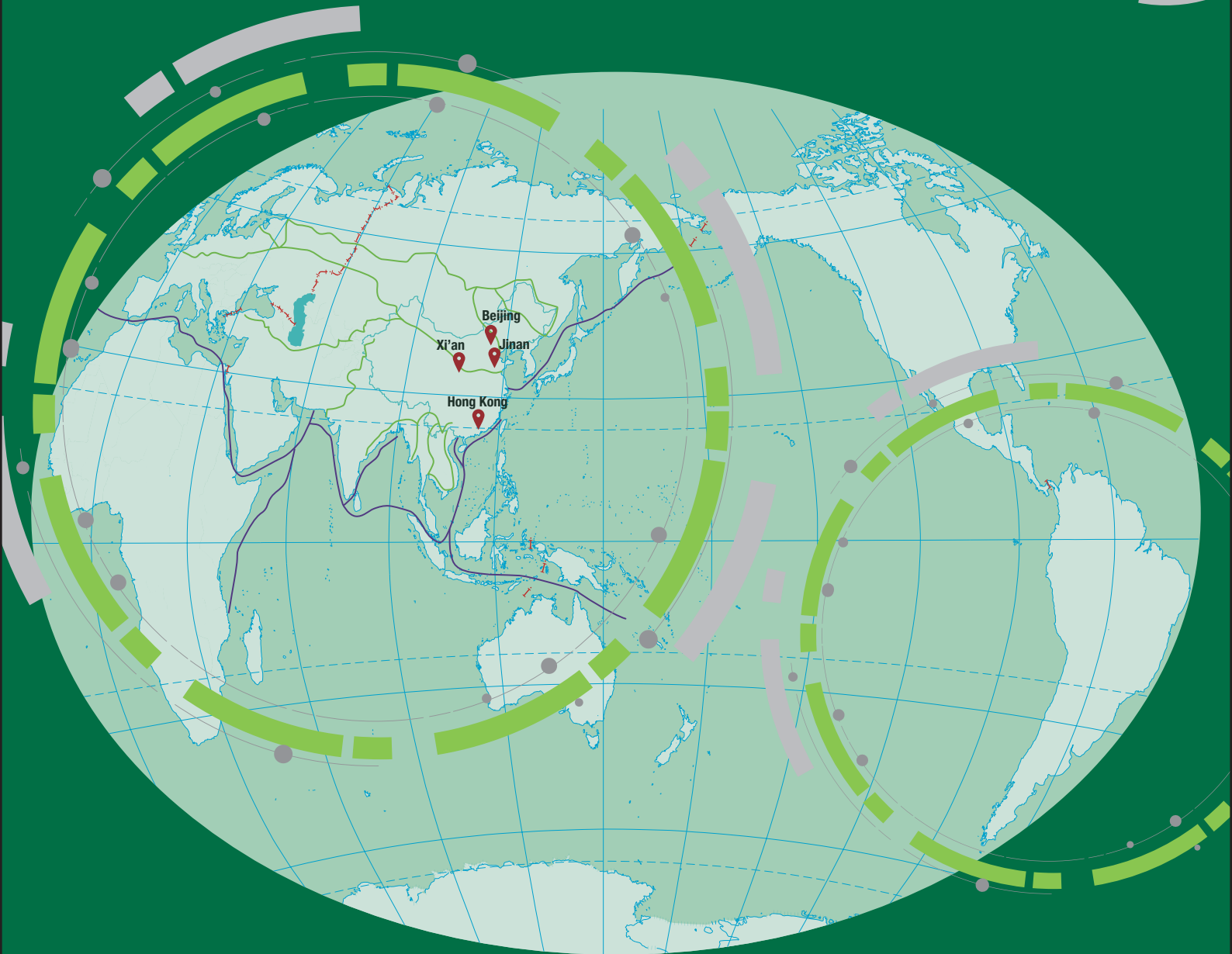
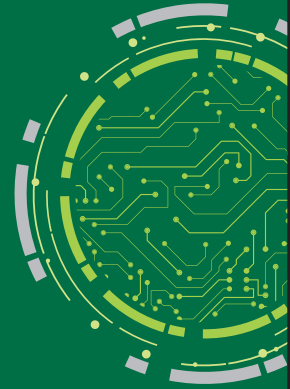


# BELT AND ROAD ADVANCED PROGRAMME IN POWER AND ENERGY 2024

## LOW-CARBON TRANSITION: LATEST DEVELOPMENT OF GREEN ENERGY (PHYSICAL MODE)



To facilitate communication and foster long-term collaboration in electric power industry among the Belt and Road countries and regions, a professional workshop is co-organised by The Hong Kong Polytechnic University (PolyU), Xi'an Jiaotong University (XJTU), State Grid of China Technology College, and The Hongkong Electric Company, Limited (HK Electric). Co-ordinated by XJTU-PolyU Silk Road International School of Engineering – a collaboration between XJTU and PolyU for talent nurturing and research collaboration in the Belt and Road countries and regions, the workshop provides a platform for connection and technology exchange among senior executives and researchers of enterprises, government units and higher education institutions. It is the first of its kind workshop in both Mainland China and Hong Kong with cross-regional, multi-cultural, systematic and innovative elements incorporated.



**24 – 29 October**

**Jinan**  
State Grid of China Technology College

**29 October – 1 November**

**Xi'an**  
Xi'an Jiaotong University

**1 – 3 November**

**Hong Kong**  
The Hongkong Electric Company Limited

**4-5 November**

**Hong Kong**  
The Hong Kong Polytechnic University



## THEME: LOW-CARBON TRANSITION: LATEST DEVELOPMENT OF GREEN ENERGY

Date	Time (UTC+8h)	Items	Items (Info)
<b>STATE GRID OF CHINA TECHNOLOGY COLLEGE (JINAN)</b>			
24/10/2024 (Thursday)	AM/PM		<b>ARRIVAL IN JINAN</b>
25/10/2024 (Friday)	AM	Activity	<b>OPENING CEREMONY</b>
		Activity	<b>VISIT – SGTC JINAN CAMPUS</b>
		Seminar	<b>BUILDING NEW POWER SYSTEMS</b> Speaker: TBC <b>Abstract:</b> This lecture introduces the essential role that a power system based on new energy is playing when promoting carbon emission reduction and neutrality, and the characteristics of power system based on new energy and zero-carbon technology for power grid will be shared from the viewpoint of State Grid Corporation of China (SGCC).
	PM	Activity	<b>VISIT</b> <b>SHANDONG ELECTRICAL ENGINEERING AND EQUIPMENT GROUP CO. (SDEE) &amp; STATE GRID INTELLIGENCE TECHNOLOGY CO. (SGIT)</b>
Activity		<b>CULTURAL EXCHANGE</b> <b>CHINESE CUISINE</b>	
26/10/2024 (Saturday)	AM-PM	Activity	<b>CULTURAL VISIT</b> <b>JINAN HISTORICAL DISTRICT</b>
27/10/2024 (Sunday)	AM	Activity & Seminar	<b>VISIT AND SEMINAR</b> <b>TRANSMISSION LINE LIVE WORK AND UAV MAINTENANCE</b> Speaker: TBC <b>Abstract:</b> Live line works are widely used in maintenance jobs of UHV AC/DC lines in SGCC with several advantages not only in saving back-up capacity but economy while the line is still in charge. This lecture shows preparation especially protection work, operation procedures and operation items, the prospect of live work is also introduced here.
		Activity	<b>SHARING SESSION</b>
	PM	Activity & Seminar	<b>VISIT AND SEMINAR</b> <b>LARGE-SCALE RENEWABLE ENERGY INTEGRATION</b> Speaker: TBC <b>Abstract:</b> This lecture introduces the integration situation and core technology of large-scale clean energy, the unified dispatching mechanism implemented in China, and rapidly respond to multi-level dispatching and coordinating the accommodation of clean energy sources in China, which enables SGCC to integrate the largest amount of renewables with the strongest power transmission capacity in the world.
		Activity	<b>CULTURAL EXCHANGE</b> <b>TAICHI &amp; CHINESE CALLIGRAPHY</b>
28/10/2024 (Monday)	AM	Activity	<b>VISIT AND SEMINAR</b> <b>DISTRIBUTION LINE LIVE WORK AND UAV MAINTENANCE</b> Speaker: TBC <b>Abstract:</b> Distribution line live work is considered as the most direct and effective technical means to improve power supply reliability and quality service level accordingly. Currently, SGCC carries out more than 1 million times of operations with power supply within the power distribution network annually, which greatly reduces the time of power outage and ensures the safe and stable operation of the power distribution network.
	PM	Activity	<b>VISIT</b> <b>COMPRESSED-AIR ENERGY STORAGE PROJECT IN TAI'AN</b>
29/10/2024 (Tuesday)	AM	Activity	<b>VISIT</b> <b>ADVANCED METERING INFRASTRUCTURE</b> Speaker: TBC <b>Abstract:</b> The AMI in SGCC is a new system and a novel technology in power metering. Its emergence and application have totally changed electricity management. In this session, we'll see how these changes happened and affected SGCC and its 1.1 billion users.
		Activity	<b>SHARING SESSION</b>
<b>XI'AN JIAOTONG UNIVERSITY (XI'AN)</b>			
29/10/2024 (Tuesday)	PM		<b>ARRIVAL</b>
		Activity	<b>DINNER</b>
30/10/2024 (Wednesday)	AM	Activity	<b>WELCOMING AND BRIEFING</b>
			<b>GROUP PHOTO</b>

## THEME: LOW-CARBON TRANSITION: LATEST DEVELOPMENT OF GREEN ENERGY

Date	Time (UTC+8h)	Items	Items (Info)
31/10/2024 (Thursday)		Lecture	<p><b>HYDROGEN FUEL CELL TECHNOLOGY AND ITS APPLICATION IN FUTURE ENERGY SYSTEMS</b></p> <p><b>Speaker:</b> Prof. SHI Le, School of Electrical Engineering, Xi'an Jiaotong University</p> <p><b>Abstract:</b> Hydrogen fuel cell technology is emerging as a cornerstone in the development of sustainable energy systems, offering a clean and efficient alternative to fossil fuels. Fuel cells convert hydrogen into electricity through an electrochemical process, emitting only water as a by-product. This technology holds significant potential for various applications, including zero-emission vehicles, stationary power generation, and industrial processes. The adoption of hydrogen fuel cells can enhance energy resilience, reduce carbon emissions, and facilitate the integration of renewable energy sources. However, challenges such as high production costs, infrastructure development, and technological advancements need to be addressed. With increasing policy support and market demand, hydrogen fuel cells are poised to become a vital component of future energy systems, contributing to a more sustainable and low-carbon economy.</p> <p><b>Bio:</b> Dr. Le Shi is a Professor in the School of Electrical Engineering at Xi'an Jiaotong University. She earned her B.S. degree from Peking University in 2013 and completed her Ph.D. at the Hong Kong University of Science and Technology in 2017. In 2018, she joined Xi'an Jiaotong University as an associate professor and was promoted to professor in 2020. Since 2023, she has served as the vice dean of the School of Electrical Engineering. Her research primarily focuses on designing and fabricating advanced materials for hydrogen fuel cells. Throughout her prolific academic career, Dr. Shi has published over 60 papers in prestigious journals such as Nature Communications, ACS Catalysis, and Chemistry of Materials, achieving an h-index of 25. She has also secured funding from the National High-Level Young Talent Program, the High-Level Young Talent Initiative in Shaanxi Province, and the Joint Fund for Young Talent Projects in Equipment Pre-Research, supported by the Ministry of Education.</p>
		Activity	<b>WELCOME LUNCH</b>
		Lecture	<p><b>ENHANCING DISTRIBUTION SYSTEM RESILIENCE: A CYBER-PHYSICAL PERSPECTIVE</b></p> <p><b>Speaker:</b> Prof. CHEN Chen, School of Electrical Engineering, Xi'an Jiaotong University</p> <p><b>Abstract:</b> With the increasing frequency and intensity of extreme natural disasters over the world, enhancing the resilience of electric power system, especially the distribution system has been emphasized in the academia and industry. The talk will introduce the concept of power system resilience, discuss the methods and techniques to improve distribution system resilience, and will also discuss how to enhance distribution system resilience from a cyber-physical perspective as well as recent related research work.</p> <p><b>Bio:</b> Dr. Chen Chen is a professor from the School of Electrical Engineering of Xi'an Jiaotong University. He obtained the Ph.D. in electrical engineering from Lehigh University, Bethlehem, PA, USA in 2013. From 2013 to 2019, he worked at Argonne National Laboratory in USA with fulltime position. His research interests include power system resilience, cyber-physical system modeling and analysis, and power system optimization. He is the principal investigator of several projects funded by NSFC and National Key R&amp;D Program of China. He has published over 70 papers in high impact journals. He is the recipient of IEEE PES Chicago Chapter Outstanding Engineer Award in 2017.</p>
	Activity	<p><b>TECHNICAL VISIT</b></p> <p><b>STATE KEY LABORATORY OF ELECTRICAL INSULATION AND POWER EQUIPMENT</b></p>	
	Activity	<b>DINNER</b>	
	AM	Lecture	<p><b>RESILIENCE-CONSTRAINED PLANNING AND OPERATION OF HYDROGEN-ELECTRICAL SMART DISTRIBUTION NETWORKS</b></p> <p><b>Speaker:</b> Prof. CAO Xiaoyu, School of Automation Science and Engineering, Xi'an Jiaotong University</p> <p><b>Abstract:</b> Recent breakthroughs of hydrogen energy technologies may revolutionarily change the physical structure and operational manner of power distribution systems. The formation of carbon-neutral energy distribution infrastructure based on Hydrogen-Electrical integration would bring new challenges as well as opportunities to the grid resiliency (i.e., the capability to prevent, resist, adapt to, and promptly recover from extreme disturbances). On the one hand, the hydrogen energy components are still with very high capital expenditures, so that many system reinforcement measures could be infeasible due to the budget restriction. On the other hand, the synergistic operation of power grids with other energy sectors and urban transport system can be leveraged to enhance system's preparedness and responsiveness to disastrous events. This talk would first mention the technical measures with cost-benefit analysis for resilience enhancement of hydrogen-electrical smart distribution networks. Then, some recent studies on resilience-oriented hydrogen-electrical planning and operation will be reported.</p> <p><b>Bio:</b> Xiaoyu Cao is a Professor with the Systems Engineering Institute (SEI), the School of Automation Science and Engineering, Xi'an Jiaotong University, Xi'an, China. He is also with the Smart Integrated Energy Department, XJTU-Sichuan Digital Economy Industry Development Research Institute, Chengdu, China, as the Director. His research interests include power systems planning, scheduling and resilience enhancement, as well as the stochastic/robust optimization with applications in cyber-physical system. He has authored and/or co-authored more than 40 international journal papers, e.g., in IEEE Trans. Power Systems, IEEE Trans. Smart Grid, IEEE Trans. Sustainable Energy, IEEE Trans. Automation Science &amp; Engineering, and Applied Energy. Five of his publications are rated as the ESI Highly Cited Papers (top 1%) by Clarivate Analytics, and one of them as the ESI Hot Paper (top 0.1%). He has been the Principal Investigator of more than 20 research projects funded by National Key R&amp;D Program of China, National Natural Science Foundation of China, and State Grid Corporation of China (SGCC), etc. Presently, he is the Chair of Technical Committee 9.3 (Control for Smart Cities) in IFAC.</p>
Activity	<p><b>TECHNICAL VISIT</b></p> <p><b>THE LABORATORY OF CYBER-PHYSICAL ENERGY SYSTEMS</b></p>		
Activity	<b>LUNCH</b>		

## THEME: LOW-CARBON TRANSITION: LATEST DEVELOPMENT OF GREEN ENERGY

Date	Time (UTC+8h)	Items	Items (Info)
31/10/2024 (Thursday)	PM	Activity	<b>CULTURAL VISIT – TERRA COTTA WARRIORS</b>
		Activity	<b>DINNER</b>
01/11/2024 (Friday)	AM	Activity	<b>FAREWELL</b> Departure from Xi'an Xianyang International Airport
<b>THE HONGKONG ELECTRIC COMPANY, LIMITED (HONG KONG)</b>			
01/11/2024 (Friday)	PM	Transportation	<b>PICKUP FROM SHENZHEN AIRPORT TO HK</b>
02/11/2024 (Saturday)	AM	Activity	<b>OPENING AND GROUP PHOTO</b>
		Lecture	<b>HOLISTIC STRATEGY FOR CONDITION ASSESSMENT OF MV POWER DISTRIBUTION CABLE</b> Speakers: Mr. Ho Kwok Wah, Chief Engineering Co-ordination Engineer Dr. Zhu Ke, Engineering Co-ordination Engineer <b>Abstract:</b> MV power distribution cables, as a key component of the distribution network, are essential for ensuring high supply reliability at HK Electric. This lecture will introduce the innovative tools used by HK Electric for condition assessment of MV power cables, including the health index and three-hyper index, imbalance insulation resistance evaluation, and an artificial intelligence diagnosis model. In addition to sharing HK Electric's practical experience, this lecture will also propose forward-looking suggestions on MV power cable condition diagnosis to further improve the asset management of the power distribution network.
	Lecture	<b>CONDITION MONITORING OF HV SWITCHGEARS</b> Speaker: Mr. Chan Sheung, Chief Construction & Maintenance Engineer <b>Abstract:</b> Condition monitoring of high voltage equipment involves assessing the health and performance of high voltage switchgears to ensure their reliability and safety. This lecture will briefly introduce different condition monitoring tools adopted for HV switchgears by HK Electric and share some successful cases in identifying genuine partial discharge inside HV switchgear, thereby preventing switchgear failure.	
	PM	Activity	<b>LUNCH</b> <b>TECHNICAL VISIT</b> <b>SYSTEM CONTROL CENTRE AND VR TRAINING CENTRE OF HK ELECTRIC</b> <b>TECHNICAL VISIT</b> <b>MARSH ROAD ZONE SUBSTATION</b>
03/11/2024 (Sunday)	AM	Lecture	<b>DESIGN AND PLANNING FOR THE SUPPLY ARRANGEMENT FOR SKYSCRAPERS</b> Speaker: Mr. Lee Kwok Kin, Chief Distribution Planning Engineer <b>Abstract:</b> This lecture will explore how HK Electric designs and plans the supply arrangement for skyscrapers in a metropolitan city, addressing the unique challenges posed by their vertical structure. Key considerations include the efficient distribution of power and ensuring high levels of safety and reliability.
		Lecture	<b>CONTINGENCY PLAN FOR SUPPLY RESTORATION IN HIGH RISE BUILDINGS</b> Speaker: Mr. Lee Ka Kit, Senior Shift Operations Engineer Mr. Mak Fong Chuen, Shift Operations Engineer <b>Abstract:</b> The supply reliability of HK Electric is among the highest in the world, consistently surpassing the pledged Customer Service Standard of greater than 99.999% since 1997. However, it is inevitable that equipment failures may occur due to third-party damage, interference or water leakage, despite HK Electric's efforts in maintenance, proactive testing and inspection. This lecture will briefly introduce the contingency plans for restoring supply to high-rise buildings during forced outages.
	PM	Activity	<b>LUNCH</b> <b>TECHNICAL VISIT – MOBILE BATTERY ENERGY STORAGE SYSTEM</b> <b>TECHNICAL VISIT – LAMMA POWER STATION OF HK ELECTRIC</b> <b>CULTURAL VISIT – VICTORIA HARBOUR</b>

## THEME: LOW-CARBON TRANSITION: LATEST DEVELOPMENT OF GREEN ENERGY

Date	Time (UTC+8h)	Items	Items (Info)
<b>THE HONG KONG POLYTECHNIC UNIVERSITY (HONG KONG)</b>			
04/11/2024 (Monday)	AM	Lecture	<p><b>RISK ASSESSMENT OF MODERN POWER GRID WITH GREEN ENERGY</b></p> <p><b>Speaker:</b> Dr. BU Siqi, Associate Professor and Associate Head, Department of Electrical and Electronic Engineering, The Hong Kong Polytechnic University</p> <p><b>Abstract:</b> Green energy is playing a vital role in facilitating the decarbonisation of modern power grid. However, the unique nature of green energy has also posed critical threats to the grid operational security as evidenced by many recent incidents. This talk will firstly introduce the growing instability risks in the operation of modern power grid featured by the large-scale integration of green energy. Then some conventional techniques to tackle these emerging challenges will be reviewed and compared. On this basis, the talk will move on to a series of effective risk assessment tools recently developed by the team covering multiple types of grid instability issues, in order to enable the secure and economic operation of high green energy penetrated power grid.</p>
		Lecture	<p><b>GREEN ENERGY DEVELOPMENT AND ELECTRIC POWER GRID RESILIENCE UNDER CLIMATE CHANGE</b></p> <p><b>Speaker:</b> Prof. XU Zhao, Professor, Department of Electrical and Electronic Engineering, The Hong Kong Polytechnic University</p> <p><b>Abstract:</b> To mitigate climate change, electric power systems must integrate more and more weather-dependent green energy in an effort towards the low-carbon transition. However, this shift poses challenges to reliable system operation, especially during extreme weather events. This presentation provides an overview of green energy development, analyses the conflicts between green energy growth and power system resilience, and explores advancements in conceptualizing power system resilience amid long-term climate change.</p>
		Activity	<p><b>TECHNICAL VISIT</b></p> <p><b>MicroGrid Lab</b></p> <p><b>Demo on solar energy performance management system</b></p>
	PM	Activity	<b>LUNCH</b>
		Activity	<p><b>TECHNICAL VISIT</b></p> <p><b>Centre for Advances in Reliability and Safety@Hong Kong Science Park</b></p> <p><b>(<a href="http://www.cairs.hk">www.cairs.hk</a>)</b></p>
05/11/2024 (Tuesday)	AM	Activity	<p><b>KEYNOTE LECTURE (Venue: AG710)</b></p> <p><b>NEW JOURNEY OF GREEN ENERGY REVOLUTION</b></p> <p><b>Speaker:</b> Prof. CHAN Ching-chuen, GBS</p> <p>Distinguished Chair Professor of Electric Vehicles and Smart Energy, The Hong Kong Polytechnic University</p>
			<b>GROUP DISCUSSION AND SHARING SESSION</b>
	PM	Activity	<p><b>LUNCH</b></p> <p><b>GROUP PHOTO</b></p> <p><b>GRADUATION CEREMONY (Venue: Chiang Chen Studio Theatre)</b></p>

## MEDIUM OF INSTRUCTION

English

## SPEAKERS

Veteran academics and professionals of the co-organisers

## TARGET PARTICIPANTS

- Senior executives, government officials, specialists, professors, researchers and scholars in the electricity industry/ research disciplines from the Belt and Road countries and regions.
- Participants are expected to have sufficient English proficiency for communication in the workshop.

## CONTENTS

The workshop comprises lectures, seminars, exchange activities and field studies in Mainland China and Hong Kong. Please see tentative schedule for details.

## FEES AND EXPENSES

No workshop participation fee will be charged except that participants should be responsible for the following –

- **Transportation**
  - While the co-organisers will arrange inter-city transportation and ground transportation for the participants within Mainland China and Hong Kong, participants are responsible for international flights at their own cost (i.e. from home country to Jinan and from Hong Kong to home country).
- **Local Accommodation**
  - Participants are responsible for their accommodation expenses in Jinan, Xi'an and Hong Kong during the whole period of the workshop. Estimated total cost would be around USD1,300.
  - Participants will be arranged to be resided at the same hotel in the above-mentioned cities for easy coordination. The co-organisers will help make reservation at the hotel for the participants who will settle the payment with the hotel directly.
- **Insurance**
  - Participants must arrange insurance at their own cost with sufficient coverage for the entire workshop period both in Mainland China and Hong Kong. He/she needs to present the insurance contract to the organiser.
- **Visa Application**
  - Participants have to obtain a visa before entry into Mainland China and Hong Kong respectively, with the exception of visa-free entry based on relevant agreements or regulations.

*About Visa to Mainland China*

<http://cs.mfa.gov.cn/wgrlh/lhqz/lhqzjjs/>

*About Visa to Hong Kong*

[http://www.immd.gov.hk/eng/services/visas/visit\\_transit.html](http://www.immd.gov.hk/eng/services/visas/visit_transit.html)
- Participants are required to apply for the visa at their own cost. The co-organisers will provide necessary assistance such as the issuing of supporting documents.



## ATTENDANCE REQUIREMENTS

- Participants are required to attend **ALL** sessions of the entire workshop. A certificate of attendance will be awarded upon completion of the workshop.
- To promote interaction and to enhance mutual learning, participants are encouraged to present and share the situation and development relating to electric power industry of their home country in the workshop.



## ENROLMENT BY INVITATION

Enrolment will be considered via nomination by the invited organisation/ institution only. Deadline is **29<sup>th</sup> September 2024**.

## CO-ORGANISERS / ENQUIRIES

### The Hong Kong Polytechnic University

<https://www.polyu.edu.hk>

[deconf@polyu.edu.hk](mailto:deconf@polyu.edu.hk)



### Xi'an Jiaotong University

<http://en.xjtu.edu.cn>

[gats@xjtu.edu.cn](mailto:gats@xjtu.edu.cn)



### State Grid of China Technology College

<http://www.sgcc.com.cn>

[intl@sgtc.sgcc.com.cn](mailto:intl@sgtc.sgcc.com.cn)



### The Hongkong Electric Company, Limited

<https://www.hkelectric.com/en>

[whchoong@hkelectric.com](mailto:whchoong@hkelectric.com)



## GENERAL NOTES

- The co-organisers reserve the rights to cancel the workshop and to make any necessary changes to the schedules, contents and mode of delivery of the workshop offered.
- The co-organisers reserve the rights to make an enrolment offer taking into consideration the composition of the workshop participants.
- All the sessions will be recorded by the organisers. By joining the workshop, participants agree that the video, audio and photos recorded and retained will be used for related academic and promotion purposes.

## PERSONAL DATA

Personal data is collected and used for processing registration and administration purpose. Participants' personal data may be shared amongst the co-organisers and authorized third parties providing services in relation to the programme. In all such circumstances, data will be treated in strict confidence.

Privacy Policy of PolyU:  
<https://www.polyu.edu.hk/privacy-policy-statement/>



Privacy Policy of HKE:  
<https://www.hkelectric.com/en/privacy-policy>



*Remark: Information presented in this leaflet is subject to change and does not form part of any contract between the University /Organisers and any person.*

<https://www.polyu.edu.hk/feng/srise>

