2025 B&R PE
"一帶一路" 电力及能源高级研讨项目
B&R Advanced Program in Power and Energy

THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學

西安交通大學 XI'AN JIAOTONG UNIVERSITY

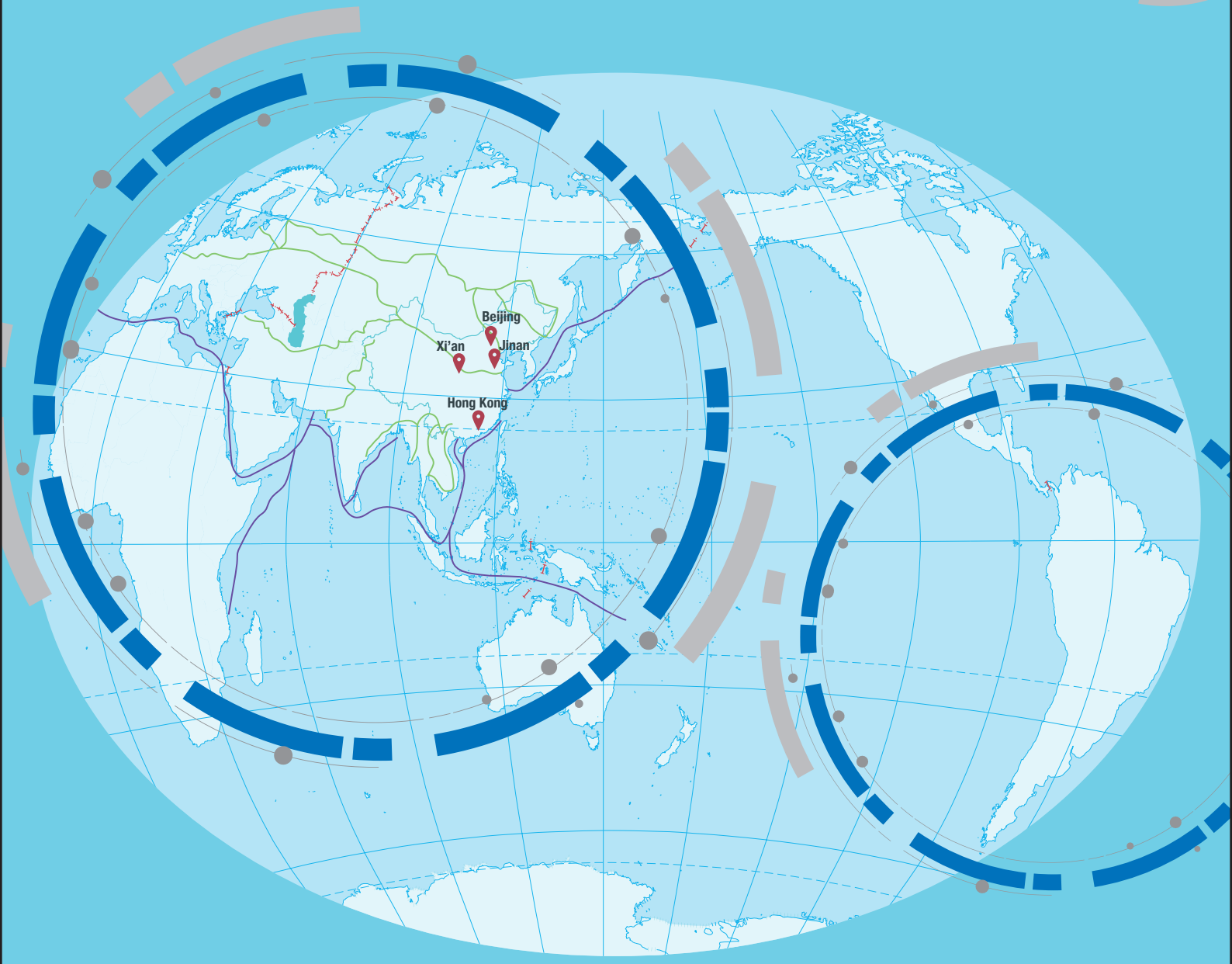
国家电网有限公司 STATE GRID CORPORATION OF CHINA

港燈 HK Electric 135+ 推動永續未來 POWERING FOR SUSTAINABILITY

BELT AND ROAD ADVANCED PROGRAMME IN POWER AND ENERGY 2025

PROMOTING COLLABORATIONS ON GREEN ENERGY BUILDING NEW TYPE OF POWER SYSTEM

推動綠色能源合作 • 構建新型電力系統



5 June - 17 June 2025

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 (SGTC), and The Hongkong Electric Company, Limited (HK Electric). 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.

5-10 June

Jinan
State Grid of China Technology College

10-13 June

Xi'an
Xi'an Jiaotong University

13-15 June

Hong Kong
The Hongkong Electric Company Limited

16-17 June

Hong Kong
The Hong Kong Polytechnic University

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Date	Time (UTC+8h)	Items	Items (Info)
STATE GRID OF CHINA TECHNOLOGY COLLEGE (JINAN)			
05/06/2025 (Thursday)	AM/PM		**ARRIVAL IN JINAN**
06/06/2025 (Friday)	AM	Activity	**OPENING CEREMONY**
		Activity	**VISIT – SGTC JINAN CAMPUS**
		Lecture	**BUILDING NEW TYPE OF POWER SYSTEM** *Speaker:* Prof. ZHOU Guiping, Ph.D., Professor, trainer of State Grid Technology College *Abstract:* This lecture introduces the background and framework of an initiative toward building a new power system based on new energy, and 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 SGCC.
	PM	Activity	**VISIT** **SHANDONG ELECTRICAL ENGINEERING AND EQUIPMENT GROUP CO.(SDEE)**
		Activity	**VISIT** **STATE GRID INTELLIGENCE TECHNOLOGY CO.(SGIT)**
07/06/2025 (Saturday)	AM	Lecture	**NEW COMMUNICATION TECHNOLOGY IN NEW TYPE OF POWER SYSTEM** *Speaker:* Ms. GUAN Ti, Associate Rapporteur of ITU-T SG20/Q3, Director of Electric Power Communications, State Grid Shandong Electric Power Company *Abstract:* Emerging communication technologies are profoundly reshaping the operational paradigms and efficiency of next-generation power systems. Innovative communication technologies, exemplified by FGOTN, SPN, and deterministic networks, have significantly enhanced the real-time responsiveness and reliable control capabilities of power systems. The integration of these technologies is accelerating the evolution of power systems towards intelligent coordination across "generation-grid-load-storage" domains. This lecture will introduce several aspects including the background of emerging communication technologies facilitating the high-quality development of power grids, the development demands of power grids, and typical solutions.
		Activity	**PRACTICES & EXPERIENCES SHARING SESSION**
	PM	Visit	**ADVANCED TECHNOLOGIES IN TRANSMISSION LINES O&M** *Speaker:* Mr. LIANG Xinyu, Senior instructor, State Grid Technology College *Abstract:* The course is developed based on recent advancements in power transmission O&M technologies, structured around two key areas: live line work on transmission lines and UAV inspection. The course consists of two components: theoretical sessions (indoors through lectures and discussions) and outdoor demonstrations of new transmission operation technologies. The live line work module covers the significance of this technology, operational workflows, and cutting-edge innovations in live line operations. The UAV inspection technology section focuses on its role in power grid maintenance, recent technical breakthroughs, and novel applications. The outdoor demonstration segment includes UAV inspections, as well as integrated applications combining live line work with UAV technologies.
		Activity	**CULTURAL EXCHANGE** **TAICHI & CHINESE CALLIGRAPHY**
08/06/2025 (Sunday)	AM/PM	Activity	**CULTURAL EXCHANGE** **JINAN HISTORICAL AND CULTURAL DISTRICT**
09/06/2025 (Monday)	AM	Lecture	**CASE STUDY ON CHINA'S GREEN POWER TRANSITION** *Speaker:* Dr. PI Junbo, Senior Engineer, National Dispatching and Control Center of China *Abstract:* This course focuses on China's green power transformation, taking the Qinghai Green Power 7-day 168-hour all-clean energy supply as a typical case. Firstly, it analyzes the background of global and China's green power transformation. Secondly, it elaborates on the implementation process, technical support, and mechanism innovation of the Qinghai project in detail. Finally, it summarizes the project experience, explores its implications for China's green power transformation, and organizes interactive discussions to look forward to future development.
		Lecture	**EV SERVICE** *Speaker:* TBC, Engineer, State Grid Technology College *Abstract:* This course focuses on electric vehicle charging services and Vehicle-to-Grid (V2G) technology. It analyzes the strategic significance of China's development of electric vehicles in terms of energy security, environmental protection, and industrial upgrading, and sorts out the remarkable achievements of the industry and the current situation of infrastructure construction in China. It provides an in-depth interpretation of the progress and application value of V2G technology, as well as the future development trends of charging technology, such as CHAOJI charging and V2G applications.
	PM	Activity	**VISIT** **VEHICLE-GRID INTERACTIVE CHARGING STATION DEMONSTRATION PROJECT IN JINAN**

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	PM	Activity	**CULTURAL EXCHANGE** **CHINESE CUISINE**
10/06/2025 (Tuesday)	AM	Lecture	**THE APPLICATION OF ARTIFICIAL INTELLIGENCE IN POWER GRID** *Speaker:* TBC, China Electric Power Research Institute Co *Abstract:* This course focuses on the deep integration of artificial intelligence and the power grid field. This course will deeply explore the applications of AI technologies, such as machine learning and deep learning, in power system. Meanwhile, through case studies of China's green power transition, especially the role of the Guangming Power Large Model, it will analyze how artificial intelligence helps transform the traditional power system towards a green and intelligent direction, promoting the efficient utilization and integration of clean energy and addressing the challenges in the energy transition process.
			WRAP-UP SESSION
			HIGH SPEED TRAIN FROM JINAN TO XI'AN
XI'AN JIAOTONG UNIVERSITY (XI'AN)			
10/06/2025 (Tuesday)	PM		**ARRIVAL IN XI'AN**
		Activity	**DINNER**
11/06/2025 (Wednesday)	AM	Activity	**WELCOMING AND BRIEFING**
			GROUP PHOTO
		Lecture	**HYDROGEN FUEL CELL TECHNOLOGY AND ITS APPLICATION IN FUTURE ENERGY SYSTEMS** *Speaker:* Prof. SHI Le, School of Electrical Engineering, Xi'an Jiaotong University *Abstract:* 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. *Bio:* 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.
		Activity	**WELCOME LUNCH**
	PM	Lecture	**ENHANCING DISTRIBUTION SYSTEM RESILIENCE: A CYBER-PHYSICAL PERSPECTIVE** *Speaker:* Prof. CHEN Chen, School of Electrical Engineering, Xi'an Jiaotong University *Abstract:* 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. *Bio:* 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&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.
		Lecture	**RESILIENCE-CONSTRAINED PLANNING AND OPERATION OF HYDROGEN-ELECTRICAL SMART DISTRIBUTION NETWORKS** *Speaker:* Prof. CAO Xiaoyu, School of Automation Science and Engineering, Xi'an Jiaotong University *Abstract:* 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

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			transport system can be leveraged to enhance system's preparedness and responsiveness to disastrous events. This talk would first mention the technical measures with costbenefit 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. *Bio:* 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 & 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&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.
		Activity	**DINNER**
12/06/2025 (Thursday)	AM	Activity	**TECHNICAL VISIT** **STATE KEY LABORATORY OF ELECTRICAL INSULATION AND POWER EQUIPMENT**
		Activity	**TECHNICAL VISIT** **THE LABORATORY OF CYBER-PHYSICAL ENERGY SYSTEMS**
		Activity	**LUNCH**
	PM	Activity	**CULTURAL VISIT – TERRA COTTA WARRIORS**
		Activity	**DINNER**
13/06/2025 (Friday)	AM	Activity	**FAREWELL** Departure from Xi'an Xianyang International Airport to Shenzhen
THE HONGKONG ELECTRIC COMPANY, LIMITED (HONG KONG)			
13/06/2025 (Friday)	PM	Transportation	**PICKUP FROM SHENZHEN AIRPORT TO HK**
14/06/2025 (Saturday)	AM	Activity	**OPENING AND GROUP PHOTO**
		Lecture	**THE EVOLUTION OF T&D APPARATUS FOR BUILDING AN ADVANCED POWER SYSTEM IN HONG KONG** *Speakers:* HO Kwok Wah, Chief Engineering Co-ordination Engineer PAU Yik Pan Frankie, Construction & Maintenance Engineer LEUNG Kai Kong, Construction & Maintenance Engineer *Abstract:* Explore the development of T&D apparatus and the network over the past decades.
		Lecture	**FIRST SUPPLY-TERRITORY-WIDE INTERNET OF THINGS PLATFORM FOR PUBLIC UTILITY IN HONG KONG** *Speakers:* CHUNG Wai Kong Jason, Chief Technical Services Engineer (Computer Hardware) CHEUNG Wing Lai Benny, Computer Hardware Engineer *Abstract:* Explore how HK Electric utilises IoT platform to enhance operational efficiency.
	PM	Activity	**LUNCH**
			TECHNICAL VISIT **SYSTEM CONTROL CENTRE AND VR TRAINING CENTRE OF HK ELECTRIC**
			TECHNICAL VISIT **MARSH ROAD ZONE SUBSTATION**
15/06/2025 (Sunday)	AM	Lecture	**THE EVOLUTION AND ENHANCEMENT OF HK ELECTRIC'S DISTRIBUTION GRID TO SUSTAIN WORLD-CLASS RELIABILITY** *Speakers:* FUNG Cheuk Wai Paul, Senior Distribution Planning Engineer CHAN Chi Leung, Senior Protection Engineer *Abstract:* HK Electric has continuously enhanced its distribution network planning to maintain world-class reliability and support future energy demands. The planning process now leverages advanced technologies, data analytics, and GIS-based tools to optimize network design and asset management.

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		Lecture	**FLEXIBLE LVDC FOR HIGH-RISE SUBSTATIONS** *Speakers:* LEE Ka Kit, Acting Chief Operations Engineer (Shift Operations) HO Man Ching Lucas, Shift Operations Engineer CHONG Chun Yuen Alan, Shift Operations Engineer *Abstract:* The use of LVDC technology enhances the supply reliability for upper-floor substations without the need of installing additional new cables from G/F to the upper-floor substations, which is sometimes impracticable due to various site constraints and may impose occupational risks due to above-ground work. This arrangement can also be extended to selected G/F substations supplying important/sensitive customers, where traditionally additional cables have to be installed, incurring extra costs in excavation and causing inconvenience to the public during the road work period.
	PM	Activity	**LUNCH**
			TECHNICAL VISIT – MOBILE BATTERY ENERGY STORAGE SYSTEM
			TECHNICAL VISIT – LAMMA POWER STATION OF HK ELECTRIC
			CULTURAL VISIT – VICTORIA HARBOUR
THE HONG KONG POLYTECHNIC UNIVERSITY (HONG KONG)			
16/06/2025 (Monday)	AM	Lecture	**SECURING THE FUTURE GRID: A HISTORICAL AND TECHNICAL PERSPECTIVE ON FAULT RIDE-THROUGH CONTROL FOR RENEWABLE** *Speaker:* Prof. XU Zhao, Department of Electrical and Electronic Engineering, The Hong Kong Polytechnic University *Abstract:* Renewable energy source (RES) generation exhibits low disturbance tolerance, and its disconnection from the grid due to faults can have increasingly severe adverse effects on power systems as penetration levels rise. Since power systems are inherently susceptible to various types of faults, RES generation must be equipped with fault ride-through (FRT) capability. This report explains why FRT is essential for RES generation, traces the historical evolution of FRT control strategies, and illustrates low voltage ride-through in wind turbines as an example.
		Activity	**GROUP DISCUSSION AND SHARING SESSION**
	PM	Activity	**LUNCH**
		Lecture	**SECURE AND INTELLIGENT OPERATION OF MODERN LOW-CARBON ACTIVE DISTRIBUTION NETWORKS** *Speaker:* Prof. BU Siqi, Department of Electrical and Electronic Engineering, The Hong Kong Polytechnic University *Abstract:* In response to the Carbon Neutrality target, traditional power distribution networks have gradually become so-called active distribution networks (ADNs) featured by large-scale integration of distributed renewables and electric vehicles (EVs). These massive distributed energy resources (DERs) have dramatically transformed the way in operation and control of distribution networks. This talk will firstly introduce the developing trend and growing challenges for modern ADNs during the low-carbon transition. To deal with these emerging issues and operational security risks resulted from the decarbonization, the talk will then move on to some latest developed intelligent regulation techniques and energy management & market tools to effectively accommodate and utilize the increasing DERs and enable the secure and economic operation of low-carbon ADNs. Additionally, the talk will also touch on some recently developed intelligent tools for the fault/anomaly diagnosis of underground cables and overhead lines to tackle the equipment aging problems of ADNs.
		Activity	**TECHNICAL VISIT** **MICROGRID LAB** **DEMO ON SOLAR ENERGY PERFORMANCE MANAGEMENT SYSTEM** **LABORATORIES**
17/06/2025 (Tuesday)	AM	Activity	**INDUSTRY VISIT**
	PM	Activity	**LUNCH** **PRESENTATION AND SHARING SESSION** **BREAK** **GRADUATION CEREMONY**

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.

COMPANY ENDORSEMENT

Participants are required to obtain your company's endorsement or approval following your successful registration of the programme.

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 co-ordination. 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
  - 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 **25 April 2025**.

CO-ORGANISERS / ENQUIRIES

The Hong Kong Polytechnic University

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The Hongkong Electric Company, Limited

https://www.hkelectric.com/en

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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.

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.

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

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