecasting technology. (3) Adaptive control technology for distributed photovoltaic power generation to enhance grid support capability and power supply quality. (4) Active synchronization control and cluster autonomous operation technology for distributed photovoltaic power generation. (5) Wide-area distributed photovoltaic cooperative support and optimization operation technology.

SESSION CHAIR

Name	Affiliation
Wenchuan Wu	Tsinghua University

SESSION SPEECHES

Name	Affiliation	Title
Yun Feng	China Electric Power Research Institute	Research and Application of Lightweight Cryptography Technology for Protecting the Security of Massive Distributed Photovoltaic Data
Hai Zhou	China Electric Power Research Institute	Power Prediction Technology for Regional Distributed Photovoltaic Clusters
Alian Chen	Shandong University	Grid-forming Control for PV Inverters
Shumin Sun	State Grid Shandong Electric Power Co., Ltd.	Grid Dispatching Management and Optimized Operation of Distributed Photovoltaic
Chenhui Lin	Tsinghua University	A Nested Operation Framework for Multilevel Power Grids Accommodating Massive Distributed PV
Tongxun Wang	State Grid Smart Grid Research Institute	Power Quality Aspects of Distributed PV
Peng Zhang	State Grid Smart Grid Research Institute	Intelligent Analysis Technology of Distributed Photovoltaic Key Equipment Operation Situation

SG-2-6: Key Technology of High-Capacity Generator Circuit Breaker

08:00-10:00 @Sihui Hall

SESSION INTRODUCTION

The generator circuit breaker (GCB) is the core equipment to ensure the safety and reliability of high capacity power generation systems. However, China has not yet broken through this key technology at present, which is entirely monopolized by ABB company. This has become a bottleneck technology, that even led to the deficiency of a nuclear power plant built by China in Pakistan due to ABB's refusal to provide GCB products. With the continuous improvement of system capacity and the proposal of the dual carbon strategy, there is an urgent need to develop eco-friendly and high-capacity high-speed GCBs to lead the direction of technological development.

SESSION CHAIR

Name	Affiliation
Fei Yang	Xi’an Jiaotong University

SESSION SPEECHES

Name	Affiliation	Title
Bin Li	Tianjin University	Analysis of Fault Current Fed by High-capacity Synchronous Generator and Toplogy of Novel Generator Circuit Breaker
Boyuan Cui	China Electric Power Research Institute	Research on Short Circuit Current Commutation and Topology of Generator Circuit Breaker
Fei Yang	Xi’an Jiaotong University	Research on Eco-friendly High-Capacity High-Speed Generator Circuit Breaker Technology
Lixue Chen	Huazhong University of Science and Technology	Characterization of Lorentz Force Distribution in Electromagnetic Repulsion Mechanism of Multiple Parallel Circuit Breakers
Yongxiang Zhe	Xi’an High Voltage Apparatus Research Institute Co. Ltd.	Tests and Standards of High Power Generator Circuit-Breaker

SG-2-7: Substation Secondary System under New-type Power System

08:00-10:00 @Sixin Hall

SESSION INTRODUCTION

The safe and stable operation of the substation secondary system is crucial for ensuring the safety of the power grid. With the large number of controlled power sources in the new-type power system and the comprehensive autonomy of the substation secondary system, higher requirements are put forward for the reliability of the substation secondary system. This seminar mainly discusses the reliability evaluation technology for substation secondary system, research on plug and play technology for relay protection decices, new fault characteristics and protection methods of new-type power system, and substation communication protocol for de-MMS.

SESSION CHAIR

Name	Affiliation
Mingjie Li	State Grid Corporation of China

SESSION SPEECHES

Name	Affiliation	Title
Zhihuai Shu	State Grid Corporation of China	Reliability Evaluation Technology for Substation Secondary System
Yi Tang	State Grid Shandong Electric Power Company	Research on Plug and Play Technology for Relay Protection Devices
Zexin Zhou	China Electric Power Research Institute	New Fault Characteristics and Protection Methods for New-type Power System
Renhui Dou	China Electric Power Research Institute	Substation Communication Protocol for de-MMS

SG-2-8: Collaborative Operation Technology and Market of Coal Electricity and New Energy

08:00-10:00 @Siyi Hall

SESSION INTRODUCTION

Accelerating the construction of a new type of power system with an increasing proportion of new energy is an important way to achieve clean, low-carbon, safe and efficient energy. By 2030, it is expected that the installed capacity of new energy in China will exceed 1.2 billion kilowatts, accounting for 50% of the total installed capacity. In the process of rapid development of new energy, the growth of installed capacity of coal power has slowed down and gradually "reduced and replaced". The contradiction between the uncertainty of new energy power generation and the lack of regulation capacity of conventional power sources such as coal power is increasingly prominent. The power system operation is faced with problems such as insufficient balance support capacity, lack of regulation flexibility, and difficulty in ensuring power supply in extreme cases, which puts forward higher requirements for system adequacy. This sub forum focuses on resource coordination on the power generation side, flexible resource expansion on the load side, optimization of multiple resources on the power grid side, and market support mechanisms. It aims to promote the coordinated development of coal-fired power and new energy, maximize the comprehensive regulation efficiency of the power system, and support system safety, supply guarantee, and low-carbon operation.

SESSION CHAIR

Name	Affiliation
Dayan Sun	National Power Dispatch and Control Center

SESSION SPEECHES

Name	Affiliation	Title
Shujun Mou	Nation Institute of Clean and Low Carbon Energy	Research on "Electric-Hydrogen-Chemical" Integrated Energy System
Shengchun Yang	China Electric Power Research Institute	Research on the Coordinated Optimal Dispatch of Multi-Resources for New Power Systems
Lizi Zhang	North China Electric Power University	Research on the Synergistic Mechanism among Capacity Market, Ancillary Services Market and Electricity Energy Market
Dong Liu	State Grid Economic and Technological Research Institute Co., Ltd.	Research on Electricity Transmission of Large-scale Wind Power and Photovoltaic Bases in Sandy Areas, Gobi Areas and Deserts
Ming Zhou	North China Electric Power University	Discussion on Wide Area Adequacy of New Power Systems

SG-2-9: Key Technologies of Intelligent Dispatching for Power Grid with High Proportion of Renewable Energy Integration

08:00-10:00 @Mingdu Hall

SESSION INTRODUCTION

The proportion of new energy has gradually increased in the process of new power system construction. In this case, power dispatch operation faces the following challenges: Firstly, as the amplitude and frequency of new energy increase sharply, it is urgent to accurately grasp the characteristics of random factors to achieve quantitative analysis and active warning of balance capacity. Secondly, the flexible adjustment capacity of the power grid is approaching the critical point of imbalance, so it is necessary to fully tap the potential adjustment capacity to achieve the comprehensive balance of source and load and efficient intelligent decision-making. Thirdly, efficient optimization solvers face barriers and risks, and it is urgent to solve the "stuck neck" problem of commercial solvers in order to achieve full autonomy and controllability of power optimization scheduling and solving. Accordingly, this session focus on accurate balance perception, comprehensive balance of source and load, forward-looking intelligent scheduling, and independent optimization engine, etc., so as to support the safe and economic operation of the power grid in the scenario of high proportion of new energy.

SESSION CHAIR

Name	Affiliation
Jiye Wang	State Grid Digital Technology Holding Co., Ltd.

SESSION SPEECHES

Name	Affiliation	Title
Xiaomeng Ai	Huazhong University of Science and Technology	Analysis Technology for Power and Energy Balance Capability of New Power Systems
Nian Liu	North China Electric Power University	Multi Time Scale Source Load Comprehensive Balance Collaborative Optimization Technology
Yaping Li	China Electric Power Research Institute Co., Ltd	Knowledge-data Hybrid Driven Approach for Power System Look-ahead Dispatch Optimization
Qiang Ding	China Electric Power Research Institute Co., Ltd	The Technology of Engine Optimization Construction for Dispatching and Operation in the Power System

SG-2-10: Core Software and Hardware Platform for Substation Secondary System

10:15-12:15 @Sixin Hall

SESSION INTRODUCTION

The improvement of the reliability level of the software and hardware of the substation secondary system is the core of building a highly reliable substation secondary system, which is crucial for ensuring the safe operation of the power grid. This seminar mainly explores the reliability growth practice of protection and control device, substation equipment monitoring technology based on multi-level collaboration, a novelty and credible optical communication technology for high real-time services, as well as autonomous core technology and new industrial control systems.

SESSION CHAIR

Name	Affiliation
Zexin Zhou	China Electric Power Research Institute

SESSION SPEECHES

Name	Affiliation	Title
Hualiang Zhou	NARI Group Corporation	Reliability Growth Practice of Protection and Control Device
Hongxia Qin	Beijing Sifang Automation Corporation Limited	Substation Equipment Monitoring Technology Based on Substation and Master Station Collaboration
Zifan Li	State Grid Information & Telecommunication Branch	A Novelty and Credible Optical Communication Technology for High Real-Time Services
Xu Ming	Loongson Technology Corporation Limited	Loong Architecture and New Industrial Control Systems

SG-2-11: Advanced Computing Technology in Electric Power

10:15-12:15 @Sihui Hall

SESSION INTRODUCTION

The new power system has a wide spatial distribution, multiple control levels, and complex coupling relationships. It is a real-time balance system with multi-agent collaborative interaction. The collection, transmission, storage, calculation, and application of power grid data have a larger scale, more links, and higher real-time performance. Computational power has become the core productivity of collaborative computing, intelligent decision-making, and precise control in the entire power system. Advanced power computing is showing a development trend of data storage fusion, multi modal feature fusion, and computing paradigm fusion.

SESSION CHAIR

Name	Affiliation
Kunlun Gao	State Grid Smart Grid Research Institute Co.,LTD.

SESSION SPEECHES

Name	Affiliation	Title
Long Zheng	Huazhong University of Science and Technology	Outlook on Key Technologies for High Performance Graph Computing
Jinlei Jiang	Tsinghua University	Data Management and Calculation Acceleration of Power Diagram Calculation
Yi Wang	NARI Technology Development Limited Company	Evaluation and Optimization of New Energy Consumption Capacity in Distribution Networks Based on Graph Computing
Suyang Zhou	Southeast University	Graph Computing-driven Key Node Identification, Partition and Real-time Fault Tracing Technology for Large-scale Complex Distribution Network
Canbing Li	Shanghai Jiao Tong University	Graphic Modeling and Efficient Optimization of SCUC
Min Xia	China Electric Power Research Institute	Scheduling Optimization Solution Technology Based on Graph Neural Network
Lei Wei	State Grid JiangSu Electric Power Co.,LTD.	JiangSu Digitalized Power Grid: Calculation, Inference, and Engineering Application
Mingze Zhang	State Grid Shanghai Economic Research Institute	The Challenges of New Distribution Network Forms and the Practice of Shanghai Power Grid

SG-2-12:
CSEE JPES Forum: The Structure and Transformation Pathway for New Type Power System

10:15-12:15 @Siyi Hall

SESSION INTRODUCTION

Under the “double-carbon” goals, the formulation of new type power system structure and evolutionary trajectory, marked by decarbonization, safety, reliability, technical feasibility, and affordability, has emerged as a paramount global concern in recent years. However, the precise direction and course of future power system transformation remain undetermined, and the structural configuration and evolutionary pathway for the power system to attain carbon neutrality lack a clear blueprint. Consequently, deliberations concerning the optimization of new type power system structural configurations and transformation pathways are of considerable significance and merit comprehensive examination.

This panel will address this promising area of research and development while focusing on the new theoretical insights, innovative technical solutions and practices experiences on the new type power system. This panel will explore several topics that are becoming increasingly prevalent: 1) Reshaping industrial electrification pathway toward grid-friendly decarbonization, 2) Collaborative planning and optimization for electric-thermal-hydrogen-coupled energy systems, 3) Key dispatching technique of new type power system, 4) Flexibility adjustment potential of new type electrified loads, 5) A federated split learning approach for on-device individual load forecasting.

SESSION CHAIR

Name	Affiliation
Ershun Du	Tsinghua University

SESSION SPEECHES

Name	Affiliation	Title
Jianxiao Wang	Peking University	Reshaping Industrial Electrification Pathway Toward Grid-friendly Decarbonization
Tianguang Lv	Shandong University	Collaborative Planning and Optimization for Electric-thermal-hydrogen-coupled Energy Systems with Portfolio Selection of The Complete Hydrogen Energy Chain
Zhifang Yang	Chongqing University	Preliminary Research on Key Dispatching Technique of New Type Power System
Haojie Wang	Global Energy Interconnection Development and Cooperation Organization	Research on Flexibility Adjustment Potential of New Type Electrified Loads
Yi Wang	The University of Hong Kong	Making Smart Meters Really Smart: A Federated Split Learning Approach for On-Device Individual Load Forecasting

SG-3-1: Complementary Operation and Intelligent Dispatching of High-Proportion Hydro-Wind-Solar Power Systems

13:30-15:30 @Mingdu Hall

SESSION INTRODUCTION

During the 14th Five-Year Plan, Yunnan Power Grid encounters renewable energy installed capacity of up to 75000MW. It became the first hydro-wind-solar base in China, where renewable energy accounts for 40% of installed capacity and 20% of electricity. As a significant energy hub for the west-to-east power transmission and the Lancang-Mekong region, Yunnan benefits from advanced experience and technology concerning multi-energy complementary coordinated operation and dispatch in China, which comes out in front during market-oriented construction. This panel session focuses on the construction of an intelligent dispatching system that adapts to high-proportion renewable energy power systems. The speakers discuss the multi-energy complementary utilization of cross-regional and cross-basin on water, wind and solar as well as the multi-level coordination to achieve mutual support of spatial resources in a larger range. They reveal the impact of the multi-time scale coordination on the gradual reduction of renewable energy uncertainty, which improves the bearing capacity of renewable energy in the power system and the coordinated ability of generation-grid-load-storage operation. The panel session is of great significance in not only supporting the construction of the new power system in southern China, but also promoting Yunnan to be a hub-type demonstration province concerning the new power system with the characteristics of "internal and external connections, integration and complementarity".

SESSION CHAIR

Name	Affiliation
He Huang	CSG Power Dispatching and Control Center

SESSION SPEECHES

Name	Affiliation	Title
He Huang	CSG Power Dispatching and Control Center	Operation Risk Analysis and Intelligent Dispatching of High-Proportion Hydro-Wind-Solar Power Systems
Zhengfan Li	Huaneng Lancang River Hydropower Inc.	Construction of Lancang River Hydro-Wind-Solar Integrated Base in New Power System
Haiwang Zhong	Tsinghua University	Application Status and Challenges of Domestic Solvers for Power Systems
Lingfang Li	Yunnan Power Grid Co. , Ltd.	Implementation of Grid-Load Coordination and Interaction Technology in Yunnan’s New Power System
Zuyi Li	Zhejiang University	A New Electricity Market Mechanism Under High-Proportion Renewable Energy Scenarios

SG-3-2: Gate Driver IC for Power Electronic Devices

13:30-15:30 @Siyi Hall

SESSION INTRODUCTION

High-voltage high-power electronic devices are the essential components of power electronic equipment. The gate driver plays a crucial role in connecting the equipment controller and the power device to ensure reliable switch control and protection functions. Developing a gate driver IC is a crucial method to reduce costs, minimize the size, and enhance the performance of devices and equipment. With the construction of new power systems, there is a growing demand for power electronic devices and gate driver IC technology holds immense development prospects. However, the gate driver IC for high-voltage high-power devices faces significant challenges due to the harsh electromagnetic environment, high isolation voltage levels, the complexity of balancing insulation performance and signal transmission integrity, and the intricate design and manufacturing of analog-digital-power circuit integration. Therefore, it is urgently required to break through the key technologies of gate driver IC.

SESSION CHAIR

Name	Affiliation
Zhanqing Yu	Tsinghua University

SESSION SPEECHES

Name	Affiliation	Title
Han Peng	Huazhong University of Science and Technology	Electromagnetic Characteristics and Key Issues Analysis of Power Electronic Device Driver
Wanyuan Qu	Zhejiang University	Research on Digital Signal Isolation IC
Jinkun Ke	State Key Laboratory of Advanced Power Transmission Technology (State Grid Smart Grid Research Institute Co., Ltd.,)	Research on Key Technology of High Voltage High Power IGBT Gate Driver and Development of Gate Driver IC
Zhanqing Yu	Tsinghua University	Key Technology of IGCT Gate Driver IC

SG-3-3: The Technology of GWh-scale Lithium-ion Battery Energy Storage System

13:30-15:30 @Sixian Hall

SESSION INTRODUCTION

The GWh-scale energy storage power station is an aggregation of millions of batteries. Throughout its life cycle, energy storage batteries operate under complex electric and thermal field operating conditions. And the consistency control of massive batteries, as well as the safety control of battery cells and the overall system level, face enormous challenges. How to develop long-life energy storage batteries? How to construct friendly operating conditions and strong safety protection capabilities for massive batteries? And how to achieve support for power grids, flexible adjustment and large-scale peak shaving functions? All these issues urgently need innovative solutions.. In response to the above issues, this forum will focus on the GWh-scale lithium-ion battery energy storage system technology, including key technologies for long-life lithium-ion batteries, safety design and challenges of energy storage systems, the double-frequency current, and SOC balance of battery clusters in high-voltage large-capacity energy storage systems, as well as the output characteristics of battery cells in the centralized energy storage power station.

SESSION CHAIR

Name	Affiliation
Dong Hui	CEPRI

SESSION SPEECHES

Name	Affiliation	Title
Jiang Liu	CATL	Discussion on Key Technologies for the Long-life Lithium-ion Batteries
Xiaobo Chen	CATL	Safety Design and Challenges of Lithium-ion Battery Energy Storage Systems
Hui Yan	NARI-TECHNOLOGY	Discussion on the Double-frequency Current Problem and SOC Balance Problem of Battery Clusters in Large-capacity High-voltage Cascade Connection Energy Storage Systems
Xiangjun Li	CEPRI	Analysis and Application Prospects of Battery Output Characteristics in Centralized Energy Storage Power Stations Based on Actual Operating Conditions

SG-3-4: New Application and Challenge for Power Distribution IoT

13:30-15:30 @Kaiyuan Hall 1

SESSION INTRODUCTION

Carbon neutrality and carbon peaking have become a global consensus. Every country has increased investment and construction of new energy. IEA predicts that the number of distributed PV sites worldwide will reach 100 million by 2030, while 25 million at 2022 with a fourfold increase. The rapid growth of distribution network in China pose new challenges and application requirements to the planning, construction, management and operation of distribution network. This session will focus on how to use the cloud-pipe-edge-device architecture based power distribution IoT system to ensure safe and reliable operation and maintenance of low-voltage power distribution network, and to meet flexible deployment and quick rollout of new services such as distributed PV monitoring and orderly charging of electric vehicles. We will also conduct in-depth discussions on challenges and hit topics of power distribution IoT such as field communications and low-voltage transparency to promote the digital transformation of distribution networks and accelerate the construction of modern smart distribution networks.

SESSION CHAIR

Name	Affiliation
Ying Zhang	CEIA：Energy Digitization Professional Committee

SESSION SPEECHES

Name	Affiliation	Title
Jiaying Lin	State grid shanghai energy interconnection research institute	Power Distribution IoT
Zhiguo Yao	State grid shanghai energy interconnection research institute	Field Communication for Power Distribution
Yulei Ge	Qingdao Topscomm Communication Co., Ltd.	Digital Solution for 400V Electrical Transformer District
Liangliang Sun	Shangdong Megsky Electric Co.,Ltd.	Power Distribution IoT Based New Energy Management
Zhengcheng Pan	Huawei Technologies Co. , Ltd.	Digital Base for Power Distribution IoT

SPECIAL SESSION

SS01 / Local Energy Systems with Flexible Resources and Energy Transaction

10:15-11:51 @Mingdu Hall

SESSION INTRODUCTION

Driven by the net-zero carbon emissions target, conventional energy systems are undergoing a rapid change from large national energy systems to local energy systems (LESs) in communities, neighborhoods, districts and buildings. LESs interconnected at the global power distribution level are designed to locally produce and utilize energy, thereby alleviating the pressure on transmission infrastructure. The emergence of LESs not only alleviates fuel poverty but also supports community income generation, strengthens network management, and reduces operational expenses. The LESs with a high penetration of renewable power generation and electrification of heat and transport at the grid edge, facing challenges such as the variability of new energy output and the uncertainty of energy markets, requires new technologies such as energy storage and flexible energy demand management as well as new energy policies, business models and market mechanisms to enable synergetic interactions between the energy systems to improve the overall energy efficiency and reduce carbon emissions.

This special issue is devoted to collection of the state-of-the-art on the original research and development modeling, control, optimization, and application in the local energy Systems and pave the way for bringing together the local range of energy carriers to reduce carbon emission and enable clean energy.

SESSION CHAIRS

Name	Affiliation
Jiajia Yang	James Cook University
Yongxi Zhang	Changsha University of Science and Technology
Chunyu Zhang	Taizhou University

SESSION SPEECHES

Time	ID	Presenter	Paper Title
10:15-10:27	1247	Pengfei Su	Optimal Scheduling of Steelmaking Process Considering Multiple Electricity Bill Components
10:27-10:39	2819	Zhichen Ye	Evaluation Study of Deep Learning-based Models on Probabilistic Power Load Forecasting
10:39-10:51	2970	Tian Ni	Medium- and Long-Term Electricity Load Forecasting Based on ARIMA-GM-LSTM
10:51-11:03	6600	Dezheng Liu	Coordinated Scheduling of Frequency Regulation Resources Based on the Coordination Coefficient
11:03-11:15	7239	Bo Jie	Estimation of Optimal PV & ESS Installed Capacity in R&D Facility EMS
11:15-11:27	7386	Yong Chen	A Study on the Framework in Evolving Energy Trading from Web 2.0 to Web 3.0

11:27-11:39	7832	Yunqi Wang	Towards Low-Carbon Collaborative Planning for Charging Stations and Distributed Renewable Resources
11:39-11:51	8101	Bohan Zhang	Evaluation of Diffusion Models on Non-intrusive Load Monitoring

SS02 / Enhancing Grid Resilience Through DERs and Active Distribution Networks

10:15-12:03 @Side Hall

SESSION INTRODUCTION

In light of the rising occurrence of extreme events, which include natural disasters, human-made accidents, and deliberate attacks, the stability and economic operation of power grids are under increasing threat. These challenges expose the shortcomings of conventional grid designs, prompting a rethinking of our prevailing practices and strategies. At this juncture, distributed energy resources (DERs) and active distribution networks have emerged as critical components. They not only exhibit adaptability but also represent a comprehensive approach for evolving a grid system with resilience, agility, and foresight. This Research Topic delves into the progressive capabilities of DERs and active distribution networks, underscoring their vital role in augmenting the resilience of microgrids and the broader distribution framework.

This Special Session invites original contributions analyzing the synergistic role of DERs within microgrids and active distribution networks, particularly their prompt and adaptive reaction during extreme events. We welcome papers addressing a wide range of topics related to these areas.

SESSION CHAIR

Name	Affiliation
Yunqi Wang	Monash University

SESSION SPEECHES

Time	ID	Presenter	Paper Title
10:15-10:27	3412	Yalei Yuan	A Study of Medium Voltage Flexible Loop Closing Control Strategy Based on Sen Transformer
10:27-10:39	4030	Dunjian Xie	Frequency-Constrained Robust Service Restoration of Distribution Networks under Renewable Power Uncertainty
10:39-10:51	9255	Fanmin Meng	Security Region-Based Economic Dispatch of Distribution Grids with Multiple Virtual Power Plants
10:51-11:03	8145	Soumyabrata Dev	Intra-hour Solar Irradiance Estimation Using Infrared Sky Images And Mobilenetv2-based CNN Regression
11:03-11:15	2787	Zifan Kong	Power Coordinated Control of Multi-Port Electric Energy Router Based on VSG Adaptive Parameter Tuning
11:15-11:27	2803	Yuxi Wu	Dynamic Economic Dispatch of Wind-CHP Coupling System Considering Multiple Uncertainties

11:27-11:39	7789	Teng Lin	Reactive Power Planning Contributed by Energy Storage under Uncertainty of Renewables and Load
11:39-11:51	8157	Xiaoyu Peng	Power Internet-of-Thing B5G Networks for Differential Protection in New-Type Power Systems
11:51-12:03	8532	Yun Bai	Research on Prediction Methods of Key Parameters for Regulating the Heat Supply in District Heating System with Data Augmentation

SS06 / Situation Awareness of Renewables Dominated Power Distribution Systems

10:15-12:03 @Sile Hall

SESSION INTRODUCTION

The energy transition towards clean and low carbon has resulted in the rapid development of renewable energy. However, high proportional connections of renewable energy sources and flexible loads in the power distribution system will increase the uncertainties of electric generation and load demand, and further lead to difficulties of operation and control. Therefore, it is urgent to have real-time operational insights to ensure seamless and efficient grid operation of power distribution systems with high proportional distributed controllable resources, such as winds, PVs, storages, flexible loads including EVs and air conditioning, etc.

Given this background, this session intends to shed light on the significance, challenges, and strategies associated with operation situation awareness and flexible coordinated interaction control in renewable dominated power distribution systems. Meanwhile, it aims to provide a platform for experts, researchers, and industry practitioners to share recent advancements and methodologies surrounding situation awareness to provide essential support for system operators to monitor the real-time operation status, predict the future development trend, and formulate the operational control strategy for renewable dominated power distribution systems.

SESSION CHAIRS

Name	Affiliation
Zhenzhi Lin	Zhejiang University
Tao Lin	Wuhan University
Ming Wu	China Electric Power Research Institute
Tianhan Zhang	National University of Singapore

SESSION SPEECHES

Time	ID	Presenter	Paper Title
10:15-10:27	5708	Yuanqian Ma	Extraction of Demand Response Features of Industrial Typical Customers

10:27-10:39	6450	Lizhuo Peng	Autoencoder and Kernel Density Estimation-Based Anomaly Detection Method for Power Consumption among Distribution Network Customers
10:39-10:51	8285	Zhenyang Wu	Assessment and Prediction of Energy Usage Based on ECV and ARIMA-DBN Methods
10:51-11:03	7617	Yukun Chai	An Assessment Method for Operational Situations of Distribution Networks with High Proportion of Distributed Photovoltaics
11:03-11:15	2318	Chengeng Niu	Optimal Scheduling Strategy for Integrated Electric-Thermal-Gas Energy Systems Considering Multiple Types of Energy Storage Resources
11:15-11:27	2128	Xinyi Zhu	BIRCH-AHC Two-Layer Clustering Algorithm-Based Typical Scenario Generation of Photovoltaic Output for Power Systems
11:27-11:39	7526	Zhihai Gao	Dynamic Reconfiguration of Microgrids Considering Mobile Energy Storage System
11:39-11:51	1610	Jiaqi Lu	An Enhanced Capacity Optimization Method Considering Battery Lifetime for HESS in Frequency Regulation Market
11:51-12:03	7646	Zhaoxiang Ma	A Fault Branch Location Approach for Partially Observable Distribution Network

SS10 / Coordinated Operation, Control and Cyber-physical Security of Smart Grid Considering Supply-and Demand-Side Resources

08:00-09:36 @Sile Hall

SESSION INTRODUCTION

Smart energy system is regarded as a promising solution to the challenge of increasing demand and environmental concerns by realizing the efficient utilization of coupled energy components such as combined heat and power units and power-to-gas facilities, and a range of market incentive mechanisms. However, despite the high efficiency and sustainability of smart energy systems, the interplay between suppliers and consumers can bring about diverse emerging control and operation issues. Besides, the deep involvement of cyber system also makes smart energy systems vulnerable to cyber-physical security risks, such as time delay, cyber failures, malicious attacks, etc. Therefore, how to achieve the coordinated control and robust optimization of smart energy system considering supply- and demand-side resources and how to enhance its cyber-physical security are of great importance.

SESSION CHAIRS

Name	Affiliation
Yulin Chen	Zhejiang University
Hongxun Hui	University of Macau
Xianbo Wang	Zhejiang University

SESSION SPEECHES

Time	ID	Presenter	Paper Title
08:00-08:12	1313	Shaohua Yang	Decoupling-based Withdrawal Scheme to Enhance Resilience of Multi-agent Energy Storage Systems under Contingencies
08:12-08:24	2935	Zhumeng Song	Optimized Operation of Integrated Energy Systems Considering Tradable Green Certificate and Carbon Trading Mechanism
08:24-08:36	4081	Zhongchao Zhang	Power Equipment Fault Traceability Method Based on Graph Data-driven
08:36-08:48	4886	Xing Huang	Distributed Hybrid Secondary Control of Virtual Synchronous Generators for Isolated AC Microgrids with Low Bandwidth Communication
08:48-09:00	7308	Meng Zhou	Virtual Inertia Synthesis Strategy for Thermostatically Controlled Load Cluster Integrating Time-Triggered Mechanism
09:00-09:12	7330	Haorui Tan	A Distribution Network Voltage Optimization Scheduling Method Based on the Virtual Power Plant
09:12-09:24	7826	Sheng Wang	Incremental Learning Based on V-I Trajectory Feature for Non-intrusive Load Monitoring
09:24-09:36	9194	Jiatu Hong	Distributed Self-triggered Control of Thermostatically Controlled Loads for Providing Ancillary Services

PANEL SESSION

P06 / Virtual Power Plant Construction and Operation Development

13:30-15:30 @Sile Hall

PANEL INTRODUCTION

In order to guide and promote the standardized and orderly development of virtual power plants, this conference focuses on the role and development trends of virtual power plants in the construction of new power systems. Through exchanges and discussions among participants, the user-side flexible resources will be fully tapped to participate in grid balancing in the form of virtual power plants. capabilities, and explore the construction of electricity market mechanisms and business models related to virtual power plants.

PANEL CHAIRS

Name	Affiliation
Yi Ding	Zhejiang University
Lvbin Ma	Zhejiang Huayun Information Technology Co., LTD

PANELISTS

Paper Presentations		
Chengjin Ye	Zhejiang University	#2489: A Carbon Emission Flow Model for the Distribution System Considering Network Characteristics
Xiaochen Yang	State Grid Hangzhou Power Supply Company	#666: Enlightenment and Thinking of the Development of Virtual Power Plant
Jialei Song	State Grid Jinhua Power Supply Company	#698: Resource Loss Detection Method for Fixed Power Virtual Power Plant Considering Spatio Temporal Correlation
Lan Deng	State Grid Jiaxing Power Supply Company	#4902: Research on the Coordinated and Optimal Allocation Strategy of Power-Storage-Load in Virtual Power Plants
Keynote Reports		
Hongchao Gao	Tsinghua University	Technical Framework and Research Progress of Virtual Power Plants with Scalable Flexible Resources
Junhua Zhao	The Chinese University of Hongkong	The Participation of Virtual Power Plant in the Southern Regional Market: Theory and practice
Xuedong Jiang	Zhejiang University	Research and Exploration of Integrated Virtual Power Plants with Source-Grid-Load-Storage
High-Level Dialogue: Engaging in high-level dialogue on “Key Issues in the Construction of Zhejiang Virtual Power Plants”		

P11 / Multi-agent and Multi-market Trading Mechanism in Energy Internet

13:30-15:30 @Sihui Hall

PANEL INTRODUCTION

The market transaction of integrated energy system (IES) under energy internet presents the characteristics of external multi-market (power market, auxiliary service market, carbon market, etc.) and internal multi-agent. On the one hand, the carbon footprint runs through the process of internal and external energy trading in IES; on the other hand, the internal multi-agent trading in IES presents the characteristics of diverse decision-making preferences and complex trading behaviors. This forum focuses on market trading policies and mechanisms under the energy internet market, and explores the IES multi-market (external)-multi-agent (internal) trading mechanism to create a mutually beneficial energy Internet ecosystem.

PANEL CHAIRS

Name	Affiliation
Ming Zeng	North China Electric Power University (NCEPU)
Yongli Wang	North China Electric Power University (NCEPU)

PANELISTS

Name	Affiliation	Title
Tongwei Yu	State Grid Liaoning Electric Power Company	Distributed Intelligent Protection Control and Market Operation
Shuo Zhang	North China Electric Power University	Simulation Study of New Type Power System in Market Operation Driven by Multiple Agents
Minda Shi	State Grid Zhejiang Electric Power Company	Exploration and Practice of 5G Station Energy Storage Flexibility Operation Strategy under Electricity Spot Market
Bo Zeng	North China Electric Power University	Challenges and Practices Faced in the Planning of Integrated Smart Energy Systems
Yongli Wang	North China Electric Power University	A Multi-Market Coupled Integrated Energy System Supporting Power System Dispatch Optimization Methodology

TECHNICAL SESSION

T02 / Renewable Generation and Distributed Energy Resources

13:30-15:30 @Baoding Hall

Chair: Zhengshuo Li, Shandong University

Time	ID	Presenter	Paper Title
13:30-13:42	4002	Yongtian Jin	A Multi-Objective Peaking Approach with Electric Vehicle Cluster Participation
13:42-13:54	4245	Xuechun Zhang	Transient Synchronization Stability Mechanism of PLL-based VSC during Grid Fault Considering Different LVRT Strategies
13:54-14:06	5154	Bing Sun	A Fast Island Partition Method Considering Energy Storage in Smart Distribution Network
14:06-14:18	5206	Eyad Talal Attar	Recycling Chicken Bones into Environmentally-Friendly Products is a Step Towards Achieving the Sustainable Saudi Vision 2030
14:18-14:30	5707	Yehui Ma	User-side Optimal Battery Storage Configuration Considering the Costs of Degradation
14:30-14:42	5814	Bohan Zhang	Expert Incorporated Deep Reinforcement Learning Approach for Market Arbitrage Strategy of the Battery Energy Storage
14:42-14:54	5998	Yuanyu Ge	An Energy and Reserve Combined Dispatch Model for Wind-Thermal-Pumped Storage Complementary Generation System
14:54-15:06	6025	Yutao Zhang	Optimal Reactive Power Model for Distribution Network Considering the Grid-connected Characteristics of Photovoltaic
15:06-15:18	6036	Shiqi Duan	An Intelligent Power Flow Violation Adjustment Method Based on Adversarial Process
15:18-15:30	2315	Haiyang Huang	Optimization Design and Dynamic Compensation Strategy of Inverter Parallel Virtual Impedance Based on Residual Generator

T03 / Computational Intelligence, Big Data, ICT and Blockchain Applications in Smart Grids

13:30-15:30 @Sixin Hall

Chair: Jianmin Zhang, Hangzhou Dianzi University

Time	ID	Presenter	Paper Title
13:30-13:42	960	Soumyabrata Dev	Harnessing ERA5 Reanalysis Data for Improved Long-Term Rainfall Forecasting in Southern Iran
13:42-13:54	344	Siyuan Liu	Empirical Study of Model Repair of DNN for Power System Transient Stability Assessment

13:54-14:06	400	Zhen Tao	Power Consumption Data Compression via Shift-invariant Dictionary Learning
14:06-14:18	1552	Zhen Yang	Scenario Generation of PV Power Based on DDPM
14:18-14:30	2425	Liang Shao	Model-Agnostic Meta-Learning Based Short-term Carbon Emission Price Forecasting
14:30-14:42	2574	Yulin Li	Blockchain Based Decentralized Multi-microgrid Collaborative Control
14:42-14:54	3102	Zifei Wang	Distributed Settlement Mechanism Design for Carbon Market Based on Blockchain-enabled Edge Intelligence
14:54-15:06	4232	Jiahui Guo	A Forecasting Aided State Estimator Based on Enhanced Autoformer UPF for Active Distribution Networks
15:06-15:18	7379	Chenchen Zhang	A Semantic Understanding Method for Patent Text Based on Large Language Model
15:18-15:30	6677	Arjun Pakrashi	Assessing Interconnected Factors in CO2 Emissions: A Case Study of India Using Principal Component Analysis

T04 / Grid Resiliency, Security, Reliability, Stability and Protection

13:30-15:30 @Side Hall

Chair: Yun Liu, South China University of Technology

Time	ID	Presenter	Paper Title
13:30-13:42	609	Weizhi Huang	Enhanced Short-Term Voltage Stability Assessment with the Incorporation of Impedance Information Learning
13:42-13:54	1670	Zhecheng Wang	Preliminary Study on Frequency Stability Analysis for Active Power Regulation in Variable Speed Pumped Storage Plants
13:54-14:06	1725	Le Wang	Risk Map of Rainstorm Induced Outage of Distribution System
14:06-14:18	2052	Dachuan Yu	Modified VMD Algorithm based Fault Location Method for Overhead-Cable Hybrid Transmission Line in MTDC System
14:18-14:30	2056	Zhiwen Pan	Coordination Design of Parameters of Additional Multi-Controller in the Wind-PV-Thermal-Bundled Power Transmission System Under Multiple Operation Modes
14:30-14:42	2067	Xiaoman Zhang	During-Event Mobile Energy Storage Real-Time Dispatching Method of Resilient istribution Systems
14:42-14:54	2453	Shilong Wang	D-Vine Copula Based Spatial Correlation Characterization for Capacity Credit Assessment of Wind and PV Power
14:54-15:06	3531	Yuanchen Dong	Evaluation of Inertia Distribution in Power Systems Based on Regional Inertial Centers
15:06-15:18	3604	Xinglong Feng	Research on Uninterruption Power Technical Requirements and Methods for PT-Type Automation Terminals

15:18-15:30	3839	Yifan Zhao	Resilient Wide-area Damping Control to Mitigate Sparse Attack Using Robust Subspace Tracking

T05 / Grid Planning, Operation and Management

15:45-17:45 @Kaiyuan Hall 1

Chair: Weijia Yang, Wuhan University

Time	ID	Presenter	Paper Title
15:45-15:57	3078	Yanguang Chen	An Efficient Optimization Method for Randomly Aggregating Unit Variables in SCUC
15:57-16:09	3091	Tianao Zheng	A Collaborative Control Method of Air Conditioner Groups Considering Rebound Reward and Punishment Under Multi-market Mechanism
16:09-16:21	3188	Apsara Adhikari	Evaluation of the Robustness of a Transmission Line Network Using Available Transfer Capacity
16:21-16:33	3202	Xiaochong Dong	An Extreme Scenario Reduction Algorithm for Multi-Time Scale Net-Load
16:33-16:45	3228	Muhammad Zeshan Afzal	Optimal State-of-Charge Management for Electric Vehicle Batteries Using Eagle Particle Swarm Optimization-based Hybrid Deep Reinforcement Learning
16:45-16:57	3402	Liqian Gao	A Graph Reinforcement Learning Algorithm for Unit Commitment
16:57-17:09	3924	Qianchen Wang	A Two-Layer Optimization Model for Two-Part Transmission Pricing for Special Projects Based on Multi-scenario Operation Simulation
17:09-17:21	4166	Xudong Li	Effects of Operating Range of Hydropower Units in Hydro-Wind-PV Hybrid System Considering Benefit, Risk and Stability
17:21-17:33	4621	Tianao Zheng	Resident Carbon Credit Incentive Decision-Making Method to Promote Valley Filling
17:33-17:45	5660	Zhiyang Kang	The Calculation Method of Capacity Reserve Cost Considering Uncertainty of High-Proportion Renewable Energy Power System

T06 / Renewable Generation and Distributed Energy Resources

15:45-17:45 @Baoding Hall

Chair: Kaishun Xiahou, South China University of Technology

Time	ID	Presenter	Paper Title
15:45-15:57	387	Xia Lin	Research on New Energy Protection Strategy Based on Zero-Sequence Voltage and Current Balance Configuration
15:57-16:09	505	Yiting Yue	Reactive Power Distribution Strategy for Wind Power and Hybrid Energy Storage Combined System
16:09-16:21	1929	Kanghua Xu	Dynamic State of Charge Balancing Control Strategy for Sodium-ion and lithium-ion Hybrid Energy Storage System in DC Microgrids
16:21-16:33	2068	Eyad Talal Attar	Implementing A Smart Irrigation System Using IoT Technology to Achieve Saudi's Green Ambition
16:33-16:45	2098	Bing Sun	Distributed Dispatching Method for Intelligent Distribution Network Based on the Multi-node Integration of Energy Microgrid
16:45-16:57	6399	Soumyabrata Dev	Spatial-Temporal-TES: Reanalysis Dataset Based Short-Term Temperature Forecasting System
16:57-17:09	2415	Lingxuan Chen	An Improved Generative Adversarial Network for Extreme Scenarios Generation
17:09-17:21	3234	Huarui Zhang	The Lessons and Insights of Flexibility Adjustment Resource Development in Germany
17:21-17:33	3725	Yiyun Guo	ADRC Limited Power Control Strategy for Single Stage Photovoltaic Inverter Systems
17:33-17:45	8724	Arjun Pakrashi	Nearshore Wave Prediction For Renewable Energy: Initial Results With Remote Sensing And Buoy Data

T07 / Key Equipment in Energy Internet & Smart Condition Monitoring and Fault Diagnosis Techniques

15:45-17:45 @Sihui Hall

Chair: Akif Nadeem, Qilu Institute of Technology

Time	ID	Presenter	Paper Title
15:45-15:57	814	Shuyi Xia	Lifespan and Carbon Cost of Battery Storage in Planning
15:57-16:09	2133	Xinglong Feng	Research and Application of High Precision Clamp Standard Sensor Based on Active Compensation Scheme
16:09-16:21	7220	Zhe Zhang	Failure Protection Method for 500kV Hybrid DC Circuit Breaker

16:21-16:33	8699	PeilinWu	Impact of Turbine Governor on Stability of Variable-Speed Pumped Storage Units with Full-Size Converter
16:33-16:45	9222	Jinghan Fan	Environmentally Friendly Generator Circuit Breaker Based on Vacuum Switch and Air Circuit Breaker
16:45-16:57	1638	Yujin Zhang	Fault Identification Model of Dry-Type Air-Core Reactor Based on Fault Feature Extraction and Ensemble Learning
16:57-17:09	2283	Akif Nadeem	Stochastic Correlation Estimator Fault Location Method on Lossy Transmission Lines with Multi Uncertain Parameters
17:09-17:21	4874	Xueqing Yang	Feature Sequence Fusion Faster R-CNN-based Metal Foreign Object Detection for Electric Vehicle Wireless Power Transfer System
17:21-17:33	6699	Dongchen Hou	A Fast Iterative Method for Dynamic State Estimation with Unknown Noise Statistics
17:33-17:45	7849	Yu Chen	Data Driven and Combinational Empowerment Based Operational Assessment for Electric Distribution Transformers

T08 / Integrated Energy System

15:45-17:45 @Sixin Hall

Chair: Yixun Xue, Taiyuan University of Technology

Time	ID	Presenter	Paper Title
15:45-15:57	1322	Yunshou Mao	Coordinated Flexible Energy Operation Strategy for a CCHP System Under Uncertainties
15:57-16:09	1419	Yang Liu	Data-Driven Parameter Estimation of Power Electronics Transformers Based On Koopman Operator
16:09-16:21	1564	Jintao Lu	Optimal Scheduling Model of Integrated Energy Systems Considering Wind Power Uncertainty
16:21-16:33	2104	Chenxu Yin	Multi-Objective Optimization of Park Integrated Energy Systems Considering Time-of-Use Price Incentives
16:33-16:45	2168	Kaishun Xiahou	Security Defense of AC Microgrids against False Data Injection Attacks Based on Distributed Disturbance Observers
16:45-16:57	2343	Xinyue Chang	Distributed Energy Management of Electricity-Heat-Hydrogen Integrated Energy System Based on Neurodynamics
16:57-17:09	2427	Yiwen Liao	A Physical Experimental Platform of Hydropower-Dominant Hybrid Energy System: Preliminary Progress
17:09-17:21	2541	Sahar Moghimian Hoosh	Assessing the Value of Energy Storage Systems for Distribution Grid Applications
17:21-17:33	3113	Bin Wang	Risk Evaluation of Minimum Design Temperature of Gas Insulation Switchgear

17:33-17:45	3156	Fang Kong	Research on Multi-objective Complementary Operation of Wind-photovoltaic-cascade hydropower Integrated System

T09 / Microgrids, Standalone Power Systems and Virtual Power Plants

15:45-17:45 @Sixian Hall

Chair: Hui Zhou, Beijing Jiaotong University

Time	ID	Presenter	Paper Title
15:45-15:57	8729	Soumyabrata Dev	Optimizing Remote Sensing Image Classification with Spectral Indices and Convolutional Neural Networks
15:57-16:09	3172	Wenhao Wang	Optimal Allocation of Energy Storage Capacity for Microgrid Primary Frequency Modulation
16:09-16:21	3353	Mohan Lin	Mixed Game Optimization Scheduling of Integrated Energy Systems with Shared Energy Storage
16:21-16:33	3836	Kejia Liu	Economic Scheduling Strategy of Virtual Power Plant with Electric Vehicles
16:33-16:45	5579	Haiyang Huang	Performance Improvement Control Strategy of Microgrid Multi-Inverter Parallel System
16:45-16:57	6222	Hanyang Lin	A Review on Virtual Power Plants: Development Progress and Market Participation Mechanisms
16:57-17:09	6241	Muhammad Salman	A Consensus Index-Based Distributed Control for Islanded AC Microgrids
17:09-17:21	8160	Yanjia Wang	Dynamic Triggering Strategy for VPPs Based on Physical Operating State and Electricity Market
17:21-17:33	8922	Yongliang Zhu	Frequency Modulation Strategy of Virtual Synchronous Generator Based on Adaptive Model Predictive Control
17:33-17:45	8974	Lingyi Ma	Power Management and Control Strategy of Island Energy Supply System Based on Energy Router

T10 / High Voltage Technology & Active Distribution Networks and DC Distribution Networks & Grid Planning, Operation and Management

15:45-17:57 @Side Hall

Chair: Chenye Wu, The Chinese University of Hong Kong, Shenzhen

Time	ID	Presenter	Paper Title
15:45-15:57	3292	Letian Tong	An Enhanced Passive IGBT Driver Technology Based on Multi-stage Regulation

15:57-16:09	6708	Xiaowei Huang	Force Calculation and Analysis on Salvaging of Faulted Submarine Cables Considering Submarine Topography and Soil Mulch
16:09-16:21	7766	Dongyang Li	Short Circuit Analysis of 110kV Transformer Based on Distributed Optical Fiber Strain Sensing
16:21-16:33	281	Sheng Wang	Active Bypass Control for Fault Tolerant Operation of Cascaded Three-Level Neutral-Point-Clamped Converters
16:33-16:45	2987	Haobo Li	Intelligent Clustering and Trending Analysis of EV Charging Behavior in Active Distribution Power Network
16:45-16:57	6555	Zida Zhao	An Optimal Control Strategy for Improving Virtual Inertia in DC Distribution Network
16:57-17:09	5953	Yue Yang	Visualization of Extreme Source-load Scenarios for High Percentage of Renewable Energy Based on Improved Energy Distance
17:09-17:21	6163	Oguzhan Ceylan	Optimal Allocation of Distributed Generators and Mobile Battery Energy Storage Systems in Distribution System
17:21-17:33	9031	Qinghan Wang	A Flexible Model for Collaborative Charging Scheduling of Electric Vehicles and Hydrogen Vehicles in Distribution Network
17:33-17:45	9198	Bing Sun	Evaluation Method of Comprehensive Balance Capacity for Provincial Power System Considering Efficient Interaction Between Source and Load
17:45-17:57	9828	Danyang Xu	Frequency-Constrained Unit Commitment Considering Pumped Hydro Storage's Participation in Primary Frequency Regulation

T11 / Integrated Energy System

15:45-17:45 @Sile Hall

Chair: Hong Fan, Shanghai Electric Power University

Time	ID	Presenter	Paper Title
15:45-15:57	3714	Xiaojie Chen	Forecasting Multivariate Loads of Integrated Energy Systems Based on LSTM and Weather Variables
15:57-16:09	4307	Yan Xu	Accelerated Solution for Electricity and Heat Distributed Dispatch Considering Electric Boiler and Heat Dynamics
16:09-16:21	4469	Xiang Dai	Step-based Carbon Trading Model for the Optimal Dispatch of RIES Considering Demand Response Incentivized by TOU Pricing
16:21-16:33	4544	Kunlong Yuan	Optimal Scheduling of Thermal and Carbon Capture Power Plants Considering Power-to-Gas Synergies

16:33-16:45	4545	Kaibin Guo	WGAN GP Based Data Reconstruction for Operational Faults of Power Distribution Networks
16:45-16:57	4765	Sitao Lu	Capacity Planning of Park Integrated Energy System Considering Carbon Market Trading
16:57-17:09	5513	Xingye Xu	Dynamic Security Evaluation Method for Power Systems Considering Cascading Failures
17:09-17:21	6081	Yufeng Cheng	Optimized Operation of a Two-Tier Game for Community-Based Integrated Energy Systems Considering Stepwise Carbon Trading and Integrated Demand Response
17:21-17:33	6645	Xia Shuyi	Energy Storage Operation and Planning for Wind Farms Verified by Second-order Cone Method
17:33-17:45	7607	Yinqiao Liu	A Multi-step Real-time Simulation Method for Integrated Energy System Based on Multi-platform Combination

POSTER SESSION

Poster Session 03 / Grid Planning, Operation and Management & Computational Intelligence, Big Data, ICT and Blockchain Applications in Smart Grids & Emerging Technologies and End-user Systems & IoT Enabled Energy Systems

10:00-11:00
@Foyer

Order	ID	Presenter	Paper Title
001	419	Yuxie Zhou	Multiple Agent-Based Modeling and Analysis for Coupled Electricity and Carbon Market
002	438	Baixi Chen	A Data-Driven Method for Approximation of Dynamic Security Region Boundary Based on Kernel Fuzzy Membership
003	584	Qingxue Cui	Primary and Secondary Collaborative Planning Method Based on New Power Distribution System
004	727	Junjie Chen	Exploring GAN and Their Derivatives in Power Data Generation: A Review
005	802	Ningjie Su	Sheath Loss Calculation and Loss Reduction Analysis of 220 KV Cable System
006	822	Ziang Liu	Two Stage Day Ahead and Intra Day Peak Shaving Strategy Considering Flexible Loads Resources
007	867	Xiyuan Zhou	Strategic Bidding and Trading in Joint Electricity-Carbon Market with Deep Reinforcement Learning
008	882	Mengjian Dong	A Classification Method for Electricity Users Based on the Light GBM Algorithm
009	913	Ying Wang	Collaborative Real-time Operation for Long-Term and Short-Term Energy Storage: A Scheduling-Corrective Approach
010	925	Guolong Liu	MDRAE: An Attention Mechanism-Based Auto-Encoder for Missing Data Recovery in Smart Grids
011	968	Yushan Yao	Internal Power Allocation Strategy of Multi-Type Energy Storage Power Stations Based on Improved NSGA- II
012	1118	Guo Chen	Dynamic Load Shedding Model for CVaR-Based Reliability Evaluation of Power Systems with Wind Power Integration
013	1138	Wenlong Li	Estimation of Urban V2G Carbon Emission Reduction Potential
014	1217	Mingkang He	Optimal Capacity of Wind Thermal Pumped-Storage Baling Transmission System
015	1231	Hongzhi Tan	Fast Access of Power Iot Devices Based on Deep Message Parsing-Revised
016	1293	Xiaoya Wang	Classification of Frequency Disturbance Event in Power Systems Considering Optimal PMU Placement

017	1301	Tian Zhou	Joint Planning of Energy Storage and Distribution System Considering Network Reconfiguration
018	1365	Xiaolin Yang	Multi-Stage Offensive and Defensive Game Method for FDIA on Power CPS
019	1366	Jin Kang	Analyzing the Relationship Between Intraday Load Power and Abrupt Changed Temperature
020	1663	Runlong Liu	A Power Data Generation Method Based on CNN-LSTM-GAN for Cable Transmission Line Assessment
021	1742	Yuandi Lin	Recognition System for Safety Helmets and Reflective Clothing in Power Transmission Engineering Construction Based on Machine Vision
022	1778	Dongdong Zhang	Enhancing the Efficiency of Relay Coils in Three-Coil Wireless Power Transmission Systems through Design and Optimization
023	1811	Jianmin Zhang	Unified Modeling of Physical- Cyber -Logic -Attack -Protection for Digital Substation by Extension of IEC61850 Logic Space Model
024	1830	Shuting Jia	Comprehensive Assessment of Wind Farm Life-Cycle Performance Based on Improved CRITIC Weighting Method
025	1977	Ran Zhang	Operation Risks Analysis and Supply Guarantee Strategies for Urban Power System
026	2014	Yukun Qiu	Reactive Power Cooperative Optimization of Wind Farm for Various Reactive Power Compensation Devices
027	2019	Han Liu	An Interpretable Soft Sensor Model for Power Plant Process Based on Deep Learning
028	2088	Zeyu Mu	High Wind Power Penetration System Power Flow off-Limit Early Warning Based on GCN and Rule Guidance
029	2100	Yucui Wang	A Method for Analyzing User Energy Saving Potential Based on Cluster Analysis
030	2185	Jie Li	Dynamic Clustering and Operation Evaluation of Renewable Energy Station
031	2261	Bo Hong	The Electricity Spot Market Clearing Method Considering the Participation of Electric Energy Storage Based on Capacity Compensation Mechanism
032	2277	Guo Chen	Adaptive Smoothing Optimization Method for Dynamic Load Shedding Based on CVaR Under Photovoltaic Uncertainty
033	2413	Cheng Xin	Comparative Study on Common and Different Values of Pumped Storage and Thermal Power
034	2641	Zhiyang Kang	The Coordinating Thermal Energy Storage Capacity Planning of Concentrated Solar Power Considering Demand Side Response
035	2682	Xiao Han	Deep Reinforcement Learning Applied in Distribution Network Control and Optimization

036	2704	Qiang Li	Research on a Transmission Line Insulator Defect Detection Algorithm Based on Small Sample Learning
037	2964	Ming Hu	A Load Balancing Method of New Energy Specialized Chip Based on Segments Division Adjustment
038	3076	Fan Yang	Obvervability Assessment and Optimal Placement of Measurement Terminals in Distribution Networks with Graph Theory and Intelligent Optimization
039	3088	Hongda Zhao	Constructing Knowledge Graph for Electricity Keywords Based on Large Language Model
040	3201	Junfeng Zhou	Scheduling Optimization Method for Charging Piles in Electric Vehicle Charging Stations Based on Mixed Integer Linear Programming
041	3436	Hanxuan Liu	Application of Intelligent Optimized Adaptive Disturbance Rejection Control in Fuel Cell
042	3447	Hang Mu	Study and Verification of Covert Channels for Process Layer Network in Smart Substations
043	3623	Zhi Wu	Observability Analysis and State Estimation of Distribution Network
044	3646	Jiyu Huang	Topology-Adaptive Small-Signal Stability Assessment Based on An Edge-Graph Learning Scheme
045	3686	Zhihong Huang	Thermal Fault Detection of Power Equipments with Low-Rank Tensor Decomposition and Guided Filter
046	3717	Meng Wu	Dynamic Equivalence Algorithm for AC-DC Hybrid System
047	3856	Pingping Wu	Short-Term Load Forecasting Method Based on VMD and Rank Set Pair Analysis
048	3858	Hongyi Li	Blockchain-Based Carbon Emission Accounting Method for Multi-Energy Systems
049	3895	Haotian Zhao	Real-Time Flexibility Quantification of the Natural Gas Networks for the Electric Power System
050	3969	Shuo Han	Research on Source-Grid-Load-Storage Integration Technology in Jilin Province, Which is Adapted to the New Power System
051	4276	Qiuting Guo	Research on Intelligent Algorithm of Transformer Area Topology Recognition Based on Distribution Network Measurement Data
052	4302	Li Bin	Deduction Simulation of Industrial Flexible Load Based on CEEMDAN-VMD-GRU
053	4409	Fujia Han	Data Driven Electricity Theft Detection Based on Federated Learning
054	4589	Xuan Wang	Federated Learning Based Non-Intrusive Load Monitoring in Domestic Energy Systems
055	4752	Zhiqiang Yao	Secondary System Data Flow Planning and Design for Substations

056	4780	Yuning Sheng	Sizing of Short-Term Energy Storages for Wind Farms Providing Frequency Response
057	4816	Xuesong Li	A Modeling Method Considering New Energy Generation and Deep Peak Regulation
058	4848	Pengfei Jia	Research on State Sensing Technology for Substation Equipment Based on Internet of Things
059	4974	Gengrui Chen	A Two-Stage Robust Optimization Method for Microgrids Considering Wind Power and Photovoltaic Uncertainties
060	5026	Junlong Zhu	Research on Fast Transmission Communication Method for Client-Side Heterogeneous Resources Information Modeling
061	5040	Baohua Zhong	Research on Defect Classification of Electric Power Equipment Based on Knowledge Graph
062	5338	Hao Li	Implementation of GPU Scheduling Method for Kubernetes for Power Cloud
063	5414	Jiaxiong Xiang	Evaluating the Aggregated Frequency Regulation Capability of Energy Storage Clusters
064	5520	Weihong Liu	A Novel Generation Expansion Planning Method Considering Energy Storage Demand Assessment
065	5674	Qi Peng	Unified Model of Substation for Dispatching and Centralized Control Applications
066	5760	Shuting Jia	Optimization of Renewable Energy Consumption Responsibility Weighting Apportionment Model Considering Equity Principle
067	5821	Xinyu Gu	A Resources Allocation Method for Power Systems Considering the Characteristics of Nuclear-Storage Joint Operation
068	5867	Wenyuan Pang	Determination of Safe Inspection Range of Transmission Line UAVs
069	6125	Qiyi Yu	Offshore Transmission Network Planning for Wind Power Considering Economy and Grid Security
070	6278	Yuji Cao	Interzonal Carbon Emission Flow Minimization
071	6280	Peizheng Xuan	Power Grid Flexible Partition and Regional Flexibility Assessment Based on Complex Network Theory
072	6326	Xianbo Wang	Topology Identification of Low Voltage Distribution Network Based on Signal Injection Method
073	6342	Huibin Jia	Optimizing Substation Communication: A Time-Sensitive Networking Approach for Addressing Real-time Transmission Demands
074	6361	Zuge Chen	Insulator Defect Detection in Power Transmission and Transformation Based on the Diffusion Model
075	6493	Weidong Huang	Joint Long-Term and Short-Term Energy Storage Planning Considering Carbon Capture

076	6550	Libo Zhang	Reliability Evaluation of Generation System Containing Wind Farms Using the Johnson System
077	6688	Zhi Cai	Security Constrained Dimensionality Reduction Strategy for Unit Commitment
078	6689	Ruzhe Ge	A Lithium Battery SOC Estimation Method Based on AEKF-Composite Neural Network Hybrid Driven Model
079	6725	Yutong Wu	A Composite-Window-Based Load Event Detection Method in Non-Intrusive Load Monitoring
080	6741	Xiaoshuang Xu	Opportunity Constraint-Based Planning Model for Source-Grid-Load Coordination Expansion of Water-Wind-Solar Hybrid Power System
081	6772	Xinyang Cao	Research on Power-Grid-Load-Storage Integration Based on Electricity-Carbon-Gas Cycle
082	6800	Hanxuan Liu	Design and Research of Control Unit Based on Power Grid Harmonic Pollution Control
083	6812	Zhuqing Li	Research on Load-Transfer Capacity Analysis and Network Reconstruction Method for Large City Distribution Networks
084	6819	Jiewen Deng	Transformer-Based Named Entity Recognition for Power Research with Dependency Relationship Information
085	6924	Yisheng Xue	Towards Accurate and Efficient Power Load Forecasting: A Cooperative Game-Based Optimization
086	6936	Qing Peng	Research on Improving The Measurement Accuracy of The Hall Current Sensor Based on The Extreme Learning Machine
087	6960	Ziang Wang	A Rolling Optimization Generation Expansion Planning Under Uncertainty of Planning Boundary
088	7007	Shuting Jia	Genetic Algorithm Based Whole Life Cycle Cost Prediction Model for Wind Farms
089	7027	Qi Wei	Statistical Characteristics and Non-Gaussionity of Grid Frequency Based on Measured Data
090	7085	Chong Liu	Cross-Platform Electromagnetic Transient Real-Time Simulation Method of Large-Scale Power Grid
091	7185	Wenkai Dong	Optimal Allocation of Synchronous Condensers in Renewable Power Grids Considering Equity
092	7410	Pingping Wu	Research on Power Load Forecasting Based on Modified-SCSO Optimized LSTM
093	7464	Shihong Zhang	Probability-Based Vulnerability Analysis of UHVDC Supported Filter Circuit Under Earthquakes
094	7745	Yanhong Liu	Clustering Based NCUC Transmission Constraints Elimination Method

095	7812	Bo Hong	Generation Schedule Generation Method Based on Joint Clearing of Electric Energy and Operational Reserve
096	7976	Hongyan Zhao	Fast Modeling Algorithm for Power Systems Based on RSCAD
097	7994	Bo Hong	Flexible Auxiliary Service Market Clearing Method Compatible with Frequency Modulation Service and Electric Energy Schedule
098	8010	Xianbo Wang	An Active Distribution Network Topology Identification Method Based on GAIN-GAT
099	8186	Jianhu LV	Optimization Model of Unit Commitment Considering Nonconvex Cost Characteristics of Coal-Fired Unit Deep Peak Shaving
100	8218	Tianhan Zhang	Nash Bargaining Based Shared Energy Storage Joint Planning Strategy of Prosumers
101	8404	Hancheng Gong	A Benchmark System for the Dynamic Study of New Power Systems with High Penetration of Non-Synchronous Power Sources
102	8486	Zhendong Tan	Modeling of Three-Winding Transformer Based on Shifted-Frequency Transformation
103	8554	Xu Zhou	Wide-Band Oscillation Disturbance Source Location Based on Compressed Sensing and CNN-LSTM
104	8605	Ziyu Huo	Improved Backward Scenario Reduction Method for Generation Planning Considering
105	8680	HUI ZHOU	Identification of Abnormal Users Based on Isolated Forests During Electricity Price Implementation
106	8758	Yao Zhang	Online Reconciliation Method for Short-Term Hierarchical Load Forecasting
107	8765	Yunfeng Yan	Multi-layer Feature Fusion for Small Target Detection Based on Yolov5
108	8867	Pengfei Jia	Research on Risk and Investment Prediction Method for Power Grid Equipment Based on Asset Wall Monte Carlo Simulation
109	8884	Yong Qiu	A New Planning Model of Total Supply Capability of Distribution Network Based on Equivalent Bus
110	9016	Chun Wang	Data-Driven Demand-Side Carbon Emission Accounting for Residential Users
111	9074	Yufeng Zhong	EUDet: Power Equipment Defect Detector Driven by Elastic Unit
112	9103	Feiyang Lu	Design and Implementation of An Intelligent Customer-Transformer Relationship Topology Recognition System
113	9171	Mo Feng	Line Parameters Identification with Data-Mechanism-Combined Method Under Insufficient Measurement Condition
114	9282	Zhaoyuan Wu	Multi-Temporal Flexibility Requirement Evaluation Considering the Correlation of Renewable Energy
115	9423	Qianlong Zhang	Compound Voltage Control Based on Ramp Charging Algorithm

116	9460	Mu Wang	Coordinated Planning of HVDC Terminal and Multi-time Scale Energy Storage in Multi-Area Hybrid AC/DC Power System
117	9517	Jian LI	Research on Coordinated Optimization of Transmission and Distribution Networks Based on Deep Reinforcement Learning
118	9564	Binghao HE	Environmental Assessment for China's Energy Policy Based on Disaggregated Input Output Table
119	9703	Xiaokang Lai	Detection of False Data Injection Attacks in Smart Grid Based on Graph Signal Processing
120	9778	Mingkang He	Research on Evaluation System of Renewable Energy Transmission System Considering Energy Storage
121	9782	Tianqing Yu	Collaborative Optimization of Base Station Backup Battery Considering Communication Load
122	9810	Xiaoyang Wang	Stealth FDIA Localization in Power Systems Using Spatio-Temporal Graph Neural Networks
123	9826	Guangyin Li	Collaborative Planning for Retirement of Coal-Fired Power Plants and Energy Storage Considering Frequency Security Constraints
124	9869	Hangcheng Chen	Distribution Network Planning Considering the Microgrids' Flexible Capability
125	9919	Jingxuan Zhang	Optimal Location and Capacity Planning of Distribution Network Considering Demand Response and Battery Storage Capacity Degradation
126	9994	Li Bin	A Demand-Side Adjustable Resources Response Interaction Capacity Assessment Method Based on Scale-Space Theory
127	5085	Siqi Chen	Research on the Key Technology of 550kV 1000H Grounded Reactor for Offshore Wind Power Flexible HVDC Transmission Projects
128	779	Yuan Hu	LSTM-Adaboost Electricity Sales Forecasting Model Based on One-Dimensional Time Series Input
129	778	Haoran Liu	Comprehensive Assessment of the Power System Blackout Source Events Damage
130	8854	Kejia He	Power Entity Alignment Active Learning Framework Based on Semantic and Structure Sampling Strategy
131	5995	Yan Meng	Impact of Energy Storage on Effective Load Carrying Capability of Renewable Energy Based on Reliability Analysis

Poster Session 04 / HVDC Transmission & Grid Resiliency, Security, Reliability, Stability and Protection & Smart Homes, Buildings and Cities and Cyber Security & Smart Condition Monitoring and Fault Diagnosis Techniques

17:00-18:00
@Foyer

Order	ID	Presenter	Paper Title
001	111	Haiyan HONG	A Reliability Evaluation Model for Dual Relay Protection System Considering Environmental Factors Classification and Defect Aggregation
002	214	Qiannuo Zhang	Overvoltage Research and Insulation Coordination for HVDC Transmission System Based on Medium-Frequency DRU-MMC
003	226	Nan Wang	Overvoltage and Insulation Coordination of ±500kV Offshore Wind Power Flexible DC Transmission System
004	241	Yichi Zhang	A Method for Cyber Attack Threat Assessment of Electric Power Supervision and Control System Considering Its Vulnerability
005	290	Yuan Xin	Survey of Electric Vehicles and Charging Equipment for Fault Warning with Deep Learning
006	460	Baixi Chen	Analysis of Key Influencing Parameters of Small Disturbance Stability for Doubly-Fed Induction Generator Connected to the Series-Compensated AC Grid Based on Fuzzy Rough Set Theory
007	531	Yuxiang Chen	Research on Evaluation Method of Ac Filter Circuit Breaker Based on Fuzzy Hierarchy Method
008	544	Ziyue Li	Fast Preventive Generation Scheduling by Clustering Scenario-Insensitive Decision Variables
009	631	Zhuo Wei	Research on Transformer Oil Breakdown Voltage Detection Method Based on Digital Images
010	702	Qiluan Yang	Efficient Simulation Method for Modular Multilevel Converter with Embedded Super Capacitor Energy Storage System
011	810	Shiping Chen	Design of A Low-Noise Multi-Range Broadband Front-End Amplifier for MEMS Electric Field Sensor
012	932	Jingjie He	Small-Signal Stability and Additional Damping Control of Wind-Solar-Energy Storage System
013	1027	Yuda Li	A Noval IR Drop Elimination Method for Polarization Potential Detection of Grounding Grid in Homogeneous Soil
014	1039	Mingjie Wei	Modeling of New Energy Generator Available for the Short Circuit Calculation of Asymmetrical Fault
015	1330	Junlong Zhang	Forced Disturbance Equipment Location Based on Spectral Residual Estimation
016	1391	Weitong XIE	A Section Location Method for High Resistance Fault in Resonant Grounding System

017	1501	Quan Guo	Stability Analysis of Modular Multilevel Converter Considering Damping Sensitivity
018	1517	Yuren Zhou	Response-Based Synchronization Stability Analysis of Multi-Converter Power Systems
019	1549	Yongjiang Jiang	Flywheel Energy Storage System with Synchronous Machine for High Proportion New Energy Connected Power Grid
020	1651	Peng Liang	Economic Transmission Distance Analysis Based on Three Different Offshore Wind Farm Integration Schemes
021	1657	Mengke Li	Robust Primary Frequency Reserve Optimization for Renewable Energy Power Systems
022	1676	Wenxuan Liu	An Accurate Auxiliary Monitoring Method for Substation Environment Based on Dynamic Simulation Technology
023	1677	Weina Cui	Evaluation of Inertia Requirements Considering Fast Frequency Response and Spinning Reserve in Primary Frequency Response
024	1738	Taiming Jiao	A Refined Life Cycle Investment Model for Improving the Reliability of Distribution Networks
025	2033	Wenzhe Xu	DC Fault Characteristics Analysis of Full DC Offshore Wind Farm
026	2081	Zhan Zhang	Grid-Supporting Control Strategies of MMC-HVDC Links Connected to Extremely Weak AC System
027	2125	Zhenyu Lei	Analysis and Comparison of Sub/Super-Synchronous Oscillation Source Location Methods
028	2135	Yue Hou	Optimal Monitor Allocation Method of Voltage Sag Source Location
029	2145	Jiaxin Liu	Resilience Enhancement Strategies for Active Distribution Grid Fault Recovery in Collaboration with Dynamic Network Reconfiguration
030	2148	Qiwen Peng	Research on Stray Current Suppression Method for Establishing Separate Grounding Grid of Cables
031	2247	Junlong Ma	Research on Static Voltage Stability Index of Regional Power Network with New Energy Stations Based on Voltage Stability Criterion
032	2324	Yunfeng Huang	Topology and Control for An Advanced Assembly HVDC Breaker with Self-Powered and Power Flow Control Capability
033	2360	Xuegang Lu	Inertia Evaluation Strategy for Power System Partition Based on GPU
034	2535	Yulei Cao	A Novel Exponential Transform Method for Evaluating the Small Signal Stability with Enhanced Efficiency and Accuracy
035	2563	Chenhui Lin	High Share Participation of Grid-Forming Inverter-Based Resources in Grid Frequency and Voltage Support
036	2593	Kaichen Zhang	Fault-Tolerant Control Strategy for Three-Level ANPC Inverter Based on Finite-Time Controller

037	2724	Xifang Huang	Emergency Reactive Voltage Control Strategy to Improve the Transient Stability of New Energy Access to the Receiving End Grid
038	2736	Han Chen	Camdetector: Detect and Positioning Hidden Cameras With Raspberry Pi 4 via EM Radiation
039	2824	Haoyong Chen	Fault Segment Detection Method of Multi-Terminal Hybrid Overhead-submarine MMC-HVDC Transmission Lines Based on Waveform Similarity
040	2859	Yizhuo Ma	Shafting Dynamic Analysis of the PMSG-Based Wind-Driven System Considering Virtual Inertia Control
041	2893	Cangbi Ding	Cooperative Reactive Power Configuration of Hybrid HVDC Transmission System for Offshore Wind Farm Clusters
042	3030	Haifei Miao	Application and Verification of Trusted Computing for Substation Automation Equipment
043	3126	Peng Guo	Hidden Fault Diagnosis Method of Relay Protection Equipment Based on Multi-Layer Collaboration of Equipment, Substation Control and Centralized Control
044	3313	Jiacheng Fo	Research on Target Prediction Method for Urban Distribution Network Reliability Planning
045	3346	Junlong Zhang	Research on Frequency Characteristics and Analysis Methods of New Power System
046	3422	Guowei Zhou	Multi-Physical Field Simulation Study of High Voltage Converter Valve Saturated Reactor
047	3590	Chenzhao Han	Oscillatory Stability Analysis of Direct-Drive Wind Power Grid-Connected Systems during Fault Transient Processes
048	3596	Conghao Ma	Fuzzy PID-Based Temperature and Humidity Adaptive Air Conditioning Regulation System
049	3613	Ying Du	Typhoon Related Cascading Fault Chain Dynamic Evolution and Risk Mitigation in Distribution Systems
050	3658	Xiaosen Cui	Gas Sensing Performance of Composite MoS2@CMOF to Li-Ion Battery Off-Gas C2H4
051	3811	Zongqi Wang	Analysis and Suppression of High-Frequency Common-Mode Electromagnetic Interference for Tunnel Cable PD Monitoring
052	3936	Yuqi Meng	Research on Simulation Method of Multiphase Generator Based on Low-Phase Model
053	4144	Youjin Jiang	Hybrid Time Domain Simulation Based on Numerical Integration and Holomorphic Embedding
054	4162	Jingming Ding	Differential Protection Method for Active Distribution Network Based on Frechet Distance Algorithm
055	4582	Xingyu Xu	Review of Fault Probability Prediction Models for Power System Equipment Under Extreme Weather Conditions

056	4779	Xin Gao	Feature Extraction Method for Transient Overvoltage Based on Spearman Correlation Coefficient
057	4847	Geng-Chen Li	Prediction Method for Transmission Line Fault Probability Under Ice Disasters by Modified BPNN
058	4983	Shiping Zhang	Research on Power System Fault Recovery Strategy Considering the Spatial and Temporal Influence of Typhoon Weather
059	5086	Peng Wang	DNN Based Prediction Method of Optimal Load Shedding for Power System with High Penetration of Renewable Energy Under Typhoon Weather
060	5143	Bingliang Shan	Resilience Enhancement of Distribution Power Network through Defect Location of XLPE Cables Based on BIS
061	5178	Yan Liu	Power System Restoration Strategy with High Proportion of New Energy Considering Power Network Pre-Decision
062	5225	Tong Sun	Fault Diagnosis Method of Transformer Based on WSO and SVM
063	5267	Yunjing Shan	Research on the Identification of True Vertical-Foot-Voltage Drop Point
064	5381	Junjie Lu	Li-ion Battery SOH Estimation Based on BO-SVR Model
065	5389	Guoqiang Qi	Distribution Network Precise Investment Strategy Based on Hierarchical Identification of Weak Links
066	5420	Hualiang Zhou	Practice and Analysis of Electromagnetic Interference Influence of Relay Protection Devices Under Thermal Stress
067	5431	Zhekai Li	Frequency-Reactive Power Optimization Strategy of Grid-Forming Offshore Wind Farm Using DRU-HVDC Transmission
068	5432	Chenxi Liu	Minimum Inertia Requirement Evaluation Method of Power Systems Considering Frequency Stability Constraints and Spatial Distribution Characteristics
069	5474	Ji Tang	Artificial Bee Colony Algorithm Based Fault Repair Method for Distribution Network Under Natural Disaster
070	5565	Hualiang Zhou	Research on Testing Methods for Memory Data Abnormal Bit Flipping of Relay Protection Devices Under Radiation Impact
071	5777	Jiancheng Bai	A Multi-Level Driver for Switching Trace Regulation Method of SiC MOSFET
072	5860	Xiaoyu Liu	Design and Application of Online Evaluation System for Deep Peak Regulation Capacity of Thermal Power Units
073	5974	Biao Zhao	Optimization Method for Steady State Voltage Control and Transient Voltage Prevention Considering STATCOM
074	6176	Liang Kong	A Comprehensive Control Method with Model Predicitve Function of MMC-HVDC System Under Unbalanced Grid Faults
075	6216	Tong Sun	Prediction of Dissolved Gases Concentration in Transformer Oil Based on VMD and ELM

076	6477	Junjie Lu	Li-ion Battery SOH Estimation Model Based on Finite Sampling in Relaxation Phase
077	6533	Nan Ge	Analytical Calculation Method of Distribution System Reliability Indexes Considering Access Mode of Double-Ended SOP
078	6642	Liangcheng Cheng	Power System Security Boundary Identification and Rules Extraction Based on Tighten Weighted Oblique Decision Tree
079	6647	Xiang Li	Improved Self-Synchronization Technology Using in Current Differential Protection of Distribution Grid
080	6778	Yadong Liu	Online Identification Solution and Key Technology for Secondary Equipment and Circuit Anomalies in Substations
081	6864	Yijia Yuan	Fault Isolation Strategy Based on Diode Groups of All-DC Offshore Wind Power Transmission System
082	6956	Hangyu Sun	Wideband Oscillation Identification and Oscillation Source Localization Method Based on Response Data and Primary Features
083	7201	Dongwei Yang	Research on Runoff Flow Prediction Based on Variational Mode Decomposition and PSO-SVM Model
084	7217	Xinyao Wang	Robust Control Strategy for VSC-HVDC Considering Renewable Energy Fluctuation
085	7231	Zhuping Liu	Graph Convolutional Network Based Power System Risk Assessment
086	7232	Dinghao Liu	Analysis of Energy Consumption of Office Buildings
087	7348	Qiang Huang	Improved Differential Protection Method for the Transmission Line of Photovoltaic Station
088	7485	Zhi Wu	Inertia Evaluation of Power Systems with High Proportion of Renewable Energy
089	7575	Hujie Li	Interfacial Defect Detection of Three-layer Structure in Composite Cross-arms Using Active Infrared Thermography
090	7583	Zerun Wang	Online Condition Monitoring Methods of Inverter IGBT Based on Output Voltage
091	7633	Zongze Wang	Turn-off Control Method of the Hybrid Commutated Converter Based on Fault Prediction
092	7674	Jingqi Fan	Resilience-Oriented Load Restoration Considering the Topology Transition Process
093	7689	Zichao Meng	Low-Order Frequency Response Modeling for Offshore Wind Farm-MTDC Systems
094	7706	Hao Ying	Robust Damping Controller Design in Renewable-integrated Power System Considering Communication Resilience
095	7726	Yangxin Huang	Automatic Generation Technology of Secondary System Configuration in Substations

096	7740	Zeyu Cao	Research on Transient Stability Domain Estimation of VDCOL Control of HVDC System Based on Polynomial Lyapunov Function
097	7771	Xincheng Zheng	Virtual Fault Resistance-Based High Impedance Fault Section Location for Active Distribution Networks
098	7947	Chenwei Gao	Optimal Restoration of Distribution System Under Multiple Faults Considering Outage Propagation
099	7982	Guowei Zhou	Research on Denoising of Partial Discharge Signals in Converter Valves Based on Improved Wavelet Threshold
100	8199	Zhou Xin	Hybrid MMC AC Side Smooth Start-up Strategy
101	8456	Chenzhao Han	Analysis of Energy Path Transmission in Direct Drive Grid Connected System Under Transient Fault Conditions
102	8603	Tao Li	Analysis of the Effectiveness of Stability Indices for Various Stability Modes in New Power Systems
103	8723	Yixin Pan	DC Voltage Control of Multi-Terminal MMC-HVDC Based on Virtual Synchronous Generator
104	8769	Xuejing Xia	Robust Control Method for LCL-Type Grid-Connected Inverters Based on Adaptive Correction of Grid Voltage Feedforward Considering Digital Control Delay
105	8780	Peng Li	Numerical Simulation Method for Aging Detection of 10 KV Composite Insulator Based on Microwave Transmission Method
106	8826	Pei Yi	Online Monitoring of Primary Frequency Regulation Capability of High-Proportion New Energy Power System
107	8875	Song Wang	Mechanism and Analysis of HCC to Suppress DC Commutation Failure
108	8938	Haochen Zhang	Communication Restoration and Fault Location in Distribution System by UAVs
109	8960	Jiaqi Zhao	Probabilistic Optimal Power Flow Method for HVAC/DC Systems Considering Wind Power Correlation
110	9082	Bo Yang	Exploring Adversarial Robustness of LiDAR-Camera Fusion Model in Autonomous Driving
111	9136	Bo Chen	Impact Mechanism of DC Power Recovery Speed on Transient Stability After Sending End AC Fault
112	9169	Jinglei Deng	Model Driven Based PMU Data Calibration Method Considering Time-Varying Characteristics of Line Parameters
113	9197	Chenwei Gao	Resilience-Oriented Optimal Allocation of Multi-Port Soft Open Point in Distribution Network
114	9226	Yu Wang	Effects of Positive-Negative Sequence Separation Method on the Impedance Characteristics of HVDC System
115	9305	Jiacheng Fo	Research on Fault Self-Healing Control Method of Intelligent Power Distribution System Based on Deep Learning

116	9380	Yu Wang	Line Commutated Converter Based on Integrated Gate Commutated Thyristor
117	9452	Guowei Zhou	Multiphysics Coupling Simulation Calculation of Anode Saturable Reactor
118	9478	Rui Tong	An Identification Method for Biological Electric Shock in Low-Voltage Distribution Networks
119	9642	Zhongwei Liu	Support Vector Machine Based Data Cleaning for Water Supply Network Monitoring
120	9838	Runing Li	The Direct-Drive Permanent Magnet Synchronous Generator Based On An Improved VSG-Controlled High Voltage Ride-through Strategy
121	5018	Gaurav Dhakal	Modeling of Induction Motor Bearing Fault by Using Finite Element Method

AGENDA ON DEC. 18

VENUE	*Starts at 08:30*	*Starts at 10:15*
Sihui Hall	Technical Session 12: Energy Forecasting, Peer-to-peer Energy Trading and Transactive Energy Management & Emerging Technologies and End-user Systems	Technical Session 15: Renewable Generation and Distributed Energy Resources
Sixin Hall	Technical Session 13: HVDC Transmission	Technical Session 16: Grid Resiliency, Security, Reliability, Stability and Protection
Siyi Hall	Special Session 11: Intelligent Interactions between Electric Vehicles and Power Grid	Panel 04: Planning and Control Methods for HVDC/HVAC Hybrid Power Systems with Growing Penetration of Renewable Energy
Sixian Hall	Special Session 08: Low-carbon Smart Grid Transformation and Its Cyber-physical Security	Panel Session 05: Floating Offshore Wind Turbine and Island Multi-Energy Complementary Technology
Side Hall	Special Session 03: Theory and Application of Rural Energy Internet	Technical Session 17: Integrated Energy System & FACTs
Sile Hall	Technical Session 14: Smart Homes, Buildings and Cities and Cyber Security & Renewable Generation and Distributed Energy Resources	Technical Session 18: Policy, Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects

10:00-11:00 | Poster Session 05

10:00-10:15 | Coffee Break

12:00-13:30 | Lunch

SPECIAL SESSION

SS03 / Theory and Application of Rural Energy Internet

08:30-09:42 @Side Hall

SESSION INTRODUCTION

The theory and application of rural energy internet is an emerging and interdisciplinary field that focuses on the integration of renewable energy, smart grid technologies, and information communication systems to create a sustainable and efficient energy ecosystem in rural areas. This special session aims to provide a platform for researchers, practitioners, and industry experts to gather and discuss the latest research findings, exchange ideas, address challenges, and explore opportunities in the development and implementation of the Rural Energy Internet.

SESSION CHAIRS

Name	Affiliation
Xueqian Fu	China Agricultural University
Liwei Ju	North China Electric Power University
Gen Li	Technical University of Denmark
Wei Gan	Cardiff University

SESSION SPEECHES

Time	ID	Presenter	Paper Title
08:30-08:42	Invited	Qingxin Shi	Economic Scheduling of Electricity-Hydrogen Integrated Port Energy System Considering the Piecewise Linearization of High Order Equations
08:42-08:54	3074	Fuhao Chang	Fine-Scale Simulation Technique for Summer High-Temperature Weather Based on Generative Adversarial Networks
08:54-09:06	3232	Wei Gan	Statistical Impact Quantification of Peer-to-Peer Energy Trading on Power Flows of Power Distribution Networks
09:06-09:18	3612	Yingyuan Zhang	Rural Green Transformation of Energy in a Demonstration County in China
09:18-09:30	5073	Xiaolong Zhao	Modeling and Coordination Strategies for the Cluster Effects of Distributed Photovoltaic Power and Air Conditioning
09:30-09:42	5925	Jianrun Chen	Improved Multi-tier Exergy Hub for Micro Rural Energy System Management
09:42-09:54	9928	Lian Liu	An Improved Wind Power Forecasting Framework Based on Seasonal Feature Selection And Temporal Convolutional Network

SS08 / Low-carbon Smart Grid Transformation and Its Cyber-physical Security

08:30-09:30 @Sixian Hall

SESSION INTRODUCTION

The transition to a sustainable energy future is one of the most pressing challenges facing the world today. As we move away from fossil fuel-based energy systems, the integration of renewable energy sources into the grid becomes increasingly important. However, this shift is not without its complexities. The session on "Low-carbon Smart Grid Transformation and Its Cyber-physical Security" aims to delve into the intricacies of modernizing our energy infrastructure to be both low-carbon and secure. This transformation involves not just the physical components of the energy system, but also the cyber elements that control and manage it. As smart grids become more prevalent, ensuring their security against cyber threats is paramount. This session will bring together experts, policymakers, and industry leaders to discuss the challenges and opportunities in creating a low-carbon, secure, and resilient smart grid.

SESSION CHAIRS

Name	Affiliation
Gaoqi Liang	Harbin Institute of Technology
Jiaqi Ruan	The Hong Kong Polytechnic University
Huan Zhao	Nanyang Technological University

SESSION SPEECHES

Time	ID	Presenter	Paper Title
08:30-08:42	6469	Qingxi Fang	A Method for Low Carbon Operation Decision Support of Thermal Power Plants Based on Data-driven Causal Inference
08:42-08:54	5774	Chao Yang	Coordinated Restoration of Generators and Load for the High Renewable Energy Penetrated Power System with Frequency Regulation
08:54-09:06	4179	Jiaqi Ruan	Investigation of Artificial Intelligence Vulnerability in Smart Grids: A Case from Solar Energy Forecasting
09:06-09:18	3616	Peipei Yu	Wind Power Forecasting: LSTM-Combined Deep Reinforcement Learning Approach
09:18-09:30	1165	Zhenze Jiang	Cyber-Physical System Defense Decision-Making Based on Priori Knowledge of Traffic Anomaly Detection

SS11 / Intelligent Interactions between Electric Vehicles and Power Grid

08:30-09:54 @Siyi Hall

SESSION INTRODUCTION

Amid the global imperative to curtail carbon emissions and address climate change, electric vehicles (EVs) have emerged as a pivotal component of eco-conscious sustainability. Moreover, the confluence of EVs and the power grid has yielded a profound paradigm shift in energy consumption, distribution, and ecological sustainability. Nonetheless, the seamless integration of EVs into the power grid faces some intricacies and challenges, such as the load fluctuation caused by the extra energy consumption. The session titled "Intelligent Interactions between Electric Vehicles and the Power Grid" is currently dedicated to unraveling the complex interplay of charging preferences and market participation behaviors exhibited by EV users in EV-grid interactions. This session is poised to bring together experts, policymakers, and industry leaders for a comprehensive discourse on the challenges and prospects of dynamic interrelation in EV-grid integration.

SESSION CHAIRS

Name	Affiliation
Xiaoying Tang	The Chinese University of Hong Kong (Shenzhen), China
Junhua Zhao	The Chinese University of Hong Kong (Shenzhen), China

SESSION SPEECHES

Time	ID	Presenter	Paper Title
08:30-08:42	3375	Mengge Shi	A Cooperative Game Approach for Electric Vehicle Charging Site Recommendation Considering User Price Sensitivity
08:42-08:54	4592	Huanyu Yan	Incentivizing EVs to Participate in Peak-Shaving Markets: A Prospect Theoretical Approach
08:54-09:06	6295	Mengge Shi	Efficient Revenue Allocation Approach to Virtual Power Plant Operation with Electric Vehicles
09:06-09:18	7850	Xuecui Jia	Research on the Optimal Scheduling Method for Electric Vehicles Participating in Load Aggregators Based on Demand-side Response
09:18-09:30	7817	Zhi Li	Simulation Testing Method for Distribution Network Control Based on Embedded Energy Management System and Matlab
09:30-09:42	8695	Yang Zou	A Heuristic Method for Route Programming in Puzzle-based Energy Storage Systems
09:42-09:54	9402	Minzheng Hu	A Data-driven Approach for Lithium-ion Battery Life Classification Based on Early Cycles

PANEL SESSION

P04 / Planning and Control Methods for HVDC/HVAC Hybrid Power Systems with Growing Penetration of Renewable Energy

10:15-12:15 @Siyi Hall

PANEL INTRODUCTION

In the context of building new power systems with the goals of full absorption of renewable energy, optimized allocation of large-scale energy resources, reliable supply of electricity, and secure and stable operation of power grid, this panel will discuss research on revolutionizing theory and methodologies of power system planning, operation and control, by focusing on solving critical issues caused by the uncertainty of developing renewable energy projects, strong uncetainty of renewable generators' power outputs and the new characteristics of high-penetration power electronics. In particular, this panel includes topics of (1) large-scale spatio-temporal optimization models for planning cross-regional DC interconnection network; (2) theory and methodologies for coordinated planning of various regional renewable energy, supporting power supplies, energy storage, and HVDC topology considering multi-timescale power and energy balance as well as stability constraints; (3) security and stability control theory and technologies for coordinated precise control of source, network, load and storage devices in various types of power grid partitions; (4) combined balance control of active power and reactive power, ride-through control of renewable energy clusters, and coordinated stability control of renewable generators and storage devices for the control areas with renewable energy only and without sufficient synchronous power supplies. This panel will also discuss new theory and technologies for optimizing active power scheduling and frequency control with multi-timescale and cross-regional coordination.

PANEL CHAIRS

Name	Affiliation
Ruisheng Diao	Zhejiang University
Haiwang Zhong	Tsinghua University

PANELISTS

Name	Affiliation	Title
Lin Guan	South China University of Technology	Construction of a Coarse-Grained Grid Model for Long-term Power System Planning
Haiwang Zhong	Tsinghua University	Multi-Area Asynchronous Grid Operation with Frequency Reserve Sharing
Baorong Zhou	CSG Power Dispatching and Control Center	Key Technology for Transmission Projects of the Large-scale Wind Power and Photovoltaic Bases in Deserts, Gobi and Desert Areas
Yiping Chen	CSG Power Dispatching and Control Center	The Application Experience and Inspiration of Flexible Regulation Capability of LCC-HVDC for New Power Systems

Ying Huang	Zhejiang University	Stability Analysis and Key Technologies of the New Type AC/DC Power Systems
Yishen Wang	State Grid Smart Grid Research Institute	Power Decision Intelligence Application Driven by Computing Paradigm Fusion
Junbo Zhang	South China University of Technology	A Comparative Study on the Multi-type Power Support Schemes for Large-scale Photovoltaic Power Generation System Interconnected with VSC-HVDC
Ruisheng Diao	Zhejiang University	High-fidelity Modeling, Analytics, and Intelligent Control Techniques for Hybrid AC/DC Power System Operation

P05 / Floating Offshore Wind Turbine and Island Multi-Energy Complementary Technology

10:15-12:15 @Sixian Hall

PANEL INTRODUCTION

This panel session is for reporting about the experience, state-of-the-art methodology and technologies of floating offshore wind turbines and island multi-energy complementarity systems. Due to the lack of connection to the large mainland power grids for power supply, the islands faces prominent challenges such as high cost, high carbon emission intensity, and poor stability in energy supply. Building and developing island multi-energy complementary systems based on floating wind power is one of the preferred solutions. However, such systems are facing special climate conditions, such as high temperature, humidity, salt mist, heavy precipitation, strong lightning, and strong typhoons. Therefore, it is urgent to develop key technologies, including dynamic simulation of floating offshore wind turbine generator sets and platforms, mooring system dynamics simulation based on floating wave energy generation platform, energy management and comprehensive assessment of floating wind power-based offshore multi-energy complementary system, etc, and form a replicable and scalable low-carbon power supply operation mode for offshore islands.

PANEL CHAIRS

Name	Affiliation
Bin Wang	Tsinghua University
Zhe Zhu	Electric Power Research Institute, China Southern Power Grid

PANELISTS

Name	Affiliation	Title
Fanying Liu	Mingyang Smart Energy	Integrated Coupling Analysis and Control Technology for Floating Wind and Wave Power Generation Platform
Zhenpeng Wang	Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences	Research and Application of Floating Sharp Eagle Wave Energy Conversion Technology

Yinliang Xu	Tsinghua Shenzhen International Graduate School	Wind-PV-Wave Power Probabilistic Prediction Based on An Improved Sequence-to-Sequence Attention Model
Shuai Fan	Shanghai Jiao Tong University	Self-Approaching Optimization-Based Operation Method for Island Power Systems
Haotian Zhao	Tsinghua University	Data-Driven Optimal Dispatch for Park-Level Integrated Energy System Considering Heat Transfer Time Delay
Lipeng He	China Southern Power Grid Co., Ltd	Concept of a Demonstration Project for a Wind-Solar-Wave-Storage Integrated Power Generation Platform Based on Floating Wind Power

TECHNICAL SESSION

T12 / Energy Forecasting, Peer-to-peer Energy Trading and Transactive Energy Management & Emerging Technologies and End-user Systems

08:30-09:54 @Sihui Hall

Chair: Yiping Yuan, University of Electronic Science and Technology of China

Time	ID	Presenter	Paper Title
08:30-08:42	1333	Yuhang Meng	Topology Identification for Island Electric Power Systems Through Voltage Curves Similarity and Impedance-Based Distance
08:42-08:54	2203	Jiahe Xu	Analysis of Body Grid Aggregation and Sharing via an Umbrella: A Case Study of Shenzhen Metro Station
08:54-09:06	5442	Junkai Liang	Attention Mechanism Based Probabilistic Day-Ahead Net-Load Forecasting with Behind-the-Meter Solar
09:06-09:18	6218	Haoyang Zhou	Probabilistic Forecast of Wind Power in High Wind Scenarios of Cold Wave Weather
09:18-09:30	7115	Yuchen Xie	Photovoltaic Cluster Forecasting Based on Spatial Correlation-Informed Deep Learning
09:30-09:42	7534	Yanhui Chen	Day-Ahead Wind Power Forecasting Considering Value-oriented Evaluation Metrics
09:42-09:54	9789	Yangning Zhang	Analysis of SCADA Data Preprocessing Methods for Wind Power Farms

T13 / HVDC Transmission

08:30-09:54 @Sixin Hall

Chair: Wankai Yang, China Electric Power Research Institute Ltd.

Time	ID	Presenter	Paper Title
08:30-08:42	9473	Juntao Pan	Research and Analysis on the Influence Factors of Smart Meter Disturbance Based on Time Series Interval Values
08:42-08:54	2086	Wenhao Du	Voltage Transient Coordinating Control Strategy for Renewable Generation System with HVDC
08:54-09:06	3566	Yingqi Liang	Comparative Techno-economic-environmental Analysis of HVDC and HVAC Technologies for an Offshore Wind Farm in China
09:06-09:18	5384	Zan Jia	Improved Capacitor Voltage Balancing Control for MMC Considering Voltage Convergence
09:18-09:30	6309	Degao Zhu	Theoretical Study and Application of New Rock Dumping Protection Technology for Ultra-long Suspended Submarine Cable

09:30-09:42	6631	Wankai Yang	Analysis and Solution of UHVDC Current Oscillation Caused by DC Line Fault Restart
09:42-09:54	6661	Zihao Sha	Harmonic State-Space Based Hybrid AC/DC D-Q Admittance Model of MMC

T14 / Smart Homes, Buildings and Cities and Cyber Security & Renewable Generation and Distributed Energy Resources

08:30-09:42 @Sile Hall

Chair: Liang Yu, Nanjing University of Posts and Telecommunications

Time	ID	Presenter	Paper Title
08:30-08:42	2075	Ilia Kamyshev	Physics-Informed Appliance Signatures Generator for Energy Disaggregation
08:42-08:54	5025	Tong Wu	HIL-based Distributed Control of Inverter-Air-Conditioner for Power System Frequency Regulation
08:54-09:06	9375	Bing Sun	An Optimization and Dispatching Method of Shared Energy Storage Based on the Operation Risk of Distribution Network
09:06-09:18	9685	Wenyun Zhang	Performance Analysis on Compression-assisted Chemisorption Chiller for Data Center Waste Heat Utilization
09:18-09:30	9709	Jiarong Li	Economic Impacts of the Capacity and Topology Design on the Wind Power-to-Hydrogen Cluster
09:30-09:42	6317	Hang Meng	Application of One-key Sequence Control Transformation and Efficient Acceptance Technology of Substation Based on Evidence Comparison

T15 / Renewable Generation and Distributed Energy Resources

10:15-12:15 @Sihui Hall

Chair: Peng Lu, Tsinghua University

Time	ID	Presenter	Paper Title
10:15-10:27	6903	Teng Lin	Coupling Characteristics of Active and Reactive Power in Power System with Renewable Integration
10:27-10:39	7077	Zijian Zeng	Influence of Carrier Phase Difference on Supraharmonics in Grid-Connected Photovoltaic System with Parallel Converters
10:39-10:51	7176	Haohan Ji	Distribution of Power Impact Among Grid-Forming Devices
10:51-11:03	7256	Zhonghan Zhou	Steady-State Performance Modeling and Simulation Analysis for All-DC Wind Power System
11:03-11:15	7365	Yuxuan Wang	A Wind Power Forecasting Method Using Causal Inference

11:15-11:27	8246	Lingxuan Chen	A Two-tier Wind-solar Output Modelling Method Considering Day-to-day Output Pattern Transition and Intraday Output Dependent Changes
11:27-11:39	8283	Zihan Lin	Distributed Photovoltaic Location Planning and Hosting Capacity Improvement Considering Network Reconfiguration and Mobile Energy Storage
11:39-11:51	3917	Yongtian Jin	A Unified State Model-Based Approach for Cooperative Voltage Regulation of Multiple DSRs
11:51-12:03	8796	Yuanyu Ge	Intelligent Scheduling of Wind-Solar-Hydro-Battery Complementary System Based on Deep Reinforcement Learning
12:03-12:15	9249	Hongxing Wang	A Switched-Capacitor Based Single-Stage Multi-port DC Collector for Wave Energy

T16 / Grid Resiliency, Security, Reliability, Stability and Protection

10:15-12:15 @Sixin Hall

Chair: Wanjun Huang, Beihang University

Time	ID	Presenter	Paper Title
10:15-10:27	8075	Lunshu Chen	Hardware-in-the-loop and Field Demonstration Towards Voltage Regulation in Distribution System Considering Adjustable Inverter Air Conditioners
10:27-10:39	4794	Kun Liu	Research on Suppression Strategy for Distribution System with Multiple Inverters Based on Impedance Reshaping
10:39-10:51	4829	Xinlin Sun	Transient Stability Analysis Method Based on the Combination of Multiple Indicators
10:51-11:03	5954	Hao Zhang	Fault Line Selection Method for a Non-effectively Grounded Distribution Network
11:03-11:15	6828	Weijie Gong	An Approach for Extracting Key Weather Processes Affecting Power Supply Driven by Meteorological Data
11:15-11:27	7048	Mo Chen	Optimal Reactive Power Allocation in Power Systems Based on Improved Binary Table Particle Swarm Optimization
11:27-11:39	7218	Xinglong Feng	Analysis of Voltage Transformer Failure Mechanism and Prevention Measures Based on ATP-EMTP
11:39-11:51	7551	Lixin Wang	Damping Level Enhancement Strategy for Large-Scale Renewables Penetrated Power System Based on Data-Driven Global Sensitivity
11:51-12:03	8398	Duanjiao Guo	Distributed Hierarchical Resilient Event-Triggering Control for DC Microgrids under Mixed Cyber Attacks

12:03-12:15	8901	Ziyuan Zhao	Line Pilot Protection for DFIG Wind Farm Transmission Lines Based on Wasserstein Distance

T17 / Integrated Energy System & FACTs

10:15-12:15 @Side Hall

Chair: Peng Li, North China Electric Power University & Hongxia Guo, South China University of Technology

Time	ID	Presenter	Paper Title
10:15-10:27	4061	Yixue Liang	Research on Strategy of Voltage Sag Mitigation with Configuration for Dynamic Voltage Restorers in Distribution Network
10:27-10:39	6274	Jiahui Xu	Study on the Influence of Pressure on Bubble Movement in Silicone Gel
10:39-10:51	7806	Yuxin Du	Integrated Energy System Dynamic Simulation Toolbox based on Refined Modeling Method
10:51-11:03	7899	Jia Wei	Influence of Capacity Configuration on Stability of Hydropower-Photovoltaic Hybrid Energy Systems
11:03-11:15	8168	Guanxian Ding	Impact of Installed Capacity and Load Characteristics on the Environmental Benefits of Pumped Storage in Hybrid System
11:15-11:27	8615	Yutao Zhang	Step-based Carbon Trading Model for the Thermal-electric Optimization of Integrated Energy Systems Considering the Correlation between Wind and PV
11:27-11:39	8647	Mingxuan Jiang	Reliability Assessment of Electricity-heat Integrated Energy System Considering Thermal Characteristics
11:39-11:51	9239	ShuFu Liu	Demand Response-based Operation Optimization of a Typical Industrial and Agricultural IES
11:51-12:03	9565	Yaoyao Wang	Energy Storage Siting and Capacity Planning Considering Voltage Flexibility Under Extreme Scenarios
12:03-12:15	9614	Jun Wang	Risk Management of Integrated Energy System Decarbonization

T18 / Policy, Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects

10:15-12:15 @Sile Hall

Chair: Jun Xie, Hohai University

Time	ID	Presenter	Paper Title
10:15-10:27	2348	Xiyang Guan	Method and Application of Energy Storage Spot Trading Based on Dual Settlement Market Model
10:27-10:39	2638	Denghui Fu	Locational Marginal Electricity-Carbon Price Considering Wind Power Uncertainty

10:39-10:51	2717	Yachen Tang	Research on High-Frequency Spatiotemporal Electrical Carbon Intensity
10:51-11:03	3163	Kai Jiang	Capturing Demand Response Dynamics in Market Equilibrium Using Mean-Field Theory
11:03-11:15	4653	Jiaqi Sun	Bidding Strategies and Equilibrium Analysis in Electricity Market Under RPS and CET
11:15-11:27	4753	Chi Zhang	Thermal Analysis and Simulation of Quad Flat No-Leads Packaging on Printed Circuit Board with ANSYS
11:27-11:39	4943	Xuecen Wang	The Economic and Environmental Benefits of Second-life Batteries Applied in the Power System
11:39-11:51	5791	Jinrui Tang	Construction Necessity and Benefit Assessment of Virtual Power Plant: The Hubei Province Case
11:51-12:03	7226	Jianan Duan	A VCG Energy Price Mechanism for Day-Ahead Market Clearing in Electricity-Gas Combined System Considering Energy Contracts
12:03-12:15	7917	Cuiyu Zhou	Bidding Strategy for Pumped Hydro Storage Station Based on Information Gap Decision Theory

POSTER SESSION

Poster Session 05 / Integrated Energy System &Policy, Electricity Market, Innovative Business Mechanism, Policy/Regulatory Aspects &Energy Forecasting, Peer-to-peer Energy Trading and Transactive Energy Management

10:00-11:00
@Foyer

Order	ID	Presenter	Paper Title
001	7847	Yinan Wang	Research on A Differentiated Development Path Method for Provincial New Type Power Systems
002	222	Yanbin Xu	Typical Elastic Load Regulation Performance Evaluation and Optimal Selection Method
003	262	Zhenlan Dou	Analysis Method of Electrical Energy Substitution Potential Based on Time Series and BP Neural Network
004	291	Youpeng Pan	Optimal Operation of Regional Integrated Energy System Based on Stackelberg Game
005	389	Jiachen Zhang	A Privacy-Preserving Combined Heat and Power State Estimation Method Based on Physics-Informed Neural Networks
006	447	Yinan Wang	Development Analysis and Prospective Research for New Type Power Systems
007	605	Chenglong Zhang	Research on Energy Consumption "Dual-Control" Policy Adjustments Impact and the Mid-long Term Energy Demand
008	660	Xianan Huang	Analysis of Influencing Factors of Carbon Emission Based on LMDI Model
009	684	Shan Zhang	Distributed and Coordinated Operation of Interconnected Electric Heating System Based on Multi-Agent P2P Transaction
010	832	Yanjin Zhu	Regional Integrated Energy Optimization Scheduling Considering Mutual Recognition of Energy-consuming Quota and Carbon Quota
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