
Final Program

2023 IERE-CSIRO Brisbane Hydrogen Workshop

Hydrogen in Clean Energy Transition

In-Person Event



The Story Bridge in Brisbane, Queensland, Australia

May 22–25, 2023

Brisbane, Australia

Organized by IERE and CSIRO

Hydrogen in Clean Energy Transition

About the theme

The world is seeking for various technological pathways to support the decarbonisation of electricity, transport, and industrial sectors. Hydrogen has emerged as a real opportunity in this context: it can be used as a transport fuel, as a long-term energy storage medium, and as a vector for distribution of renewable energy from those countries with significant resources to those with fewer resources, as well as it can be utilised as a chemical reagent and reductant in various industries. While hydrogen can play a role in supporting electricity grids with greater penetration of variable renewable energy it also offers the opportunity for the electricity sector to be coupled more closely with transport and industry to support significant decarbonisation around the globe.

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.

Who is IERE

IERE is a worldwide, non-profit organisation—established in 1968 as International Electric Research Exchange—serving executives, senior managers, engineers, and researchers who are responsible for electricity and energy related R&D and solutions.

Who is CSIRO

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is an Australian Government agency responsible for scientific research. CSIRO addresses major scientific and technology challenges across a number of fields, including energy and heavy industry.

Outline Schedule

Monday, May 22, 2023	Welcome Reception
Tuesday, May 23, 2023	2023 IERE-CSIRO Brisbane Hydrogen Workshop Official Dinner
Wednesday, May 24, 2023	2023 IERE-CSIRO Brisbane Hydrogen Workshop
Thursday, May 25, 2023	Technical Visit (Optional) Social Event (Optional)

Opening Session:

Opening Address:	MINO Yoshiaki (IERE Chair)
Welcome Speech:	David HARRIS (CSIRO, Australia)

Plenary Session:

Keynote Speeches:	MITSUSHIMA Shigenori (Professor, Yokohama National University, Japan)
	Ian MACKINNON (Professor, Queensland University of Technology, Australia)
	Patrick LAVERY (Contributor, International Flame Research Foundation, England)

Technical Session 1: Hydrogen Supply

As hydrogen is an integral part of the transition to clean energy, the reliable supply of hydrogen at scale required to support this transition is critical. The hydrogen supply chain should address not only the scale issues, but also should be sustainable (with low carbon footprint) and commercially affordable. This session will address the topics related to ensuring the hydrogen supply for clean energy transition.

Potential topics include:

1. Biological hydrogen production
2. Biomass and waste conversion
3. Direct hydrogen carrier production
4. Electrolysis
5. Fossil fuel conversion
6. Natural hydrogen
7. Photochemical and photocatalytic processes
8. Thermal water splitting

9. Separation materials and technologies

Technical Session 2: Hydrogen Storage and Distribution

Establishing large-scale hydrogen energy value chains depends on the cost and efficiency of hydrogen storage and transport. This session will explore technological solutions for storage of hydrogen at various scales and applications, such as for grid stabilisation, seasonal energy storage, or long-distance transportation.

Potential topics include:

1. Liquid hydrogen
2. Ammonia
3. LOHCs
4. Underground storage
5. Pipeline storage
6. Pipeline materials and performance
7. Pipeline design and integrity management
8. Pipeline and network operations
9. Hydrogen embrittlement
10. Hydrogen compression

Technical Session 3: Cross-Cutting Areas

Emerging of hydrogen industry also results in several questions to be addressed to support this industry. Understanding the environmental impact of large-scale hydrogen production and transport, as well as ensuring that this new industry will have a social acceptance is very important for the deployment of hydrogen-base technologies. The appropriate policies and regulations, as well as safety standards and certification processes will ensure the smooth transition. It also requires good understanding of the socio-technical risks and techno-economic evaluation of various options.

Potential topics include:

1. Environmental impacts
2. Safety and standards
3. Public acceptance
4. Socio-technical risks
5. Techno-economic evaluation
6. Energy systems integration
7. Sector coupling
8. Supply chain integration
9. Policy and Regulations
10. Hydrogen certification schemes

Technical Session 4: Hydrogen Utilization

A feature of the emergence of hydrogen energy systems is the diversity of potential application pathways and industrial sectors. Commonly described as ‘Power-to-X’, there are also opportunities

for industrial sectors not traditionally associated with hydrogen to play a role in production (such as the waste sector) or utilization for decarbonization (such as agriculture). This session will explore the different ways that various industry sectors can come together to both support ‘hydrogen at scale’ as well as decarbonization of industries such as metals production.

Potential topics include:

1. Electricity—grid balancing & stability, grid integration, stationary fuel cells, distributed power generation, engines & turbines
2. Export potential—shipping technology development, loading/offloading, infrastructure optimisation from production site to port loading site
3. Gas networks and appliances—appliance testing, metering, hydrogen gas separation
4. Heat storage—covers thermal batteries based on metal hydrides
5. Industrial heat processes—steel, cement, metals refining, etc.
6. Industrial feedstock processes—ammonia, synthetic fuels, and methanol production
7. Mobility—mobile fuel cells; onboard storage; refuelling stations; bunkering: land, sea, air mobility forms; vehicle/engine improvements

Program

Session structure, speakers and timetable are subject to change.

Welcome Reception

Monday, May 22, 2023
Stamford Plaza Brisbane, Riverside Garden

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

2023 IERE-CSIRO Brisbane Hydrogen Workshop - Workshop Day 1 -

Tuesday, May 23, 2023
Stamford Plaza Brisbane, Grand Ballroom

08:00–09:00	Registration
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Opening Session

09:00–09:10	O-1	Opening Address MINO Yoshiaki (IERE Chair)
09:10–09:20	O-2	Welcome Speech David HARRIS (CSIRO, Australia)

Plenary Session: Keynote Speeches

09:20–09:50	K-1	Hydrogen energy systems based on renewable electricity and its fundamental research MITSUSHIMA Shigenori (Professor, Yokohama National University, Japan)
09:50–10:20	K-2	Hydrogen transition: opportunities for step change in energy efficiency of national and regional infrastructure Ian MACKINNON (Professor, Queensland University of Technology, Australia)

10:20–10:50	K-3	Use of hydrogen in European industry – challenges and progress – a summary of IFRF TOTeM 48 Patrick LAVERY (Contributor, International Flame Research Foundation, England)
10:50–11:20		Coffee Break

Technical Session 1: Hydrogen Supply (Part 1)

Chair Person: Sebastian HEUER
(Process Engineer, RWE Technology International GmbH, Germany)

11:20–11:40	S1-1	Opportunities and Challenges of Hydrogen Production as a Pathway for Decarbonization Noraziah MUDA (Head Renewable Energy and Green Technology, TNB Research, Malaysia)
11:40–12:00	S1-2	Green Hydrogen Generation: Construction of a 6 MW Power-to-Gas System in South Germany Reihaneh ZOHOURIAN (Senior project manager, Energie Baden-Württemberg (EnBW), Germany)
12:00–12:20	S1-3	J-POWER's experiences in clean hydrogen production Hiroshi HAYAKAWA (Department Director, Research & Development Dept., J-Power, Japan)
12:20–12:40	S1-4	Biomass and Waste Gasification for Carbon-Free Hydrogen Production Daniel ROBERTS (Research Program Director, CSIRO, Australia)
12:40–13:40		Lunch Break

Technical Session 1: Hydrogen Supply (Part 2)

Chair Person: David WONG
(CSIRO, Australia)

13:40–14:00	S1-5	Techno-economic evaluation of electrolyzers for hydrogen production Sebastian HEUER (Process Engineer, RWE Technology International GmbH, Germany)
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14:00–14:20	S1-6	New solid oxide electrolyser for hydrogen production Sarab GIDDEY (Principal Research Scientist, Group Leader, Thermal & Electrochemical Technologies, CSIRO, Australia)
14:20–14:40	S1-7	Natural hydrogen exploration – State of knowledge and focus on the Intra-cratonic systems Ema FRERY (Team Leader, Reservoir Imaging and Modelling, CSIRO, Australia)
14:40–15:00	S1-8	Preliminary assessment of possibility for hydrogen production in geological formations Marina PERVUKHINA (Senior Principal Research Scientist, Rock Properties, CSIRO, Australia)
15:00–15:30		Coffee Break

Technical Session 2: Hydrogen Storage and Distribution

Chair Person: Mina NISHI
(Research Scientist, CRIEPI, Japan)

15:30–15:50	S2-1	Integrated Hydrogen-based micro-grid systems Evan GRAY (Professor, Griffith University, Australia)
15:50–16:10	S2-2	SPERA Hydrogen™ – Chiyoda’s Hydrogen Supply Chain Andrew TAN (President & CEO, Chiyoda Oceania Pty Ltd, Australia)
16:10–16:30	S2-3	Establishment of International Liquefied Hydrogen Supply Chain Masaya HASHIMOTO (Senior Staff Officer, Hydrogen Strategy Division, Kawasaki Heavy Industries, Japan)
16:30–16:50	S2-4	Application of ortho-para hydrogen conversion to hydrogen liquification process Liangguang TANG (Senior Experimental Scientist, Gas Processing, CSIRO, Australia)
16:50–17:10	S2-5	Solid state compressors – challenges and solutions Sandy EDWARDS (Engineer, Hydrogen & Gasification Innovation, CSIRO, Australia)

- 17:10–17:30 S2-6 **Technoeconomic Analysis of Hydrogen Storage and Battery Energy Storage System (BESS) for Energy Storage of Excess Solar PV Generation**
Aizuddin bin MOHD SOPIAN
(Senior Manager (Generation), Tenaga Nasional Berhad, Malaysia)
- 19:00–21:00 Official Dinner at River Room, Stamford Plaza Brisbane

2023 IERE-CSIRO Brisbane Hydrogen Workshop

- Workshop Day 2 -

Wednesday, May 24, 2023

Stamford Plaza Brisbane, Grand Ballroom

Technical Session 3: Cross-Cutting Areas

- Chair Person: Sarb GIDDEY
(Principal Research Scientist, Group Leader, Thermal & Electrochemical Technologies, CSIRO, Australia)
- 09:00–09:20 S3-1 **Study on global hydrogen demand-supply including detailed industry sectors using the energy model GRAPE**
Yuki ISHIMOTO
(Senior Researcher, The Institute of Applied Energy, Japan)
- 09:20–09:40 S3-2 **Effects of transactions on balancing market on hydrogen production cost in Japan**
Kohei IWATSUBO
(Kansai EPCO, Japan)
- 09:40–10:00 S3-3 **Research on Scenario Construction and Economic Analysis for Electric-hydrogen Coupling**
Jiandong KANG
(Division Director, China Electric Power Research Institute Co., China)
- 10:00–10:20 S3-4 **Techno-economic Assessment of Green Hydrogen Systems**
Tara HOSSEINI
(Senior Research Scientist, Techno-economics for Decarbonisation, CSIRO, Australia)
- 10:20–10:40 S3-5 **Cost analysis of blue hydrogen production in 2030**
Mina NISHI
(Research Scientist, CRIEPI, Japan)
- 10:40–11:00 S3-6 **Analysis and Prospect of Global Hydrogen Energy Policy and Technology**

Jinming Wan
(Engineer, China Electric Power Research Institute Co., China)

11:00–11:30 Coffee Break

Technical Session 4: Hydrogen Utilization (Part 1)

Chair Person: Fan CHANG
(Director, Business Strategy – Generation, Generation Business Group, CLP, Hong Kong)

11:30–11:50 S4-1 **Hydrogen Utilization in Maintaining Reliable and Cost-Effective Electricity Generation**
Mohamad Hakim ZAINUDDIN
(Manager (Generation), Tenaga Nasional Berhad, Malaysia)

11:50–12:10 S4-2 **Research Trends on Green Hydrogen Fuel Cell Utilization on Power System Using Bibliometric Analysis and Visualization Based on The Scopus Database in 1958-2022**
Handrea Bernando Tambunan
(Research Engineer, PLN Research Institute, Indonesia)

12:10–12:30 S4-3 **Development of Pulverized Coal/Ammonia Co-firing Technology with Single-burner and Multi-burner Furnaces**
Kazuki TAINAKA
(Research Scientist, CRIEPI, Japan)

12:30–12:50 S4-4 **Accelerating hydrogen market development in EU and US**
Manabu HIRANO
(Research Director, Japan Electric Power Information Center, Japan)

12:50–13:10 S4-5 **The Feasibility of Green Hydrogen for Co-Firing Gas fired Power Plants in Indonesia**
Zainal ARIFIN
(Chief Certification Centre, PLN, Indonesia)

13:10–14:10 Lunch Break

Technical Session 4: Hydrogen Utilization (Part 2)

Chair Person: Daniel ROBERTS
(Research Program Director, CSIRO, Australia)

14:10–14:30	S4-6	Study of Hydrogen Co-firing in an Existing GTCC Power Plant Naoya KUMAZAWA (Electric Power R&D Center, Chubu EPCO, Japan)
14:30–14:50	S4-7	The Emergent of Hydrogen Fuelling: Indonesian Youth's Knowledge and Acceptance Benny SUSANTO (Senior Officer, PLN Research Institute, Indonesia)
14:50–15:10	S4-8	Technical Analysis of Hydrogen Co-firing: Case Study in Indonesia Power Plant Eko HARIYOSTANTO (Senior Officer, PLN, Indonesia)
15:10–15:30	S4-9	Comparative Analysis of Hydrogen-Ready Gas Turbines in Peninsular Malaysia and the Techno-economic viability Joel PRAVEEN MAKENTHIRAN (Manager (Generation), Tenaga Nasional Berhad, Malaysia)
15:30–15:50	S4-10	Transformation to Hydrogen Firing in Black Point Power Station - A Technology and Readiness Review Towards 2030 and Beyond Fan CHANG (Director, Business Strategy – Generation, Generation Business Group, CLP, Hong Kong) Antony HO (Senior Engineer, Generation Engineering, Generation Business Group, CLP, Hong Kong)
15:50–16:10		Coffee Break
Panel Session		Relevance of Hydrogen R&D to the Real World
16:10–17:15		Moderator: Nikolai KINAEV (Leader–Hydrogen Future Science Platform, CSIRO, Australia) Panelists: David HARRIS (CSIRO, Australia) Patrick LAVERY (Contributor, International Flame Research Foundation, England) Barry MACCOLL (Senior Regional Manager–Africa, SE Asia, Australia & NZ, EPRI, US) Ian MACKINNON (Professor, Queensland University of Technology, Australia) MITSUSHIMA Shigenori (Professor, Yokohama National University, Japan)

Andrew TAN
(President & CEO, Chiyoda Oceania Pty Ltd, Australia)

Results of Survey for R&D Collaboration on Hydrogen

17:15–17:35 TAKEI Katsuhito
(Secretary General, IERE)

Closing Remarks

17:35–17:40 Nikolai KINAEV
(Leader–Hydrogen Future Science Platform, CSIRO, Australia)

17:40–17:45 TAKEI Katsuhito
(Secretary General, IERE)

Technical Visit (Optional)

Thursday, May 25, 2023

Visiting CSIRO Queensland Centre for Advanced Technologies (QCAT)

(For participants who have booked the optional Technical Visit)

09:00	Meeting Point: Stamford Plaza Brisbane Bus Transfer: 30 minutes
09:40–11:40	CSIRO QCAT Duration: about 2 hours
11:50	Group A: Social Event -Lunch Group B: Return to Hotel without Lunch Bus Transfer: 30 minutes
12:20	Group B: Arrival at Stamford Plaza Brisbane
12:30	Group A: Departure to Social Event Bus Transfer: 30 minutes

- Time schedule may be changed.
- The maximum number of participants is up to 70.
- Please register with Workshop registration.
- Admission will be allotted in order of application.

CSIRO QCAT, Pullenvale, Queensland

The Queensland Centre for Advanced Technologies is a collaboration between the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the State Government of Queensland. The establishment of the Centre flows from an agreement between the Australian and Queensland Governments in 1990 to expand and diversify the research and development activities undertaken by CSIRO in Queensland. The Centre commenced operation in 1992 and was officially opened in 1993. Following the construction of new facilities, Stage Two was opened in 2000.

QCAT is a world class research and development precinct recognised for the excellence of its contribution to the mining, energy and manufacturing industries. Our mission is to generate products and processes of high value to Australia's mineral, energy resources, and manufacturing industries with particular focus on those resources and industries located in Queensland. Today, QCAT is home to over 400 researchers.



Queensland Centre for Advanced Technologies

Social Event (Optional)

Thursday, May 25, 2023

Visiting Lone Pine Koala Sanctuary and Lunch

(For participants who have booked the optional Technical Visit)

12:30	Meeting Point: CSIRO QCAT (Group A of Technical Visit) Bus Transfer: 30 minutes
13:00–15:00	Lone Pine Koala Sanctuary Duration: about 2 hours
15:00	Departure to Stamford Plaza Brisbane Bus transfer: 30 minutes
15:30	Arrival at Stamford Plaza Brisbane

- Time schedule may be changed.
- Please register and finish payment with Workshop registration.

Lone Pine Koala Sanctuary

Lone Pine Koala Sanctuary is the world's first and largest koala sanctuary, home to over 100 koalas and 70 species of other Australian native animals.

As Brisbane's premier wildlife attraction, Lone Pine is the perfect place to get up close and personal with Australia's furry, feathery, and scaly friends in a natural, intimate setting.

With a daily schedule full of shows, presentations, photo opportunities and free-range kangaroo feeding, there is something for guests of all ages.

Don't miss the new 360-degree crocodile viewing dome, where you can come face to face (or tooth to tooth!) with Australia's largest apex predator, the saltwater crocodile!

Lone Pine Koala Sanctuary is accredited by the Zoo and Aquarium Association for positive animal welfare. The health and wellbeing of the sanctuary's animals are at the forefront of everything they do, along with their extensive research and conservation efforts.

Lone Pine is open every day from 9 am-5 pm and just 12 kilometres from Brisbane CBD. The sanctuary can be accessed by car, bus, or Mirimar River Cruise.



<https://www.queensland.com/au/en/things-to-do/attractions/p-56b262122cbcbe7073adc7cf-lone-pine-koala-sanctuary>

Call for Papers (Closed)

to: register@iere.jp

IERE Central Office

2-11-1 Iwado Kita, Komae-shi, Tokyo 201-8511, Japan

Phone: +81-3-5438-1717 Fax: +81-3-3488-5100

<< **Presentation Files Submission: No later than April 28, 2023**>>

As for the **format of the abstract**, please refer to “Events” page on IERE website.

<https://www.iere.jp/events/workshop/2023-brisbane/forspeakers.html>

You are kindly requested to submit presentation files (PowerPoint) of the Oral Session and Poster Session for the 2023 IERE-CSIRO Brisbane Hydrogen Workshop via E-mail by **April 28, 2023**.

- Presentation file will be uploaded to IERE website and opened to all participants before the Workshop.
- The official language of the IERE Workshop is English.

Registration

Total number of participants is limited to 90 persons.

If possible, please register using the method (a) below. If you are unable to use Google Forms due to limitations in your system environment or other reasons, please register using method (b) below.

(a) On-Line Registration (Google Forms)

URL: <https://forms.gle/h75WJ7tberY8W99b9>

or

(b) Submit a Registration Form (Format 1) to IERE Central Office via E-mail

Photos and videos taken by IERE at this Event will be used for publication on websites and/or in magazines. Therefore, at the time of your application of the registration, IERE deems you have granted IERE the right to use the above photos or videos.

Registration Fee

The Registration fee will cover attendance at both workshop days (include lunches & refreshments at coffee breaks), welcome reception on May 22, official dinner on May 23 and conference package:

IERE Members:	AUD 900
Non-IERE Members:	AUD 1,350
Academic Participants:	AUD 900
Students:	AUD 675

Recommended Options

Technical Visit (Optional) May 25 a.m.: Free of Charge

· CSIRO Queensland Centre for Advanced Technologies (QCAT)

*The maximum number of participants is up to 70.

** This offer is on a first-come-first-served basis.

Social Event (Optional) May 25 p.m.: AUD 100

· Lone Pine Koala Sanctuary and Lunch

*The maximum number of participants is up to 70.

** This offer is on a first-come-first-served basis.

Payment

On-Line Credit Card Payment is available.

[On-Line Credit Card Payment]

URL: <https://events.csiro.au/2023-IERE-CSIRO>

VISA

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

<https://immi.homeaffairs.gov.au/visas/getting-a-visa/visa-finder/visit>

If you need an Invitation Letter*, please refer to 'Invitation Letter for VISA Request Form'.

* CSIRO 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 CSIRO, so please submit the form as soon as possible.

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

Conference Venue & Accommodations

Stamford Plaza Brisbane, Queensland

Location: Edward St, Brisbane City, Queensland, Australia

Website: <https://www.stamford.com.au/spb>

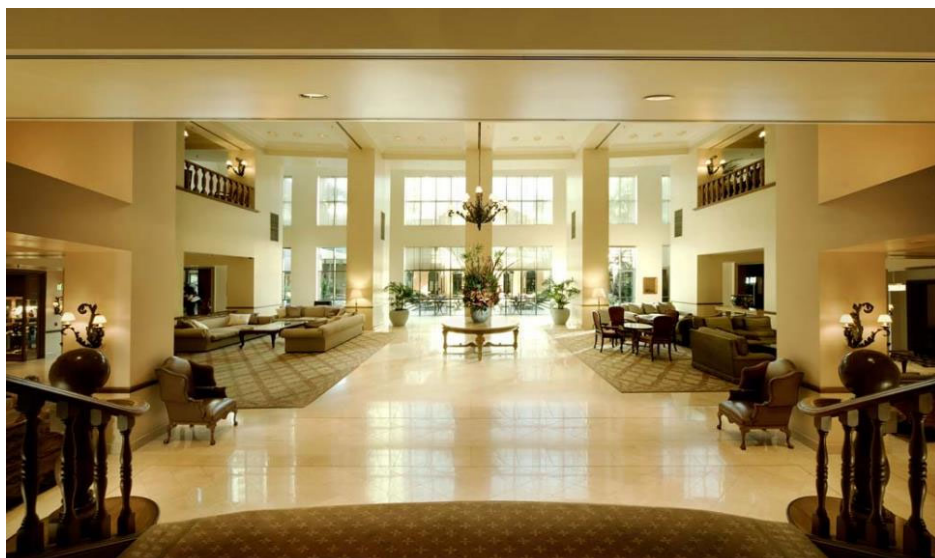
Rooms of the Stamford Plaza at special rate (AUD 230 per night) has been available for Workshop participants between May 21–26, 2023.

- Visit this website for reservation at special rate.

<https://bit.ly/42Knr4Q>

* Please make reservations as early as possible if you need.

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





<https://goo.gl/maps/3kW4xkBeBaYD7eXz6>

Submission Items & Deadlines

For Participants [including Speakers]

Items	Format No.	Deadline/ Limitation	To:
Registration Form	1	Limited to 90 Participants	register(at)iere.jp [Please substitute (at) with @]
Invitation Letter for VISA Request Form (If necessary)	5	April 14, 2023 (It takes a few weeks to issue)	Ditto
Registration Fee	—	Limited to 90 Participants	Please refer to Page 14
Technical Visits Fee [Optional]	—	Limited to 70 Participants	Ditto
Social Event Fee [Optional]	—	Limited to 70 Participants	Ditto

The formats (No.1 and 5) can be downloaded from

URL: <https://www.iere.jp/events/workshop/2023-brisbane/register.html>

For Speakers

Items	Format No.	Deadline	To:
Abstract	2	March 17, 2023	register(at)iere.jp [Please substitute (at) with @]
Speaker's Information	3	April 28, 2023	
Copyright Permission	4	April 28, 2023	
Presentation Slides (PowerPoint File)	—	April 28, 2023	

The formats (No.2 to 4) can be downloaded from

URL: <https://www.iere.jp/events/workshop/2023-brisbane/forspeakers.html>

Speakers are kindly requested to submit their Speaker's Information, Copyright Permission and Presentation Slides (PowerPoint File) **by April 28, 2023**.

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 an LCD projector.

Each presentation is strictly limited to 20 minutes max., which includes approximately 5 minutes for Q&A.

Abstract files will be uploaded on IERE website and opened.

Presentation files will be uploaded on IERE website and opened to all participants before the Workshop and to the participants of the Workshop and IERE members after the Workshop.

Poster Session

There is no poster session in this Workshop.

Language

Working language is English.

IERE Members List (as of April 1, 2023)

Australia	CSIRO		
Canada	Hydro-Québec	Powertech Labs	
China	CEPRI	GPG	NARI
Czech	CEZ		
Finland	Vaisala		
France	Enedis	ENGIE	
Germany	E.ON	EnBW	RWE TI
Hong Kong SAR	CLP		
Indonesia	PLN		
Iran	NRI		
Israel	IEC		
Japan	Chubu EPCO	Chugoku EPCO	CRIEPI
	FEPC	Fuji Electric	Hitachi
	Hokkaido EPCO	Hokuriku EPCO	IHI
	J-POWER	JAPC	Kansai EPCO
	Kyushu EPCO	MHI	Mitsubishi Electric
	NGK	Sumitomo Electric	Shikoku EPCO
	Tohoku EPCO	TEPCO	TOSHIBA
Malaysia	TNB		
Mexico	INEEL	Prolec GE	
Netherlands	TenneT		
Norway	SINTEF		
Pakistan	Karachi Electric		
Philippines	APC	MERALCO	
Singapore	SPPA		
South Africa	Eskom	PIESA	
South Korea	Hyundai Electric	KEPCO	KERI
	KOEN	KOMIPO	KOWEPO
	LS Electric		
Spain	NATURGY		
Taiwan	TPC		
US	EPRI	SwRI	

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.

<https://www.iere.jp>

About CSIRO

CSIRO is Australia's national science agency, undertaking research in support of Australian industry and the wider community. CSIRO's purpose is to solve the greatest challenges through innovative science and technology. This is done through our impact science lines of business: Agriculture and Food, Health and Biosecurity, Data61, Energy, Land and Water, Manufacturing, Mineral Resources, and Oceans and Atmosphere, as well as through our National Facilities and Collections lines of business where we manage infrastructure and biological collections for the benefit of research and industry. CSIRO maintains more than 50 sites across Australia and in France, Chile and the United States, employing about 5500 people. We collaborate with research institutes from around the world, and we partner with industry to solve problems and commercialize new technologies.

CSIRO's Energy research is supporting a transition to a net zero emissions energy future. We do this by focusing on new and emerging renewable energy technologies, including hydrogen energy systems, while supporting the use of gas as a key transition fuel. We develop technologies to help our electricity grid evolve to support these low emissions technologies, and we explore the environmental and economic implications of the energy transition.

<https://www.csiro.au/>

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