

2025 IEEE IAS ANNUAL MEETING INCORP. I&CPS-ASIA CONFERENCE

New Taipei City, Taiwan, 15-20 June 2025

## **CONFERENCE PROGRAM**

## EMPOWERING CONNECTIONS

2025 IEEE IAS Annual Meeting Incorporating the Industrial & Commercial Power Systems Asia Conference

## Infinite Innovations INSPIRING COLLABORATION







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### Welcome from the General Chair.

### Dr. Avoki Omekanda



We welcome you to New Taipei, Taiwan, for the **2025 IEEE Industry Applications Society Annual Meeting Incorporating The Industrial & Commercial Power Systems (I&CPS)-Asia Conference**, sponsored by the IEEE Industry Applications Society (IAS). This conference will be an excellent opportunity for all attendees to expand their knowledge, network with colleagues, and enjoy Taiwan's sights and sounds.

The IEEE IAS Annual Meeting is the leading conference in electrical and electronic engineering, catering to a wide range of attendees under the IAS's mission to enable the advancement of theory and practice in the design, development, manufacturing, and application of safe, sustainable, reliable, intelligent electrical systems, equipment and services.

The Executive Board of the IEEE Industry Applications Society decided to promote global participation since most of its membership today is outside North America. Our first choice was to move the IAS Annual Meeting to New Taipei, Taiwan, in Asia, from June 15 to June 20, 2025. This is a fantastic opportunity for all the conference attendees, especially those who did not have a chance to enter the United States of America because of visa reasons, to join this conference along with experts from around the globe to share their insights, experiences, research findings and enjoy Taiwan's sights and sounds.

The conference will coincide with the 60th anniversary of the founding of the IEEE Industry Applications Society and will be a landmark event. The annual meeting will feature technical sessions, tutorials, and industrial tours that showcase the latest developments in electrical, electronic, and electromechanical technologies in industry and commerce.

New Taipei, the capital of Taiwan, highlights a vibrant blend of cultural attractions, natural beauty, and lively night markets, establishing itself as a popular tourist destination. Must-visit sites include Taipei 101, the National Palace Museum, Chiang Kai-shek Memorial Hall, etc.

The local and international organizing committees of the 2025 IEEE Annual Meeting Incorporating The I&CPS Asia Conference are working diligently to plan an outstanding conference. They have been meticulously curating a comprehensive technical program, augmented by in-depth tutorials, panel sessions, the Po-Tai Cheng Plenary session, and engaging Women-In-Engineering (WIE) & Young Professional (YP) activities designed to enrich the conference experience and provide a platform for profound learning and networking opportunities. We look forward to meeting you in person in Taipei, Taiwan, from June 15 to June 20, 2025.

See you there!

**Dr. Avoki Omekanda** Conference General Chair

### Welcome Message from the Technical Committee Chairs

The future of our world is closely tied to advancements in electrification technologies, which play a vital role in improving global prosperity. As electrification becomes increasingly central to industries worldwide, its applications—from energy conversion and industrial control to transportation and power generation—are essential for transforming natural energy sources into practical, usable power.

The 2025 IAS Annual Meeting incorp. I&CPS Asia Conference serves as a leading global platform for collaboration among industry experts, academic researchers, and government institutions. This year, the conference received an outstanding 717 paper digests from contributors around the world. The Program Technical Committee, made up of Chairs, Senior Editors, and Associate Editors, led a rigorous review process, with each paper evaluated by international experts.

The final program features over 450 technical papers presented through 72 Oral Sessions, 2 Poster Sessions, and 6 Academic Special Sessions. The conference will also offer 8 Tutorial Sessions on its opening day, along with 3 Industry Sessions and 5 Panel Sessions focused on current developments in energy, transportation, and electrical equipment. These sessions provide attendees with valuable opportunities to engage directly with leading experts.

All accepted papers will be published in the IEEE Xplore Digital Library, ensuring global accessibility and visibility. Authors are also encouraged to submit extended versions of their work for consideration either in the IEEE Transactions on Industry Applications or in the IEEE Industry Applications Magazine, following the publication's editorial policies.

The conference will be held at the Hilton Taipei Sinban in New Taipei City, Taiwan—a modern, world-class venue offering exceptional hospitality and a prime location. The Technical Program Committee warmly welcomes all participants to this important international event.

The success of the 2025 IAS Annual Meeting incorp. I&CPS Asia Conference is a result of the dedication and efforts of professionals worldwide. Special thanks go to Conference Chair Dr. Avoki Omekanda for his vision and leadership in making this event possible.

We look forward to your participation and hope you enjoy the conference experience.



Luca Solero Roma Tre University, Italy - TPC

Allen Wu Yuan-Kang

National Chung-Cheng

University, Taiwan - I&CPS

Asia Local Chair



Xiaodong Liang University of Saskatchewan, Canada - TPC



Luca Zarri University of Bologna, Italy - Special Sessions Chair



Saleh Saleh University of New Brunswick, Canada - TPC



**Fernando Briz** Universidad de Oviedo, Spain -Tutorial Chair



Pericle Zanchetta University of Pavia, Italy - General Co-Chair and TPC



**Chia-Chi Chu** National Tsing Hua University, Taiwan -Tutorial Chair



**Min-Fu Hsieh** National Cheng Kung University, Taiwan - Local Committee Chair and Industry Chair



Chun-Lien Su National Kaohsiung University of Science and Technology, Taiwan - Special Sessions Chair



### **Conference Organizing Committee**

**General Chair** 

Avoki Omekanda General Motors Global R&D Center, USA

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Pericle Zanchetta University of Pavia, Italy

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Tamas Ruzsanyi Ganz-Skoda Electric Ltd, Hungary

International Advisor Andy Knight University of Calgary, Canada

#### **Event Manager**

Michelle Measel IEEE, USA

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 Roma Tre University, Italy

- Xiaodong Liang
   University of Saskatchewan, Canada
- Saleh Saleh University of New Brunswick, Canada
- Pericle Zanchetta General Co-Chair and TPC University of Pavia, Italy
- Min-Fu Hsieh
   Local Committee Chair and Industry Chair
   National Cheng Kung University, Taiwan
- Allen Wu Yuan-Kang
   I&CPS Asia Local Chair
   National Chung-Cheng University, Taiwan
- Luca Zarri Special Sessions Chair University of Bologna, Italy

#### Chun-Lien Su

Special Sessions Chair National Kaohsiung University of Science and Technology, Taiwan

- Fernando Briz Tutorial Chair
  - Universidad de Oviedo, Spain
- Chia-Chi Chu

Tutorial Co-Chair National Tsing Hua University, Taiwan

• Komal Khan TPC Chair, Virtual Program University of Oviedo, Spain

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- Min-Fu Hsieh (Chair) National Cheng Kung University
- Yuan-Kang Wu (Vice Chair) National Chung Cheng University

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- Luca Zarri University of Bologna, Italy
- Chun-Lien Su
   National Kaohsiung University of Science and Technology, Taiwan
- Le-Ren Chang-Chien National Cheng Kung University, Taiwan

#### **Po-Tai Chen Plenary Chairs**

- Wei-Jen Lee (Advisor) The University of Texas at Arlington, USA
- Andy Knight University of Calgary, Canada
- Shyh-Jier Huang National Cheng Kung University, Taiwan

#### **Conference Organizing Committee**

**Tutorial Chairs** 

Fernando Briz Universidad de Oviedo, Spain

Chia-Chi Chu National Tsing Hua University, Taiwan

#### Industry/Expo Chairs

Ching-Ming Lai National Chung Hsing University, Taiwan

Hsueh-Hsien Chang Minghsin University of Science and Technology, Taiwan

#### Chapters & Membership Committee (CMD) Chair

Srikanth Pillai McMaster University, Canada

#### **Professional Development Chair**

Nehad El-Sherif MNKYBR Technologies Inc., Canada

#### Women-In-Engineering (WIE) Chairs

- Yanni Zhong IEEE IAS
- Yu-Shan Cheng National Taiwan Ocean University, Taiwan

#### **Graduate Student Poster Competition Chair**

Payman Dehghanian The George Washington University, USA

#### Young Professionnal (YP) Chairs

- Achref Selmi IEEE IAS
- Kuo-Lung Lian National Taiwan University of Science and Technology, Taiwan
- Student Activities Chairs Shiue-Der Lu National Chin-Yi University of Technology, Taiwan
- Heng-Yi Su National Taipei University of Technology, Taiwan

#### Local Organizing Committee (LOC)

- Min-Fu Hsieh
   Chair
   National Cheng Kung University, Taiwan
- Wu Yuan-Kang

Co-Chair National Chung-Cheng University, Taiwan

- Wei-Jen Lee
  - Advisor The University of Texas at Arlington, USA
- Chia Hung Lin

National Kaohsiung University of Science and Technology

- Kun-Che Ho National Formosa University
- Te-Tien Ku
   National Kaohsiung University of Science and Technology
- Ming-Tse Kuo National Taiwan University of Science and Technology
- Jian-Hong Liu National Taiwan University of Science and Technology
- Yu-Jen Liu
   National Chung Cheng University
- Kin-Cheong Sou National Sun Yat-sen University
- Yu-Chen Su National Tsing Hua University
- Chin-Chung Wu Taiwan Power Company, Taiwan
- Tung-Sheng Zhan National Kaohsiung University of Science and Technology
- Chun-Yu Hsiao Tatung University

#### **Conference Organizing Committee**

#### **Publicity Chair**

Chen-I Chen
National Central University, Taiwan

#### Webmaster

Anant Singh Tesla Corporation, USA

Graphics Designer
Bornface Ochieng
IEEE, Kenya

Conference App Chair Amira Ouerfelli IAS Chapter, Tunisia

#### **IEEE Industry Applications Society (IAS)**

- Ayman El-Refaie
   IAS President
   Marquette University, USA
- Patrick McCarren IAS Executive Director
- Kimberly (Kim) Borini IAS Admin
- Aeisha VanBuskirk IAS Communications & Marketing Manager



### **Local Volunteers' List**

### **Key Workers**

- Huang Ming Yu
- Liao Yi Chun
- Lu,Ling-Chueh
- Cheow Wen Hui
- Hsien-Yuan, Hsu
- Fan Chaing, Cheng-Yen
- Wei-Jie, Huang
- Lo Tzu Yao

### **Volunteers**

- To-Lei Huang
- Chia Ching Lai
- Abhishek Tarikallu Thippesh
- Chiu Chien-Ming
- Guang Ming, Jin
- Hsu Chih Ching
- Huang-Chien-Chen
- Yu-Po Wang
- Lu Wei-Lin
- Mao-Lin Liu
- Le Gia Huy
- Ho Yung Hsiang
- Ming-Kai,Cheng
- Abdillah Muhamad Ahdzak
- Phan Quoc Thang
- Yu-Shih Huang
- Chen, Wei-Yu
- Wang Chung Hao
- Degu Bibiso Biramo
- Chu Jiann Yeu
- Kuo Hsuan Wei

- Chen En Wang
- Hu Zhi-Wei
- Kuo Tzu Yu
- Feng, Zhen-Yang
- Wen-Jun-Liang
- Hong En Chiang
- Huang Wei Min
- Wang Pin Cheng
- Lu-Yi-Tse
- Pham Anh Hao
- Wang Cheng Ho
- Kuo Yu Chen



# **Program - At-A Glance**

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1930 - 2130 CMD Dinner (By Invitation only)		Standard) Benefits	-	Oral Special Sections	222 Mail 100 Mail	1120 - 1300 WE Event "A Better Me"	An Deal	osco-noo Po-Tai Cheng Plenary Session	07500 - 08500 Presentors Breakfast	MONDAY June 16 2025		PROCR
				12:00 - Note Exhibit Lunch		EXPO OPEN	1000-1800	Oral & Specia Sessions	ora Present	š Z	lew Taipe	CORP.
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### **Schedule -At-A Glance**

### Sunday, June 15<sup>th</sup> 2025

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07:00 - 18:30 ----- Registration

08:00 - 11:00 ----- AM Tutorials

11:00 - 13:00 ----- Lunch on your Own.

13:00 - 16:00 ----- PM Tutorials

16:00 - 17:00 ----- PM Break

17:00 - 18:00 ----- First Time Attendees

18:00 - 20:00 ----- Welcome Reception



### **Tutorials schedule**

Tutorial Title	Instructor Team (name, email, affiliation)	Room	Session
Advanced HIL and PHIL Simulations for IBR-Dominated Power Systems	Chia Chi Chu (National Tsing Hua University ;ccchu@ee.nthu.edu.tw ), Kuo Lung Lian (National Taiwan University of Science and Technology; ryanlian@mail.ntust.edu.tw), Danny Lin (Cybernet; danny.lin@cybernet-ap.com.tw)	Meeting Room 1	8:00 - 11:00
The IEEE Fellow Program and How to Improve a Nomination shared with Preparation and customization of IAS Standards	Wei-Jen Lee, University of Texas at Arlington, wlee@uta.edu and Prof. Liu	Wishful B	13:00 - 16:00
Advanced Electric Machines and Drives for eVTOL	Chunhua LIU, chunliu@cityu.edu.hk; Rundong HUANG, rundong.huang@cityu.edu.hk; Yuxin LIU, yuxin.liu@my.cityu.edu.hk; Zhiping DONG, Zhiping.Dong@my.cityu.edu.hk. They are all with City University of Hong Kong	Meeting Room 3	13:00 - 16:00
Cyber Physical Hybrid AC/DC Distribution System: Stability and Operations	Pengfeng LIN, linp0010@e.ntu.edu.sg (pengfeng_lin@sjtu.edu.cn), Shanghai Jiao Tong University; Miao ZHU, miaozhu@sjtu.edu.cn, Shanghai Jiao Tong University; Amer M. Y. M. Ghias, amer.ghias@ntu.edu.sg, Nanyang Technological University;	Wishful B	8:00 - 11:00
Contributing to DC Distribution Systems: Solid-State Transformer, Solid-State Circuit Breaker, and Dynamic Wireless Power Transfer	Yu-Chen Su (ycsu@ee.nthu.edu.tw), National Tsing Hua University, Taiwan Keiji Wada (kj- wada@tmu.ac.jp), Tokyo Metropolitan University, Japan Ryosuke Ota (r_ota@tmu.ac.jp), Tokyo Metropolitan University, Japan	Meeting Room 2	8:00 - 11:00
Driver Design for GaN/SiC: Enabling Next-Generation Power Conversion	Ching-Jan Chen, National Taiwan University, Taiwan, chenjim@ntu.edu.tw; Katherine A. Kim, National Taiwan University, Taiwan, kakim@ntu.edu.tw; Yi- Rong Huang, National Taiwan University of Science and Technology, Taiwan, dannyhuang@mail.ntust.edu.tw	Meeting Room 3	8:00 - 11:00
Multi-Level and Partial Power Processing Converters -From Theory to Practice-	Univ. Prof. Dr. Petar. J. Grbović Full Professor, Innsbruck Power Electronics Laboratory (i-PEL), Institute of Mechatronics, University of Innsbruck, Austria petar.grbovic@uibk.ac.at https://www.uibk.ac.at/mechatronik/i-pel/ +43 (0)664 12 50 951	Meeting Room 2	13:00 - 16:00
Digital Transformation of Power and Energy Systems	<ul> <li>[1] Asheesh Kumar Singh, Professor, Electrical Engineering Department, Motilal Nehru National Institute of Technology Allahabad, Prayagraj, Uttar Pradesh, India (Email: asheesh@mnnit.ac.in)</li> <li>[2] Sourabh Ghosh, Senior Research Fellow, Electrical Engineering Department, Motilal Nehru National Institute of Technology Allahabad, Prayagraj, Uttar Pradesh, India (Email: sourabh.2020ree08@mnnit.ac.in)</li> </ul>	Meeting Room 1	13:00 - 16:00

#### **AM Tutorial**

### Advanced HIL and PHIL Simulations for IBR-Dominated Power Systems.

#### **Summary of the Tutorial**

The rapid transition to cleaner energy has led to increased integration of inverter-based resources (IBRs) into power grids, raising challenges for system stability and efficiency. Hardware-in-the-Loop (HIL) and Power Hardware-in-the-Loop (PHIL) testing have become essential for simulating and validating power systems under real-world conditions.

HIL integrates physical components into simulated systems, while PHIL adds power-level interactions for higher fidelity. These methods support system optimization, evaluating dynamics and control strategies in IBR-dominated grids. This tutorial will explore industrial applications of HIL/PHIL, system validation, design considerations, and overcoming challenges like impedance ratio constraints in PHIL and bandwidth improvements for power amplifiers.



**Chia-Chi Chu** National Tsing Hua University, Taiwan



**Kuo Lung Lian** National Taiwan University of Science and Technology, Taiwan



Cybernet Systems Taiwan Co. Ltd. Taiwan



#### **PM** Tutorial

# (a) The IEEE Fellows Program and How to Improve a Nomination.

### (b) Enter the Exciting World of Standards – Preparation and Customization of IAS

#### **Summary of the Tutorial**

(a) This tutorial discusses IEEE fellows program and how to improve a nomination. The speakers provide several personal experiences and useful suggestions for improving the nomination of IEEE Fellows.

(b) Standards serve as a universal framework used by subject matter experts to set specifications or guidelines that define the attributes and performance benchmarks for products, services, or systems. They provide clear parameters and testing methods to ensure that items or services are designed and evaluated to meet required levels of performance, safety, and quality. This interactive tutorial will start with an overview of IAS's scope, highlighting the technical topics covered by IAS Standards. It will also delve into the process of developing IAS standards and demonstrate how these standards can be tailored for different applications to maximize their benefits.



Wei-Jen Lee University of Texas at Arlington, USA



**Tian-Hua Liu** National Taiwan University of Science and Technology, Taiwan



**Daleep Mohla** Chair of the I&CPS Standards Development Committee, USA



Daryld Ray Crow Chair of the IEEE standard 463, USA

#### **AM Tutorial**

### Multi-Timescale Management of Cyber-Physical Hybrid AC/DC Microgrids: Control and Operation

#### **Summary of the Tutorial**

This lecture explores stability and operation in cyber-physical hybrid AC/DC grids, addressing modern power system complexities. It covers fundamental concepts, module-based modeling, small/large-signal stability, and autonomous stabilizer design. Emphasis is placed on global power management, including decentralized/distributed control and a novel dynamic circuit approach for global inertia characterization. Case studies include Singapore's Semakau Island and Saudi Arabia's Red Sea Microgrid. Integrating cyber-physical components with traditional grids presents challenges and opportunities for stability, efficiency, and reliability. Bridging theory and practice, the discussion offers insights into the future of hybrid power distribution systems.



Amer M. Y. M. Ghias Nanyang Technological University, Singapore.



Pengfeng LIN Shanghai Jiao Tong University, Shanghai



Miao ZHU Shanghai Jiao Tong University, Shanghai



#### **AM Tutorial**

### Contributing to DC Distribution Systems: Solid-State Transformer, Solid-State Circuit Breaker, and Dynamic Wireless Power Transfer

#### **Summary of the Tutorial**

DC distribution systems have gained significant attention due to their advantages in efficiency, reliability, and seamless integration of renewable energy and battery storage. However, several technical challenges must be addressed for their widespread adoption, including efficient AC/DC conversion, reliable protection mechanisms, and advanced electric vehicle charging solutions. This tutorial introduces three key technologies for next-generation DC distribution systems: solid-state transformers (SSTs), solid-state circuit breakers (SSCBs), and dynamic wireless power transfer (DWPT). By attending this tutorial, participants will gain a comprehensive understanding of these three technologies, their design principles, and their roles in shaping future DC distribution networks.



**Yu-Chen Su** National Tsing Hua University, Taiwan



Keiji Wada Tokyo Metropolitan University, Japan



Ryosuke Ota Tokyo Metropolitan University, Japan

### Driver Design for GaN/SiC: Enabling Next-Generation Power Conversion

#### **Summary of the Tutorial**

Wide bandgap switching devices such as GaN and SiC become game-changing devices to meet the power density and efficiency demand of power converters due to their superior figure-of-merits. However, to fully use the potential of GaN and SiC, its gate driver must be carefully co-designed. In this tutorial, GaN and SiC driver design will be illustrated to achieve high power density, efficiency, and reliability for power converters. This tutorial will cover the advantages and demonstration of GaN/SiC converters to meet power converter trends in the first part, GaN/SiC properties and driving characteristics in the second part, and challenges and solutions to drive GaN/SiC in the third part.



**Ching-Jan Chen** National Taiwan University, Taiwan



Katherine A. Kim National Taiwan University, Taiwan



**Yi-Rong Huang** National Taiwan University of Science and Technology, Taiwan

### Multi-Level and Partial Power Processing Converters-From Theory to Practice.

#### Summary of the Tutorial

Power electronics and power conversion in general is today part of every segment of our life. Any piece of electric equipment we have today is somehow based on power electronics and converters; home appliance, industrial equipment, renewable energy, automotive, avionic, etc., etc. Conversion efficiency, specific power, power density and converter cost are today the most critical requirements for new converters.

In last decade, we have seen dramatic progress, particularly in the field of power semiconductors. Each new generation of power semiconductor introduces new challenges and issues. Some of the issues such as high and in combination with parasitic inductance and capacitance of the device and package make almost impossible to fully utilize advantages of new power semiconductors (SiC and GaN). One way to increase the conversion efficiency and reduce cost/size/weight is to deploy Multi-Level and/or Multi-Cell converters and Partial Power Rated (Processing) power concept.

The objective of this tutorial is to fully explore Pros and Cons of Multi-Level and Partial Power Rated (Processing) converters. Advantages of these topologies, such as significant reduction of the filter and the dc bus capacitor size will be extensively discussed. Moreover, strong impact on the device switching performances including switching loses and the switch over-voltage stress will be addressed too. A short design guideline for different concepts will be discussed too.

Several case studies and design examples are given in concluding part of the tutorial. One particular design example presented in the tutorial is 25kW battery interface dc/dc converter. An extraordinary efficiency of 99.5%, specific power of 30kW/kg and power density of 50kW/dm<sup>3</sup> have been achieved.

This tutorial is aimed at power electronics engineers and graduate students who want to improve their knowledge and understanding of Multi-Cell, Multi-Level and Partial Power Rated converters and their application, nowadays as well as in the near future.



Full Professor, Innsbruck Power Electronics Laboratory (i-PEL), Institute of Mechatronics, University of Innsbruck, Austria



#### **PM Tutorial**

### **Digital Transformation of Power and Energy Systems**.

#### **Summary of the Tutorial**

This course explores how digital technologies like AI, cyber-physical systems, digital twins, and sensor fusion are revolutionizing modern energy infrastructure. It covers microgrid fundamentals, control strategies, and energy management systems, followed by AI-driven CPS for automation and security. The digital twin module highlights real-time monitoring and predictive maintenance, while sensor fusion focuses on data integration for enhanced grid reliability. Through case studies and applications, participants will gain critical insights and skills to support smart, efficient, and sustainable energy systems—ideal for students, researchers, and professionals in energy and power domains.



Asheesh Kumar Singh Professor at MNNIT Allahabad, India



Sourabh Ghosh Ph.D. scholar at MNNIT Allahabad, India



### **Schedule -At-A Glance**

### Monday, June 16<sup>th</sup> 2025

07:00 - 17:00 ----- Registration

07:00 - 8:00 ----- Presenters Breakfast

08:00 - 11:00 ----- Po-Tai Cheng Plenary Session

11:00 - 11:20 ----- AM Break

11:20 - 13:00----- WIE Event, "A Better Me"

13:00 - 17:00 ----- CMD Chapter Workshop

13:00 - 14:40 ----- Oral and Special Sessions

14:40 - 15:00 ----- PM Break

15:00 - 17:00 ----- Standards Workshop

19:30 - 21:30 ----- CMD Dinner (By Invitation Only)





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### Tech Program Schedule – Oral & Poster Sessions

#### Monday, June 16, 1:00 PM-2:40 PM

Oral Session	Session Title	Room
RSECSC1	Dynamic Control and Grid Integration of PV Systems	Auspicious C
ESC1	Electric Vehicles Applications	Auspicious D
AcSS1	Orienting Future Power-Electronics-Dominated Power Grids Towards Sustainability	Wishful CD
PEDCC1	Planar, integrated, and special magnetics	Wishful E
ESC2	Energy Storage Systems	Meeting Room 1
PSEC1	Transmission Line Assessment	Meeting Room 1
PSEC2	Microgrids – I	Meeting Room 1
EMC1	Permanent Magnet Motors - I	Meeting Room 1

#### Tuesday, June 17, 8:00AM-9:40AM

Oral Session	Session Title	Room
RSECSC2	DC Power Flow and Energy Management Strategies	Auspicious C
PEDCC2	Component reliability and characterization	Auspicious D
PSEC3	Microgrids — II	Wishful B
AcSS2	From Smart Homes to Smart Grids: Challenges in Renewable Integration, Cybersecurity, and Power Quality	Wishful CD
ESC3	Microgrid Systems -Stability	Meeting Room 1
PSEC4	Grid Forming Converters	Meeting Room 1

<b>Oral Session</b>	Session Title	Room
IACC1	Electric Machines	Meeting Room 3
PEDCC2	Special Machines	Meeting Room 3

#### Tuesday, June 17, 10:30 AM-1:00 PM

Poster Session	Room
Codes and Standards	
Data Center	
Electrostatic Processes	
Energy Systems	
Industrial Automation and Control	Auspicious AB
Industrial Power Converters	
Power Electronics Devices and Components	
Renewable and Sustainable Energy Conversion	
Academic Special Sessions	

#### Wednesday, June 18, 8:00AM-10:30AM

Poster Session	Room
Electric Machines	
Industrial Drives	
Metallurgy	
Mining Industry	Auspicious AB
Power Systems Engineering	
Power Systems Protection	
Transportation Systems	

#### Wednesday, June 18, 3:20 PM-5:00 PM

Oral Session	Session Title	Room
RSECSC3	Optimization and Fault Management in Battery Systems	Auspicious C
IPCC1	Converter Topology - I	Auspicious D
PSEC5	Energy Storage Systems	Wishful B
PSPC1	Power Protection in IBR Dominated Power Grids	Wishful CD
PSEC6	Grid Resilience	Wishful E
ESC4	Renewable Energy - I	Meeting Room 3
EMC3	PMSM Control	Meeting Room 4

#### Thursday, June 19, 8:00AM-9:40AM

Oral Session	Session Title	Room
PSEC7	V2G Technology	Auspicious B
RSECSC4	Adaptive Modeling for Photovoltaic and Hybrid Systems	Auspicious C
IPCC2	Converter Topology - II	Auspicious D
PSEC8	Power Dispatching and Scheduling	Wishful CD
ILDC1	Industrial Lighting and Display - I	Wishful E
ESC5	Microgrid Systems -Control	Meeting Room 1
IACC2	Industrial Control Applications – I	Meeting Room 2
METC1	Advanced Techniques in Metal Industry: Monitoring, Design and Optimization	Meeting Room 3
EMC4	Condition Monitoring and Fault Detection	Meeting Room 4

#### Thursday, June 19, 10:00 AM-11:40 PM

Oral Session	Session Title	Room
PSEC9	Forecasting and Estimation Methods	Auspicious B
RSECSC5	Optimal Energy Placement and System Design	Auspicious C
IPCC3	Grid-Interactive Inverters	Auspicious D
PSEC10	Virtual Inertia Control	Wishful CD
ILDC2	Industrial Lighting and Display - II	Wishful E
ESC6	Renewable Energy – II	Meeting Room 1

#### Thursday, June 19, 1:20 PM-3:00 PM

<b>Oral Session</b>	Session Title	Room
PSEC13	Assessing Harmonics and Oscillations	Auspicious B
RSECSC6	Machine Learning Applications in Electric Power Systems	Auspicious C
IPCC5	Battery Converters and Management Systems	Auspicious D
AcSS4	State-of-the-Art Renewable Power Forecasting Techniques	Wishful CD
PSEC14	Distribution System Planning	Wishful E
ESC8	Energy Management – I	Meeting Room 1
IACC5	Industrial Control Applications – II	Meeting Room 2
ESC9	Power Electronics and Systems	Meeting Room 3
IDC2	Controls and Applications of Reluctance and Induction Machines	Meeting Room 4

#### Friday, June 20, 8:00AM-9:40AM

Oral Session	Session Title	Room
ESC10	Power System Detection and Estimation	Auspicious A
PSEC15	Machine Learning in Power Grid Applications – I	Auspicious B
RSECSC7	Converter Design and Energy Solutions for Electric Vehicles	Auspicious C
IPCC6	Fault Detection and Fault Tolerant Converter Operation	Auspicious D
AcSS5	Future Technologies for Sustainable Transportation	Wishful CD
PSEC16	Innovative Grid Technology	Wishful E

Oral Session	Session Title	Room
IACC3	Power Converter Control	Meeting Room 2
PSPC2	Advanced Signal Processing Techniques for Power Applications	Meeting Room 3
EMC5	Permanent Magnet Motors - II	Meeting Room 4

#### Thursday, June 19, 1:20 PM-3:00 PM

Oral Session	Session Title	Room
PSEC11	Wind Power Integration with STATCOM	Auspicious B
IPCC4	DC Technologies	Auspicious D
AcSS3	Advanced Power Electronics and Control Strategies for Efficient Integration of Renewables in Microgrids	Wishful CD
PSEC12	Modern Grid Ancillary Services	Wishful E
ESC7	Renewable Energy – III	Meeting Room 1
IACC4	Power Grid Applications	Meeting Room 2
PSPC3	Fault Management for Resilient Power Systems	Meeting Room 3
IDC1	Controls and Applications of Permanent Magnet Synchronous Machines	Meeting Room 4

Oral Session	Session Title	Room
TSC1	Electrified Transportation Systems	Meeting Room 1
IACC6	Micro-Grid Control Applications	Meeting Room 2
ESC11	Energy Management – II	Meeting Room 3
EMC6	Winding Technologies and Generators	Meeting Room 4

#### Thursday, June 19, 1:20 PM-3:00 PM

Oral Session	Session Title	Room
ESC12	Power Systems – I	Auspicious A
PSEC17	Active Distribution Networks	Auspicious B
RSECSC8	Advanced Estimation Techniques for Power Systems	Auspicious C
IPCC7	Converter Control	Auspicious D
AcSS6	Advanced Power Conversion Technologies in Robotics	Wishful CD
PSEC18	Machine Learning in Power Grid Applications – II	Wishful E
ESafC1	Electrical Safety	Meeting Room 1
IACC7	Industrial Data Analytics	Meeting Room 2
ESC13	Power Systems – II	Meeting Room 3
EMC7	Flux Switching Machines	Meeting Room 4

## **PO-TAI CHENG PLENARY SESSION**



#### Dr. Jen-Yao Chung

VP, Business Development Inventec Corporation

Topic

Linking Technology to Services: Process to Identify Innovation and AI Cloud Services



#### Dr. Charles Tsai

Delta Electronics Inc. / General Manager

#### Topic

Opportunities and Challenges for Green Hydrogen Application in Taiwan



**Dr. Chin-Chung Wu** Taiwan Power Company

Vice President / Chief Digital Officer

#### Topic

Development and Applications of Distributed Battery Energy Storage System in the Taiwan Power System



#### Dr. Tsung-Rong Chen

China Steel Corporation/ Assistant Vice President, Technology Division

#### Topic

Applications of High-Grade Electrical Steel in Green Energy and Green Transportation

## A Better Me – Women in Engineering Panel Discussion

Join us for a powerful and inspiring WIE session at the 2025 IEEE IAS Annual Meeting as we explore the journey of becoming "A Better Me."

An exciting session designed to empower women with the tools, insights, and support to thrive in both career and life.

#### Why Attend?

- Hear from dynamic speakers and industry leaders
- Participate in interactive panels and discussions
- Network with professionals who share your values and vision
- Walk away with real-world tools for personal and career advancement



### **Speakers**



#### Dr. Katherine A. Kim

Dr. Katherine A. Kim is a Professor of Electrical Engineering at National Taiwan University. She received her B.S. degree from Franklin W. Olin College of Engineering and her M.S.

and Ph.D. degrees from the University of Illinois at Urbana-Champaign. She is an IEEE Industrial Applications Society (IAS) member and an active volunteer in the IEEE Power Electronics Society (PELS), currently serving as Vice President of Global Relations (2024-2025). She previously held roles as PELS Member-at-Large, Women in Engineering Chair, and Constitution and Bylaws Chair. Beyond her research in power electronics and education, she is committed to fostering a more inclusive and equitable technical community, ensuring that individuals of all backgrounds have the opportunity to contribute and thrive in engineering.



#### Dr. Zuhaina Zakaria

Dr. Zuhaina Zakaria is a Professor at Universiti Teknologi MARA (UiTM), Malaysia, where she has served for over 30 years. She holds a PhD in Electrical Engineering from the

University of Strathclyde, Glasgow, a Master's degree from Napier University, Edinburgh, and a Bachelor's degree from Universiti Teknologi Malaysia.

Her research focuses on energy efficiency, power quality, load profiling, and power system analysis. She currently serves as the Dean of the Institute of Postgraduate Studies at UiTM.

An active IEEE volunteer since 1999, she was the Malaysia Section Chair (2015–2016), Founder of the Malaysia WIE Affinity Group, Chair of the IEEE Admission and Advancement Committee (2022–2023), and Region 10 Educational Activities Coordinator (2017–2018). Most recently, she was one of the candidates for 2025-2026 IEEE Region 10 Director-Elect Her contributions have been recognized through multiple awards, including the 2018 IEEE MGA Leadership Award and the 2023 Region 10 Outstanding Volunteer Award.

#### Dr. Tina Chou

Dr. Tina Chou holds a Ph.D. in Electrical Engineering from National Taiwan University and specializes in smart grids, wide-area measurement systems, power restoration, high-

voltage apparatus fault diagnosis, power system modeling and simulation, and artificial intelligence applications to enhance power system safety and resilience. She is currently the Managing Director at InterGrid, where she leads initiatives in system planning, monitoring, control, protection, energy management, and renewable energy integration. She is also actively involved in talent development and career coaching programs to encourage the next generation's participation in the power and energy sector. Dr. Chou has been an active member of the IEEE Power & Energy Society, IEEE Young Professionals, and IEEE Women in Engineering. She also serves as the IEEE PES Women in Power representative in Taiwan.



#### **Tzu-Ting Hsu**

Tzu-Ting Hsu, a mechanical engineering expert with a Master's from National Taiwan University and over 15 years of experience in

She previously led the R&D department for the Electric Motor Business Unit, driving the development of highefficiency traction motors and systems.

Now, as Senior Manager of Actuator System Business Development, Ms. Hsu leads the creation of advanced actuator systems to enhance robotics performance and reliability. Her leadership is instrumental in accelerating the adoption of electric actuators across diverse industries.



#### Dr. Morgan Kiani

Morgan Kiani (S'05–M'05–SM'17) ) is a professor in the engineering department at Texas Christian University where she leads

educational and research efforts in modeling and diagnostics of electric machines and adjustable speed motor drives.

### **Chapters and Membership Department (CMD)**

#### Organizer: Srikanth Pillai, Chair, IAS Chapters and Membership

#### **Overview**

IAS boasts over 540+ chapters across 30+ countries, cementing its significance. This extensive global network fosters unparalleled collaboration and knowledge exchange on an international scale. The Chapters and Membership Department (CMD) is responsible for membership and chapter development, engagement and retention within the society and is widely popular among the IAS members and IAS Society Chapters with its various awards and programs to engage, support and recognize the chapter and member activities. CMD organizes its annual workshop with the invited chapter chairs and colleagues every year at the IAS Annual meeting. The following are the events organized by CMD this year at the IAS Annual Meeting in Taiwan.

#### CMD Annual Workshop: Monday 13:00- 17:00

If you are interested to learn about the activities of IAS Chapters or wondering how to open a chapter, join us!

• Open to all

#### CMD Dinner: Monday 19:30- 21:30)

• By invitation only (Ticketed)

#### CMD Sessions#1: IAS Chapter and Member programs: Tuesday 08:00- 09:00

• Open to all

#### CMD Session#2: IAS Chapter and Member programs: Wednesday 10:30-12:30

• Open to all

#### CMD Technical Session: TBD

- Open to all
- Please check the program schedule

#### Organizer



#### Srikanth Pillai

Chair, IAS Chapters and Membership, Canada

279.52

### **IAS Standard Workshop**

Learn from Experts- Global Application and Utilization of IAS Standards

#### **Overview:**

The IEEE Industry Application Society (IAS) is one of IEEE's most active groups in developing industry standards. These standards are a compilation of best practices, innovative technologies, and experience-based guidelines designed to capture lessons learned over time. They encompass various areas including specifications, operations, maintenance, and the enhancement of performance, quality, and safety.

IAS standards are vital for industries such as Industrial and Commercial Power Systems, Power Conversion, and sectors including petroleum, chemicals, paper, metals, and cement. These standards are developed, updated, and maintained by dedicated volunteers, whose practices influence the standards. Historically, most standards meetings were held in person, which often resulted in a North American-centric perspective due to travel limitations.

However, with technological advancements, global participation is now commonplace. This workshop offers an invaluable opportunity for attendees to learn how to adapt and implement IAS standards in their own regions, taking into account local electrical parameters and environmental conditions. Learn from Standards experts on how s to update IAS published standards for global applications.



Daleep Mohla Chair of the IAS Standards Department



Daryld Ray Crow Chair of the IEEE standard 463



Prof Wei-Jen Lee

University of Texas at Arlington

### **Schedule -At-A Glance**

### Tuesday, June 17<sup>th</sup> 2025

- 07:00 17:00 ----- Registration
- 07:00 8:00 ----- Presenters Breakfast
- 08:00 09:40 ----- Oral and Special Sessions
- 08:00 09:00 ----- CMD Session
- 09:40 10:00----- AM Break
- 10:00 19:00 ----- Expo Open
- 10:30 13:00 ----- Poster Session
- 12:00 14:00 ----- Exhibit Lunch
- 13:00 15:00 ----- YP Session #1
- 10:00 13:00 ----- WIE Event, "LEGO Hands on Outreach"
- 13:00 15:30 ----- Student Poster Session
- 13:00 15:30 ----- Panel Session #1 (Advanced Design & Manufacturing for Future Electric Motors and Power Electronics)
- 15:30 18:00 ----- Student Tour of Taipower D/S ONE
- 15:30 17:00 ----- TC/ Dept Meetings



### LEGO Outreach Event: Begin with the end in mind

#### **Summary of Session/Event Topic(s)**

(Note: This event focuses on outreach to local university students and is unavailable to conference attendees.)

The LEGO outreach event empowers future engineers through an interactive experience that fosters creativity, problem-solving, leadership, and teamwork. It bridges innovation with real-world applications in AI, robotics, smart grids, and sustainable energy.

#### Targeted audience: University undergraduate students

#### **Capacity: 40 - 60 participants**

**Facilitators:** Lead facilitator, **Sam T.H. Yang**, and two associate facilitators from Lego Serious Play Taiwan.

#### Lead facilitator



Sam T.H. Yang Kristiansen & Associates Consulting, Taiwan



Dr. Shiue-Der Lu

National Chin-Yi University of Technology, Taiwan Organiser



Dr. Yanni Zhong

Siemens Gamesa, United Kingdom Organiser



Noreen Anwar Computer Engineer and AI Researcher, Canada



#### **Panel Session #1**

### Advanced Design & Manufacturing for Future Electric Motors and Power Electronics

#### **Overview.**

Advanced Design & Manufacturing for Future Electric Motors and Power Electronics explores the latest innovations shaping the evolution of high-performance, energy-efficient electric machines and their control systems. As industries move toward electrification and sustainability, the development of next-generation electric motors and power electronics has become critical in applications ranging from electric vehicles and robotics to renewable energy and smart grids.

This topic covers advancements in motor topologies (such as axial flux and switched reluctance motors), use of high-performance materials, thermal management techniques, and miniaturized, high-frequency power converters enabled by wide-bandgap semiconductors like SiC and GaN. It also emphasizes modern manufacturing processes, including digital design, additive manufacturing, and automated assembly, which enhance precision, reduce cost, and improve scalability. By integrating design with intelligent control and manufacturing, this field is unlocking new levels of efficiency, performance, and functionality in electric motion systems.

Moderator



**Po-Wei Huang** National Cheng Kung University Taiwan, Taiwan



Christopher Gerada University of Nottingham, United Kingdom



Kenji Nakamura Tohoku University, Japan





Christopher H. T. Lee The University of Hong Kong, Hong Kong



### TAIPOWER D/S ONE Exhibition Visit (Tour)

#### https://service.taipower.com.tw/dsone/en

Convert energy into creativity! Create a sustainable future for Taiwan with green trends and energy transformation.



Location: **TAIPOWER D/S ONE** Address: No. 1, Section 2, Xianmin Blvd., Banqiao District, New Taipei City (Approximately 71 meters from the conference venue, directly across the street) All conference participants are welcome to visit TAIPOWER D/S ONE during its regular opening hours.

#### Visit Schedule

On June 17, students will be able to take a guided tour of the exhibition. At all other times, they may explore the exhibition freely.

Date	Time	Notes
June 17 (Tue)	15:30-18:00	Reserved student session (Fully booked) Meeting point: Registration desk (arrive 10 minutes early)
Other Days	10:00 - 18:00	Self-guided visit available Recommended time: 10:00–16:00

- Exhibition closed on June 16 (Mon)
- English brochures available on-site
- Visit duration: approximately 1 to 1.5 hours

### **Tour Introduction**

#### (1) Taipower D/S ONE

Taipower D/S ONE is a re-purposing of an electric industry acronym meaning "Distribution Substation." In our usage, D/S ONE integrates the concepts of "Design" and "Sustainability" to create a cross-field platform that incorporates education, technology, art and the humanities.

D/S ONE helps the public learn about green energy and explore concepts for a smart future, emphasizing the concept of creating a sustainable future for Taiwan with green trends and energy transformation.

#### (2) The Xinmin Substation

The Xinmin Substation, located in Banqiao District of New Taipei City, houses its electrical facilities on underground levels B2 to B4. It supplies over 600 million kilowatt-hours of electricity annually, ensuring a stable power supply to the Xinban District and the Banqiao transportation hub. The substation is equipped with main transformers boasting a total installed capacity of 240 MVA and a reliable capacity of 180 MVA. In 2023, it reached a peak load of 173 MVA, reflecting a utilization rate of approximately 72.17%. Beyond its primary role in power distribution, the building housing the Xinmin Substation is a multifunctional facility. The above-ground floors feature Taipower D/S ONE and Taipei South District Customer Service Center, seamlessly integrating power supply functions with educational exhibits and public services.

### **Exhibition Highlights**

Taiwan Power Company (hereafter abbreviated as Taipower) built the island's first green energy brand – D/S ONE, through the tangible experiences of ENERGYM, POWERLAB and GALLERY, to transform the concepts, knowledge and aesthetics of intangible power into green smart future, including renewable energy education, interactive exhibitions, and smart electricity experiences, etc., over the past five years since its opening, the exhibition has been dedicated to promoting energy education, attracting a total of over 330,000 visitors. The VR six-axis robotic arm is also the centerpiece of D/S ONE, with the newest topic of Hydropower Plant VR Green Energy, since the opening of this exhibition, more than 25,000 people have experienced the VR facility.

### **Award Achievements**

The significant international and domestic awards won by Taipower in 2024 :

#### 1. Vision ESG Corporate Sustainability Award (May 2, 2024)

Taipower was honored with the "Vision ESG Corporate Sustainability Award" in the Environmental Friendliness category as a model enterprise.

#### 2. Family-Friendly Business Award (May 28, 2024)

Taipower has received the "Family-Friendly Business Award - Benchmark Enterprise Category" from the Taipei City Government for the year 2024.



#### 3. Asia Corporate Social Responsibility Award (June 29, 2024)

Taipower has won two major awards: the "Investment in People Award" and the "Green Leadership Award" for its unique power operation and maintenance talent training base, the "Dalin Simulation Operation Center," and its environmentally friendly "Ecological Power Plant."

#### 4. Taiwan Sustainability Action Award (August 8, 2024)

Taipower has won three major awards—two silver and one bronze—for its achievements in electricity science education, small hydropower projects, and smart electricity solutions. Among 507 submissions from 230 organizations across Taiwan, Taipower was recognized for its efforts in energy transition and ecological integration. This marks the fourth consecutive year of recognition.

#### 5. 2024 Global Power & Utilities Digital Innovation Service Award (November 25, 2024)

Taipower has won the top prize for its "Distributed Resource Intelligent Dispatch and Monitoring System."

#### 6. National Talent Development Award (November 27, 2024)

Taipower's "Power Plant Guardians Training Base" at the Linkou Training Center has won the award for the second time.

#### 7. Sports Promoter Award (November 29, 2024)

Taipower received the Sports Promoter Award for the 15th time and won three major sponsorship awards: the "Gold Medal Award for Sponsorship," the "Long-Term Sponsorship Award," and the "Gold Medal Award for Promotion" for the 10th consecutive year.

### 8. 2024 Buying Power Social Innovation Product & Service Procurement Award (December 6, 2024)

Taipower has received the top prize from the Ministry of Economic Affairs, marking its sixth consecutive year as an award recipient and its second time securing the top honor.

#### 9. Taiwan Corporate Sustainability Award (December 11, 2024)

Taipower was awarded the Platinum Award for Sustainability Reporting and also received recognition in the Outstanding Taiwan Sustainable Enterprise Award and the Creative Communication Leadership Award categories.

#### 10. 2024 Smart Building Excellence Award (December 13, 2024)

Taipower's Headquarters Building has won the Smart Building Excellence Award.

#### 11. 24th Public Construction Golden Quality Award (December 27, 2024)

Taipower's Hsingta Power Plant Gas Unit Renewal and Reconstruction Project has won the Excellence Award for two engineering projects:

- (1) Manufacturing and Installation of Circulating Water Pumps and Auxiliary Equipment.
- (2) 345/161kV Switchyard Monitoring, Protection, and Auxiliary Power Equipment.

### **Introduction Video**







### **Schedule -At-A Glance**

### Wednesday, June 18th 2025

- 07:00 17:00 ----- Registration
- 07:00 8:00 ----- Presenters Breakfast
- 08:00 15:00 ----- Expo Hall Open
- 08:00 10:30 ----- Poster Session
- 08:00 10:00----- IAS Mentoring Session
- 10:30 12:30 ----- CMD Session #2
- 10:00 12:00 ----- Panel Session #2 (Frontiers in Future Power Systems: Intelligent Technologies, Smart Energy Systems, and Grid Modernization)

12:00 - 13:30 ----- Exhibit Lunch

- 13:00 15:00 ----- YP Session #1 (From Graduate Student to Senior Engineer: A Journey of Growth and Expertise)
- 13:00 15:00 ------ Panel Session #3 (Our Efforts Toward Taiwan's Power System Resilience)
- 15:00 15:20 ----- PM Break
- 15:00 16:00 ----- TC/Dept Meetings
- 15:20 17:00 ----- Oral and Special Sessions
- 16:00 17:00 ----- TC/Dept Meetings

19:00 - 21:30 ----- IAS 60<sup>th</sup> Anniversary Celebration & Networking Dinner

### **IAS Roundtable Mentoring Session**

#### Summary of Session/Event Topics

The IAS roundtable mentoring session is meant to provide a forum for students and young professionals (SYP) to connect with experts from industry and academia to learn about the various available career options. The session will be setup in the form of multiple themed tables. Each table will have 1-mentor and a maximum of 5-SYP to facilitate discussion. Each SYP will get a chance to visit 2-different tables of their choice.

Career paths and job functions	Name	Affiliation	Email
Academia	Prof. Wei-Jen Lee	The University of Texas at Arlington	<u>wlee@uta.edu</u>
Industrial Research and Development (R&D)	Industrial Research and Development (R&D) Prof. Yu-Chen Liu Department of Electrical Engineering, National Taipe University of Technology		ycliu@mail.ntut.edu.tw
Workplace Electrical Safety	Mr. Chi-Wen Wu	Ex-Senior General Manager, CTCI. Ex-Senior General Manager, Head of CTCI Electrical Engineering Department, EPCK (Engineering, Procurement, Construction and Commissioning ) services provider	<u>chiwen0120@gmail.com</u>
Technical Sales Engineer	Sales erMOXA Industrial communication devices, Product N		j <u>erry.fang@moxa.com</u>
Project Management Mr. Tony Lee		Head of Grid Integration APAC Offshore wind, Ørsted	TONLE@orsted.com
Consulting Engineer Dr. Chih-Ta Tsai Chief R&D C Renewable		Chief R&D Officer from HD Renewable Energy Co., Ltd.	marco.tsai@hdrenewables.com

Career paths and job functions	Name	Affiliation	Email
Applications Engineer	Prof. Bryan Pong	Department of Electrical Engineering, National Taiwan University of Science and Technology	<u>mhp@mail.ntust.edu.tw</u>
Entrepreneurship and Startups	Dr. Yi-Ting Chou (Tina)	Managing Director, InterGrid	tinachou@ieee.com

- 1. Academia Covers teaching and research in academic institutes.
- 2. Industrial Research and Development (R&D) Covers activities that companies undertake to innovate and introduce new products.
- 3. Workplace Electrical Safety Covers various measures and processes performed by electrical engineers and safety professionals to identify hazards and assess/control risks associated with electrical energy.
- 4. **Technical Sales Engineer** Covers the role of technical sales engineers who provide customers with sales advice and support. Sales engineers work on behalf of a range of industries including manufacturing and electrical utilities, providing technical knowledge to identify new business, negotiate contracts and review sales performance.
- 5. **Product Management** Covers the process of planning, developing, launching, and managing a product throughout its entire lifecycle from ideation to development to going to market.
- 6. **Consulting Engineer** Covers the role of consulting engineers who offer professional engineering services and expertise to both public and private sector organizations. Consulting engineers also act as independent agents and advocates for their clients, and are responsible for finding innovative solutions to technical problems and providing strategic advice to business and management.
- 7. Applications Engineer Covers the role of manufacturer's application engineers who act as a bridge between customers and the manufacturer's R&D team. Application engineers work closely with customers to understand their specific technical requirements to ensure that the products designed by the R&D team meet them.
- 8. Entrepreneurship and Startups Covers the process of developing, organizing, and running a new business.

### **Session Mentors**



**Prof Wei-Jen Lee** University of Texas at Arlington USA



**Prof. Yu-Chen Liu** National Taipei University of Technology, Taiwan



**Chi-Wen Wu** 



Mr. Jerry Fang Product Manager, Taiwan



Mr. Tony Lee



Dr. Chih-Ta Tsai HD Renewable Energy (HDRE), Taiwan



Prof. Bryan M.H. Pong National Taiwan University of Science and Technology, Taiwan



**Dr. Tina Chou** Managing Director at InterGrid, Taiwan



### Panel Session #2 Frontiers in Future Power Systems: Intelligent Technologies, Smart Energy Systems, and Grid Modernization

#### **Overview**

Frontiers in Future Power Systems: Intelligent Technologies, Smart Energy Systems, and Grid Modernization delves into the transformative innovations reshaping how power is generated, managed, and distributed in the 21st century. As the global demand for clean, reliable, and resilient energy grows, future power systems are evolving to integrate renewable energy sources, energy storage, and electric mobility at unprecedented scales. This topic highlights the role of intelligent technologies such as artificial intelligence, machine learning, and advanced data analytics in optimizing grid operations and forecasting energy demand. It also explores smart energy systems that enable real-time monitoring, decentralized control, and adaptive responses to dynamic load conditions. Grid modernization efforts—through digitalization, automation, and cybersecurity—are making the power infrastructure more flexible, sustainable, and responsive to the needs of both consumers and the environment. These frontiers are setting the foundation for a smarter, greener, and more interconnected energy future.



**Prof. Kuo Lung Lian** National Taiwan University of Science and Technology, Taiwan



Prof. Gary Chang National Chung Cheng University, Taiwan





Dr. Chin-Chung Wu Taiwan Power Company, Taiwan



**Prof. Zhenyuan Zhang** University of Electronic Science and Technology of China, China

Speaker



Prof. Wei-Jen Lee University of Texas at Arlington, USA

### Panel Session #3

#### **TP2E Special Session**

### **Our Efforts Toward Taiwan's Power System Resilience**

#### Abstract of the Session

The Taiwan Power and Energy Engineering Association (TP2E) is a non-profit organization committed to advancing the safety, stability, and intelligent management of Taiwan's power and energy systems. By fostering collaboration among industry, government, academia, and research institutions, TP2E promotes technological innovation, supports industrial development, cultivates talent, and strengthens the resilience of the national power grid. This special panel session highlights TP2E's strategic initiatives and key contributions to enhancing Taiwan's power system resilience. The discussion will feature a range of topics, including an introduction to TP2E's mission and activities, developments in demand-side technologies, submarine cable infrastructure for offshore wind power, applications of integrated resource planning (IRP), and the cultivation of T-shaped professionals to meet the interdisciplinary demands of the evolving energy sector.

Moderator



Dr. Yi-Ting (Tina) Chou Secretary General, Taiwan Power and Energy Engineering Association, Taiwan



Prof. Le-Ren Chang-Chien Vice Chair, Taiwan Power and Energy Engineering Association; Professor, National Cheng Kung University, Taiwan

Speaker



Dr. Chueh-Cheng Wu Electricity Group CEO, Taiwan Research Institute, Taiwan

Speaker



**Mr. Kevin Liu** Vice President, Corporate Strategy, Walsin Lihwa Corporation, Taiwan

Speaker



**Prof. Chih-Wen Liu** Distinguished Professor, National Taiwan University, Taiwan



### Agenda

Time	Topics	Speaker
13:00-13:15	<b>Opening remarks: Introduction to TP2E</b> and Its Activities	Dr. Yi-Ting (Tina) Chou
13:15-13:30	Demand-Side Technology Development at ITRI	Prof. Chih-Wen Liu
13:30-13:45	Submarine Cables for Offshore Wind Power	Mr. Kevin Liu
13:45-14:00	Integrated Resource Planning (IRP) Applications in Taiwan	Prof. Le-Ren Chang-Chien
14:00-14:15	Cultivating T-Shaped Talent for the Energy Industry	Mr. Chih-Meng Tsai
14:25-14:45	Panel Discussion	Moderator: Dr. Yi-Ting (Tina) Chou Panelists: All Speakers
14:45-14:55	Q&A	-
14:55-15:00	Closing remarks	Dr. Yi-Ting (Tina) Chou
15:00	Session Adjourned	-



### Young Professional (YP) Session

### From Graduate Student to Senior Engineer: A Journey of Growth and Expertise

#### **Overview**

This session highlights the transformative path from academic foundations to professional excellence in engineering. This topic showcases how continuous learning, mentorship, hands-on experience, and adaptability play key roles in progressing from a graduate student to a seasoned industry expert. It reflects on the milestones, challenges, and critical skills acquired along the way—from mastering technical tools and leading complex projects to contributing to innovation and guiding the next generation of engineers.

#### Preliminary program agenda

#### **Party 1: Presentations:**

- Introduction: 10 minutes
- Speaker 1: 15 minutes
- Speaker 2: 15 minutes
- Speaker 3: 15 minutes
- Speaker 4: 15 minutes
- Q/A: 10 minutes

#### Organizer



Eng. Achref Selmi Airbus Industrie, France



**Prof. Kuo Lung Lian** National Taiwan University of Science and Technology, Taiwan Speaker



Dr. Yung-Fu Huang ITRI, Taiwan



**Prof. Kun-Long Chen** National Taiwan University of Science and Technology, Taiwan Speaker

**Party 2: Round Table discussion:** 

Feedback & Closing: 10 minutes

• Topic 1: 15 minutes

• Topic 2: 15 minutes



Prof. Ping-heng Wu Delta, Taiwan

### Schedule -At-A Glance Thursday, June 19<sup>th</sup> 2025

- 07:00 17:00 ----- Registration
- 07:00 8:00 ----- Presenters Breakfast
- 08:00 09:40 ----- Oral and Special sessions
- 08:00 09:40 ----- Panel Session #4 (Electrical Grid and Transportation in Smart Cities)
- 09:40 10:00----- AM Break
- 10:00 11:40 ----- Oral and special Sessions
- 10:00 11:50 ----- Panel Session #5 (Energy Efficiency and Power Supply Solutions in Modern Data Centers)
- 11:40 11:50 ----- Break
- 12:00 13:20 ----- ZUCKER Luncheon
- 13:20 15:00 ----- Oral and Special Sessions
- 13:20 15:00 ----- Industry Session #1 (Driving the Net-Zero Transition: Taiwan Power Company's Innovative Strategies for a Resilient and Reliable Grid)
- 13:20 15:00 ----- Industry Session #3 (Industry and Transportation of the Future: Lessons Learned and Case Studies)
- 15:00 15:20 ----- PM Break
- 15:20 17:00 ----- Oral and Special Sessions
- 15:20 17:00 ----- Taipower Industry Session #2 (Driving the Net-Zero Transition: Taiwan Power Company's Innovative Strategies for a Resilient and Reliable Grid)

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#### **Panel Session #4**

### Electrical Grid and Transportation in Smart Cities

#### **Overview**

Electrical Grid and Transportation in Smart Cities explores the integration of advanced power infrastructure with intelligent transportation systems to create more efficient, sustainable, and connected urban environments. This topic examines how smart grids—enabled by real-time data, automation, and renewable integration—support the growing energy demands of electric vehicles, charging networks, and mass transit. It also looks at how the synergy between power and transport systems improves urban mobility, reduces emissions, and enhances the quality of life through better planning, energy management, and digital connectivity in modern smart cities.

#### **Moderator**



Wei-Jen Lee ESRC, University of Texas at Arlington, Arlington TX, USA



#### **Kun-Chung Lee**

Controlnet International Inc., R. O. C., Taiwan

Speaker



**Chiu-Liang Liu** Project Director, Key Direction Limited, Taiwan



#### **Lawrence Wang**

New Energy Engineering & Construction Division, Fortune Electric Co., Ltd., R. O. C., Taiwan

**Speaker** 



Hwa-Dong Liu NTNU, R. O. C., Taiwan

#### **Panel Session #5**

### **Energy Efficiency and Power Supply Solutions in Modern Data Centers**

#### **Abstract of the Session**

The growing demand for data processing, storage, and cloud computing services has driven significant changes in the design and operation of data centers. As the backbone of the digital economy, data centers are responsible for an increasing portion of global energy consumption. This proposal seeks to bring together academic experts, industry engineers, and manufacture leaders to discuss the latest developments in data center energy management, power supply systems, energy savings techniques, and system integration for enhanced operational efficiency. The forum will focus on presenting practical solutions to the challenges data centers face in balancing operational demands with sustainability goals, particularly around power usage effectiveness (PUE), system integration, and emerging technologies..



Dr. Charles Tsai Delta Electronics, Taiwan



Dr. Chun-Kai Liu Electronic and Optoelectronic System Research Laboratories (EOSL), Industrial Technology Research Institute (ITRI), Taiwan



Prof. Zhaohao Ding North China Electric Power University, China



Mr. Richard Chan Delta Electronics, Taiwan



Dr. Ming-shan Jeng Green Energy and Environmental Research Laboratories (GEL), Industrial Technology Research Institute (ITRI), Taiwan

#### **Topics of discussion**

- Data Center Energy Management: Best Practices and Challenges
- Data Center Energy Savings: Energy efficiency and cooling system engineering
- Data Center Power Supply Systems: Wide bandgap power devices Application
- Data Center Power System Integration: Power solution and its Trend of AI Data Center

(Prof. Zhaohao Ding) (Dr. Ming-shan Jeng) (Dr. Chun-Kai, Liu) (Mr. Richard Chan)



### Driving the Net-Zero Transition: Taiwan Power Company's Innovative Strategies for a Resilient and Reliable Grid

#### Moderator: Dr. Chin-Chung Wu, Vice President of Taiwan Power Company (Taipower).

He graduated from the Department of Electrical Engineering and Technology at the National Taiwan Institute of Technology in 1990 and received the "Taipower Scholarship," which enabled him to join Taipower. Over the past 35 years, he has held various positions, including Dispatch Section Chief, Planning Section Chief, Central Dispatch Superintendent, Director of the Power Dispatching Department and concurrently Director of the Emergency Supply Center, Senior Professional Engineer, and Spokesperson of Taipower.

In 1991, Dr. Wu passed the National Civil Service Senior Examination, and in 1995, he obtained the Electrical Engineering Professional Engineer Certification. While working at Taipower, he pursued further studies at the Graduate Institute of Electrical Engineering at National Taiwan University of Science and Technology (NTUST), earning his master's degree in 1993 and a Ph.D. in 2003. In 2015, Dr. Wu was selected for Taipower's "Global Vision Program" and attended the Executive Management Program at the London Business School (LBS) in the UK. He has also been assigned multiple times to conduct overseas studies on power dispatching centers, electricity markets, and international conferences.

#### Session #1

#### General abstract of the presentations:

Taipower, a vertically integrated state-owned enterprise, has invested significantly in developing a reliable and sustainable power system for Taiwan. In line with national energy transition goals, Taipower has implemented advanced technologies across its power generation, transmission, and distribution operations. The company has also demonstrated leadership in institutional innovation within the electricity sector, notably through the introduction of a free and open ancillary services market to procure services from private providers and the establishment of a small-scale green energy sales program designed to stimulate Taiwan's renewable energy market. This session will highlight Taipower's efforts and achievements in facilitating the Net-Zero transition.

#### • 13:20 – 13:45: Dr. Yen-Chi Huang, Taiwan Power Company, Taiwan

Type of presentation: Case Study. "A Private Public Partnership Practice for the Grid Resilience Enhancement: Taiwan's Ancillary Service Market".

• 13:45 – 14:10: Dr. Ping-Heng Ho, Taiwan Power Company, Taiwan

Type of presentation: Case Study. "Grid Stability & Energy Storage Applications".

• 14:10 – 14:35: Dr. Hsiao-Wei Chen, Taiwan Power Company, Taiwan

Type of presentation: Case Study. "Driving the Future of Transition: Taipower's R&D Strategies for Innovation and Technology Deployment in the Net-Zero Era".

• 14:35 – 15:00: Extra time for questions & discussion

#### Session #2

#### General abstract of the presentations:

Taipower, a vertically integrated state-owned enterprise, has invested significantly in developing a reliable and sustainable power system for Taiwan. In line with national energy transition goals, Taipower has implemented advanced technologies across its power generation, transmission, and distribution operations. The company has also demonstrated leadership in institutional innovation within the electricity sector, notably through the introduction of a free and open ancillary services market to procure services from private providers and the establishment of a small-scale green energy sales program designed to stimulate Taiwan's renewable energy market. This session will highlight Taipower's efforts and achievements in facilitating the Net-Zero transition.

• 15:20 – 15:45: Ms. Yi-Ping Chen, Taiwan Power Company, Taiwan

Type of presentation: Case Study. "Chasing DREAMS: Mastering the rapidly changing renewable energy".

• 15:45 – 16:10: Mr. Hao-Hsien Hsu, Taiwan Power Company, Taiwan

Type of presentation: Case Study. "H2 Cofiring Demonstration Project on HSINTA GT33".

• 16:10 – 16:35: Ms. Chia-Ling Chen, Taiwan Power Company, Taiwan

Type of presentation: Case Study. "Taiwan's Renewable Energy Market: Opportunities and Challenges for Taipower".

16:35 – 17:00: Mr. Cheng-Ying Ho, Taiwan Power Company, Taiwan
 Type of presentation: Case Study. "Grid enhancing for energy transitions".





#### **Speakers**

#### Moderator



**Dr. Chin-Chung Wu** Taiwan Power Company, Taiwan



**Dr. Hsiao-Wei Chen** Taiwan Power Company, Taiwan



**Dr. Yen-Chi Huang** Taiwan Power Company, Taiwan



**Ms. Yi-Ping Chen** Taiwan Power Company, Taiwan



**Dr. Ping-Heng Ho** Taiwan Power Company, Taiwan



**Ms. Chia-Ling Chen** Taiwan Power Company, Taiwan



Mr. Hao-Hsien Hsu Taiwan Power Company, Taiwan



**Mr. Cheng-Ying Ho** Taiwan Power Company, Taiwan

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#### **Industry Sessions #3**

### Industry and Transportation of the Future: Lessons Learned and Case Studies

Moderator: Prof. Marco Di Benedetto, University of Roma Tre, Italy.

#### 13:20 – 13:40: Dr. Adil Usman, Varroc Engineering Limited, India

Type of presentation: Best Practices. "Industrial Transition to Advanced Electric Machines for Next Generation Electric Vehicles".

#### **Abstract of the Presentation:**

For the last few decades, significant steps have been adopted to transform and improve electric transportation or e-mobility systems widely. The transition to electric road transport technologies requires an electric-traction drive system (ETDS) to offer improved performance and capabilities. ETDS is continuously being advanced to provide feasible solutions for high-performance traction motor drive systems. This industry presentation will address critical challenges and opportunities in enhancing and developing advanced electric machines for electric vehicle (EV) applications by adopting emerging technologies into industry practices. The core issue centers on achieving better performance, higher efficiency, and reliability while minimizing environmental impact and cost. Speaker/s from Varroc Engineering Limited, India will share their perspectives, in identifying actionable pathways for advancing electric motor drive technology for next-generation electric vehicles. This industry presentation will therefore aim to highlight key innovations, identify barriers, and propose actionable strategies to accelerate advancements in electric motor technologies.

#### 13:40 – 14:00: Dr. Chaima Frih, ENISO, Tunisia

Type of presentation: Case Study. "AI-Driven Predictive Maintenance for Energy Optimization in Industrial Environments".

#### **Abstract of the Presentation:**

In today's energy-intensive industrial landscape, optimizing power consumption while ensuring operational efficiency is a growing challenge. This presentation explores a real-world case study on the implementation of Al-driven predictive maintenance to enhance energy efficiency and reduce downtime in industrial environments. The case study will outline the initial challenges, including unoptimized power usage, unpredictable equipment failures, and high operational costs. It will then detail the integration of IoT sensors, machine learning algorithms, and real-time data analytics to anticipate failures and optimize energy consumption. Key lessons learned will include insights into technology adoption barriers, data-driven decision-making, and return on investment (ROI) evaluation, offering practical strategies for professionals seeking to implement AI solutions in industrial settings.

Attendees will gain a deeper understanding of how predictive maintenance can lead to cost savings, improved equipment longevity, and reduced energy waste. Whether you are a plant manager, engineer, or technology strategist, this session will provide actionable takeaways to drive smart manufacturing initiatives and sustainable energy management in the industrial sector.

#### 14:00 – 14:20: Dr. Abdesh Khan, Rockwell Automation Cambridge, ON, Canada

Type of presentation: Case Study. "Performances of medium voltage current source inverter (CSI) drives for heavy industry applications with heavy duty and ultra heavy-duty load profiles".

#### **Abstract of the Presentation:**

Heavy industry applications such as Banbury rubber mixers, feeder conveyors and extruders have load profiles such as heavy duty and ultra heavy-duty types, which are different than the conventional fan, pump and compressor load profiles. These applications demand high peak torque with fast rate of change of torque, high starting torque, and constant torque below the rated motor speed. When these applications are operated by the variable frequency drives, various operational challenges are experienced and therefore, modifications and adjustments are performed on the drives control loops to adapt to the end user load profiles. Three case studies will be presented where the medium voltage current source inverter (CSI) drives were installed to successfully operate the Banbury rubber mixers, feeder conveyors and extruders in automotive tire manufacturing, oil and gas mining, and EV battery recycling plant, respectively. These case studies will highlight the operational challenges that were encountered at the fields and then will discuss the related modifications and adjustments performed on the medium voltage CSI drive controls to meet the load profiles at the heavy industries. Finally, performance summary of the medium drive CSI drive will be presented for the selected heavy industry case studies.

#### 14:20 – 14:40: Dr. Abdesh Khan, Rockwell Automation Cambridge, ON, Canada

Type of presentation: Case Study. **"WBG power electronics - design, development, and demonstration projects for off-road heavy-duty vehicles**".

#### **Abstract of the Presentation:**

This presentation will cover publicly known information on the 200 kW 1050 VDC silicon carbide (SiC) inverter technology development project in John Deere. The SiC inverter converts vehicle engine power into electrical power needed for the permanent-magnet-motor based electric powertrain used in heavy-duty construction and mining vehicles. The presentation will cover design, development, and test verification of WBG technology deployed in the successful realization of a power-dense (43 kW/Liter) high-temperature (suitable for 115 degrees C coolant) high-efficiency (> 98% over entre range of coolant) SiC dual-inverter.



#### 14:40 – 15:00: Dr. Brij N. Singh, John Deere Fellow, USA

Type of presentation: Best Practices. "Machine-Readable Datasheets: Spinning the Wheels of Design Automation in Power Electronics".

#### **Abstract of the Presentation:**

The rapid electrification of society and the emergence of new semiconductor technologies are putting increasing pressure on engineers to deliver power electronic solutions with shorter development cycles. Yet, today's design process remains slow, iterative, and often yields suboptimal prototypes. Two major obstacles stand in the way of true design automation: the lack of high-quality, structured data, and the fragmented, multi-vendor nature of the design process. This presentation introduces the concept of the machine-readable datasheet as a foundational enabler for automation in power electronics. We analyze current pain points in data access across key stakeholders—device manufacturers, simulation tool providers, and end users—and highlight how file-based measurement silos and model misuse hinder progress. By establishing a standardized, updatable data interface between manufacturers and the design ecosystem, we unlock automation workflows such as model synthesis, component comparison, and early-stage design exploration. Attendees will gain insight into how structured data exchange can shift power electronics development from verification-centric to synthesis-driven, paving the way toward faster, more robust design cycles.





Dr. Marco di Benedetto University of Roma Tre, Italy

Speaker



Dr. Adil Usman Varroc Engineering Limited, India

Speaker



Dr. Brij N. Singh John Deere, USA



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