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## **Final Program**

(as performed)

2017 IERE-TNB Putrajaya Workshop

Technologies reshaping the electricity supply industry



Masjid Putra, Putrajaya

November 20 (Monday) – November 23(Thursday) 2017  
Putrajaya, Malaysia

Organized by  
TNB Research and IERE



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# Technologies reshaping the electricity supply industry

## *About the theme*

The electricity supply industry has been facing many challenges worldwide. The issues includes challenges to produce, transmit, and use energy in an environmentally acceptable and sustainable manner. At the same time, the electricity supply industry needs to reduce its costs by improving operating efficiency and business practices with digital world becoming the forefront tools in reshaping the operating model in the future. In addition, the industry also needs to ensure customer satisfaction beyond the traditional supply reliability and power quality. Hence, research and development on new and enabling technologies plays a major role in shaping the future directions of electricity supply industry.

## *Who should attend?*

The workshop is intended for experts actively involved in the selected themes, from IERE members and non-members, as well as all those interested in the evolution of the electrical power industry and the technology development and business development opportunities associated to this evolution. IERE will invite prominent speakers for keynote speeches.

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## Outline Schedule:

Monday	– November 20, 2017	Welcome Reception
Tuesday	– November 21, 2017	2017 IERE-TNB Putrajaya Workshop Dinner
Wednesday	– November 22, 2017	2017 IERE-TNB Putrajaya Workshop Social Event (Optional)
Thursday	– November 23, 2017	Technical Tour (Optional)

## General Theme: Technologies reshaping the electricity supply industry

The world of commodities of oil, gas and metal soaring have showed a very substantial disruption over the past 15 years. With the technological innovation such as the adoption of robotics, artificial intelligence, Internet of things (IoT) and data analysis rising rapidly that eventually transform the resources utilization.

Recently, as more energy efficiency technologies takes place on the demand side, the consumption of energy becoming less intense. In addition, technological advances are helping to bring down the cost of renewable energies, such as solar and wind energy, contributing to its greater role in global energy mix. On the supply side, the advancement of technology also raising the ability of these companies to deploy wider range of technologies in future.

The volatility of energy resources is expected to takes place in coming years, with the prices may diverge widely. This trend will strongly depends on the adoption of technology innovation, energy producers and policy makers, as such will reshape the electricity supply industry for the future.

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## Session Themes:

### >Session 1: The road to low carbon economy

In achieving Paris Agreement, it has been stated that the inclination trends of carbon emission and carbon intensity need to be curbs and balance with the development, implementation of renewable energy as well as carbon capture, storage and utilization (CCUS) technology. As such will leads the road to low carbon economy. This session enables the speakers to share the research findings on low carbon economy and related matters. Potential topics includes:

- Renewable Energy
- Carbon Capture, Storage & Utilization
- Energy Efficiency & Energy Infrastructure
- Institutional frameworks / roadmap

### >Session 2: Customer experience at the heart of next generation operating model

New technology and digital age is reshaping client involvement in practically every part. As the technology enter the markets, it comes with drastically new offers and disturbing the conventional ways that organizations deal with customer. The next generation operating model for customer experience will required setting a high bar for simplicity, personalization, and interactivity. This session enables the speakers to share the experienced and research findings on next generation operating model with customer experience will the pinnacles factor. Potential topics include:

- Mobile apps & Smart home
- Smart Meter & Smart Grid
- Strategy for customers satisfaction.
- Modifications of fundamental practices.
- Alteration the way employees work.

### >Session 3: Next generation operating model for the digital world

The next generation operating model for the digital world required a companies to be more agile, quicker to react and more effective to deliver great customer experiences, take advantage of new technologies to cut cost, improve quality and transparency, and build value. Such a way in achieving it by providing compelling customer experiences at lower cost. This session enables the speakers to share the experienced and research findings on the next generation operating model for the digital world and related matters. Potential topics include:

- Lean process design
- Digitization
- Intelligent process automation
- Advance analytics
- Business process outsourcing

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## >Session 4: Enabling technologies & others

In supporting the renewable energy technologies, certain form of enabling technologies is required and shared similar weightage for the advancement and deployment of renewable energy technologies. The enabling technology will facilitating the successful integration of renewable electricity generation. The potential topics include:

- Energy storage
- Energy management system technologies
- Advance distribution network management
- Advance system control
- End-use technologies and electric vehicles

## Poster Session

There is no poster session in this Workshop

## Program :

### **IERE Welcome Reception**

*Monday, November 20, 2017*

*Putrajaya Shangri-La, Grand Garden Pavilion/Garden, Level 1, Putrajaya*

17:30 –	Registration
18:00 – 20:00	IERE Welcome Reception

### **2017 IERE-TNB Putrajaya Workshop**

- Workshop Day 1 -

*Tuesday, November 21, 2017*

*Putrajaya Shangri-La, Dewan Putra Perdana , Level 1, Putrajaya*

08:30 – 09:00	Registration
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## Opening Session

09:00 – 09:15	O-1	Opening Address <i>Dr. Sung Hwan Bae</i> <i>(Vice Chair of IERE, President of KEPCO Research Institute, Korea)</i>
09:15 – 09:30	O-2	Welcome Address <i>Mr. Loo Kok Seng</i> <i>(Senior General Manager (Corporate Planning and Sustainability), TNB, Malaysia)</i>

## Keynote Addresses

09:30 – 10:00	K-1	‘Ocean Energy: The New Frontier in South East Asia’ <i>Prof. Omar Yaakob</i> <i>(Marine Technology Centre, Universiti Teknologi Malaysia, Malaysia)</i>
10:00 – 10:30		<u>Coffee Break</u>

## Session 1 : The road to low carbon economy

*Chair person: Dr. Ming-Wei Yang, Senior Research Specialist, Taiwan Power Research Institute (TPRI), Taiwan*

- 10:30 – 10:55 S1-1 ‘Technology Adoption Strategy for Improving Electricity Utility Company’s Performance’  
*Dr. Zainal Arifin*  
*(Senior Manager, Technology Development and Standardization, PLN, Indonesia)*
- 10:55 – 11:20 S1-2 ‘OSAKI CoolGen Project - Demonstration of Integrated Coal Gasification Fuel Cell Combined Cycle’  
*Mr. Kazuya Egusa*  
*(Staff Deputy Manager, General Affairs & Planning Dept., Osaki CoolGen Corporation, Japan)*
- 11:20 – 11:45 S1-3 ‘Improvement of CO<sub>2</sub> Dissolution in Microalgae Culture by Applications of Nano-Material’  
*Mr. Afifi Zainal*  
*(Researcher, Green Technology & Renewable Energy Unit, TNB Research, Malaysia)*
- 11:45 – 12:10 S1-4 ‘Promoting Circular Economy to a Coal-fired Power Plant: Opportunities and Challenges’  
*Ms. Liyana Yahya*  
*(Researcher, Green Technology & Renewable Energy, TNB Research, Malaysia)*
- 12:10 – 12:35 S1-5 ‘Enhancement of Post-combustion Carbon Capture via Adsorption Technology’  
*Ms. Noraziah Muda*  
*(Principal Researcher, Low Carbon Power Generation, Advanced Research Program, TNB Research, Malaysia)*
- 12:35 – 12:50 S1-6 ‘Energy saving and CO<sub>2</sub> reduction by boiler control optimization system "ULTY-V plus”’  
*Dr. Toru Yamashita*  
*(Manager, Coal & Environment Research Laboratory, Coal Business Department, Idemitsu Kosan Co., Ltd., Japan)*
- 12:50 – 14:00 Lunch Break

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## Session 1 : The road to low carbon economy (continued)

*Chair person: Dr. Ming-Wei Yang, Senior Research Specialist, Taiwan Power Research Institute (TPRI), Taiwan*

- 14:00 – 14:25 S1-7 ‘Development of an Auto-Milling Control System to Improve Coal Power Plant Combustion Efficiencies’  
*Mr. Hamdan Hassan*  
*(Specialist Combustion & Performance, Generation Unit, TNB Research, Malaysia)*
- 14:25 – 14:50 S1-8 ‘Co-firing with a high-ratio of wood biomass to make the most existing coal-fired power plant’  
*Ms. Emi Ohno*  
*(Manager, Boiler Basic Design Department, IHI Corporation, Japan)*
- 14:50 – 15:10 Coffee Break

## Session 2 : Customer experience at the heart of next generation operating model

*Chair person: Prof. Hideo Ishii, Waseda Univ., Japan*

- 15:10 – 15:35 S2-1 ‘Smart Meter and Distribution Data Integration and Practices’  
*Dr. Wenpeng Luan*  
*(Professor, Power Distribution Department, China EPRI, China)*
- S2-2 (missing number)
- 15:35 – 16:00 S2-3 ‘Smart Energy House Project to aim at optimizing domestic energy consumption’  
*Mr. Nobuhisa Sakai*  
*(Senior research engineer, R&D Center, Kansai EPCO, Japan)*
- 16:00 – 16:25 S2-4 ‘Smart Sizing: A tool for long term planning of smart distribution networks’  
*Mr. François Depierreux*  
*(Product Manager, Energy Transition, Tractebel Engineering Ltd., Thailand)*



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- 16:25 – 16:50 S2-5 ‘Wireless Virtual Private Network Technologies for Smart Distribution and Utilization Service’  
*Mr. Delong Yang*  
(*Engineer, Information & communication Department, China EPRI, China*)
- 16:50 – 17:15 S2-6 ‘Recent examples of efforts by low-carbon countries to expand their renewable energy growth rate’  
*Dr. Joji Kawano*  
(*Deputy Senior Research Associate, Research Department, JEPIC, Japan*)
- 19:30 – 22:30 Dinner [*Putrajaya Shangri-La, Grand Garden Pavilion, Level 1*]

## **2017 IERE-TNB Putrajaya Workshop**

- Workshop Day 2 -

**Wednesday, November 22, 2017**

*Putrajaya Shangri-La, Dewan Putra Perdana, Level 1, Putrajaya*

### Keynote Addresses

- 08:30 – 09:00 K-2 ‘Decentralization and Cooperative Management in Electric Energy System’  
*Prof. Hideo Ishii*  
(*Secretary General, Advanced Collaborative Research Organization for Smart Society (ACROSS), Waseda University, Japan*)

### Session 3 : Next generation operating model for the digital world

*Chair person: Dr. Zainul Asri Mamat, Managing Director, TNB Research, Malaysia*

- 09:00 – 09:25 S3-1 ‘Direct Load Analysis and Modeling System’  
*Mr. Azlan Abdul Rahim*  
(*Head of Unit, Utility Automation Unit, TNB Research, Malaysia*)
- 09:25 – 09:50 S3-2 ‘Operation Big Data based Failure Probability Assessment for Risk Based Maintenance of Fossil Power Boiler Tube’  
*Mr. Myungsoo Park*  
(*Senior Researcher, Clean Power Generation Lab., KEPCO RI, Korea*)

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- 09:50 – 10:15 S3-3 ‘Development of Metrology for Digital Measurement Technology in SGCC’  
*Mr. Zili Xu*  
(*R&D Senior Engineer, Metrology Department, China EPRI, China*)
- 10:15 – 10:40 S3-4 ‘R&D of energy Internet of Things in Korea -Towards KEPCO IoT technology-’  
*Ms. Myung-hye Park*  
(*General Researcher, Smart Power Distribution Lab., KEPCO RI, Korea*)
- 10:40 – 11:05 S3-5 ‘How to Promote Energy Conservation Behaviors based on Smart Meter Data Analytics: Case Studies on Energy Advice Reports for Residential and Commercial Customers’  
*Dr. Hidenori Komatsu*  
(*Research Scientist, Energy Innovation Center, CRIEPI, Japan*)
- 11:05 – 11:25 Coffee Break

#### Session 4 : Enabling technologies & Others

*Chair person: Dr. Wenpeng Luan, China EPRI, China*

- 11:25 – 11:50 S4-1 ‘Effect factors of sandstorm on insulator and hardware damage of power transmissions in deserts’  
*Dr. & Prof. Chaohai Zhang*  
(*Chief Scientist, Wuhan Nari, NARI Group, China*)
- 11:50 – 12:15 S4-2 ‘A Dynamic Optimization Sizing Tool for Waste Heat Recovery-Gas Turbine Inlet Cooling’  
*Mr. Saiful Adilin Bin Shokri*  
(*Researcher, Generation Unit, TNB Research, Malaysia*)
- 12:15 – 12:40 S4-3 ‘Forecasting and Component Investigation of Respirable Particulate Matter (PM10 and PM2.5) from Dust Dispersion’  
*Ms. Radin Diana R. Ahmad*  
(*Principal Researcher, Built Environment and Climate Change Unit, TNB Research, Malaysia*)
- 12:40 – 14:00 Lunch Break

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## Session 4 : Enabling technologies & Others (continued)

*Chair person: Dr. Wenpeng Luan, China EPRI, China*

- 14:00 – 14:25 S4-4 ‘Maximizing Energy with Power to Gas’  
*Mr. Alan Kneisz*  
*(Director Business Development, Hydrogenics Corp., Canada)*
- 14:25 – 14:50 S4-5 ‘Reduction of Biomass Gasification Power Plant Maintenance Problem using Catalysts Mixture of Coal Bottom Ash:Dolomite’  
*Dr. Nor Fadzilah Othman*  
*(Principal Researcher, Renewable Energy Section, TNB Research, Malaysia)*
- 14:50 – 15:15 S4-6 ‘Applications of secondary-battery technologies for realizing a low-carbon society’  
*Dr. Tomohiko Ikeya*  
*(Associate Vice President, Materials Science Research Laboratory, CRIEPI, Japan)*
- 15:15 – 15:40 S4-7 ‘Research of SOC Estimation Algorithm for LiFePO<sub>4</sub> Battery based on Differential Curves’  
*Mr. Shouping Xu*  
*(Senior Engineer, Energy Storage and Electrotechnics Department, China EPRI, China)*
- 15:40 – 16:05 S4-8 ‘A study on detection of distribution facilities deterioration with the active thermography method’  
*Mr. Akimori Matsuo*  
*(Chief, Customer Supply Network Group, Energy applications Research and Development Center, Chubu EPCO, Japan)*
- 16:05 – 16:30 S4-9 ‘Early Detection and Localization of Thermal Faults from Acoustic Emission Measurement for TNB In-Service Power Transformers’  
*Dr. Yasmin Hanum Md Thayoob*  
*(Senior Engineer, Asset Management (Strategy & Design Standard), Tenaga Nasional Berhad, Malaysia)*
- 16:30 – 16:50 Coffee Break

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## Moderated panel discussion by session chairs

16:50 – 17:40

Moderated panel discussion on the various approaches as shown in the sessions

Moderator:

*Dr. Mohd Hariffin Boosroh*

*(General Manager (Generation & Environment), TNB Research, Malaysia)*

Panelist:

*Session Chairs*

*Session 1: Dr. Ming-Wei Yang, TPRI, Taiwan*

*Session 2: Prof. Hideo Ishii, Waseda Univ., Japan*

*Session 3: Dr. Zainul Asri Mamat, TNB Research, Malaysia*

*Session 4: Dr. Wenpeng Luan, China EPRI, China*

## Closing Remarks

17:40 – 17:45

*Dr. Zainul Asri Mamat*

*(Managing Director, TNB Research, Malaysia)*

17:45 – 17:50

*Dr. Takao Watanabe*

*(Secretary General, IERE Central Office, Japan)*

## Social Event (optional)

Putrajaya lake cruise with dinner

19:00 - 20:00

Move to Dataran Putra; the biggest square near Putra Mosque and Prime Minister's Office, by bus

20:00 - 22:00

Putrajaya lake cruise with dinner

Around 22:30

Return to Putrajaya Shangri-La Hotel

- Time schedule may be changed.
- The maximum number of participants is up to 50.
- Admission will be allotted in order of application.
- Only Halal foods are served and no alcoholic drinks.
- Shuttle bus service is available between Shangri-La hotel and the dinner cruise boarding point.



## Technical Tour (Optional) - Workshop Day 3 -

*Thursday, November 23, 2017*

Visiting TNBR research facilities

(For participants who have booked the optional Technical Tour)

07:30-08:00	Gathered at Level 2, Shangri-La Hotel for bus arrival <b>Bus will depart at 08:00</b>
08:30-09:00	Arrival of visitors at TNB Research Welcome speech and Safety briefing
09:00-10:40	Visit to laboratories Gas Insulation Analysis Laboratory Cable Laboratory High Voltage and Testing Laboratory IEC 61850 System Verification & Simulation Laboratory Materials Laboratory
10:40-11:30	Enjoying some light refreshments the exhibition booth
11:30-12:30	Visit to Integrated Gasification Combined Cycle (IGCC) Pilot Plant
12:30-13:30	Lunch at D'Tasik Restaurant (Floating restaurant) Moving back to Putrajaya Shangri-La Hotel
Around 14:00	Arriving at Putrajaya Shangri-La Hotel

- Time schedule may be changed.
- The maximum number of participants is up to 40.
- Admission will be allotted in order of application.
- It is advisable that visitors do not take pictures in the laboratory
- Visitors will be split into two groups during the visit
- Each group will be accompanied by General Managers & Senior Managers of TNBR



## Registration

(a) On-line Registration

URL: [https://www.iere.jp/cgi-bin/event\\_form/event\\_form\\_entry.cgi](https://www.iere.jp/cgi-bin/event_form/event_form_entry.cgi)

or

(b) Please submit a registration form (Format 1, Page 19) to IERE Central Office by e-mail.

**Deadline: October 23, 2017**

## Registration Fee

Please make payment of following fee **No later than October 23, 2017** by credit card payment or bank transfer.

The Registration fee will cover attendance at both workshop days (include lunches & refreshments at coffee breaks), welcome reception on November 20, dinner on November 21 and conference package:

<b>IERE members</b>	<b>:</b>	<b>US\$ 350.-</b>
<b>Non-members</b>	<b>:</b>	<b>US\$ 400.-</b>
<b>Academic participants</b>	<b>:</b>	<b>US\$ 200.-</b>

*Recommended options\**

**Social Event (optional) : US\$ 60.**

Putrajaya lake cruise with dinner on November 22

**Technical Tour (optional): US\$ 50.-**

Visiting TNBR research facilities on November 23

\* Both offers are on a first-come-first-served basis.



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## Payment

On-line Credit Card Payment and Bank Transfer are available.

**Deadline: October 23, 2017**

### (a) On-line Credit Card Payment

If you prefer using your credit card for the payment of registration fee, please contact to this URL: [https://www.iere.jp/Payment/paypal\\_17WS.html](https://www.iere.jp/Payment/paypal_17WS.html)

### (b) Bank Transfer \*

Name of the Bank:	The Bank of Tokyo-Mitsubishi UFJ, Ltd.
Name of the Branch:	Seijo branch
Name of the account:	IERE Central Office
Account Number:	0068198
Bank address:	15-1 Seijo 6-chome, Setagaya-ku, Tokyo, 157-0066 JAPAN
SWIFT code:	B O T K J P J T

\* Remittance charge, Lifting charge, Correspondent charge and other charges should be paid by participants.

## VISA (Please do not forget!) :finished

For participants from some countries needing a VISA to enter Malaysia, please consult with travel agent in your country for the details.

If you need an Invitation Letter\*, please refer to 'Invitation Letter for VISA' on Page 20.

\*TNB Research may be able to issue an invitation letter for participants who need to apply for Visa. It may take a few weeks to complete the procedures in TNB Research, so please submit the form as soon as possible.

Disclaimer: TNBR reserves the right to fulfill or decline, at TNB Research's discretion, requests for letters of invitation for visa application support purpose.

## Conference Venue & Accommodations

### >Conference Venue

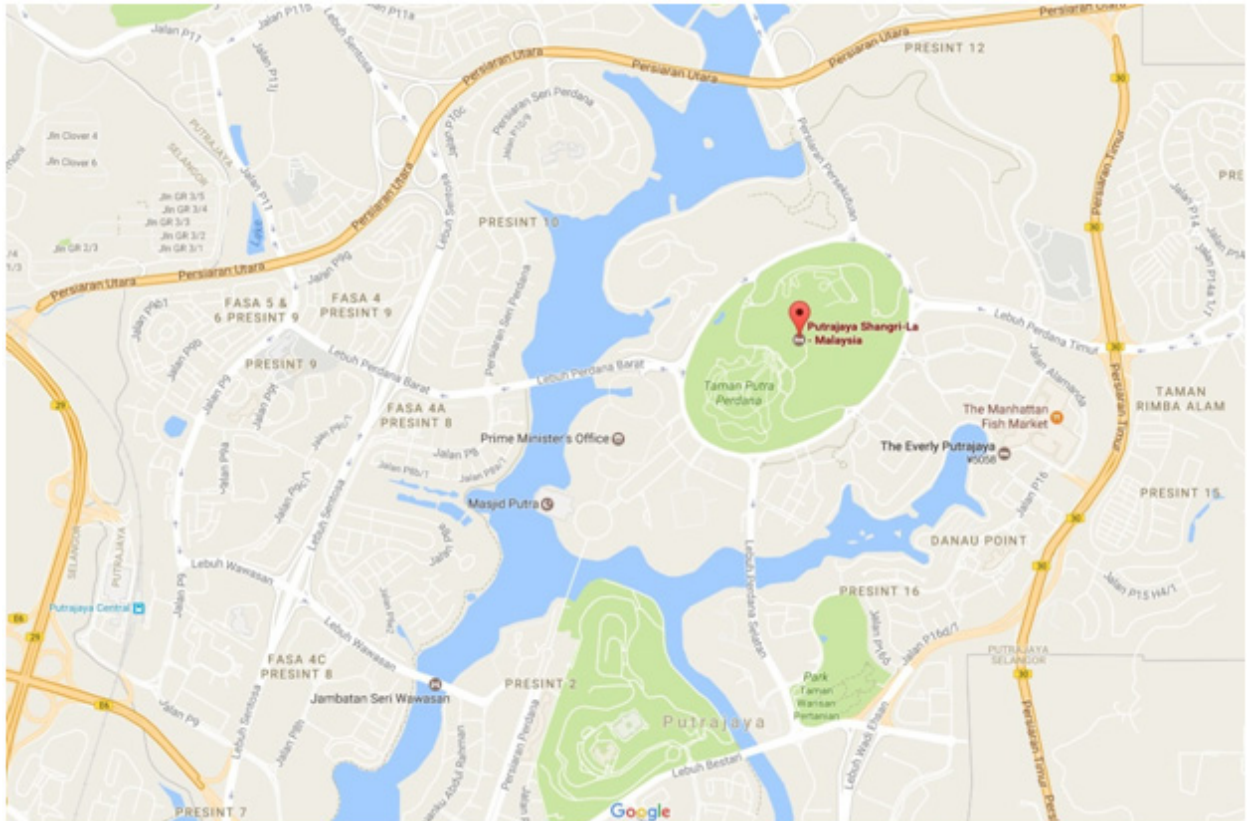
Putrajaya Shangri-La, Putrajaya

Location: Taman Putra Perdana Presint 1, Wilayah Persekutuan, Putrajaya, 62000, Malaysia

Website: <http://www.shangri-la.com/kualalumpur/putrajayashangrila/>







Map URL: <https://goo.gl/maps/fcy1WeHTeM42>

## >Accommodations

Putrajaya Shangri-La, Putrajaya

Location: Taman Putra Perdana Presint 1, Wilayah Persekutuan, Putrajaya, 62000, Malaysia

Website: <http://www.shangri-la.com/kualalumpur/putrajayashangrila/>

A block of rooms at special rates has been reserved for conference participants.

[How to book *Putrajaya Shangri-La* at special rates?: **finished on November 1<sup>st</sup>, 2017**]

- Visit our website

<https://www.iere.jp/events/workshop/2017-malaysia/venue.html>

- At the part of the site “Venue”, please download the ‘*Hotel Reservation Form(pdf file)*’ and follow the instructions to fill out the form;

- Complete the form, sign it and send it by e-mail to the indicated mail-address of *Putrajaya Shangri-La Hotel*

\* Please make reservations as early as possible as the number of rooms blocked at the special rate is limited.

\*\* To book at ‘Special Rates’, reservation should be completed by November 1st, 2017.

\*\*\* Please be sure to read cancellation policy of the form before application.

## Submission Items & Deadlines

### For Participants [including speakers]

Items	Format No.	Deadline	Submit To:
Registration Form (Page 19)	1	October 23, 2017	Dr. Takao Watanabe <a href="mailto:register@iere.jp">register(at)iere.jp</a> [Please substitute (at) with @]
VISA Form (If necessary, Page 20)	5	October 23, 2017 (It takes a few weeks to issue)	Ditto
Registration Fee	—	October 23, 2017	Please refer to Page 13
Social Event Fee [optional]	—	October 23, 2017	Ditto
Technical Visits Fee [optional]	—	October 23, 2017	Ditto

- Central Office plans to distribute 'Participants list' with conference kit to facilitate communication among participants. The list will contains '1. Name', '2. Position, Department', '3. Company/ Organization etc.' and e-mail address of this format. If you DON'T want to open these information, please check at appropriate boxes of registration format.

### For Speakers

Items	Format No.	Deadline	Submit To:
Abstract	2	August 31, 2017	Dr. Takao Watanabe <a href="mailto:register@iere.jp">register(at)iere.jp</a> [Please substitute (at) with @.]
Speaker's Information	3	October 23, 2017	
Copyright Permission	4	October 23, 2017	
Presentation Slides (PowerPoint file)	—	October 23, 2017	

- Abstract and presentation file are uploaded IERE's website and open to the public after the workshop.
- The medium of communication is English.

Registration Form (No. 1) can be **DOWNLOADED** from  
<https://www.iere.jp/events/workshop/2017-malaysia/register.html>

The formats (No.2-5) can be **DOWNLOADED** from  
<https://www.iere.jp/events/workshop/2017-malaysia/forspeakers.html>

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## Information on Presentation:

### **Oral Session:**

Speakers may only use PowerPoint files for their presentations.

Speakers at all sessions are required to arrive at the session at least 15 minutes in advance of the first paper and be seated at the front of the room.

Speakers are expected to get in contact with the Session Chair and confirm the PowerPoint files before the session begins.

The session room will be equipped with a laptop computer loaded with Microsoft software and a LCD projector.

Each presentation is strictly limited to 25 minutes max, which includes approximately 5 minutes for Q&A.

PowerPoint files for the presentations are uploaded on IERE's website approximately one week before the workshop for participants to download.

IERE will post the presentations on the IERE website after the workshop for general public viewing.

### **Poster Session:**

There is no poster session in this Workshop

### **Language**

The medium of communication is English.



## REGISTRATION FORM

Format 1

### Technologies reshaping the electricity supply industry

2017 IERE-TNB Putrajaya Workshop  
November 20-23, 2017, Putrajaya, Malaysia

Please type  at appropriate boxes, then return this form by email **NO LATER THAN October 23, 2017** to:  
IERE Central Office at Email: **register(at)iere.jp** [Please substitute (at) with @] / Fax: +81-3-3488-5100

1. Name	<input type="checkbox"/> Prof. <input type="checkbox"/> Dr. <input type="checkbox"/> Mr. <input type="checkbox"/> Ms. <input type="checkbox"/> Other, Please specify:		
	First Name	Family Name	
2. Position, Department			
3. Company/ Organization etc.			
4. Address	Zip Code	Country/Region	
5. Contact Information	E-mail		
	Phone Number	+	Fax Number +
6. I will contribute to a presentation	<input type="checkbox"/> Yes <input type="checkbox"/> No Title: _____		
7. Reception/Dinner attendance <b>not mandatory</b>	Registration Fee covers the welcome reception and dinner (as well as lunch on Nov. 21 & 22). For restaurant reservations, please let us know your attendance. <input type="checkbox"/> <b>Welcome Reception on Nov. 20</b> <input type="checkbox"/> <b>Dinner on Nov. 21</b> <input type="checkbox"/> <b>None</b>		
8. Accompanying Person	If your family accompany you on reception/dinner, please write her or his name and title (Mr./Ms./ ) _____		
9. Registration Fee [Nov. 20-22]	Registration Fee [ Participants including speakers should pay registration fees. ] <input type="checkbox"/> <b>US\$ 350 : IERE Member</b> <input type="checkbox"/> <b>US\$ 400 : Non-IERE Member</b> <input type="checkbox"/> <b>US\$ 200 : Academic Participant</b> Note: When participation is canceled irrespective of the reason after October 23, 2017, Registration Fee might be charged or not be reimbursed.		
10. Social Event (Optional) [Nov. 22]	<b>US\$ 60 per person</b> : Putrajaya lake cruise with dinner <input type="checkbox"/> <b>Yes : Number of participants _____ (including accompanying persons)</b> <input type="checkbox"/> <b>No</b> * The offer is on a first-come-first-served basis up to 30 persons.		
11. Technical Tour (Optional) [Nov. 23]	<b>US\$ 50 per person</b> : Visiting TNBR research facilities <input type="checkbox"/> <b>Yes : Number of participants _____ (including accompanying persons)</b> <input type="checkbox"/> <b>No</b> * The maximum number of participants is up to 40. ** Admission will be allotted in order of application.		
12. Payment Amount	Total : US\$ _____ (Registration Fee & Technical Tour Fee)		
13. Payment Method [no later than Oct. 23]	<input type="checkbox"/> <b>Credit Card : URL for On-line Credit Card Payment :</b> <a href="https://www.iere.jp/Payment/paypal_17WS.html">https://www.iere.jp/Payment/paypal_17WS.html</a> <input type="checkbox"/> <b>Bank Transfer</b> * IERE Central Office will send you the invoice.		
14. Invitation letter for VISA	<input type="checkbox"/> I need an invitation letter for Visa application. <input type="checkbox"/> <b>No</b> * Please refer our Announcement Document.		
15. Information from IERE	Do you agree with receiving e-mail notice on future activities/IERE E-mail Magazine from IERE Central Office? <input type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>No</b>		

**Central Office plans to distribute 'Participants list' with conference kit to facilitate communication among participants. The list will contains '1. Name', '2. Position, Department', '3. Company/ Organization etc.' and e-mail address of this format. If you DON'T want to open these information, please type '✓' at appropriate boxes shown below.**

**Position, Department**  **e-mail address**



Format 5

# Invitation Letter for VISA

If participants need an invitation letter, please type  and fill out the form and send to: IERE Central Office at Email: register(at)iere.jp [Please substitute (at) with @].

<input type="checkbox"/> <b>I need an invitation letter for Visa application.</b> * TNB Research may be able to issue an invitation letter for participants who need to apply for Visa. It may take a few weeks to complete the procedures in TNB Research, so please submit the form as soon as possible.  Disclaimer: TNB Research reserves the right to fulfill or decline, at TNB Research's discretion, requests for letters of invitation for visa application support purposes.			
Name on passport	First Name:	Middle Name:	Family Name:
Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female		
Nationality			
Date of birth			
Passport No.			
Occupation			
Company/ Organization etc.			
Expected date of entry			
Duration of stay			
Expected date of departure			
Colloquium Participation	<input type="checkbox"/> November 20, Welcome Reception		
	<input type="checkbox"/> November 21, 2017 IERE-TNB Putrajaya Workshop (Day 1)		
	<input type="checkbox"/> November 22, 2017 IERE-TNB Putrajaya Workshop (Day 2)		
	<input type="checkbox"/> November 23, Technical Tour		

**IERE Members List (as of November 1, 2017)**

Canada	Powertech Labs Inc.		
China	CEPRI	GPG	NARI
France	Enedis	ENGIE	
Germany	EnBW	innogy SE	RWE TI
Hong Kong	CLPRI		
Indonesia	PLN		
Iran	NRI		
Japan	Chubu EPCO	Chugoku EPCO	CRIEPI
	FEPC	Fuji Electric Co., Ltd.	Hitachi
	Hokkaido EPCO	Hokuriku EPCO	IHI
	J-POWER	JAPC	Kansai EPCO
	Kyushu EPCO	MHPS	Mitsubishi Electric
	NGK	Sumitomo Electric	Shikoku EPCO
	Tohoku EPCO	TEPCO	TOSHIBA
Korea	KEPCO	KEPCO E&C	KERI
	KESRI*		
Malaysia	TNB		
Mexico	INEEL	Prolec GE	
Philippines	APC	MERALCO	
Singapore	SPPG		
South Africa	Eskom	PIESA	
Spain	Gas Natural Fenosa	REE	
Taiwan	TPC		
Thailand	EGAT	EURC*	
U.S.A.	EPRI	Light the World Inc.	

\*: Academia

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## About TNB Research

TNB Research, better known as TNBR, has been the in-house solution provider for Tenaga Nasional Berhad (TNB) since 1993. Situated in Bangi, Selangor, the R&D Centre provides a centralised, one-stop centre for technical solutions and innovation.

Streams of solution developed under various Applied Research projects have been introduced to our parent company. These solutions have contributed towards improving the overall operational performance of the company in areas such as power plant unplanned outage rate (UOR), transmission system minutes, distribution SAIDI and many others.

While continuing effort on operational improvement initiatives in TNB, TNBR is now embarking on various Advanced Research projects in positioning TNB to be an early adopters of promising technologies.



## About TNB

Tenaga Nasional Berhad (TNB) is the largest electricity utility in Malaysia and one of the largest in the region, with an asset base totaling RM110.7 billion. With a history spanning 65 years, TNB is also the most experienced energy player in the country, responsible in keeping the lights on for all residents of Peninsular Malaysia, Sabah and Labuan.

## About IERE

IERE is an organization for exchanging electricity and energy related cutting-edge technologies and R&D information among its members from the electricity & energy supply industry, equipment provider businesses, academic research, government, etc. This unique platform is of great help for executives, senior managers, engineers, and researchers who are responsible for R&D and solutions. It is a worldwide, non-profit organization, established as “International Electric Research Exchange” in 1968.



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1<sup>st</sup> issue: November 8, 2017

2<sup>nd</sup> issue: November 13, 2017: Time schedule of Social Event is slightly changed

As performed: November 26, 2017