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INTERNATIONAL SCIENCE, TECHNOLOGY AND INNOVATION CENTRE FOR SOUTH-SOUTH COOPERATION UNDER THE AUSPICES OF UNESCO

AETDEW
THE ACADEMY OF ENGINEERING AND TECHNOLOGY OF THE DEVELOPING WORLD

SOUTHERN
UNIVERSITY COLLEGE
南方大學學院

Training Course on Sustainable Energy for Big Data Centres

24-26 May 2025 | Johor Bahru, Malaysia

BACKGROUND

Johor Bahru's strategic location and growing technical infrastructure have attracted significant investments in large-scale data centers, according to Johor State Executive Councillor Lee Ting Han in September 2024. Councillor Lee is Johor State Investment, Trade, Consumer Affairs and Human Resources Committee chairman. First phase of Johor's data centre strategic plan set for completion by 2027, says exco man - MIDA | Malaysian Investment Development Authority Johor State Government is currently reviewing 36 applications to develop data centre infrastructure in the State. There are already 10 data centres in operation in Johor, with seven more in development. These developments are part of Phase One of Johor's Data Centre Sector Development Strategy, which is expected to be completed by 2027. In 2025, Johor plan to begin Phase Two, focusing on the data centre ecosystem, including cooling systems, material production, server racks, and printed circuit boards, among others. Once these are in place, Johor can then move on to Phase Three, which involves attracting more investment in artificial intelligence, cloud computing, and big data. State Councillor Lee stressed Johor State Government need to work with the private sector and local companies to organise training courses that will train local talent to meet the workforce demands of these projects.

Johor Bahru is thus emerging as one of the digital hubs in the world. The rapid expansion of data centers in Johor Bahru has also fueled commercial development, especially in modern multi-purpose property development. This has underscored the urgent need for sustainable energy solutions for Johor Bahru, starting with the massive energy requirement of big data centres. Big data centre facilities, essential for handling massive amounts of data generated by cloud computing, artificial intelligence, and IoT applications, are energy-intensive, with their cooling and processing requirements driving up electric power consumption. However, relying on traditional energy sources, such as fossil fuels, poses environmental challenges, contributing to greenhouse gas emissions and climate change. To ensure the region's growth aligns with global sustainability goals, integrating renewable energy, such as solar or wind power, into the energy mix is crucial. Sustainable energy not only helps reduce the carbon footprint of these data centers but also enhances their long-term viability by lowering operational costs and improving energy security. As Malaysia pursues its vision of becoming a regional leader in green technology, sustainable energy solutions in Johor Bahru's data center development will be key to fostering eco-friendly digital infrastructure, benefiting both the environment and the economy.

China leads the world in AI and related digital technologies. China has thus accumulated vast expertise and experience in the design, construction, operation and maintenance of big data centres. China also leads the world in renewable energy technologies and their applications in all human endeavours. China is greening the energy supply for big data centres. Malaysia, ASEAN and other South countries can learn from China, especially how to keep digitally savvy human resources up to date with the rapid development in AI and related digital technologies.

One of the leading institutions offering training programs on sustainable green and AI power grids is the School of Electric Power Engineering at South China University of Technology (SCUT). SCUT operates the largest big data centres in Chinese universities. SCUT is well-equipped with state-of-the-art facilities and expertise in fields like smart energy grids, grid-connected technologies, and new energy power generation. Experts from SCUT, through the Asia-Pacific Research Institute of Smart Grid and Renewable Energy, which was founded by SCUT Professor and AETDEW Fellow Professor Chen

Haoyong will be the high-quality trainers in this training course in Johor Bahru. Experienced managers in the construction of big data centres in Johor will also be invited to share their experience.

This training course in Johor Bahru aims to equip data centre professionals with the skills to design, implement, and maintain sustainable energy solutions. The focus will be on integrating renewable energy sources, optimizing energy efficiency, and applying AI technologies for smart energy management. By fostering knowledge exchange and hands-on experience, this program will enable participants to lead the transition to greener, more sustainable data infrastructure.

OBJECTIVES

- **Knowledge Exchange:** Facilitate the sharing of global best practices and technologies in sustainable energy management for data centres.
- **Technology Integration:** Introduce participants to the latest renewable energy solutions and AI-driven tools for energy optimization in big data centres.
- **Skill Enhancement:** Provide hands-on experience in implementing green energy technologies and AI-driven energy management systems.
- **Networking Opportunities:** Encourage collaboration and networking among industry professionals to promote sustainable practices across the data centre sector.

EXPECTED OUTCOMES

- **Enhanced Knowledge:** Participants will gain a comprehensive understanding of sustainable energy technologies for data centres, with an emphasis on renewable integration and energy optimization.
- **Practical Skills:** Hands-on workshops will enable participants to develop practical skills in designing and managing energy-efficient data centres.
- **Professional Network:** Participants will establish connections with industry leaders and peers, facilitating ongoing collaboration in sustainable energy initiatives.
- **Leadership and Training:** Participants will be empowered to lead the shift towards greener data centres, driving sustainability efforts within their organizations and beyond.

PARTICIPANTS

The program is designed for approximately 40 professionals working in data centre management, energy operations, and infrastructure design. Preferred qualifications include:

- A degree in engineering, IT infrastructure, or energy management.
- Relevant experience in data centre operations, energy management, or IT systems.
- Mid-to senior-level professionals responsible for energy efficiency, sustainability, or data infrastructure.
- Proficiency in English for technical communication and collaboration.

FEE

The participation fee is RM 2000.00 per participant. Payment of the fee entitles the participant to attend all the sessions of the training program. It includes lunch, refreshments, and training materials. The approved local participants will pay the fees to AETDEW or Southern University College bank account.

APPLICATION

Interested applicants are encouraged to apply online through the following link: https://forms.gle/ckEiqA19LQi331dX8

CLOSING DATE OF APPLICATION

The closing date of application is 20 May 2025. Applicants will be asked to pay the registration fee on receipt of application.

DATES AND VENUE

The training program will be conducted over a period of three days:

- Dates: 24-26 May 2025
- Venue: Main Building, Southern University College, KM15, Jalan Skudai, 81300 Skudai, Johor.

TRAINERS AND DELIVERABLES

Trainers

1. Professor Chen Haoyong, SCUT and APRI-SGRE.
2. Wei Huali, CCIE Engineering Malaysia.
3. Professor He Kejing, SCUT
4. Professor Bai Fenglin, APRI-SGRE.
5. Mr. Xu Min, APRI-SGRE
6. Dr Lin Zhenjia, APRI-SGRE

Deliverables will include:

- Lectures: Expert-led sessions covering key topics such as energy-efficient data centre design and AI in energy management.
- Workshops: Hands-on sessions where participants will work with renewable energy systems and AI-driven tools for optimizing energy consumption.
- Live Demonstrations: Demonstrations of real-time energy monitoring systems and cooling efficiency technologies.
- Panel Discussions and Q&A: Interactive discussions that will allow participants to engage with experts and peers on sustainable energy challenges and solutions.
- Site Visit.

PROVISONAL AGENDA

Day 1: 24 May 2025	
9:00 AM - 9:45 AM	**Opening Ceremony** • Welcome Address by *Prof. Ir. Ts. Dr. Chuah Joon Huang* *President of Southern University College* (5 minutes) • Welcome Remarks by *Professor ChM. Dr. Mohd Basyaruddin Abdul Rahman* *Chair of ISTIC Governing Board* (5minutes) • Welcome Remarks by *Lawrence Tan Koon Peng, Treasurer of AETDEW*, representing *President of AETDEW* (5minutes) • Keynote Address and Official Opening by *Guest of Honor - Iskandar Puteri City Council Member* (30 minutes) (To be confirmed)
9:45 AM - 10:00 AM	Group Photo and Morning Coffee Break
10:00 AM - 12:00 PM	Keynote Addresses • Role of Professional Registration Board in Skilled Manpower Development in Fast Changing AI Era *Dr. Md Fauzi bin Md Ismail* *Registrar, Malaysia Board of Technologists* (50 minutes) • Today's AI Technology Development and Energy Needs *Professor Chen Haoyong* *Asia-Pacific Research Institute of Smart Grid and Renewable Energy (APRI-SGRE)* (50 minutes) Q&A Session
12:00 PM - 2:00 PM	LUNCH
2:00 PM - 3:20 PM	IT Equipment and Systems in Data Centres *Professor He Kejing*
3:20 PM - 3:40 PM	Coffee Break
3:40 PM - 5:00 PM	Current and Future Development of Data Centre Construction in Johor *Wei Huali* Q&A
Day 2: 25 May 2025	
9:00 AM – 12.30 PM	Gather at SUC (Lobby, Main Building) Site Visit to Data Centre, Ulu Tiram, Johor
12:30 PM - 2:00 PM	LUNCH
2:00 PM - 3:20 PM	AI for Smart Energy Management in Data Centres *Dr Lin Zhenjia*
3:20 PM - 3:45 PM	Coffee Break

3:45 PM - 5:00 PM	Panel Discussion: "Challenges and Innovations in Sustainable Data Infrastructure" *Professor Chen Haoyong and Dr Lin Zhenjia*
Day 3: 26 May 2025	
9:00 AM - 10:20 AM	Comprehensive Energy Utilization and Energy Efficiency in Data Centres *Professor Chen Haoyong*
10:20 AM - 10:40 AM	Coffee Break
10:40 AM - 12:00 PM	Air Conditioning Systems and Energy Saving Technologies for Data Centres *Bai Fenglin and Xu Min* Q&A
2:00 PM - 3:00 PM	**Closing Ceremony** • Presentation of Certificates Closing Remarks by Professor Chen Haoyong
1:00 PM	LUNCH & END OF PROGRAMME

CONTACT PERSONS

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GENERAL INFORMATION

Visa Application

Foreign participants who require a visa to enter Malaysia must obtain their visa before departure. To facilitate the application process, participants will need to present an official invitation letter from the organizer when applying at the Malaysian Embassy, High Commission, or Visa Center in their respective countries. The organizer will promptly issue invitation letters to all selected international participants to support their visa applications and travel arrangements.

Other foreign participants who do not require a visa may enter Malaysia without prior visa application. However, they should ensure their passports meet Malaysia's entry requirements.

Computer Requirement

Each participant is expected to bring a computer (laptop or tablet) for study, presentation preparation, and communication during the course.

ORGANISERS

INTERNATIONAL SCIENCE, TECHNOLOGY AND INNOVATION CENTRE FOR SOUTH-SOUTH COOPERATION UNDER THE AUSPICES OF UNESCO (ISTIC)

The creation of the International Science, Technology and Innovation Centre for South-South Cooperation under the auspices of UNESCO (ISTIC) is a follow up of the Doha Plan of Action which was adopted by the Heads of States and Governments of the Group of 77 and China in Doha, Qatar, June 2005 on the occasion of the Second South Summit of the Group of 77. The Summit urged UNESCO to develop and implement a programme for South-South Cooperation in Science and Technology with the objective of facilitating the integration of a developmental approach into national science, technology and innovation policies, capacity building in science and technology through providing policy advice and exchange of experience and best practices, and creating a problem solving network of Centres of Excellence in developing countries as well as supporting the exchange of students, researchers, scientists and technologists among developing countries. ISTIC will act as an international platform offering sustainable programmes and services in producing holistic talents towards institutional excellence and augmenting sustainable development for South-South Cooperation. Details of ISTIC are available at www.istic- unesco.org

ACADEMY OF ENGINEERING AND TECHNOLOGY OF THE DEVELOPING WORLD (AETDEW)

The Academy of Engineering and Technology of the Developing World (AETDEW) was established to mobilize the engineering, technological, and scientific communities in developing countries to address global challenges and achieve the United Nations' Sustainable Development Goals (SDGs) by 2030. Founded in 2017, AETDEW emphasizes South-South cooperation and aims to leverage engineering and technological innovations to combat issues such as poverty, hunger, illiteracy, and climate change. The academy's membership includes a diverse range of stakeholders from government, industry, academia, and civil society, with a particular focus on young entrepreneurs and gender representation. Details of AETDEW are available at www.aetdew.org.

SOUTHERN UNIVERSITY COLLEGE

Southern University College attained its current status in 2012. It was previously known as Southern College – established in 1990 as the first non-profit institute of higher education in Malaysia to provide a local educational channel for high school graduates who were unable to further their studies in foreign countries or gain admission to other local tertiary educational institutions. Southern UC is located in the Skudai area of Johor Bahru, Malaysia – an area within the Iskandar Malaysia Economic Zone. Its campus land is sized at 33 acres. Following the development of Iskandar Malaysia Economic Zone and Johor being a global Big Data Centre Hub, Southern UC will be one of the important educational institutions in Malaysia and has poised itself to become an international educational institution. The Southern UC campus is in a scenic spot, rich in Chinese traditional colours and a multicultural atmosphere that encompasses the spirit of coexistence and multiculturalism.

ASIA-PACIFIC RESEARCH INSTITUTE OF SMART GRID AND RENEWABLE ENERGY (APRI-SGRE)

The Asia-Pacific Research Institute of Smart Grid and Renewable Energy (APRI-SGRE) is a limited company incorporated in Hong Kong. APRI-SGRE was founded by Prof. Dr. Haoyong Chen, a leading expert in electrical engineering and renewable energy systems. The institute focuses on developing advanced solutions for smart grid technology, clean energy integration, and energy market efficiency. The institute specializes in optimizing power grids to handle intermittent renewable energy sources, ensuring stable and reliable electricity delivery while supporting the global transition to sustainable energy. Under Prof. Chen's leadership, the institute has collaborated with industry partners and academic institutions across China and Southeast Asia, contributing to the development of advanced energy systems that are critical for the future of sustainable power. Smart grid technologies are critical for enhancing the efficiency and reliability of electricity networks. By focusing on renewable energy, APRI-SGRE is positioned to contribute significantly to global sustainability goals, particularly in reducing reliance on fossil fuels and increasing the integration of clean energy sources into the power grid.