THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學

西安交通大學 XI'AN JIAOTONG UNIVERSITY

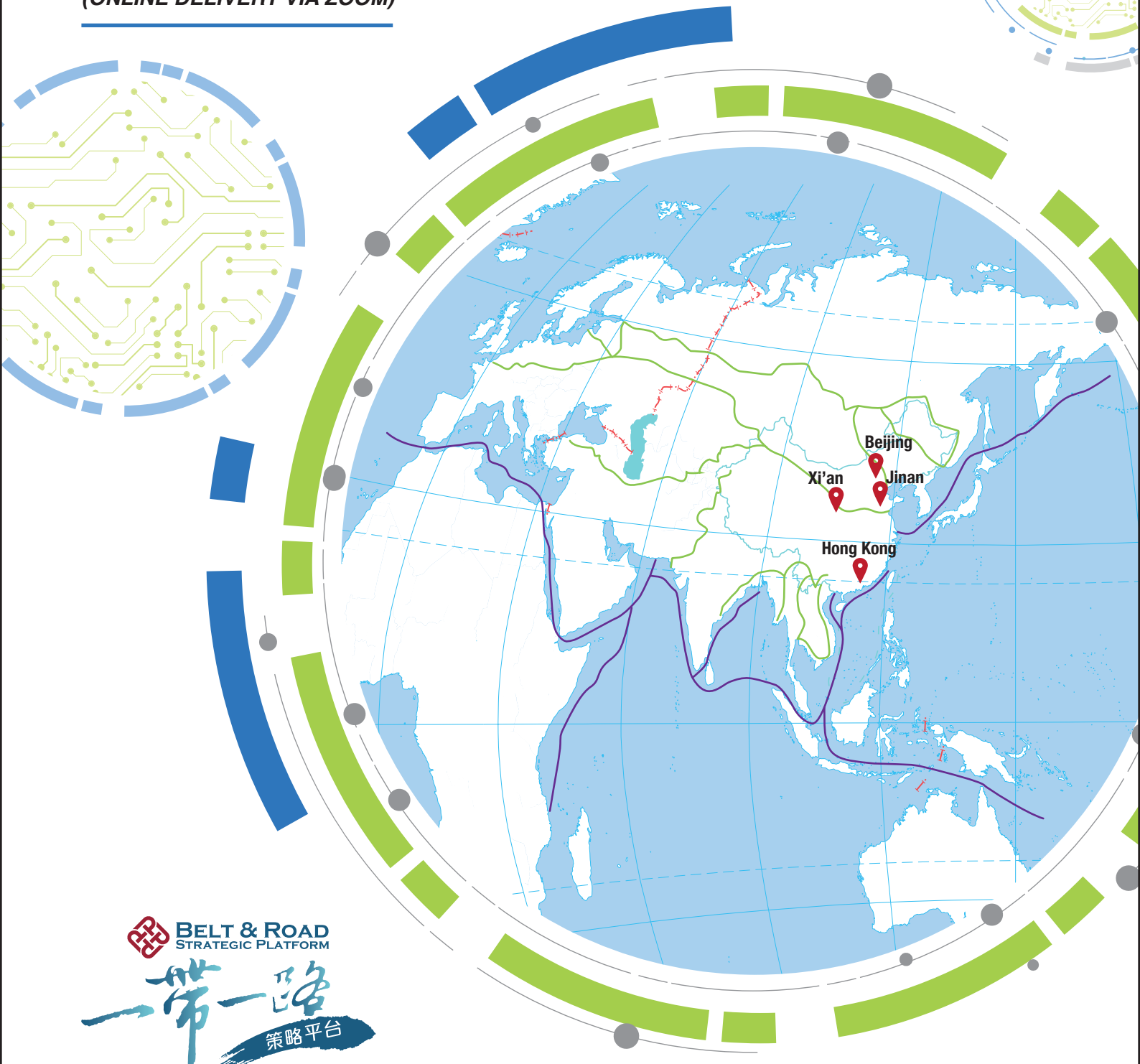
国家电网有限公司 STATE GRID CORPORATION OF CHINA

港燈 HK Electric

BELT AND ROAD ADVANCED PROFESSIONAL DEVELOPMENT PROGRAMME IN POWER AND ENERGY 2021

THEME: DECARBONISING THE SMART GRID FOR SUSTAINABLE LIVING

(ONLINE DELIVERY VIA ZOOM)



BELT & ROAD STRATEGIC PLATFORM

一帶一路 策略平台

19 October – 5 November 2021

To facilitate communication and foster long-term collaboration in electric power industry among the Belt and Road countries and regions, an online professional workshop is co-organised by The Hong Kong Polytechnic University (PolyU), Xi'an Jiaotong University (XJTU), State Grid Corporation of China, and The Hongkong Electric Company, Limited (HK Electric). Coordinated 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 online 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.

MAIN THEME: DECARBONISING THE SMART GRID FOR SUSTAINABLE LIVING

(All talks and interactive sharing session will be delivered via Zoom.)

Opening Ceremony

Unit 1: Power System based on New Energy

STATE GRID CORPORATION OF CHINA

19/10/2021 (Tue)	
20:00 - 21:15 (UTC+8h)	**OPENING CEREMONY** **CONSTRUCTION OF POWER SYSTEM BASED ON NEW ENERGY** This webinar 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 will be shared from the viewpoint of State Grid Corporation of China.
21:30 - 22:30 (UTC+8h)	**UHVAC/DC HYBRID POWER GRID** This webinar introduces the principle, application, apparatus, and advantages of UHV DC/AC transmission technology in the context of building up a power system based on new energy sources.
22/10/2021 (Fri)	
20:00 - 21:00 (UTC+8h)	**INTEGRATION OF LARGE-SCALE CLEAN ENERGY** This webinar introduces the unified dispatching mechanism which is implemented by the State Grid Corporation of China to rapidly respond to multi-level dispatching and in coordinating for the accommodation of clean energy sources in China.
21:00 - 22:00 (UTC+8h)	**SGCC EV CHARING & SWAPPING SYSTEM** This webinar introduces the biggest EV service network in the world which has facilitated smoother intercity travel for EVs in China as well as the application of the intelligent-vehicle online platform.

Unit 2: Information – Technology-Empowered Smart Grid

XI'AN JIAOTONG UNIVERSITY

26/10/2021 (Tue)	
20:00 - 21:00 (UTC+8h)	**CYBER-PHYSICAL ENERGY SYSTEMS AND ENERGY REVOLUTION** This webinar will focus on the structure of Cyber-Physical Energy Systems (CPES), and the problem of security constrained planning and the scheduling of CPES including new renewable energy sources with high uncertainties. The analytical conditions will be discussed for fast identification of the security bottlenecks in a complex power grid when new renewable energy sources coordinate with storable energy sources such as hydro and pumped storage. The new method is introduced solving the well-known N-k contingency security assessment with 2-3 orders of reduced computational complexity. Production, storage and transportation, and utilisation of hydrogen as a main secondary energy source will be introduced. It is shown that the hydrogen-based CPES will provide an ideal infrastructure for energy supply and consumption with almost no pollution carbon emission, which leads to the energy revolution expected in the new century.
21:00 - 22:00 (UTC+8h)	**KEY TECHNOLOGIES AND PROSPECTS OF INTEGRATED ENERGY SYSTEM UNDER ENERGY TRANSFORMATION** This webinar introduces the background of energy transformation in China and the concept of integrated energy system. Furthermore, the speaker will introduce why and how integrated energy system can promote the energy transformation, as well as related key technologies.

Unit 3: Research and Development of Artificial Intelligence and Smart Grid

THE HK POLYTECHNIC UNIVERSITY

29/10/2021 (Fri)	
20:00 - 21:00 (UTC+8h)	**ARTIFICIAL INTELLIGENCE FOR LOW CARBON RENEWABLE ENERGY DEVELOPMENT** This webinar introduces the latest development of Artificial Intelligence (AI) and its applications to the operation, planning and control of power grids towards carbon neutrality while maintaining high operation performance. Different AI-based algorithms and methods will be introduced, and their applications for renewable prognosis, and state estimation, etc. will also be discussed, where both technical and theoretical aspects will be addressed.
21:00 - 22:00 (UTC+8h)	**STABLE OPERATION OF DECARBONISED SMART GRID** This webinar introduces the emerging challenges in the stable operation of power grid when the grid decarbonisation gradually takes place to meet the 2050 Net-zero target. According to these facts, the efforts from both academia and industry in understanding and classifying the new system stability issues will be summarised and discussed. Then the talk will move on to the latest developed solutions to the above-mentioned challenges in the stable operation of decarbonised smart grid, including the relevant assessment methodologies and control and enhancement strategies.

Unit 4: Sustainable Network for Smart Cities

HK ELECTRIC

2/11/2021 (Tue)	
20:00 - 21:00 (UTC+8h)	**RESILIENT DISTRIBUTION NETWORK AND OPERATION** This webinar introduces the characteristics and merits of various network topologies used in distribution systems as well as the choice of suitable distribution voltage and their technical considerations. In addition, the network design for special supply solutions, such as high-rise substations, is covered.
21:00 - 22:00 (UTC+8h)	**WIRELESS IoT TECHNOLOGY FOR SMART GRID** This webinar introduces the use of wireless Internet of Things (IoT) technology for smart grid in HK Electric; and how HK Electric leverages the data collected for enhancing the supply reliability.

Closing Ceremony

5/11/2021 (Fri)	
20:00 - 20:30 (UTC+8h)	**PARTICIPANTS' SHARING SESSION**
20:30 – 21:30 (UTC+8h)	**CLOSING CEREMONY**

ATTENDANCE REQUIREMENT

- Participants are advised to join all the sessions of the workshop for better understanding of the topics.

ENROLMENT

- Please complete the e-enrolment form (https://polyu.hk/eYiEU) by **8 October 2021**.
- Enrolment will normally be considered via nomination by the invited organisation/institution only.

CONFIRMATION OF PARTICIPATION

- The workshop will be delivered via Zoom. Successful registrants will receive notifications with the meeting ID and password for the online sessions in due course.

ENQUIRIES

The Hong Kong Polytechnic University
(deconf@polyu.edu.hk)
Xi'an Jiaotong University
(seanwei@mail.xjtu.edu.cn/ duqinghe@mail.xjtu.edu.cn)
State Grid Corporation of China
(intl@sgtc.sgcc.com.cn)
The Hongkong Electric Company, Limited
(borisho@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 online sessions will be recorded by the organisers. By joining the workshop, participants agree that the video, audio and chat messages recorded and retained will be used for related academic and promotion purposes.*

Co-organisers

The Hong Kong Polytechnic University
https://www.polyu.edu.hk

Xi'an Jiaotong University
http://en.xjtu.edu.cn

State Grid Corporation of China
http://www.sgcc.com.cn

The Hongkong Electric Company, Limited
https://www.hkelectric.com/en

Closing Ceremonies of 2018 (left), 2019 (right) and 2020 (bottom)