

2026 5th Asian Conference on Frontiers of Power and Energy ACFPE 2026

Conference Program

www.acfpe.org

Co-organized by
Sichuan University
Sichuan Society for Electrical Engineering

Supported by
Hong Kong Society of Mechanical Engineers (HKSME)
Global Energy Interconnection
Global Chinese Power & Energy Society

Media Supported by
Proceedings of the CSEE, CSEE Journal of Power and Energy Systems(CSEE JPES), Automation of Electric Power Systems, Power System Protection and Control, Journal of Modern Power Systems and Clean Energy (MPCE), Protection and Control of Modern Power Systems, Power System Technology, Journal of Electrical Engineering, New Type Power Systems, High Voltage Engineering, High Voltage, Electric Power Information, Communication Technology, Cyber-Physical Energy Systems, Electric Power Automation Equipment, Chinese Journal of Electrical Engineering, Power Generation Technology, Electrical Power Engineering Technology, Electric Machines, Control Applications, Sichuan Electric Power Technology, electronics, Southern Power System Technology, Neimenggu Dianli Jianshe, Nanfang Nengyuan jishu, Smart Power & Energy Security, ÉLECTRIC POWER, Electrical Measurement & Instrumentation, ADVANCED ENGINEERING SCIENCES, Integrated Intelligent Energy, Relay Protection and Excitation Technical Committee of CSHE, Distributed Energy, Energy Engineering and JOURNAL OF XI'AN JIAOTONG UNIVERSITY, Electric Power Construction, Energy Conversion and Economics

Oct. 22-24, 2026 • Chengdu, China

CONTENTS

WELCOME MESSAGE	1
CONFERENCE SPEAKERS.....	2
KEYNOTE SPEAKERS.....	2
PROGRAMME OVERVIEW.....	7
INSTRUCTIONS TO PRESENTATIONS	8
ONLINE CONFERENCE OPERATION GUIDE VIA VOOV	9
TECHNICAL SESSION.....	11
POSTER SESSION.....	14
ABSTRACT INDEX.....	23
CONFERENCE COMMITTEE.....	33
CONFERENCE VENUE.....	35
ORGANIZER & SPONSOR.....	37
NOTE	38

WELCOME MESSAGE

Dear Participants,

Welcome to participate in 2026 5th Asian Conference on Frontiers of Power and Energy (ACFPE 2026), which will be hosted in Chengdu, China from Oct. 22 to 24, 2026. This conference is co-organized by Sichuan University and Sichuan Society for Electrical Engineering, supported by Hong Kong Society of Mechanical Engineers(HKSME), *Global Energy Interconnection* and Global Chinese Power & Energy Society, media supported by *Proceedings of the CSEE*, *CSEE Journal of Power and Energy Systems(CSEE JPES)*, *Automation of Electric Power Systems*, *Power System Protection and Control*, *Journal of Modern Power Systems and Clean Energy (MPCE)*, *Protection and Control of Modern Power Systems*, *Power System Technology*, *Journal of Electrical Engineering*, *New Type Power Systems*, *High Voltage Engineering*, *High Voltage*, *Electric Power Information*, *Communication Technology*, *Cyber-Physical Energy Systems*, *Electric Power Automation Equipment*, *Chinese Journal of Electrical Engineering*, *Power Generation Technology*, *Electrical Power Engineering Technology*, *Electric Machines*, *Control Applications*, *Sichuan Electric Power Technology*, *electronics*, *Southern Power System Technology*, *Neimenggu Dianli Jianshe*, *Nanfeng Nengyuan jishu*, *Smart Power & Energy Security*, *ÉLECTRIC POWER*, *Electrical Measurement & Instrumentation*, *ADVANCED ENGINEERING SCIENCES*, *Integrated Intelligent Energy*, *Relay Protection and Excitation Technical Committee of CSHE*, *Distributed Energy*, *Energy Engineering and JOURNAL OF XI'AN JIAOTONG UNIVERSITY*, *Electric Power Construction*, *Energy Conversion and Economics*.

ACFPE 2026 is a conference which aims at bringing together participants from academia, industry, engineering, and administrative organizations around the world to exchange novel ideas, discuss innovative designs, explore enabling technologies and open problems, and share field trial experiences in power and energy areas. We warmly welcome prospective authors to submit your research papers to ACFPE 2026, and share your latest research results and valuable experiences with other top-scientists, engineers and scholars from all over the world.

All the accepted and presented papers will be submitted for inclusion into IEEE Xplore subject to meeting IEEE Xplore's scope and quality requirements. The publisher will submit articles to Engineering Village, Scopus, Web of Science and other databases for review and indexing after publication.

On behalf of the organizing committee, I would like to thank the distinguished speakers: Prof. Vladimir Terzija from Newcastle University, UK; Prof. Yi Zhang from RTDS Technologies Inc., Canada; Prof. Zhao Xu from the Hong Kong Polytechnic University, China; Prof. Hazlie Mokhlis from University of Malaysia, Malaysia; Prof. SHADIKE Zulipiya from Shanghai Jiao Tong University, China; Prof. Rufeng Zhang from Northeast Electric Power University, China for sharing their deep insights on future challenges and trends.

I would like to thank all the committees for their great support on organizing the conference. I also would like to thank all the reviewers for their great effort on reviewing the papers submitted to ACFPE 2026. Special thanks to all the researchers and students who with their work and participate in the conference.

We hope you enjoy the conference, the food, the hospitality, and the beautiful and charming city of Chengdu.

Regards,



Youbo Liu, Sichuan University, China

CONFERENCE SPEAKERS

Keynote Speakers



Prof. Vladimir Terzija
Newcastle University, UK

Biography: Professor Vladimir Terzija was born in Donji Baraci (former Yugoslavia). He received the Dipl.-Ing., M.Sc., and Ph.D. degrees in electrical engineering from the University of Belgrade, Belgrade, Serbia, in 1988, 1993, and 1997, respectively. He is a Professor of Energy Systems & Networks at the Newcastle University, UK. He is also a Distinguished Visiting Professor at Shandong and Tsinghua Universities, China, as well as a Guest Professor at the Technical University of Munich, Germany. In the period 2021-2023 he was a

Full Professor at Skoltech, Moscow, Russian Federation. In the period 2006-2020 he was the EPSRC Chair Professor at The University of Manchester, UK. From 2000 to 2006, he was a Senior Specialist for switchgear and distribution automation with ABB, Ratingen, Germany. From 1997 to 1999, he was an Associate Professor with the University of Belgrade, Belgrade, Serbia. His current research interests include smart grid applications, wide-area monitoring, protection and control, multi-energy systems, data analytics, and complexity science applications in power systems. From 2015 to 2025, he served as Editor-in-Chief of the International Journal of Electrical Power and Energy Systems. Prof. Terzija is the Founding Editor in Chief of a new npj (nature partner journal) “Energy Systems and Resilience”, Humboldt Fellow, IEEE Fellow and the recipient of the National Friendship Award (China).

Keynote Lecture: Smart Technologies and Data Analytics for Integrating Data Centres with Power Grids

This invited lecture explores the transformation of modern electrical power systems under the pressure of digitalisation, renewable integration, and emerging load types. It begins with an overview of key operational challenges—reduced inertia, lower fault levels, and increased system complexity—before introducing smart grid concepts for enhanced data acquisition, monitoring, and protection. Particular attention is given to the role of intelligent electronic devices, communication standards (IEC 61850, IEEE C37.118), and time-synchronised measurement technologies that underpin advanced system integrity protection schemes. The second part highlights how data science and artificial intelligence are reshaping grid operation and control, leading to the digital twin concept and wide-area monitoring architectures. The lecture then focuses on modern data centres as both major energy consumers and potential active participants in power system operation. Through examples of geo-distributed workload scheduling, carbon-aware computing, and integration with renewable and ancillary services, Professor Terzija illustrates how smart technologies and data analytics can turn data centres from passive loads into intelligent, grid-supporting prosumers within future net-zero energy systems.



Prof. Yi Zhang
RTDS Technologies Inc., Canada

Biography: Dr. Yi Zhang joined RTDS Technologies in 2000, serving as Vice President R&D and Chief Technology Officer (CTO) since 2018. His expertise includes electromagnetic transient simulation, high-voltage direct current (HVDC) transmission, and voltage stability. He is one of the principal developers of the RTDS real-time simulation system, pioneering solutions in fully digital real-time simulation of HVDC transmission. He architected the

latest generation RTDS platform - NovaCor, successfully increasing the scale of real-time digital simulation to tens of thousands of nodes. Currently, Dr. Zhang is conducting research on the quantitative analysis of electromagnetic transient simulation results and nanosecond-level real-time hardware-In-Loop simulation of Solid-State Transformer (SST) circuits. He is a Fellow of the Canadian Academy of Engineering, a Fellow of IEEE, and a registered Professional Engineer in the province of Manitoba.

Keynote Lecture: System Level Electro-Magnetic Transient Simulation – Theory, Development and Practical Experience

Electromagnetic transient (EMT) simulation, long regarded as a tool for detailed equipment and local network studies, is becoming essential for system-level analysis. As power systems integrate large shares of inverter-based resources, HVDC links, and FACTS devices, conventional phasor-based transient stability analysis (TSA) can no longer reliably capture fast control interactions, sub-synchronous oscillations, weak-grid instability, and converter-driven dynamics. This keynote reviews the theoretical foundations of EMT simulation and explains why large-system EMT studies are necessary, highlighting key application areas. It then addresses the principal barrier: EMT simulation is far slower than TSA. It discusses solutions including network partitioning, parallel and real-time computing, hybrid EMT-TSA simulation, and model simplification. It surveys current developments in large-scale EMT platforms and presents successful industry experiences. Finally, the talk outlines future directions, including high-performance computing, AI-assisted modeling and analysis, and automated model conversion, to make system-level EMT simulation faster, more accessible, and more trustworthy.



Prof. Zhao Xu
The Hong Kong Polytechnic University, China

Biography: Prof. Zhao Xu received the B.Eng. degree from Zhejiang University, Hangzhou, China, in 1996, the M.Eng. degree from the National University of Singapore, Singapore, in 2002, and the Ph.D. degree from The University of Queensland, Brisbane, QLD, Australia, in 2006, all in electrical engineering. From 2006 to 2010, he was an Assistant and then an Associate Professor with the Department of Electrical Engineering, Technical University of Denmark, Kongens Lyngby, Denmark. Since 2010, he has been with The

Hong Kong Polytechnic University, Hong Kong, where he is currently a Professor with the Department of Electrical Engineering and the Leader of Smart Grid Research Area. He is also a foreign Associate Staff of the Centre for Electric Technology, Technical University of Denmark. His research interests include smart grid, renewable energy, and applications of AI and big data analytics. He has extensive research project experiences involving collaborations with academia, industrial, and

business sectors. Prof. Xu was the recipient of several awards for research excellence, including the 2017 State Award in Nature Science from MOE, China. He is currently the Chairman of the IEEE Hong Kong Joint Chapter of PES/IELS/IAS/PELS. He has served/is serving as an editor for a number of IEEE Transactions and IET journals.

Keynote Lecture: Modern Power System Inertia Analysis and Frequency Support Strategies under Climate Change

With the ongoing climate change, the penetration of renewable energy in modern power systems continues to increase. The inherent characteristics of renewable energy units, such as high variability and non-synchronous nature, have heightened concerns over inertia and frequency stability in modern power systems. This presentation will analyze the evolution of power system inertia and investigate proactive strategies to enhance inertia levels. First, the conceptual changes in modern power system inertia under climate change will be studied. Grounded in the laws of physics associated with system inertia, a data-driven equivalent inertia estimation method, particularly accounting for the effects of renewable energy integration, will be proposed to enable real-time system inertia estimation. Furthermore, frequency support strategies for renewable energy units, including both grid-following and grid-forming approaches, will be developed to guarantee compliance with the minimum inertia requirements for frequency stability.



Prof. Hazlie Mokhlis

University of Malaysia, Malaysia

Biography: Hazlie Mokhlis obtained the Bachelor of Engineering degree and Master of Engineering Science in Electrical Engineering from University of Malaya in 1999 and 2003 respectively. In 2009, he received his PhD degree from the University of Manchester. Currently he is Professor in the Department of Electrical Engineering, University of Malaya. He is active researcher that has published more than 300 publications in Power and Energy Systems and supervised to completion 40 PhD, and more than 60 Master students. His

outstanding research had been recognized in top 2% scientists by Stanford University in 2020 to 2025. He was awarded Top Research Scientist Malaysia by Academic Science Malaysia in 2021 and appointed as Fellow of Academic Science Malaysia in 2024. Besides research, he is active in the development of few Malaysian Standard related to power systems. His research interests focus on improving distribution system performance and resiliency against extreme weather. Prof Hazlie is a Chartered Engineer United Kingdom, Professional Engineer with the Board of Engineers Malaysia, Fellow IET, and Senior member of IEEE. He was Chapter chair for IEEE PES Malaysia session 2020-2022.

Keynote Lecture: Nature Inspired Optimization in Power System Research: Towards Sustainability and Climate Actions

Research in power system optimization has evolved from focusing primarily on conventional analysis such as unit commitment, load flow, and economic dispatch to addressing more complex challenges. These challenges include integration of various technologies such as renewable energy, electric vehicles, and smart grids into power systems. Additionally, the increasing frequency of extreme and unpredictable weather events necessitates optimization to enhance the resilience of power system networks. Some research efforts have explored nature-inspired optimization techniques such as Genetic Algorithms, Particle Swarm Optimization, and Evolutionary Programming to achieve optimal planning and operation of power systems. The primary aim of this talk is to discuss the

application of these nature-inspired optimization methods in modern power system research. The current challenges facing power systems, particularly those related to renewable energy integration and extreme weather events, will be examined. Potential research areas addressing these challenges through nature-inspired optimization techniques will be highlighted. Finally, examples of research projects utilizing these methods will be presented to illustrate their practical applications.



Prof. SHADIKE Zulipiya

Shanghai Jiao Tong University, China

Biography: Zulipiya Shadike is currently an Associate Professor in the School of Mechanical Engineering at Shanghai Jiao Tong University. She received her PhD in Physical Chemistry from Fudan University in 2017 and then worked as a Research Associate at the Brookhaven National Laboratory (BNL). She was promoted to a staff scientist in 2020. Her research interests focus on developing high energy electrode materials as well as investigating the bulk/interphasial chemistry of lithium/sodium batteries by synchrotron X-ray based diagnostic

techniques. She was a recipient of the “Young Investigator Award” in 2019 from the Battery500 consortium supported by the U.S. Department of Energy.

Keynote Lecture: Regulation of Oxygen Electronic Structure and Phase-Transition Kinetics in P2-Type Layered Cathodes for Sodium-Ion Batteries

Sodium-ion batteries (SIBs) have been regarded as a promising next-generation rechargeable battery technology for large-scale energy storage owing to the abundance and low cost of sodium resources. P2-type layered transition-metal oxides are attractive cathode materials because of their high energy density. The activation of oxygen redox can further enhance their reversible capacity; however, it is often accompanied by irreversible phase transitions, local structural distortion, limited oxygen-redox reversibility, and voltage hysteresis, which significantly hinder their practical applications. Herein, we focus on the regulation of the oxygen electronic structure in P2-type layered cathodes and its intrinsic relationship with phase-transition behavior and Na-ion diffusion kinetics. Cation-doping strategies with different strengths of metal–oxygen covalent interactions are employed to systematically investigate the effects of dopant species on the oxygen electronic structure, interlayer gliding, and phase-transition behavior. A “cation potential” parameter is introduced to establish the correlation between cation doping and phase transitions in P2-type cathodes, and a corresponding phase diagram is constructed, providing a theoretical basis for structural regulation. This work establishes the intrinsic relationships among cation doping, metal–oxygen covalency, oxygen electronic structure, phase-transition process, and Na-ion diffusion kinetics, and reveals a general strategy for regulating the structural and kinetic properties of P2-type cathodes through cation doping. These findings provide new design principles for developing sodium-ion battery cathodes with simultaneously high specific energy, long-term cycling stability, and fast charge/discharge capability.

**Prof. Rufeng Zhang**

Northeast Electric Power University, China

Biography: Dr. Rufeng Zhang is a Professor with the Department of Electrical Engineering, Northeast Electric Power University. He's an IEEE Senior Member. He has led more than 10 scientific research projects including National Natural Science Foundation of China and published more 70 SCI/EI indexed papers, including 5 "Web-of-Science highly cited papers". He serves as an Associate Editor/ Youth editorial board member of Applied Energy, Protection and Control of Modern Power Systems (PCMP), Electric Power

Automation Equipment (in Chinese), Power System Protection and Control (in Chinese). He also serves as guest editor of IET Energy Systems Integration and International Journal of Electrical Power & Energy Systems. His research focuses on optimal operation of power systems with renewable energy.

Keynote Lecture: Resilience Assessment and Enhancement of Urban Energy Systems under Extreme Natural Disasters

This report focuses on resilience assessment and enhancement of urban energy systems in the context of extreme natural disasters, systematically investigating the entire process of resilience evolution and collaborative regulation methods of urban energy systems across pre-disaster, during-disaster, and post-disaster stages. First, a scenario model of extreme natural disasters is constructed, and their disaster-inducing mechanisms are analyzed. Second, a resilience assessment framework covering the full disaster process is established, enabling the identification of weak links, rapid assessment of resilience levels, and quantitative characterization of recovery effects. Finally, to meet the defense and recovery needs throughout the disaster process, resilience enhancement methods integrating multi-energy complementarity, resource coordination, and full-process regulation are proposed, providing important theoretical foundations and technical support for improving the disaster resistance and supply guarantee capacity of urban energy systems.

CONFERENCE PROGRAMME OVERVIEW

Conference Venue: Xiangyu Hotel (祥宇宾馆)

ADD: No. 103 Xinnan Road, Chengdu, Sichuan, China 四川省成都市新南路 103 号

Day 1 Oct. 22, 2026	Time	10:00-17:00					
	Venue	Lobby of Xiangyu Hotel					
	Items	Registration and Conference Kits Collection					
Day 2 Oct. 23, 2026	Time	9:00-9:30	9:30-10:00	10:00-10:30	10:30-11:00	11:00-11:30	11:30-12:00
	Venue	Xiangrui Hall, 3F, Xiangyu Hotel / 三楼, 祥瑞厅					
	Items	Opening Ceremony	Keynote Speaker I Prof. Yi Zhang	Keynote Speaker II Prof. Zhao Xu	Group Photo & Coffee Break	Keynote Speaker III Prof. Hazlie Mokhlis	Keynote Speaker IV Prof. Rufeng Zhang
	12:00-13:30/Lunch 2F, Xiangjing Restaurant/二楼, 祥景厅						
	Time	13:30-14:00	14:00-14:30	14:30-15:00		15:00-15:30	
	Venue	Xiangrui Hall, 3F, Xiangyu Hotel / 三楼, 祥瑞厅					
	Items	Keynote Speaker V Prof. SHADIKE Zulipiya*	Keynote Speaker VI Prof. Vladimir Terzija*	Award Ceremony		Poster Session & Coffee Break	
	Time	15:30-18:00			15:30-18:15		
	Venue	Xiangrui Hall, 3F, Xiangyu Hotel / 三楼, 祥瑞厅			Offline: Xianghe Hall, 3F, Xiangyu Hotel / 三楼, 祥和厅 Online Room ID: 909-365-276 Password: 1023		
	Items	Technical Session I			Technical Session II		
	18:30-20:00/Dinner Banquet						
Day 3 Oct. 24, 2026	10:00-17:00	Technical Tour					

INSTRUCTIONS TO PRESENTATIONS

Oral Presentation

1. File format: MS-PowerPoint (*.ppt) or Adobe PDF (*.pdf)

PPT size: **Xiangrui Hall / 祥瑞厅 (16:9)**

Xianghe Hall / 祥和厅 (16:9)

2. Time: About 15mins, including Q/A time.

3. Language: English.

4. Fonts: Arial or Times New Roman.

5. Dress code: Formal Clothes.

6. Facility: Presenters need to use own laptop, please notify conference secretary via e-mail in advance and test the connection before session start.

7. Online conference software: Tencent VooV.

Poster Presentation

1. Poster Size: 1m*0.8m (height*width).

2. Language: English.

3. Poster format: jpg.

4. The poster should include: Paper ID, Conference Name's Acronym, Significance of the research, the methods used, the main results obtained, and conclusions drawn.

5. Posters are required to be condensed and attractive.

6. The conference organizer won't send/keep any posters after the conference.

Minutes of Q&A

Keynote Speech: 30 Minutes of Presentation including 5 minutes' Q&A

Oral Presentation: 15 Minutes of Presentation including 2 minutes' Q&A

NOTICE:

- Certificate of Participation will be awarded after presentation.
- One best presentation will be selected from each session. The best one will be announced when each session ends, and will be awarded with a "Best Presentation" certificate.

ONLINE CONFERENCE OPERATION GUIDE VIA (Tencent Meeting) VOOV

● 线上会议信息 (Online Conference Information):

时区 (Time Zone)	Beijing Time, GMT+8
会议时间 (Conference Time)	09:00 -18:15, Oct. 23 th , 2026
在线会议室 ID (Online Room ID)	909-365-276 (password: 1023)
链接 (Link)	https://meeting.tencent.com/dm/dwTnbtahhIkj

● 线上测试信息(Online Testing):

All the participants can join the conference room during the testing time; the conference secretary will arrange the participants who will do the presentation to test one by one. (p.s. Conference ID keeps the same as testing ID)

(所有线上会议室 ID, 链接相同, 进入主会场后请选择对应的会议室即可。All online meeting rooms have the same ID and link. Please select the corresponding meeting room after entering the main venue room.)

Room ID: 909-365-276 (password: 1023) Link: https://meeting.tencent.com/dm/dwTnbtahhIkj		
Room NO.	Time*	Participate
Online Room	14:30-14:55 Oct. 20, 2026	Oral Presenters: F027*, F031*, F030*, F055*, F084*, F106*
	15:00-16:00 Oct. 20, 2026	Online Poster Presenters

*Beijing Time, GMT+8

● 操作指南(Operation Guide):

1. VooV 会议视频软件 Video meeting software: (Tencent Meeting) VooV

下载链接 (download link):

A.) Chinese Version

<https://meeting.tencent.com/download-mac.html?from=1001&fromSource=1> (Mac OS)

<https://meeting.tencent.com/download-win.html?from=1001&fromSource=1> (Windows)

B.) International Version

<https://voovmeeting.com/download-mac.html?type=1&from=1000> (Mac OS)

https://voovmeeting.com/download-win.html?type=x86_64&from=1000 (Windows)

2. 加入会议(Join the Conference):

方法一: 点击会议链接, 或选择“加入会议”后输入会议 ID。进入会议室时需填写手机号

码进行验证；验证完成后在入会名称处输入您的“文章编号+姓名”即可进入。

Method 1: Click the Conference link, or click “Join the conference”, then input the Conference ID. When you join the conference room, you need to fill in your phone number for authentication, then fill in your “Paper ID +Name” at the “Name” to join the conference.

注：如您不能以游客身份直接“加入会议”，建议您按照方法二注册一个账号，登录后再加入会议。

Tip: Should you fail to “Join the Conference” as a visitor, we suggest you register an account by method 2, then log in and join the conference.

方法二：您可在腾讯会议 APP 或官网 (<https://meeting.tencent.com/>) 中进行注册，登录后通过链接或输入会议 ID 加入会议。

Method 2: You can register at the APP/ website (<https://www.voovmeeting.com/>), log in and join the conference by the link or tap the Conference ID.

● 注意(Note):

- 所有出版的论文需保证至少有一位作者出席线上会议并全程保持在线。
Presentation of paper must be done on the conference by one of author(s) of the paper. Otherwise, the paper cannot be included into the conference proceeding.
- 会议将全程进行录制，作为提交出版社的材料之一。
We'll record the whole conference. If you do mind, please inform us in advance. The recording will be used for conference program and paper publication requirements. It cannot be distributed to or shared with anyone else, and it shall not be used for commercial nor illegal purpose.
- 会务组将在会议前 10-15 分钟进行点名，请各位作者至少提前 10-15 分钟加入会议室。
会议秘书将于会议当天提前四十五分钟打开会议室等待各位加入。
The conference committee will call the roll 10-15 minutes before our conference, please join the conference in advance for at least 10-15 minutes. The conference secretaries will be waiting before forty-five minutes the conference starts. *Note: Since International version does not support the function of file transmission, we recommend you to download Chinese version, then you can upload and download file smoothly. If Chinese version is not available in your country or region, you can download international version; as for e-posters, we could email you via email box once you requested.
- 会议期间务必戴上耳机以防外界噪音。同时建议请保持视频开启，持续在线。
Please wear headphones during the meeting to block out the outside noise. Keeping the video on and keeping online are suggested.
- 请提前测试会议软件。
Please test the video meeting software in advance.
- 如有任何疑问，您可点击 <https://voovmeeting.com/> 以获取帮助，或联系会议秘书：+86 18200296850 (中国), +852-30506862 (中国香港)。
Should you have any further questions about this operation guide, please click <https://www.voovmeeting.com/> for help. You can also contact the conference secretary at +852-30506862(Hong Kong) \ +86 18200296850(China).

TECHNICAL SESSION

Keynote Speech Session			
Session Chair: Youbo Liu, Sichuan University, China			
9:00-12:00, Oct. 23, Friday			
Offline Venue: Xiangrui Hall, 3F, Xiangyu Hotel 成都祥宇宾馆, 三楼, 祥瑞厅			
Time	No.	Content	Page
9:00-9:30	Opening Ceremony		
9:30-10:00	KN 1	System Level Electro-Magnetic Transient Simulation – Theory, Development and Practical Experience <i>Prof. Yi Zhang</i> , RTDS Technologies Inc., Canada	2
10:00-10:30	KN 2	Modern Power System Inertia Analysis and Frequency Support Strategies under Climate Change <i>Prof. Zhao Xu</i> , The Hong Kong Polytechnic University, China	3
10:30-11:00	Group Photo & Coffee Break		
11:00-11:30	KN 3	Nature Inspired Optimization in Power System Research: Towards Sustainability and Climate Actions <i>Prof. Hazlie Mokhlis</i> , University of Malaysia, Malaysia	4
11:30-12:00	KN 4	Resilience Assessment and Enhancement of Urban Energy Systems Under Extreme Natural Disasters <i>Prof. Rufeng Zhang</i> , Northeast Electric Power University, China	6
12:00-13:30	Lunch-2F, Xiangjing Restaurant/二楼，祥景厅		
Keynote Speech Session			
Session Chair: Youbo Liu, Sichuan University, China			
13:30-15:00, Oct. 23, Friday			
Offline Venue: Xiangrui Hall, 3F, Xiangyu Hotel 成都祥宇宾馆, 三楼, 祥瑞厅			
13:30-14:00	KN 5	Regulation of Oxygen Electronic Structure and Phase-Transition Kinetics in P2-Type Layered Cathodes for Sodium-Ion Batteries <i>Prof. SHADIKE Zulipiya</i> , Shanghai Jiao Tong University, China	5
14:00-14:30	KN 6	Smart Technologies and Data Analytics for Integrating Data	2

		Centres with Power Grids <i>Prof. Vladimir Terzija</i> , Newcastle University, UK	
14:30-15:00	Award Ceremony		
15:00-15:30	Poster Session & Coffee Break		
Technical Session I: Power System Optimization, Planning, and Control Session Chair: <i>Lei Chen</i> , Wuhan University, China 15:30-18:00, Oct. 23, Friday Offline Venue: Xiangrui Hall, 3F, Xiangyu Hotel 成都祥宇宾馆, 三楼, 祥瑞厅			
15:30-15:45	F013 Offline	Optimal Dispatch of Power Systems Based on ARS Reinforcement Learning <i>Futao Zhu</i> , Hubei Minzu University, China	23
15:45-16:00	F017 Offline	Investigation on Adaptive Control Method for Grid-Forming Inverters Based on Reactive Power Support Performance Evaluation <i>Jingqiu Yan</i> , Wuhan University, China	23
16:00-16:15	F092 Offline	Source-Grid-Storage Coordinated Planning for Active Distribution Networks Considering Source-Load Uncertainty <i>Jizhe Dong</i> , Changchun University of Technology, China	24
16:15-16:30	F010 Offline	Optimal Low-Carbon Economic Dispatch and Risk Management Strategies for Virtual Power Plants with Day-Ahead and Intra-Day Stochastic Programming <i>Yuehua Li</i> , State Grid Jibei Electric Power Co., Ltd. Zhangjiakou Power Supply Company, China	24
16:30-16:45	F111 Offline	A Multi-Dimensional Resource-Tag-Driven Method for Flexible Resource Aggregation Potential Assessment in New-Type Distribution Networks <i>Renping Xiao</i> , Jiangmen Power Supply Bureau of Guangdong Power Grid Co., Ltd., China	24
16:45-17:00	F121 Offline	A Fast Reserve Capacity Assessment Method for Virtual Power Plants Based on State Reachability <i>Yu Xie</i> , Southwest Jiaotong University, China	25
17:00-17:15	F011 Offline	Logistics-Constrained Energy Arbitrage of Electric Logistics Vehicles: A Multi-Agent Reinforcement Learning Approach <i>Liping Zhao</i> , State Grid Jibei Electric Power Co., Ltd.	25

		Zhangjiakou Power Supply Company, China	
17:15-17:30	F032 Offline	Physics-Informed XGBoost for Battery SOH Estimation and Anomaly Detection <i>May Thet Htar Aung</i> , Southwest Jiaotong University, China	26
17:30-17:45	F073 Offline	Genetic Algorithm-Based EVCS Placement and Distribution Network Reconfiguration for Loss Minimization <i>Hasmaini Mohamad</i> , Universiti Teknologi MARA, Malaysia	26
17:45-18:00	F122 Offline	Storage-Assisted Ramp Control for AI Data Centers: Controlled Evaluation of Forecast Value and Recovery Limits <i>Ziyang Wang</i> , Sichuan University, China	27
18:30-20:00	Dinner Banquet		
Technical Session II: Data-Driven Analytics, Markets, and Active Distribution Networks Session Chair: <i>Bochao Zhao</i>, Tianjin University, China 15:30-18:15, Oct. 23, Friday Offline Venue: Xianghe Hall, 3F, Xiangyu Hotel 成都祥宇宾馆, 三楼, 祥和厅 Online Room ID: 909-365-276 Password: 1023			
15:30-15:45	F034 Offline	Data-Driven Short-Term Photovoltaic Power Forecasting Using VMD-CNN-LSTM <i>KairanWan</i> , Chengdu University, China	27
15:45-16:00	F041 Offline	Agentic Workflow based Aid Software for Electricity Market Transaction <i>Jinshuang Hu</i> , Shanghai Eneplus Intelligent Technology Co., Ltd, China	28
16:00-16:15	F126 Offline	Analysis of Peak Electrical Load Responses Integrating Real-Time and Cumulative Meteorological Factors and Hazard Warnings <i>Haonan Pei</i> , China University of Mining and Technology-Beijing, China	28
16:15-16:30	F119 Offline	Electricity Price Analysis for Countries with Very High Percentage Renewable Energy Generations <i>Xingrong Chen</i> , The University of Hong Kong, China	29
16:30-16:45	F127 Offline	Volumetric Anode Heating by Field-Emitted Electron Bombardment Before Vacuum Breakdown	29

		<i>Jiangang Ding</i> , Electric Power Research Institute of CSG, China	
16:45-17:00	F027* Online	Multi-Agent Deep Deterministic Policy Gradient Based Coordinated Voltage Control Method with Diverse Resources <i>Na Luo</i> , Guizhou University, China	29
17:00-17:15	F031* Online	A Generative Distribution Prediction Model for Downstream Wind-Speed Ratio under Multi-Upstream Wake Conditions <i>Liyang Ma</i> , The University of Manchester, UK	30
17:15-17:30	F030* Online	Transmission-Distribution Coordinated Optimization Considering Operation Flexibility Region of Distribution Network <i>Hongshen He</i> , Guizhou University, China	31
17:30-17:45	F055* Online	Automated BPA Modeling Method for Distribution Networks Based on a Four-Layer UnidirectionalData Flow <i>Qi Liu</i> , Electric Power Research Institute of Hainan Power Grid Co., Ltd., China	31
17:45-18:00	F084* Online	Controlled Comparison of Regional Battery Sizing in Electricity-Heat Integrated Energy Systems with Fixed Thermal Storage <i>Xiangjie Xu</i> , Shandong University of Science and Technology, China	31
18:00-18:15	F106* Online	Residual Deep Convolutional Embedded Clustering with Adaptive Weighting for Daily Load Curves <i>Changhui Yu</i> , Shenzhen Institutes of Advanced Technology Chinese Academy of Sciences Shenzhen, China	32
18:30-20:00	Dinner Banquet		
Poster Session I Session Chair: Yi Zhang, Fuzhou University, China 15:00-15:30, Oct. 23, Friday Offline Venue: Xiangrui Hall, 3F, Xiangyu Hotel 成都祥宇宾馆, 三楼, 祥瑞厅 Online Room ID: 909-365-276 Password: 1023			
F001*	An Intelligent Substation SCD Virtual Terminal Circuit Verification Method Based on Power Roberts and BiGRU-CRF <i>Jin Li</i> , CYG SUNRI Co., Ltd., China		
F002*	Remote Multi-Dimensional Early Warning Model for Substation Automation Equipment Based on Optimized ST-GCN and Cross-Modal Transformer		

	Hongbin Zhang , Shenzhen Power Supply Bureau Co., Ltd., China
F003*	Experimental Study on Screening and Adaptability of Fire-extinguishing Agents for Lithium-ion Battery Energy Storage Systems Weixin Zhang , Wuhan Institute of Technology, China
F009*	Multimodal Spatiotemporal Deep Fusion Model for Condition Risk Assessment of Distribution Equipment Gui Zhou , Zhongshan Power Supply Bureau of Guangdong Power Grid Co., Ltd., China
F014*	Research on Leakage Diagnosis of DC Power Supply Systems in VSC-HVDC Converter Stations Hangye Cai , Foshan University, China
F023*	A Deep Learning Based Analysis Method for Abnormal SCD Data in Intelligent Substation Yuewei Xu , The University of Sydney, Australia
F024*	User Feature Portrait Method Based on Power Quality Monitoring Data Junjun Mao , State Grid Fujian Electric Power Co., Ltd. Nanping Power Supply Company, China
F025*	Severity-Weighted Adaptive Partitioning and DVR Allocation for Voltage Sag Mitigation in Active Distribution Networks Jing Cong , Yunfu Power Supply Bureau, Guangdong Power Grid Co., Ltd., China
F026*	Adversarial Domain Adaptation with Confidence Thresholding for Voltage Sag Source Location Jing Cong , Yunfu Power Supply Bureau, Guangdong Power Grid Co., Ltd., China
F033*	Inter-Provincial Power Mutual Assistance Optimization Method Considering Transmission Section Total Transfer Capability Constraints Zixu Wang , Sichuan University, China
F035*	Data-Driven Blockchain Authorization for Secure Power Data Access in Smart Grids Yijie He , State Grid Qingyang Electric Power Supply Company, China
F039*	Unmanned Wind Farm Turbine Fault Diagnosis Method Based on Multi-source Heterogeneous Data Fusion and Improved Transformer Model Yang Yang , Liupanshui New Energy Div., Datang Guizhou Power Gen. Co., Ltd., China
F043*	Modeling and Parameter Region Evaluation of Hybrid Grid-Connected Systems with Multiple Converters Wenzhi Zhao , University of Jinan, China

F044*	State Perception Method for Digital Distribution Station Equipment Based on TransGraph Net Fusion Model <i>Jiayong Zhong</i> , State Grid Chongqing Electric Power Research Institute, China
F045*	A State Evaluation Model for Secondary Equipment in Intelligent Distribution Stations Based on Transformer Time Series Modeling and LSTM-AE Data Fusion <i>Jiayong Zhong</i> , State Grid Chongqing Electric Power Research Institute, China
F049*	A Transmission Line Condition Monitoring Method Based on Intelligent Perception and Edge Computing <i>Jiayong Zhong</i> , State Grid Chongqing Electric Power Research Institute, China
F050*	A Gated Residual LSTM-KAN Network for Short-Term Photovoltaic Power Forecasting <i>KeJia Zhang</i> , University of Jinan, China
F051*	A Multi-Time-Scale Coordinated Scheduling Framework for a Microgrid with Fast Optimization over an AC-Feasible Manifold <i>Xiaotian Li</i> , University of Jinan, China
F052*	Coordinated Battery–Hydrogen Scheduling for an Islanded Wind–PV Microgrid <i>Wenxian Zhao</i> , University of Jinan, China
F053*	Nonlinear Stability Assessment and Parameter Feasible-Region Analysis of Weak-Grid-Connected Direct-Drive PMSG Systems <i>Fantao Xue</i> , University of Jinan, China
F056*	Multi-Scale Gated Residual MambaPlus for Power Quality Disturbance Recognition in Smart Grids <i>Xiaoyu Zhang</i> , University of Jinan, China
F060*	THz-TDS-Based Condition Characterization of Thermally Aged Polyisobutylene Insulating Oil for High-Voltage Cable Terminations <i>Yang Zhang</i> , Chongqing University of Science and Technology, China
F061*	Reactive Power Optimization in Distribution Networks Using an Enhanced Quantum-behaved Particle Swarm Algorithm <i>Fengjiao Zheng</i> , University of Jinan, China
E062*	Research on the Information Management System of Metrology Technical Archives Based on File Lifecycle Theory <i>Na Wang</i> , Shandong Institute of Metrology, China
F065*	Comprehensive Evaluation Model and Empirical Research on the Benefits of Power Grid Construction Investment Projects under the Background of the New Power System

	Hao Cui , Economic and Technology Research Institute State Grid Chongqing Electric Power Company, China
F066*	Probabilistic Assessment of Power-Flow Limit Violations Considering Wind and Photovoltaic Power Uncertainties Shangwei Yu , Donghua University, China
F067*	V2G Control Strategies for Electric Vehicles to Ensure Emergency Power Supply in Power Distribution Areas Lu Xuliang , State Grid Shanghai Electric Power Company, China
F069*	A Rapid Calculation Method for N-1 and N-2 Topological Risk Analysis in Power Grids Jiehong Xu , State Grid Anhui Electric Power Company Training Center, China
F079*	Soft SOC Dead-Band Coordination for Multi-BESS Scheduling in PV-Integrated Microgrids Zhihao Shi , Shihezi University, China
F080*	BLA-PBFT: An Efficient Blockchain Consensus Protocol for Trusted Data Sharing in Smart Grids Xuening Liu , Shihezi University, China
F082*	Control Configuration and Coordination Strategies for a Split-Site Cascaded UHVDC Project Zijian Gao , State Grid Economic and Technological Research Institute Co., Ltd., China
F083*	Protection and Fault Handling Strategies for a Split-Site Cascaded UHVDC Project Zijian Gao , State Grid Economic and Technological Research Institute Co., Ltd., China
F086*	Equivalent Voltage Sag Tolerance Assessment of Distribution Users Considering the Support of Their Own Grid-Following Photovoltaic Units Jing Cong , Yunfu Power Supply Bureau, Guangdong Power Grid Co., China
F087*	Carbon Asset Portfolio Optimization of the Power Grid Based on the DGM Grey Forecasting Model Chunrui Zou , North China Electric Power University, China
F088*	Sublinear Quantum Spectral Screening for Critical Eigenvalues of Nodal Conductance Matrices in Large-Scale Power System Quantum EMTP-type Simulation Qunneng Gao , Sichuan Energy Internet Research Institute Tsinghua University, China
F090*	Dynamic Characteristics of Advanced Adiabatic Compressed Air Energy Storage for Primary Frequency Regulation

	Ji Zheng , North China Electric Power University, China
F094*	Dynamic Time-Series Power-Flow Simulation of Automatic Voltage Control Operation in Hydro-Photovoltaic Generation Clusters Rongxin Wang , Chongqing University, China
F096*	Deep Neural Network Based Intelligent Framework and Technology Adaptation for Power Marketing Pupu Guo , Beijing SGITG Accenture Information Technology Co., Ltd, China
F097*	Line Loss Analysis for Low-Voltage Distribution Areas Considering Reactive Power Xiang Chen , State Grid Xiamen Power Supply Company, China
F101*	A Physics-Informed Neural Network Method for Voltage Sag Source Location in Distribution Networks with Grid-Forming Inverters Jing Cong , Yunfu Power Supply Bureau, Guangdong Power Grid Co., China
F102*	A Source-Grid-Load-Storage Coordinated Planning Model for Distribution Networks Chao Zhu , Economic and Technical Research Institute State Grid Zhejiang Electric Power Co., Ltd., China
F105*	The Design and Implementation of a VR Teleoperation System for a Humanoid Robot in a PDLOR System Feifan Tian , Zhejiang TsingDa Intelligent Robot Co., Ltd., China
F107*	An Economic Evaluation Method for Green Power Direct-Connection Systems of Computing Centers Considering Market Trading and Self-Consumption Shuwei Li , State Grid Energy Research Institute, China
F108*	Standardizing Construction Preparation for Nuclear Steam Piping Modifications Using Retrieval Augmented Generation Aoyun Si , Suzhou Nuclear Power Research Institute Co., Ltd., China
F112*	A fire point detection method oriented towards the fire scene of substations Xiang Dong , Anhui University, China
F117*	Renewable Curtailment and High Prices in a Qinghai 2030 Spot Market Scenario Jun Yin , Economic and Technological Research Institute, State Grid Qinghai Electric Power Company, China
Poster Session II Session Chair: Yiyao Zhou, Xihua University, China 15:00-15:30, Oct. 23, Friday Offline Venue: Xiangrui Hall, 3F, Xiangyu Hotel 成都祥宇宾馆, 三楼, 祥瑞厅	
F005	A Transfer Learning Framework for Low-Frequency Oscillation Mechanism

	Identification in Hybrid GFL/GFM Wind Farms Peili Liu , Sichuan University, China
F006	Analysis of Near-Fundamental Frequency Oscillation Interactions in PMSG Wind Farms Transmitted via HVDC Zhao Li , Sichuan University, China
F007	Segmented Prediction of Electricity Sales Based on Heterogeneous Ensemble Chong Zhao , State Grid Sichuan Electric Power Supply Company Nanchong Branch, China
F008	Physics-Informed Neural Network-Based Dynamic Modeling Method for PMSG-Based Wind Farms Yujin Quan , Sichuan University, China
F012	Economic Consistency Modeling and Evaluation for National Unified Electricity Market Zhiqiang Wu , Southeast University, China
F016	Analysis on Complementary Characteristics of Different Types of Distributed Power Sources Based on Resource Endowment in Leshan Sichuan Province Liyang Liu , State Grid Sichuan Economic Research Institute, China
F018	Mechanism-driven Spatiotemporal Failure Evaluation Framework for Concurrent N-k Faults in Power Systems under Extreme Disasters Ruihong Lu , Sichuan University, China
F019	Research on the Planning Scheme for the Complete Power Disconnection and Full Conversion for the 110 kV Substation in Tianfu New Area Liyang Liu , State Grid Sichuan Economic Research Institute, China
F020	Forecast-Guided Day-Ahead Wind Power Scenario Generation Using an Optimized Conditional Generative Adversarial Network Fulin Sun , Sichuan University, China
F028	Study on Transient Recovery Voltage Characteristics of 1100 kV Circuit Breakers Under the Background of Excessive Short-Circuit Currents in UHV Grids Ning Du , China Electric Power Research Institute, China
F038	Effect of Electro-Thermal Coupling on the Insulation Properties of XLPE for 500 kV AC Cables Yubo Deng , Beijing Smart Energy Research, China
F040	Research on Coupling-Modified Alternating Iterative Power Flow Algorithm Based on Power Electronic Conversion Devices Liang Ma , State Grid Economic and Technological Research Institute Co., Ltd, China

F042	Mobile Emergency Resource Configuration and Optimal Dispatching for Community Distribution Systems under Severe Convective Weather Ruijia Lu , State Grid Gansu Electric Power Company Electric Power Research Institute, China
F046	Strategy for Enhancing Flexibility via Multi-Level Distributed Resource Dynamic Aggregation in Power Distribution Networks Shiwen Su , Tianjin University, China
F047	Influence of Grid-Forming VSC Placement on Voltage Coupling and Disturbance Propagation in Hybrid AC/DC Power Grids Lei Chen , Wuhan University, China
F048	Multi-source Coordinated Restoration Strategy of Distribution Networks Under Short-duration Intense Rainfall Zining Yin , State Grid Fujian Electric Power Co., Ltd. Fuzhou Power Supply Company, China
F058	Cooperative Game-Based Coordinated Optimal Scheduling of Multi-Park Power Systems Using Multi-Agent Reinforcement Learning and Nash Bargaining Yangming Wu , Fuzhou University, China
F068	A Short-term Aggregated Residential Load Forecasting Method Considering Spatial-temporal Correlation Mo Feng , China Electric Power Research Institute, China
F070	A Review of the Development Status and Key Technologies of Clean and Efficient Coal-Fired Power Under the “Dual Carbon” Goals Yiheng Jiang , Science and Technology Information Institute China Datang Corporation Science and Technology General Research Institute Co., Ltd., China
F074	A Virtual Simulation Platform for Superconducting Power Applications Shuai Zeng , Huazhong University of Science and Technology, China
F075	Transient Stability of SLVM Controlled Grid-Forming Converters with Adaptive Virtual Impedance-Based Current Limitation Huanghe Zhu , Huazhong University of Science and Technology, China
F076	A Method for Generating Short-Term Output Scenarios of Wind and Solar Power Based on an Improved Denoising Diffusion Probability Model Wenke Liu , Tsinghua University, China
F077	Identification of Salt-Fog Aging States in Low-Voltage Cables Based on Time-Frequency Features and Dual-Stage Attention Shengjin Mai , Tianjin University, China

F078	Low-Carbon Operation Study of Heat Dissipation Schemes for Reactor Rooms Based on CFD Simulation Yunli Wang , China Energy Engineering Group Guangdong Electric Power Design Institute Co., Ltd., China
F081	Research on the Full Life Cycle Reliability Tracking and Evaluation Technology of Chinese Domestic Chip-Based Relay Protection Devices Yifan Zhang , China Electric Power Research Institute Co., Ltd., China
F089	Analysis of Energy Transmission for Energy Islands Based on Large-scale Far-offshore Wind Power Zhongqi Liu , Global Energy Interconnection Group Co., Ltd., China
F091	System Dynamics Projection of Integrated Energy Service Station Development Under Multiple Interacting Factors Junling Wu , Sichuan University, China
F093	Risk-Aware Multi-Agent Demand Response Coordination with Runtime Feasibility Validation for Residential Virtual Power Plants Jinrui Guo , Naval University of Engineering, China
F099	A Probabilistic Wind Power Forecasting Method Integrating Quantile-Based Order Preservation with Empirical Ramping Constraints Yong Hu , Tsinghua University, China
F100	Feeder-Constrained Multi-Area EV Charging via Compact Scalar-Action Reinforcement Learning Hang Yin , Sichuan University, China
F104	State Awareness of Power System Based on Adaptive-Q Hyperbolic Tangent Extended Kalman Filter Shilin Gao , Sichuan University, China
F109	An IGCT-Based Hybrid Solid-State Transfer Switch with Data-Driven Fault Diagnosis for Resilient Distribution Systems Bin Zhao , State Grid Beijing Electric Power Company, China
F110	Research on Complex Power Quality Disturbance Identification Based on Deep Learning Bin Zhao , State Grid Beijing Electric Power Company, China
F123	Dynamic Microgrid Formation with GFM/GFL Mode Switching of DERs Chaofan Lin , Xi'an Jiaotong University, China
F124	Queue-Feasible Load–Carbon Scheduling for Distributed Computing: A Synthetic Benchmark

	<i>Qingwei Xiao</i> , South China University of Technology, China
F125	Coordinating Interregional Electricity Transfer and Computing Migration: A Synthetic Shaoguan–Guangzhou Benchmark <i>Yang Liu</i> , South China University of Technology, China
F128	Analysis of Common Problems in High-Voltage Circuit Breaker Control Circuits and Improvement Measures <i>Mouhan He</i> , State Grid Sichuan Extra High Voltage Company, China

ABSTRACT

Technical Session I	
Time	Content
F013 15:30-15:45	F013: Optimal Dispatch of Power Systems Based on ARS Reinforcement Learning Presenter: <i>Futao Zhu</i>, Hubei Minzu University, China Authors: <i>Futao Zhu, Chenming Liu, Yun Wu</i> Abstract: Power systems with high proportion of renewable energy sources (RESs) are now frequently dispatched by using re-inforcement learning (RL) methods. However, most RL methods are built on backpropagation mechanism and require gradient computation. Thus, they often fall into local optima when policy update in training. This research focuses on the integrated dispatch problem of energy and generator units, and investigates a derivative-free RL method called Augmented Random Search (ARS). To address the problem of transmission line congestion and violations of unit ramping constraint, induced by fluctuations of RESs, an optimal model of power system redispatch with time-coupled relations is developed. Then the dispatch actions of generator units and charging/discharging actions of energy storage systems (ESSs) are optimized by ARS RL method. The proposed method is validated by using IEEE 118-bus system the 118 ESSs. By comparison with state of art RL methods, the ARS method is significantly better in optimal dispatch, and is excellent for the optimal dispatch of renewable energy high penetration power systems.
F017 15:45-16:00	F017: Investigation on Adaptive Control Method for Grid-Forming Inverters Based on Reactive Power Support Performance Evaluation Presenter: <i>Jingqiu Yan</i>, Wuhan University, China Authors: <i>Jingqiu Yan, Lei Chen, Hongkun Chen, Weidong Ma, Bowen Li, Weihao Lin</i> Abstract: With the high penetration of renewable energy sources, the dynamic reactive power support capability of grid-forming (GFM) inverters under voltage fault conditions is crucial for power system stability. However, systematic and quantitative assessment methods for this capability remain insufficiently explored. To address this gap, this paper proposes an adaptive control method for GFM inverters driven by a comprehensive evaluation of reactive power support performance. First, a five-dimensional evaluation framework is established to systematically quantify dynamic support performance, encompassing response speed, support strength, control precision, dynamic quality, and stable performance. Building on this, a modified virtual synchronous generator (VSG) dual-mode control strategy is formulated to provide dynamic reactive power targets while strictly adhering to current saturation limits to ensure equipment safety. Furthermore, a comprehensive evaluation model is constructed to compute a composite score and assign performance grades. This grading mechanism is integrated into a closed-loop system that dynamically adjusts the VSG's droop coefficient and response time

	constant based on the assessment results. Finally, case studies are conducted on a GFM inverter system under various voltage dip conditions. Results demonstrate that the proposed method effectively quantifies dynamic support performance, adaptively adjusts GFM inverter parameters, and significantly enhances system stability.
F092 16:00-16:15	F092: Source-Grid-Storage Coordinated Planning for Active Distribution Networks Considering Source-Load Uncertainty Presenter: <i>Jizhe Dong</i>, Changchun University of Technology, China Authors: <i>Xin Li, Rui Ma</i> Abstract: This paper proposes a source-grid-storage coordinated planning method for active distribution networks with source-load uncertainty. Monte Carlo sampling and K-means clustering generate representative PV-load scenarios. Feeder reinforcement and PV/ESS siting and sizing are jointly optimized using a branch-flow model reformulated as a mixed-integer second-order cone program (MISOCP). On a modified IEEE 33-bus system, the proposed method reduces the annualized cost index and annual energy loss by 11.6% and 19.5%, respectively, and lowers PV curtailment from 10.8% to 4.7%, while improving network operating performance.
F010 16:15-16:30	F010: Optimal Low-Carbon Economic Dispatch and Risk Management Strategies for Virtual Power Plants with Day-Ahead and Intra-Day Stochastic Programming Presenter: <i>Yuehua Li</i>, State Grid Jibei Electric Power Co., Ltd. Zhangjiakou Power Supply Company, China Authors: <i>Pengwei Yang, Yuehua Li, Xiaoyuan Wu, Yongchen Cai, Shipo Zhao, Mengdi Li</i> Abstract: A virtual power plant (VPP) consolidates various power resources into a single integrated unit. It participates in the electricity market (EM) and optimizes internal dispatch through coordinated unit operations. However, fluctuations in distributed energy output introduce significant risks and uncertainties, causing discrepancies between the VPP's planned and actual output, leading to potential financial losses and reliability issues. Effective risk management is essential to ensure stable operations. This study puts forward a two-stage stochastic programming model to handle uncertainties and optimize both day-ahead and intra-day operations. The conditional value-at-risk (CVaR) approach is utilized to represent the risk preferences of the VPP operators and assess their influence on operational strategies. Additionally, the paper introduces a low-carbon operation objective, emphasizing the importance of managing internal carbon emissions and participating in carbon trading to achieve sustainable and economically viable outcomes. The relationship between risk preferences and carbon emissions is also explored.
F111 16:30-16:45	F111: A Multi-Dimensional Resource-Tag-Driven Method for Flexible Resource Aggregation Potential Assessment in New-Type Distribution Networks Presenter: <i>Renping Xiao</i>, Jiangmen Power Supply Bureau of Guangdong Power Grid Co., Ltd., China Authors: <i>Weijie Huang, Renping Xiao, Xiaoming Jiang, Wenhao Zhang, Haolin Chen, and Ronghui Zhao</i>

	Abstract: The increasing penetration of distributed photovoltaics (PV), battery energy storage systems (BESS), electric vehicles (EVs), and flexible loads (FLs) makes distribution-level flexibility highly heterogeneous in physical mechanism, temporal availability, regulation capability, uncertainty, and electrical location. This paper proposes a multi-dimensional resource-tag-driven method for assessing the aggregation potential of heterogeneous flexible resources. An R–T–F–U–N tag system is constructed to characterize resource attributes, temporal features, flexibility, uncertainty, and network location. A type-aware two-stage clustering strategy preserves physical-model compatibility while providing fine-grained grouping within each resource type. A reduced-order aggregate flexibility envelope is then constructed from cluster-level temporal prototypes and benchmarked against a detailed resource-level physical model. Paired Monte Carlo realizations are used to evaluate out-of-sample accuracy and flexibility-delivery reliability. On a modified IEEE 33-bus system with 146 heterogeneous DERs, the proposed method achieves a Davies–Bouldin index of 0.9732 and within-cluster temporal-flexibility homogeneity of 91.85%. Across 100 stochastic realizations, the mean envelope NMAE is 5.80%, 3.64% lower than conventional type-based aggregation, while maintaining 98.04% coverage at a 95% commitment level. The feeder-level test preserves full command executability and achieves an 8.85% peak reduction and a 19.75% peak-to-valley reduction.
F121 16:45-17:00	F121: A Fast Reserve Capacity Assessment Method for Virtual Power Plants Based on State Reachability Presenter: <i>Yu Xie</i>, Southwest Jiaotong University, China Authors: <i>Yu Xie, Zhaoyang Li, Guangsheng Yan, Chengyu Wei, Cilog Liu, Wentao Tang</i> Abstract: To address the high computational burden of full-horizon modeling and reserve boundary search, as well as the difficulty of ensuring the subsequent feasibility of temporally coupled resources under a finite prediction horizon in virtual power plant rolling scheduling, a fast reserve capacity assessment method based on temporal decoupling and adaptive vertex search is proposed. State reachability is employed to backward-map feasibility requirements beyond the prediction horizon into time-varying state boundaries, thereby reducing temporal coupling complexity while preserving subsequent feasibility. A normalized normal-projection relative error is further introduced to reduce the sensitivity of boundary refinement to feasible-region scale, eliminate redundant optimization, and enable efficient construction of reserve capacity boundaries.
F011 17:00-17:15	F011: Logistics-Constrained Energy Arbitrage of Electric Logistics Vehicles: A Multi-Agent Reinforcement Learning Approach Presenter: <i>Liping Zhao</i>, State Grid Jibei Electric Power Co., Ltd. Zhangjiakou Power Supply Company, China Authors: <i>Pengwei Yang, Liping Zhao, Jie Li, Zejun Yang, Tao Sun, Xu Li</i> Abstract: The electric logistics vehicle (ELV) has become an important carrier to participate in the energy arbitrage of the electricity market and reduce its own operating costs by virtue of its fixed distribution route, controllable outage period and large battery capacity. However, most of the current related research focuses on household EVs, and fails to fully consider the collaborative optimization

	requirements of ELVs logistics tasks and energy arbitrage. Moreover, the ELVs scheduling optimization problem has complex characteristics such as high-dimensional uncertainty and mixed decision variables, and traditional optimization methods are difficult to solve efficiently. To address this research gap, this paper suggests an ELVs energy arbitrage optimization strategy of the multi-agent proximal policy optimization (MAPPO). Firstly, the mathematical model of ELVs integrated scheduling is established, considering the constraints of transportation time, state of charge (SOC), charging and discharging power and logistics-arbitrage coupling. Secondly, the Markov decision process (MDP) for energy arbitrage is constructed, and the state space and joint action space integrating electricity price, logistics and battery information are designed and solved by MAPPO algorithm. Finally, the proposed strategy is verified through example simulation. The results show that on the basis of ensuring the completion rate of logistics tasks, this strategy can significantly improve the energy arbitrage revenue, effectively demonstrating the dual value of electric logistics vehicles as both logistics tools and mobile energy storage carriers.
F032 17:15-17:30	F032: Physics-Informed XGBoost for Battery SOH Estimation and Anomaly Detection Presenter: <i>May Thet Htar Aung</i>, Southwest Jiaotong University, China Authors: <i>May Thet Htar Aung, Bin Gou</i> Abstract: Lithium-ion battery state-of-health (SOH) estimation is highly important for safe and reliable battery management systems. Although Extreme Gradient Boosting (XGBoost) has shown promise for SOH prediction, conventional data-driven approaches do not incorporate the underlying electrochemical degradation mechanisms. This study proposes a Physics-Informed XGBoost (PI-XGBoost) framework that integrates electrochemical knowledge through physics-guided feature engineering and physics-based regularization. The framework enforces three physical constraints: monotonic degradation, degradation rate bounds, and solid electrolyte interphase (SEI) growth kinetics. Experimental results on the Oxford Battery Degradation Dataset demonstrate that PI-XGBoost provides highly accurate SOH estimation, achieving R^2 values between 0.985 and 0.999, with estimation errors ranging from 0.05% to $\pm 2.8\%$ across the tested battery cells. The framework maintains physically consistent predictions without bias or divergence over time while retaining the computational efficiency of conventional XGBoost models. Furthermore, it supports early anomaly detection by identifying abnormal degradation patterns that deviate from the expected aging trajectories.
F073 17:30-17:45	F073: Genetic Algorithm-Based EVCS Placement and Distribution Network Reconfiguration for Loss Minimization Presenter: <i>Hasmaini Mohamad</i>, Universiti Teknologi MARA, Malaysia Authors: <i>H. Mohamad, D. Z. Mohammad Zaharuddin and F.F. Mohammad Mohlas</i> Abstract: The increasing uptake of electric vehicles (EVs) has increased the need for Electric Vehicle Charging Stations (EVCS), which may raise power losses and influence voltage conditions in distribution networks. Careful EVCS siting together with feeder reconfiguration is therefore required to limit these impacts on network operation. This paper presents a Genetic Algorithm (GA)-based framework for identifying EVCS locations and network reconfiguration within a single

	optimization process, with active power loss used as the main objective. Its performance is tested on the modified IEEE 33-bus and IEEE 69-bus networks. The performance of the GA algorithm is compared with Evolutionary Programming (EP) and Harris Hawks Optimization (HHO) under identical computational settings. Four study cases are considered: the base system, mixed EVCS placement, simultaneous EVCS placement and network reconfiguration, and an extended scenario incorporating fixed solar photovoltaic (PV) generation. For the EVCS placement with reconfiguration case, GA achieves active power losses of 0.1036 MW and 0.0988 MW for the modified IEEE 33-bus and IEEE 69-bus networks, respectively. The inclusion of fixed PV generation further reduces the losses to 0.0743 MW and 0.0701 MW, respectively. The results show that simultaneous EVCS placement and network reconfiguration improve distribution network performance, while fixed PV generation provides an additional reduction in active power losses.
F122 17:45-18:00	F122: Storage-Assisted Ramp Control for AI Data Centers: Controlled Evaluation of Forecast Value and Recovery Limits Presenter: <i>Ziyang Wang</i>, Sichuan University, China Authors: <i>Ziyang Wang, Shi Chen</i> Abstract: AI data-center workloads exhibit rapid power fluctuations that storage can buffer. Using measured computing loads from one platform with fixed lossless-storage settings, we distinguish forecast-input gains within fixed model predictive control, advantages over calibrated feedback, and gaps to the same-task offline optimum. These comparisons yield different conclusions. Energy accounting explains why some within-record throughput advantages disappear after terminal recovery, while an analytical terminal-energy bound identifies infeasible recovery tasks. A recovery-window sweep shows unchanged completed throughputs at 60 and 120 s for the original 140 prefixes, but shorter budgets exclude some comparisons through infeasibility. Forecast benefits depend on workload, objective, baseline, and recovery conditions; task equivalence and feasibility are therefore essential to their interpretation.
Technical Session II	
F034 15:30-15:45	F034: Data-Driven Short-Term Photovoltaic Power Forecasting Using VMD-CNN-LSTM Presenter: <i>Kairan Wan</i>, Chengdu University, China Authors: <i>Kairan Wang, Jingjing Lyu, Chang Liu</i> Abstract: To advance the "dual carbon" goals, high-precision PV forecasting is critical for new power system transformation. Addressing the volatility and non-stationarity of PV output, this paper proposes a VMD-CNN-LSTM hybrid model. Key meteorological factors are first screened, followed by VMD decomposition to mitigate non-stationarity. A CNN-LSTM network then fuses the extracted spatial and temporal features to enhance accuracy. Validated on 70,177 measured samples, the proposed model reduces RMSE by 36.57%–39.09% and increases R² by 0.71%–0.91% compared to baseline models. The results confirm its superior accuracy and practical engineering value for ensuring the stable operation of PV power stations.

F041 15:45-16:00	F041: Agentic Workflow based Aid Software for Electricity Market Transaction Presenter: <i>Jinshuang Hu</i>, Shanghai Eneplus Intelligent Technology Co., Ltd, China Authors: <i>Jinshuang Hu</i> Abstract: Traditional electricity transaction method based on deterministic models or manual scheduling brings imbalance loss to electricity sales company and heavy workload to electricity trader. Agent based models are used in this paper to improve electricity transaction efficiency and benefits. Four AI Agents are designed and developed, i.e., Forecasting Agent, Optimization Agent, Execution Agent and Diagnosis Agent. These AI Agents are integrated into an aid software which is based on Agentic workflow and is enabled to operate autonomously to improve productivity and reduce human oversight in electricity trader's routine tasks. The actual transaction results supported by this aid software in real world electricity spot market in China during the past six months demonstrates that the software is robust, applicable, accurate and increases practical revenue of power sales company by approximate 20 percent.
F126 16:00-16:15	F126: Analysis of Peak Electrical Load Responses Integrating Real-Time and Cumulative Meteorological Factors and Hazard Warnings Presenter: <i>Haonan Pei</i>, China University of Mining and Technology-Beijing, China Authors: <i>Haonan Pei, Zhe Deng, Ce Li, Chunming Shen</i> Abstract: To characterize peak load responses to hazardous weather, we analyze hourly load, meteorological data, and weather hazard warnings for weekdays in the study region in recent years. Real-time meteorological variables, heat and cold accumulation, and warning features are integrated using extreme gradient boosting (XGBoost), ablation comparisons, and Shapley additive explanations (SHAP) to assess the incremental contribution of warnings to load prediction, the effects of peak-hour and accumulation-parameter selection, and cross-year performance. Weather-sensitive load exhibits a piecewise temperature response, with different fitted slopes across temperature ranges. Single-variable linear fits for summer heat accumulation and winter cold accumulation yield coefficients of determination (R^2) of 0.539 and 0.308, respectively. Adding overall and hazard-specific warning features to a baseline containing real-time meteorological variables, heat and cold accumulation, and previous-day weather-sensitive load at the same hour reduces mean absolute error (MAE) by an average of 4.42%, 6.92%, 5.14%, and 5.27% in spring, summer, autumn, and winter, respectively, across 20 random 80%/20% train/test splits. Hazard-specific warnings provide the main incremental information, and effective warning duration over the preceding 24 h generally contributes more than the current warning level. Mean improvement remains positive when peak hours, thresholds, and accumulation windows are selected using training data only. Training on 2019–2023 and testing on 2024 yields seasonal MAE reductions of 2.50%–5.63%; training on 2019–2024 and testing on 2025 yields 1.24%–10.48%. All 95% improvement intervals include zero. Warnings supplement historical peak load characterization, while cross-year gains require further examination.

F119 16:15-16:30	F119: Electricity Price Analysis for Countries with Very High Percentage Renewable Energy Generations Presenter: <i>Xingrong Chen</i>, The University of Hong Kong, China Authors: <i>Yanning Zhang, Jin Zhong, Shurui Huang, Xingrong Chen</i> Abstract: Over the past two decades, global electricity markets have largely adopted marginal-pricing mechanisms, which worked well when coal- and gas-fired units served as marginal units. However, with the fast growth of renewable energy installations in the power system, the marginal pricing mechanism is facing a great challenge that zero-fuel-cost renewables becoming marginal units may drive spot market prices sharply down, calling for market rule modifications. This paper analyses energy mixes and spot prices in high renewable penetrated countries/regions covering both deregulated and regulated power systems. Correlation analysis reveals that spot price trends are highly dependent on the types of renewable technology. It finds that marginal-cost pricing has difficulty in reflecting renewable value in the future. Market and pricing reforms are required. The analysis helps make evidence-based policy making as moving towards the era of 100% renewable energy.
F127 16:30-16:45	F127: Volumetric Anode Heating by Field-Emitted Electron Bombardment Before Vacuum Breakdown Presenter: <i>Jiangang Ding</i>, Electric Power Research Institute of CSG, China Authors: <i>Jiangang Ding, Shuaibing Wang, Zaixing Peng, Lei Huang, Bowen Yang and Liping Zhang</i> Abstract: Vacuum switching is a key low-carbon enabler for power systems: a vacuum interrupter contains no SF₆, and its application range is being extended to ever-higher voltage ratings, so its reliability depends on prebreakdown processes in the vacuum gap. Field-emitted electrons in a stressed vacuum gap can reach the anode before vacuum arc formation and deposit a significant fraction of their kinetic energy inside the electrode. This power is often approximated as a surface heat flux, an assumption that becomes questionable when the gap voltage reaches tens to hundreds of kilovolts, because electron transport in copper then deposits the energy over micrometre-scale depths. This paper presents a prebreakdown anode-heating model that maps the electron impact power to a volumetric heat source using precomputed Geant4/Penelope deposition kernels, with the anode current and impact energy from a field-emission/space-charge calculation, the deposited fraction and axisymmetric kernel $K(E; r, z)$ interpolated, and transient heat conduction solved in the copper anode. For copper, the mean deposition depth increases from about 0.005 μm at 1 keV to 5.5 μm at 100 keV and 64.6 μm at 500 keV. In a representative 1 mm copper gap, the quasi-steady anode melting threshold is about 82.9 kV, below the cathode-only threshold of about 131.1 kV under identical emission and space-charge settings. These results show that anode-side volumetric heating can be the first thermal trigger under slowly rising or DC-like stress, which is relevant to the design and conditioning of low-carbon vacuum switchgear.
F027* 16:45-17:00	F027: Multi-Agent Deep Deterministic Policy Gradient Based Coordinated Voltage Control Method with Diverse Resources Presenter: <i>Na Luo</i>, Guizhou University, China

	Authors: <i>Zhongqiang Zhou, Honglue Zhang, Jingxin Luo, Dan Wang, Qidi Wu, Yixin Xia, Tangqian Zhang, Na Luo</i> Abstract: With the large-scale integration of distributed photovoltaic (PV) systems and electric vehicles (EVs), distribution networks face significant voltage violation risks due to bidirectional power flow and high randomness. Traditional centralized voltage control methods struggle with communication burdens and computational complexity. This paper proposes a coordinated voltage control method based on the Multi-Agent Deep Deterministic Policy Gradient (MADDPG) algorithm. The proposed approach incorporates PV hosting capacity (HC) assessment results as safety margin indicators into the observation space of each agent, enabling proactive voltage violation prevention. Monte Carlo simulation generates highly stochastic EV charging load data to construct realistic disturbance scenarios. The control strategy coordinates PV reactive power regulation and ESS charging/discharging, while EV flexible loads are treated as high-randomness disturbance sources rather than directly controlled actuators. Their stochastic charging behavior is modeled via Monte Carlo simulation to test control robustness. Simulation results on IEEE 33-bus and IEEE 141-bus distribution systems demonstrate that the proposed method maintains average voltages near 0.9917 p.u. and 0.9881 p.u., respectively, achieving 100% voltage compliance across all time periods. The voltage fluctuation range is reduced by 64.64% compared to uncontrolled scenarios, validating the effectiveness and robustness of the proposed approach.
F031* 17:00-17:15	F031: A Generative Distribution Prediction Model for Downstream Wind-Speed Ratio under Multi-Upstream Wake Conditions Presenter: <i>Liyang Ma</i>, The University of Manchester, UK Authors: <i>Liyang Ma, Long Zhang</i> Abstract: Wake interactions introduce substantial uncertainty into the wind-speed response of downstream wind turbines (WTs), especially under multi-upstream wake conditions. This paper proposes a generative bin-wise Gaussian mixture regression (GMR) model for downstream wind-speed ratio distribution prediction. Operational SCADA data are partitioned into wind-speed bins according to an upstream reference wind speed, and a joint distribution between upstream operating features and the downstream wind-speed ratio is learned within each bin. The conditional distribution is then analytically derived from the learned joint distribution, enabling probabilistic response characterisation rather than deterministic point prediction alone. A case study is conducted using SCADA data from the Kelmarsh wind farm, where two upstream turbines are used to predict the wind-speed ratio of one downstream turbine. The proposed bin-wise GMR achieves an RMSE of 0.0828, outperforming Bin-wise Random Forest (RMSE=0.1016) and linear regression (RMSE=0.1434) baselines. It also qualitatively reproduces the main observed distributional patterns across weak-wake, single-wake, and multi-upstream-wake regimes. These results demonstrate the feasibility of the proposed framework for local wake-aware probabilistic analysis, while further validation on additional turbine configurations is required.
F030* 17:15-17:30	F030: Transmission-Distribution Coordinated Optimization Considering Operation Flexibility Region of Distribution Network Presenter: <i>Hongshen He</i>, Guizhou University, China

	Authors: <i>Jingxin Luo, Honglue Zhang, Zhongqiang Zhou, Qidi Wu, Dan Wang, Yixin Xia, Tangqian Zhang, Hongshen He</i> Abstract: To address the heavy computational burden and rough flexibility constraints of transmission-distribution coordinated stochastic optimal power flow under massive scenarios with high renewable energy integration, this paper proposes an LSTM-accelerated AWTC-ADMM method considering the boundaries and density indicators of the distribution network's operating flexibility region. First, the flexibility region is embedded into the optimal power flow model as a core constraint, and the ARIMA model generates large-scale source-load uncertainty scenarios to depict temporal fluctuation patterns. Second, ADMM decomposes massive scenarios into immediate decisions for full scenarios and independent wait-and-see decisions. Based on this, an LSTM network provides high-quality warm-start initial value predictions for ADMM, complemented by a feasibility restoration layer to correct constraints, significantly reducing iteration time. Case studies on the T118D10 system demonstrate that the proposed method significantly improves computational efficiency under massive scenarios while ensuring accuracy and strict physical feasibility, fully mining adjustable resource potential and reducing total system costs.
F055* 17:30-17:45	F055: Automated BPA Modeling Method for Distribution Networks Based on a Four-Layer Unidirectional Data Flow Presenter: <i>Qi Liu</i>, Electric Power Research Institute of Hainan Power Grid Co., Ltd., China Authors: <i>Qi Liu</i> Abstract: To address the large volume of manual data processing, cumbersome procedures, uneven data quality, and susceptibility to error in PSD-BPA modeling of distribution networks, this paper proposes an automated modeling method based on a unidirectional data flow through four layers of intermediate Excel worksheets. The method strictly decouples human fuzzy judgment from deterministic programmatic computation and establishes a “manual offline preprocessing – four-layer structured intermediate worksheets – automated programmatic computation and export” linear pipeline. The four progressive data-processing modules comprise a pole-topology association layer, a drawing-to-asset-record segment mapping layer, a distribution-transformer-to-load matching and mapping layer, and a bus aggregation and BPA export layer. Standardized Excel files are the sole data carriers between layers, with no backward rollback interaction. A dual-track constraint system is also designed, consisting of G-series global engineering hard constraints and C-series mandatory layered-architecture constraints; key rules such as matching thresholds and error classification are hard-coded as program constants. A representative case study of the 10 kV Hongqi Line I–Wuxing Branch Farm Feeder in Hainan Power Grid verifies the engineering feasibility of the method. The results show that the simulated voltage deviation is within 0.8% and the power deviation is within 7%, satisfying engineering accuracy requirements. For matching scores of at least 90, the program automatically binds 54.5% of segments and 60.9% of distribution transformers, substantially reducing manual effort.
F084* 17:45-18:00	F084: Controlled Comparison of Regional Battery Sizing in Electricity-Heat Integrated Energy Systems with Fixed Thermal Storage

	Presenter: <i>Xiangjie Xu</i>, Shandong University of Science and Technology, China Authors: <i>Xiangjie Xu, Xin Yang</i> Abstract: Battery sizing in electricity-heat integrated energy systems depends on regional market signals as well as renewable-resource profiles. To compare these effects under the same technical conditions, this study formulates a controlled mixed-integer linear programming model for a unified electricity-heat integrated energy system. System topology, load profiles, equipment parameters, and thermal-storage capacity are fixed across the four regional cases, whereas time-of-use electricity tariffs, natural-gas prices, and wind and photovoltaic (PV) profiles vary among North China, Northeast China, Northwest China, and East China. Battery rated energy is the only sizing variable, while the thermal storage tank participates in dispatch at a fixed rating. The cost-minimizing battery ratios are 40%, 24%, 22%, and 78% for North China, Northeast China, Northwest China, and East China, respectively. These results indicate three storage-value patterns: price-driven energy shifting in East China, resource-coordinated balancing in Northwest China, and system-balancing operation in North and Northeast China. The sensitivity tests further indicate that the selected ratios respond differently to natural-gas prices and battery investment costs.
F106* 18:00-18:15	F106: Residual Deep Convolutional Embedded Clustering with Adaptive Weighting for Daily Load Curves Presenter: <i>Changhui Yu</i>, Shenzhen Institutes of Advanced Technology Chinese Academy of Sciences Shenzhen, China Authors: <i>Haijing Zhang, Yankun Feng, Qiang Li, Xinyan Su, Wei Feng, Changhui Yu</i> Abstract: Clustering daily load curves is essential for identifying electricity consumption patterns and supporting demand-side management. However, conventional methods struggle to extract informative features from high-dimensional load data, while two-stage approaches separate feature extraction from clustering, limiting overall clustering performance. This paper proposes residual deep convolutional embedded clustering (Res-DCEC) and its adaptive-weight variant (AW-Res-DCEC) for daily load curve analysis. First, Res-DCEC is developed by integrating a one-dimensional residual convolutional autoencoder with an embedded clustering layer to jointly optimize representation learning and clustering. Then, an adaptive weighting strategy is further proposed in AW-Res-DCEC to adjust the clustering-loss weight according to the reconstruction error. Finally, a case study using data from the University of California, Irvine (UCI) Machine Learning Repository shows improved clustering indices for the proposed methods compared with the conventional clustering methods.

CONFERENCE COMMITTEE

Honorary Chair

Junyong Liu, Sichuan University, China

General Chair

Youbo Liu, Sichuan University, China

Conference Committee Co-Chair

Yue Xiang, Sichuan University, China

Advisory Committee

Lalit Kumar Goel, Nanyang Technological University, Singapore

Tseng King Jet, Singapore Institute of Technology, Singapore

Program Committee

Pascal Lorenz, University of Haute Alsace, France (Chair)

Chunhua Liu, City University of Hongkong, China

Dardan Klimenta, University of Pristina in Kosovska Mitrovica, Serbia

Jiebei Zhu, Tianjin University, China

Roberto Montemanni, University of Modena and Reggio Emilia, Italy

Yang Han, University of Electronic Science and Technology of China, China

Regional Chair

Rinaldy Dalimi, University of Indonesia, Indonesia

Organizing Committee

Zhifang Yang, Chongqing University, China (Chair)

Gao Qiu, Sichuan University, China

Gaolin Wang, Harbin Institute of Technology, China

Sheng Chen, Hohai University, China, China

Publication Chair

Lei Chen, Wuhan University, China

Zhaohao Ding, North China Electric Power University, China

Publicity Chair

Bo Liu, Tianjin University, China

Local Committee

Yi Zhong, Sichuan Society for Electrical Engineering, China

Financial Chair

Jianbo Yi, University of Electronic Science and Technology of China, China

International Technical Committee

M F Ab Rashid, Universiti Malaysia Pahang, Malaysia

Noor Izzri b. Abd. Wahab, Universiti Putra Malaysia, Malaysia

Abu Zaharin Ahmad, Universiti Malaysia Pahang, Malaysia

Mohd Ashraf Bin Ahmad, Universiti Malaysia Pahang, Malaysia
Adem Akpınar, Bursa Uludag University, Turkey
Md Liakat Ali, Rider University, USA
Mahajan Sagar Bhaskar, Prince Sultan University, Saudi Arabia
Chew Kuew Wai, Universiti Tunku Abdul Rahman, Malaysia
Thitiphan Chimsook, Maejo University, Thailand
Paolo Crippa, Marche Polytechnic University, Italy
Nikolay Djagarov, Nikola Vaptsarov Naval Academy, Bulgaria
Smith Eiamsa-ard, Mahanakorn University of Technology, Thailand
Hossam A. Gabbar, University of Ontario Institute of Technology, Canada
Patrick Goh Kuan Lye, Universiti Sains Malaysia, Malaysia
Gheorghe Grigoras, Technical University of Iasi, Romania
Serdar Ethem Hamamci, Inonu University, Turkey
Song Han, Guizhou University, China
Khoa Dang, Hoang University of Huddersfield, UK
Mohamed Gamal Hussien, Tanta University, Egypt
Zhenya Ji, Nanjing Normal University, China
Vibhor Kumar, Texas A&M University, USA
Lei Li, Hosei University, Japan
Qibin Li, Chongqing University, China
Shunyi Li, Sichuan University, China
Yan Li, China Electric Power Research Institute, China
Furong Liu, Wuhan University of Technology, China
Xueqin Liu, Queen's University Belfast, UK
Hugo Morais, Universidade de Lisboa, Portugal
Loc Nguyen, University of Natural Sciences, Vietnam
Worachest Pirompugd, Burapha University, Thailand
Mihaela Popescu, University of Craiova, Romania
Uthpala Premarathne, The Open University of Sri Lanka, Sri Lanka
S. Surender Reddy, Woosong University, South Korea
Sathishkumar V E, Sunway University, Malaysia
Pierluigi Siano, University of Salerno, Italy
Patrick Siarry, University of Paris XII, France
Ekkachai Sutheerasak, Burapha University, Thailand
Teo Tee Hui, Singapore University of Technology and Design, Singapore
Thong Li Wah, Multimedia University, Malaysia
Lei Wang, Hunan University, China
Qian Wang, Wuhan University of Technology, China
Tanakorn Wongwuttanasatian, Khon Kaen University, Thailand
Ahmad Zahedi, James Cook University, Australia
Cong Zhang, The Hong Kong Polytechnic University, Hong Kong, China
Francesco Zirilli, Sapienza Universitat di Roma, Rome, Italy

CONFERENCE VENUE

Chengdu Xiangyu Hotel

祥宇宾馆

Address: No. 103 Xinnan Road, Chengdu, Sichuan, China

地址：中国四川省成都市新南路 103 号



1. 成都双流国际机场——成都祥宇宾馆

Chengdu Shuangliu International Airport — Chengdu Xiangyu Hotel



A、地铁 (Metro)

成都双流国际机场→地铁 10 号线(太平园方向)→太平园(站内换乘)→地铁 3 号线(成都医学院方向)→磨子桥(B 口出)→步行 290 米→成都祥宇宾馆(人民币 5 元)(大约 40 分钟)

Chengdu Shuangliu International Airport → Metro Line 10 (Bound for Taipingyuan) → Taipingyuan Station → Metro Line 3 (Bound for Chengdu Medical College) → Moziqiao Station (Exit B) → 步行 290 米 → Chengdu Xiangyu Hotel (5.00 RMB) (About 40 minutes)

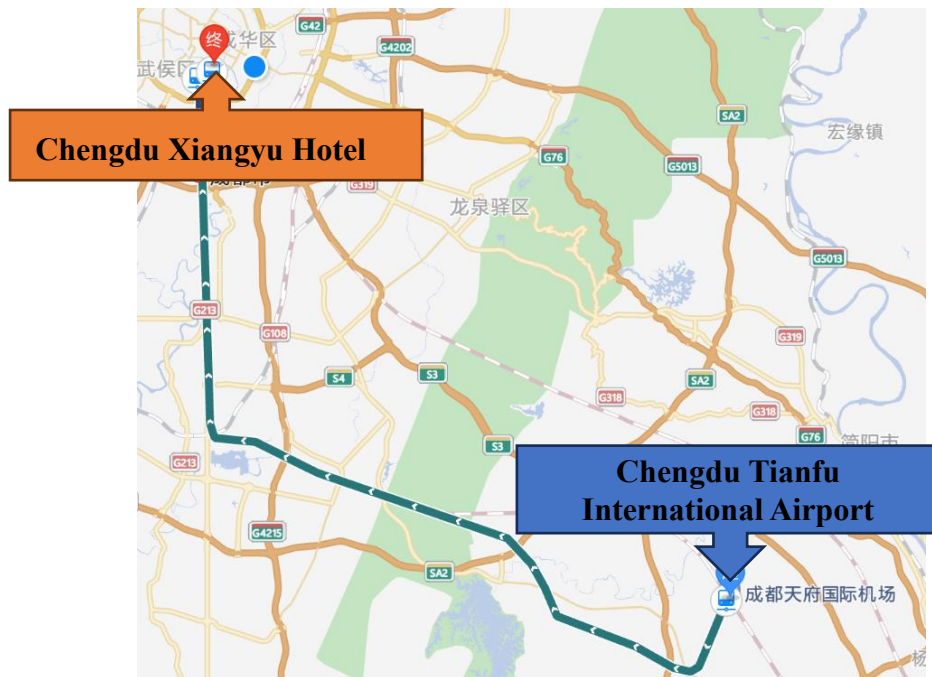
B、出租车 (Taxi)

约 43 元, 20 分钟, 16.9 公里

About 43 RMB, 20 minutes and 16.9 kilometers.

2、成都天府国际机场——成都祥宇宾馆

Chengdu Tianfu International Airport — Chengdu Xiangyu Hotel



A、地铁 (Metro)

成都天府国际机场 → 地铁 18 号线 (火车南站方向) → 火车南站 (站内换乘) → 地铁 1 号线 (韦家碾方向) → 省体育馆 (站内换乘) → 地铁 3 号线 (成都医学院方向) → 磨子桥 (B 口出) → 步行 290 米 → 成都祥宇宾馆 (人民币 10 元) (大约 1 小时 15 分钟)

Chengdu Tianfu International Airport → Metro Line 18 (Bound for South Railway Station) → South Railway Station → Metro Line 1 (Bound for Weijianian) → Sichuan Gymnasium Station → Metro Line 3 (Bound for Chengdu Medical College) → Moziqiao Station (Exit B) → 步行 290 米 → Chengdu Xiangyu Hotel (10.00 RMB) (About 1 hour and 15 minutes)

B、出租车 (Taxi)

约 166 元, 50 分钟, 60 公里

About 166 RMB, 50 minutes and 60 kilometers

ORGANIZER & SPONSOR

Co-organizer:



四川大学
SICHUAN UNIVERSITY



四川省电机工程学会
SICHUAN SOCIETY FOR ELECTRICAL ENGINEERING

Supporter:



全球能源
互联网



Global Energy
Interconnection



Media Supporter:

中国电机工程学报
Proceedings of the CSEE

CSEE Journal of
Power and Energy
Systems

电力系统自动化
AUTOMATION OF ELECTRIC POWER SYSTEMS

电力系统保护与控制
Power System Protection and Control



Journal of Modern Power Systems
and Clean Energy



Protection and Control of
Modern Power Systems
现代电力系统保护与控制

新型
电力系统
New Type Power Systems

电网技术
POWER SYSTEM TECHNOLOGY

HIGH VOLTAGE ENGINEERING
高电压技术

High Voltage

电力工程技术
ELECTRIC POWER ENGINEERING TECHNOLOGY

电力信息与通信技术
ELECTRIC POWER INFORMATION AND COMMUNICATION TECHNOLOGY



电力自动化设备
Electric Power Automation Equipment

电气工程学报

Chinese Journal of
Electrical Engineering

发电技术
Power Generation Technology

DIANJI YU KONGZHI YINGYONG
电机与控制应用
Electric Machines & Control Application

四川电力技术



electronics

南方电网技术

南方能源建设
NANFANG NENGYUAN JIANSHE

内蒙古
NEIMENGGU
DIANJI JISHU

电力技术

Smart Power &
Energy Security

中国电力 电测与仪表
ELECTRIC POWER Electrical Measurement & Instrumentation

A 工程科学与技术
ADVANCED ENGINEERING SCIENCES



综合智慧能源
Integrated Intelligent Energy



分布式能源
DISTRIBUTED ENERGY



Energy Engineering



西安交通大学学报
JOURNAL OF XI'AN JIAOTONG UNIVERSITY

EPC 电力建设
ELECTRIC POWER CONSTRUCTION



能源转换与经济 (英文)
Energy Conversion and Economics
EI 数据库收录期刊

NOTE