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

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2023 IERE-CSIRO Brisbane Hydrogen Workshop
- Workshop Day 1 -
Tuesday, May 23, 2023
Stamford Plaza Brisbane, Grand Ballroom

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Opening Session

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Plenary Session: Keynote Speeches

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<tr>
<td>09:20–09:50</td>
<td>K-1</td>
<td>Hydrogen energy systems based on renewable electricity and its</td>
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<td>MITSUSHIMA Shigenori</td>
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<td>09:50–10:20</td>
<td>K-2</td>
<td>Hydrogen transition: opportunities for step change in energy</td>
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<td>efficiency of national and regional infrastructure</td>
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<td></td>
<td></td>
<td>Ian MACKINNON</td>
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<td>(Professor, Queensland University of Technology, Australia)</td>
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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 electrolysers for hydrogen production
Sebastian HEUER
(Process Engineer, RWE Technology International GmbH, Germany)
14:00–14:20 S1-6 New solid oxide electroliser for hydrogen production
Sarb 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 liquefaction 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)

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.
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.

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:

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<tr>
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<td>AUD 900</td>
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<td>Non-IERE Members:</td>
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<td>Academic Participants:</td>
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<td>Students:</td>
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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.


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.
* Please make reservations as early as possible if you need.
** Please be sure to read cancellation policy of the form before application.
Submission Items & Deadlines

For Participants [including Speakers]

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<tr>
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<td>Social Event Fee [Optional]</td>
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The formats (No.1 and 5) can be downloaded from URL: https://www.iere.jp/events/workshop/2023-brisbane/register.html

For Speakers

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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.
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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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