

Newsletter



Hydrogen
Society
of Australia

Looking backwards, looking forward!

Hydrogen is marching on – will you join us?

In this month's newsletter....

- Message from the HSA President [Pg 1]
- Members Spotlight – ABB [Pg 2]
- There is a lot happening in the hydrogen space [Pg 3 and 4]
- National Hydrogen Industry Technical Masterclass [Pg 5 to 11]
- Career Opportunities and Member Benefits [Pg 12]
- Education and Knowledge Sharing [Pg 13]
- Upcoming Events [Pg 14 and 15]
- Snippets of Hydrogen making moves around the world [Pg 16 to 26]
- We acknowledge the support of our corporate partners, academic and research institutions [Pg 27]

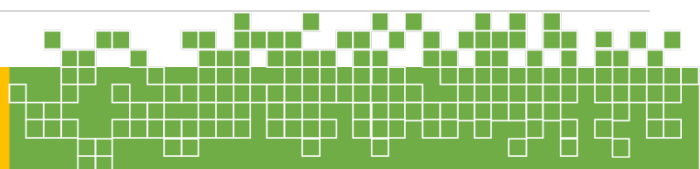
Message from the HSA President – Adam Osseiran

Your Society is healthy and is growing thanks to the contributions of the volunteers who are passionate about the role that we can play in the transition of Australia to cleaner energy sooner than later. The HSA Chapters in New South Wales, Victoria, Western Australia and South Australia are now real, and their committees are actively working together. In the near future they will be joined by new HSA Chapters in Queensland and Tasmania. A lot is happening in these states already, and we are eager to collaborate together under a national HSA banner. The launch of the WA Chapter was celebrated on 14 December in Perth - [Click for more details](#)

One of our key HSA initiatives is to provide training and upskilling in the hydrogen space. We are collaborating with **Engineers Australia** and the **Australian Institute of Energy** to deliver a national series of hydrogen industry training across Australia (**NHITM**), with the Perth masterclass successfully delivered on 13 to 15 February [refer to page 5 to 11].

There has been an increasing number of events related to hydrogen in Australia. The HSA will be partnering with other like-minded organisations to deliver these events for the benefit of our members (ie. discounted registration fees). The **Connecting Green Hydrogen Summit** in July 2024 is one such opportunity [refer to page 15].

Last but not least, we wish our readers all the best for the New Year and look forward to collaborating with you in the hydrogen space. **If you are not yet a member of HSA, please consider joining us to get access to free or discounted events, training material and the latest information in the hydrogen space.** <https://hydrogensociety.org.au/members-portal/>



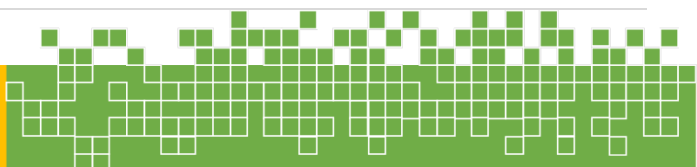
Members Spotlight: ABB

ABB is a leading technology company in the field of electrification and automation that aims to create a more sustainable and resource-efficient future. The company's solutions involve connecting engineering expertise and software to optimise manufacturing, transportation, power supply, and operations. With over 140 years of experience, ABB's more than 105,000 employees are dedicated to driving innovations that accelerate industrial transformation. Looking ahead ABB's goals are clear and ambitious. The company aims to remain at the forefront of electrification to help decarbonise heavy-to-abate industries, but in cases where electrification is not possible, they look to alternative sources of energy such as green hydrogen. Hydrogen plays a vital role in helping hard-to-electrify sectors achieve **Australia's Net Zero by 2050** goal.

When it comes to the hydrogen sector, ABB is well versed in offering electrical solutions for the whole green hydrogen value chain. They utilise their product range to provide flexible hydrogen applications and support their customers as hydrogen demand grows. They help customers define project scope and mitigate risks through their packaged solutions, leveraging their extensive rectifier (**IGBT/Thyristor and Diode**) portfolio. ABB's team of experts can assist in finding the optimal electrical system configuration, reducing electricity usage, and improving efficiency. By conducting simulation studies, they can identify the best system configuration and integration for facilities.

Their key products and services are designed to standardise and simplify manufacturing, minimise the amount of electricity required to produce one unit of hydrogen, and increase equipment durability. This helps extend the lifetime of the equipment and spread the cost of the electrolyser facility over a larger hydrogen production volume. Currently, ABB is collaborating with their clients globally in the research and development phase to test different electrolyser technologies to optimise hydrogen production. ABB's low-harmonic insulated-gate bipolar transistor (IGBT) and Thyristor rectifiers regulate the supply of electricity to the electrolyser, allowing for accurate control of voltage and current, which can be used to simulate various operating conditions.

ABB's plans also include a relentless focus on research and development to introduce new technologies that will further optimise hydrogen production. They are already working on hydrogen-specific applications and solutions to enhance operational efficiencies and yield greater production volumes. As they continue on this journey, ABB is mindful of their responsibility towards the planet and future generations. Being a technology leader in electrification and automation, their solutions are instrumental in driving a more sustainable and resource-efficient future. ABB is not just a company; they are a partner to their clients, committed to delivering excellence and innovation at every step of the journey. [Click to learn more about our Hydrogen Highlights](#) or contact: **Rajesh Maker**, rajesh.maker@au.abb.com



There is a lot happening in the Hydrogen Space in Australia!

New Zealand Hydrogen Symposium (NZHS2) 2024

Our HSA NSW Chapter Chair **Dr Quentin Meyer**, NSW Steering Committee member **Dr Thomas Gao** and former National Steering Committee member **Prof Craig Buckley** from Curtin University attended the New Zealand Hydrogen Symposium (NZHS2) 2024 in the Museum of New Zealand **Te Papa Tongarewa** in Wellington. Located in incredible settings, this conference gathered technical experts on hydrogen from academia and industry, from New Zealand, Australia and overseas such as the US, Netherland, and Germany, with over 200 delegates attending. The quality of the presentations was exceptional, and there was a fantastic speaker panel focusing on start-ups. Both Quentin Meyer (UNSW) and Thomas Gao (Powerfuel including Hydrogen Network) gave great talks. We hope to see similar events in Australia in the future - keep an eye out for the AHRC in Perth in September 2024 <https://ahrc2024.com.au/> and other great events foreshadowed in our newsletter [Refer to pages 14 and 15].



HSA Steering Committee members Quentin Meyer and Craig Buckley had some interesting discussions



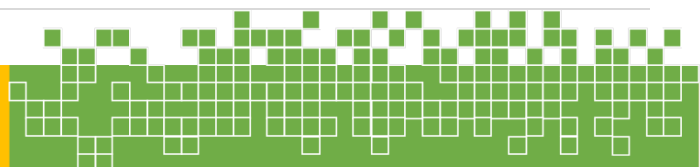
Quentin Meyer presented his team’s research topic *“how to make hydrogen fuel cells cheaper and more efficient”*

Hydrogen Links: Industry Focused Academic Research - Session 8 on 25 January 2024

University of Wollongong (Gerry Swiegers) in collaboration with Powerfuels including Hydrogen Network – “Bubble-Free Capillary Electrolysis”

The Hydrogen Society of Australia's recent Hydrogen Links Session 8 proved to be an enlightening exploration into the future of renewable hydrogen, drawing the participation of twenty individuals in person and an additional thirty online attendees. The event featured a keynote presentation by Professor Gerry Swiegers from the University of Wollongong, in collaboration with the NSW Decarbonisation Innovation Hub. The session, titled *“Bubble-Free Capillary Water Electrolysis: A New Approach to Industrial Water Electrolysis and Reflections on Commercialisation of Technological Innovations,”* delved into groundbreaking advancements in green hydrogen technology.

Revolutionizing Renewable Hydrogen Production: The Bubble-Free Approach: The focus of the presentation was on a revolutionary technology that promises to redefine the landscape of renewable hydrogen production. Prof. Swiegers detailed an electrochemical cell architecture that utilizes capillary action to feed water to the electrodes, enabling direct hydrogen production without the formation of



gas bubbles. This 'bubble-free' water electrolysis technology boasts remarkable efficiencies exceeding 95%, translating to an energy consumption of 41.5 kWh per kg of hydrogen. This is a significant leap compared to the 50-53 kWh/kg consumed by current commercial electrolyzers. Prof. Swiegers highlighted that this efficiency surpasses the International Renewable Energy Agency's 2050 target, marking a significant step toward cost-competitive renewable hydrogen.

Commercialization Insights and Industry Impact: The session not only showcased cutting-edge technology but also provided insights into the commercialization of such innovations. Hysata Pty Ltd, the company spearheading this groundbreaking technology, has already secured an order book exceeding \$5 billion, underscoring the growing demand for cost-competitive green hydrogen. As we march toward a decarbonized future, the implications of this advancement are profound, particularly for 'hard-to-abate' sectors such as heavy transport, steel, chemicals, and aviation.



Meet Professor Gerry Swiegers: Professor Gerhard (Gerry) F. Swiegers, an Australian Research Council Industry Laureate Fellow at the University of Wollongong, has been at the forefront of commercializing fundamental research for over two decades. With a rich academic background and an impressive track record, including founding seven spin-off companies and licensing or selling three new technologies, Prof. Swiegers is a driving force in bridging the academia-to-industry gap. His commercialization efforts have attracted an estimated \$150 million in private investment and garnered numerous awards, including two DuPont Innovation awards.

Electrifying Future of Green Hydrogen: During the presentation, Prof. Swiegers hinted at the monumental demand for green hydrogen, projecting an annual production of 500 million tonnes by 2050. This staggering figure underscores the dramatic increase in electrolyser demand expected in the coming decades, signaling a shift towards a cleaner, more sustainable energy landscape.

Dr. Quentin's Reflections: *"We look forward to seeing Prof Gerry Swieger's next breakthrough and cannot wait to see how far Hysata can go as a company. It is such a great example of a successful translation to industry, and truly an inspiration to researchers from industry and academia alike. As a society like the HSA, it was a huge honour to host Prof Gerry! We were impressed by the industry attendance as well. Stay tuned for our next event!"*



National Hydrogen Industry Training Masterclass – Perth - 13 to 15 February

The Hydrogen Society of Australia collaborated with **Engineers Australia (EA)** and the **Australian Institute of Energy (AIE)** to facilitate a 3-day Technical Masterclass in Perth from **13th to 15th February 2024**. This is part of a national hydrogen industry technical training series that will be rolling out across Australia over the coming year. We thank our HSA members who have made a significant and ongoing contribution to the planning of this technical series. We especially thank **Furat Dawood**, who developed the program and engaged most speakers and MCs. We also thank **Brian Haggerty**, who chaired and led the working group in developing the Masterclass. Many other supporters included **Cedric Pierson, Derek Cross, Jack Schubert, Lorie Jones, Adam Osseiran** and other HSA members.

Special thanks to the speakers and presenters who shared their knowledge and experience of working in the hydrogen space. Thanks to our HSA Steering Committee member **David Cavanagh Integrated Energy** for sponsoring lunch and providing an interesting display of hydrogen and renewable projects across Australia using virtual reality combined with visual fly throughs of a number of the projects. We also would like to acknowledge the sponsorship of the **Government of Western Australia** who is supporting the development of the HSA WA Chapter through the **Department of Jobs, Tourism, Science and Innovation**.

In addition to the speaker presentations, there were four site visits provided during the afternoon on Day 3, being:

- Tour 1: ATCO followed by PAC (Pipeline Actuation and Controls); and
- Tour 2: Hazer followed by Morek

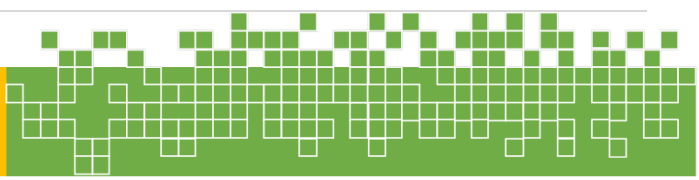
The event was well attended (in fact sold out), with approximately 80 people registered, including presenters. Based on the feedback received from a survey of attendees after the event, the overall sentiment was very positive. We will take into consideration the learnings and suggestions, as we proceed to roll out the NHITM series around the country over the coming year.

The next few pages (Page 6 to page 11) capture some of the key photos and provide a summary of the presentations delivered. For more information including the bios and photos of each speaker, visit our website at the following link: [2024 02 NHITM-WA-Program.pdf](https://www.hydrogensocietyofaustralia.com.au/2024-02-NHITM-WA-Program.pdf)



National Hydrogen Industry
TECHNICAL MASTERCLASS
13th -15th February 2024, Perth, Western Australia

SPONSORS

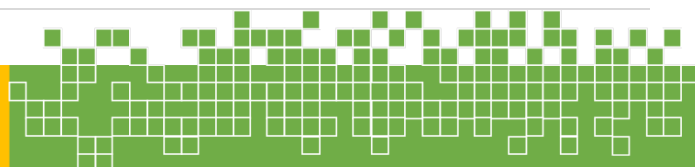


Day 1 – 13 February 2024		
Session 1 - Introductory Session		
1.1	Hydrogen in WA	Katie Cook - Director Director Energy Transition Strategies, Resources and Project Facilitation Department of Jobs, Tourism, Science and Innovation (JTSI), WA Government
1.2	Social, legal, governance and regulations	Diane Hinson - Senior Advisor - Renewable Gas Development, Australian Gas Infrastructure Group (AGIG) - QLD
Session 2- Electrolytic hydrogen		
2.1	Electrolysers: Balance of Plant, and auxiliary systems	Deepak Mistry - General Manager Engineering & Projects in ENGV Pty Ltd (Group of Pacific Energy) – VIC
2.2	Balance of Plant, auxiliary systems, process, safety, and relevant standards	ENG V as a oal representative will present on behalf of oal . Deepak Mistry - General Manager Engineering & Projects in ENGV Pty Ltd (Group of Pacific Energy) – VIC
Session 3 - Gaseous hydrogen		
3.1	Hydrogen gas compressors, BOP Process, safety and relevant standards	Tim Meyers - Australian Country Manager - PDC Machines - QLD
3.2	Compressed gas transport: storage vessels and pipelines, tracks and ships Process, safety and relevant standards	Jason Amiri - Senior Engineering Manager - Nacan Pty Ltd -VIC
Session 4 - Liquid hydrogen		
4.1	Water treatment for electrolysers	Mat Francis - General Manager, Moerk Water - WA
4.2	Hydrogen liquefaction process Storage vessels Liquid hydrogen–vaporisation Process, safety and relevant standards	Saif Al Ghafri - Future Energy Exports CRC - WA



Each of the speakers was provided with a certificate of appreciation, and a donation was made to the charity **Engineers without Borders** on their behalf.

Above: Saif Al Ghafri receiving a certificate of appreciation from Luigi Bonadio (Session MC)

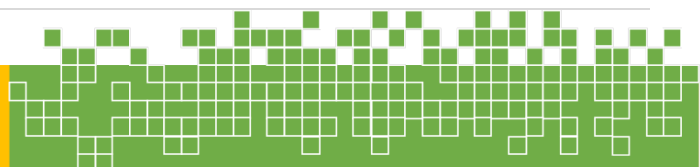


Day 2 – 14 February		
Session 5 - Hydrogen pressure regulation, and Hydrogen/NG blend		
5.1	Hydrogen-NG-Blend process safety and relevant standards	Alhoush Elshahomi Senior Engineer - Renewable Gas Planning & Assessment - Gas Distribution Jemena
5.2	Pressure regulators and reduction skids	Shane O'Neill – PAC – Manager, Pipeline Actuation Control (PAC) – WA
Session 6 - Fuel cells		
6.1	Fuel cells - general operation, pressure reduction skids, process, safety and relevant standards	Noel Dunlop - Vice President at Energys Australia - VIC
6.2	Fuel cells applications: BOP, stationary and mobile	Victoria Munro – F CEV Expert - VIC
Session 7 - <u>H2</u> Fuelling Stations BOP Safety and handling		
7.1	Hydrogen dispensation, H2 Fuelling Stations BOP	Sean Blyth - Managing Director, in ENGV Pty Ltd (Group of Pacific Energy) – VIC
7.2	Safety and handling, and detection	Derek Cross - Team Lead at Gexcon Australia - WA
Session 8 - Hydrogen conversions, carriers and green industries		
8.1	Ammonia / Methanation / Methanol	Adrian Hansen – Senior Process Safety Engineer at Yara Pilbara - WA
8.2	Green industries e.g., Green Steel	Stephanie Moroz - Davanz - QLD



The room was packed, and the audience was fully engaged!

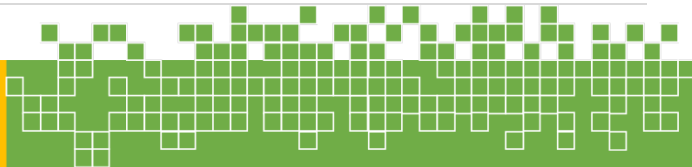
Thanks to Engineers Australia for providing their Perth CBD facilities...



Day 3 – 15 February		
Session 9 - Hydrogen combustion		
9.1	Hydrogen combustion and flame propagation	Derek Cross - Team Lead at Gexcon Australia - WA
9.2	Hydrogen turbines and ICE	Sara Khoo – Project Director, Siemens Energy - WA
Session 10 - Hydrogen plants		
10.1	H2 plant Licensing	Steve Emery- General Manager Hydrogen and Alternate Fuels, WorkSafe Petroleum Safety and Dangerous Goods Directorate, Department of Energy, Mines, Industry Regulation and Safety (DMIRS), WA Gov - WA
10.2	Hydrogen Standards (AS ME-093)	Rachelle Doyle – Chair of ME-093 Committee - WA
Day 3 - Site visits		
	ATCO	
	PAC	
	Hazer	
	Moerk Water	

Tour 1 - ATCO Site Visit followed by PAC

ATCO hosted a site visit of their Jandakot facilities for the NHITM attendees on Day 3 (15 February). Due to time constraints, the ATCO tour was limited to a brief overview of the hydrogen refuelling station in Jandakot and other ATCO initiatives, provided by Jim Richardson. With the support of the Australian Renewable Energy Agency, ATCO is investing \$3.3 million in a leading research and development facility at their Jandakot Operations Centre, called the Clean Energy Innovation Hub. The Hub is a testing bed for hybrid energy solutions and it integrates natural gas, solar PV, battery storage and hydrogen production. The Clean Energy Innovation Hub is providing valuable insights into how ATCO’s extensive existing gas distribution infrastructure can continue to benefit customers as part of the future energy mix. Very interesting facilities, and the HSA looks forward to organizing another tour of ATCO facilities for our members in the near future.



Pipeline Actuation Controls (PAC) – Australian Company providing Complete Hydrogen Solutions

PAC delivered an engaging presentation at the National Hydrogen Industry Technical Masterclass in Perth on 14 February (Day 2) and hosted a site visit of their O'Connor facility on 15 February (Day 3).

As part of the Australian owned HIFraser Group, Pipeline Actuation Control (PAC) have built a significant reputation for engineering and manufacturing bespoke flow control systems across various industries. In an exclusive agreement with Elogen, a European leader in PEM electrolysis, PAC now manufactures and supports hydrogen electrolyzers in Australia and New Zealand. As part of this partnership, PAC locally assembles the balance-of-plant of Elogen's state-of-the-art electrolyzers (adapted to Australian standards) and their team of specialised engineers and technicians provide thru-life support.

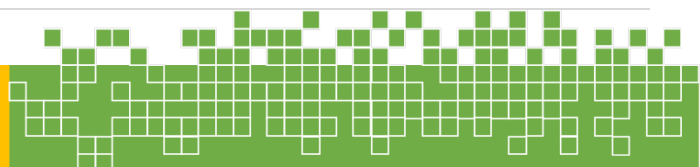
With a proven and reliable network of global OEMs, PAC also provides storage, compression and dispensing solutions, which they offer independently or as part of a complete hydrogen system. Headquartered in Perth, Western Australia, with offices in New South Wales and Queensland, the team at PAC are currently working on multiple projects throughout Australia assisting key end users with delivering hydrogen solutions. PAC has extensive experience in providing solutions to ensure that the operation of multiple systems is seamless. Their engineering expertise allows for customised design solutions based directly upon project requirements. PAC's track record in customised flow control solutions includes: hydraulic pressure units, pressure reduction systems, metering and analysis systems, injection systems, cascade filling system control and hydrogen refuelling systems. Visit their website for further information: <https://www.pipact.com.au/>



Shane O'Neil receiving a certificate of appreciation from Lorie Jones (Session MC) following his presentation at the NHITM



PAC hosting a site tour on Day 3 of the NJITM, discussing some recent locally built Hydrogen systems.

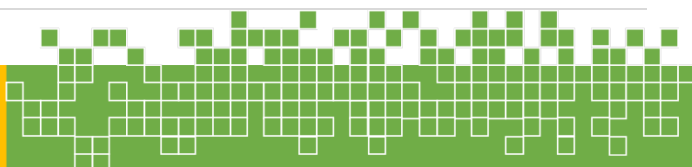


Tour 2 - HAZER GROUP Site Visit followed by Morek Water

The visit to the HAZER GROUP site on Day 3 (15 February) proved to be excellent, it was a privilege to see the plant a week after being commissioned to produce hydrogen. We highly valued the time extended to us by Mark Edwards, particularly considering they are in the initial stages of ramping up the plant's first extended run. Mark provided comprehensive information, demonstrating a clear grasp of the technical aspects of the plant. The Masterclass attendees had an open discussion of a variety of technical and commercial aspects.

This was followed by a site visit to Morek Water, the OEM of the water desalination process and purification process for the electrolyser. The presentation was very informative, and attendees had good discussion with the SMEs on this topic.

Both site visits left an excellent impression among the Masterclass attendees.

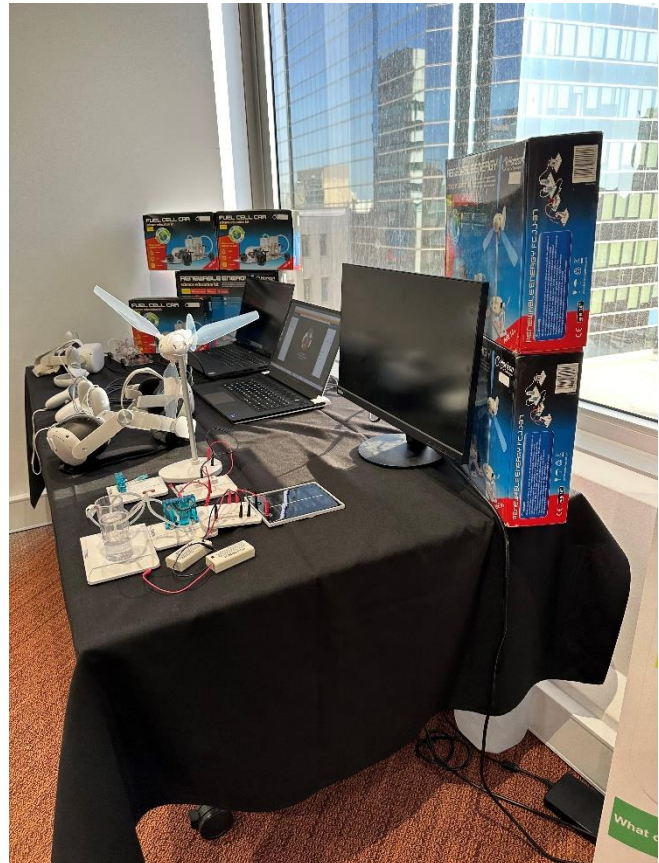


NHITM Event Sponsor Integrated Energy – Audio Visual Stakeholder Engagement

During the Hydrogen Master Class (NHITM) in addition to David Cavanagh’s lunchtime presentation, Integrated Energy showcased a number of hydrogen and renewable projects across Australia using virtual reality prepared by Integrated Energy, combined with visual fly throughs of a number of the projects.

The projects spanned many parts of the renewable energy and hydrogen ecosystem, ranging from a factory for the production of electrolyzers, a hydrogen hub (which included solar farm, hydrogen production facility, hydrogen offtake terminal and hydrogen refuelling stations), minesite application of solar and hydrogen for transport and energy, and large scale heavy duty hydrogen refuelling stations for WA and NSW.

Virtual reality enables a rich visual and audio experience of the design of the future renewable and hydrogen projects in the context of the current environment. The use of high end Alienware gaming laptops and powerful modern Virtual Reality Headsets and Controllers can provide a dynamic and detailed representation and collaboration space. In this way stakeholders from operators and operation management, project and engineer teams, environment, finance as well as CEOs and board members are able to quickly grasp the concept, and “kick the tyres” of the lifelike detail, to provide their input to further development, understand safety, operations and maintenance aspects, or make key decisions for project execution. It has proven to be an effective tool for education also. Importantly, it also provides a tool for wider community stakeholder engagement, ranging from school children to community groups, Mayors and Councillors, to bring the community along the journey.



Integrated Energy are now in their fourth generation of application of virtual reality having used it in locations from the highlands of Papua New Guinea to the executive suites of Morocco, on the Australian stand at United Nations COP26 for the last three years, and all across Australia over the last ten years or so, and incorporate this experience effectively and efficiently in their work.

Integrated Energy offers multidisciplinary project development, execution and operational support across all stages of renewable and hydrogen projects, having delivered eighty hydrogen projects over the last seven years for a range of government and private companies ranging from the United Nations and World Trade Organisation to large renewable energy multinationals, local councils and small hydrogen technology startups. Integrated Energy disciplines cover all engineering streams including environmental and safety, together with architecture, finance and commercial. They develop and export hydrogen technology, write national and global standards for hydrogen in transportation and provide courses and workshops at global, national and local levels, enabling sustainable, economic, renewable and hydrogen ecosystems today. <https://integratedenergy.com.au/>

Career Opportunities:

There are a number of academic and employment opportunities highlighted in our HSA Knowledge Portal including those listed below:

UNSW PhD Candidate

The University of New South Wales (Sydney, Australia) is looking for a PhD candidate to work on an Australian Research Council-funded project in Electrochemical Nitrogen Reduction in the School of Chemistry. Please apply if you have a passion for research and wish to pursue a career in the fields of clean energy and sustainability such as: Energy storage and conversion; Hydrogen economy; and Decarbonisation technologies. Click on the following link for further information: <https://hydrogensociety.org.au/phd-scholarships-on-electrosynthesis-of-ammonia-at-unsw/>

UNSW is also offering a number of PhD Scholarships on the following topics:

- Electrosynthesis of Ammonia [Click here for more information](#)
- Fuel Cells UNSW [Click here for more information](#)
- CO2 Electroreduction [Click here for more information](#)
- Water Electrolysis [Click here for more information](#)

Curtin University - Job opportunities with International Futures Lab – Redefine H2E (Munich)

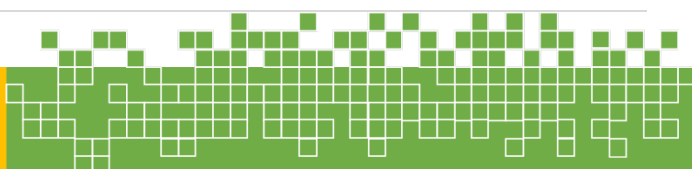
Expression of Interest for Researcher positions at the Technical University of Munich: An opportunity provided by the Technical University of Munich, Curtin University, and the International Future Lab: Redefine H2E. Working under the supervision of Professor Peta Ashworth (Director of the Curtin Institute for Energy Transition), we have an exciting opportunity available for a Core Scientist. Click on the following link for further information. <https://hydrogensociety.org.au/job-opportunities-with-international-future-lab-redefine-h2e-munich/>

For the full list of opportunities currently advertised on the HSA website, [click on this link](#)

Member Benefit – Hydrogen Standard subscription (HSA members discount)

The Hydrogen Society of Australia (HSA) has partnered with The **Hydrogen Standard** to offer HSA members a significant discount to gain access to the **Global Government Hydrogen Platform**, a renowned source of hydrogen policy data. <https://thehydrogenstandard.com/hydrogen-global-governance-platform/>

The Hydrogen Standard provides market insights, research and news for the hydrogen community to stay up to date with the latest developments. One of the flagship products is the hydrogen global governance platform that provides insights into government commitments to hydrogen on a country, regional and global scale. If you can't keep up with all the developments governments across the globe are providing on their hydrogen roadmaps, you are not alone. More than 50 countries worldwide have now a strategic hydrogen document and another two dozen or so are actively considering or preparing one. As such, Hydrogen Standard has developed the Hydrogen Global Governance Platform, which keeps track of all those individual developments daily.



Subscribers will have access to a global, regional and country specific overview on a host of topics outlined in various government hydrogen roadmap strategies, such as funding arrangements, R&D interests, infrastructure commitments, fuel cell vehicle targets, electrolyser capacity commitments, trade agreements and more.

Thanks to the collaboration between the Hydrogen Standard and the Hydrogen Society of Australia, HSA members will get a significant discount on the initial subscription to the platform (75% for students; 52% for individuals and 80% for Enterprise members). If you are interested in subscribing to the **Hydrogen Global Governance Platform** at a significant discount, please select the Hydrogen Standard subscription product within our HSA Members Only portal: [Click here for further information.](#)

Education and Knowledge Sharing – Past Events and Presentation Material

Log in to your password protected HSA members portal and you can access the videos and PowerPoint presentations from past events in the **Knowledge Centre**: <https://hydrogensociety.org.au/knowledge-centre/videos/> HSA members can also view the event proceedings and find the links to the various presenters under **Past Events**: <https://hydrogensociety.org.au/hydrogen-space-2023-networking-and-presentations/>

Upcoming Hydrogen Events organised by HSA

Hydrogen Links – Industry focused Academic Research Series

This is an evolving series of presentations, with our objective being to lock in one online presentation a month. Each talk will range from 30 to 40 minutes, with a brief Q&A session at the conclusion. The intent is to hold some of these as hybrid events, including food and networking, as well as laboratory tours. We are reaching out to academic research institutions to encourage their participation.



Hydrogen Links - Sessions Delivered:

- UNSW (**Quentin Meyer**) – How to make hydrogen fuel cells cheaper and more efficient [delivered - 25 May, refer to Issue 16, page 3]
- Washington State University (**Liam Turner**) - How to unlock zero waste liquid hydrogen storage through the cool properties of cryogenic Hydrogen [delivered - June 22, refer to Issue 17, page 3].
- MU and HBI (**Furat Dawood** and **Benny Abraham**) – Integrated Drinking Water and Renewable Energy based Power Supply for remote Aboriginal communities in WA. [delivered - August 01 – refer to Issue 18, page 3 and 4]. The full knowledge-sharing report (74 pages) has been published recently on the WA Government website [Click here for the full report](#)
- ECU (**Alireza Keshavarz**) – Hydrogen geo-storage: challenges and opportunities [delivered - August 31 – refer to Issue 19, page 3 and 4].
- UNSW (**Chuan Zhao**) – Challenges and Opportunities for Green Hydrogen Production from Water Electrolysis [delivered - September 21]. For more information, refer to Issue 20, page 5.

- QUT (**Anthony O'Mullane**) / AHERN (**Andrew Dicks**) / CSIRO (**Patrick Hartley**) - Accelerating Australian Hydrogen Industry through Research Collaboration [delivered – October 19]. For more information, refer to Issue 21, see page 5].
- CO2CRC (**David Whittam**) / CSIRO (**Jonathan Ennis-King** and **Dr Sarb Giddey**) [Delivered - December 05]. For more information, refer to Issue 22, see page 6].
- University of Wollongong (**Gerry Swiegers**) in partnership with **Powerfuels including Hydrogen Network** – Delivered - January 25. [refer to page 3 and 4 of this newsletter].

Great speakers are currently being approached, and our series will continue through 2024. If you are an emerging or well-established academic or working in the hydrogen industry and would like to share knowledge about challenges and opportunities in the hydrogen space, contact Quentin Meyer on q.meyer@unsw.edu.au

[Click here for more information about the Hydrogen Links series](#)

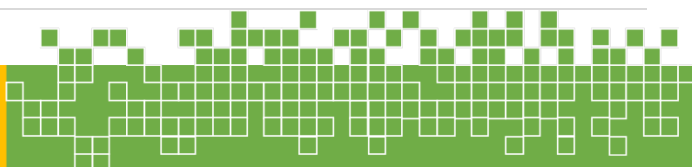
In addition to the academic research institutions, the Hydrogen Society of Australia is collaborating with like-minded organisations to foster collaboration and knowledge sharing between industry and academics, including: Australian Hydrogen Research Networks (AHRN); Global Hydrogen Economy (GlobH2E); GELS; and Commonwealth Scientific and Industrial Research Organisation (CSIRO).

The ARC Training Centre for the Global Hydrogen Economy (GlobH2E) is a research consortium established in 2021 and funded by the Australian Research Councils and industries. GlobH2E brings together leading Australian researchers and global research institutions, industry partners, hydrogen start-up and government agencies to work together to develop and ramp up new technologies and build nation's skills in a short timeframe. The full playlist of GlobH2E webinars can be found on YouTube at the following link:

[Click here for GlobH2E webinars](#)

Other upcoming hydrogen related events around the globe

- 2024 03 04 to 06 – 9th Annual Sustainability Week – London and virtual - [Click here for more details](#)
- 2024 03 04_Energy Transition Summit – London - [Click here for more details](#)
- 2024 03 06 to 07_Smart Energy Conference and Exhibition – Sydney - [Click here for more details](#)
- 2024 03 04 to 07 – World Electrolysis Congress – Germany - [Click here for more details](#)
- 2024 03 12 & 13_Sustainability Reporting Summit_Sydney - [Click here for further details](#)
- 2024 03 12 to 13 – 3rd Annual Sustainability Week Asia – Bangkok and virtual - [Click for details](#)
- 2024 03 13 to 15 – AOG Energy 2024 – Perth Convention and Exhibition Centre - [Click for details](#)
- 2024 03 25 to 28 – 11th Annual Australia Domestic Gas Outlook – Sydney - [Click here for further details](#)
- 2024 04 21 to 26 – World Renewable Energy Congress – Bahrain - [Click here for more details](#)
- 2024 05 16 to 17 – Future Energy ASIA and Future Mobility ASIA – Bangkok - [Click for details](#)
- 2024 05 01 to 02 – Sydney Build Expo – ICC Sydney - [Click here for further details](#)
- 2024 05 21 to 22 – World Hydrogen Forum – Saudi Arabia - [Click here for more details](#)
- 2024 05 21 to 23_Centre for Hydrogen Safety Americas Conference – Las Vegas [Click for details](#)
- 2024 06 11 to 14 – Australian Energy Week 2024 – Melbourne - [Click here for further details](#)
- 2024 06 19 to 20_Australian Hydrogen Conference_Adelaide - [Click for details](#)
- 2024 07 09 to 11_Connecting Green Hydrogen APAC 2024_Melbourne - [Click for details](#)
- 2024 09 04 to 07-Australian Hydrogen Research Conference_Perth - [Click for details](#)
- 2024 09 17 to 20_Gastech 2024_Houston - [Click for details](#)



- 2024 09 12 to 13_Asia Pacific Hydrogen Summit and Exhibition in 2024_(Brisbane)
- 2024 10 23 to 24_All Energy Australia_Melbourne – info@all-energy.com.au

Upcoming Hydrogen Events supported by HSA in Partnership with other Associations:

The Hydrogen Society of Australia will be considering partnership agreements with event coordinators to deliver quality events on hydrogen and the energy transition, particularly those conferences to be held in our State Chapters. We will be seeking complimentary and/or discounted registration fees for our HSA members.

The Connecting Green Hydrogen APAC 2024 Conference & Exhibition in Melbourne (July 09 to 11) is one example of our members benefits.

Connecting Green Hydrogen APAC 2024 Conference & Exhibition

Date: 9-11 July, 2024 Location: Melbourne Venue: Melbourne Convention and Exhibition Centre

The Hydrogen Society of Australia will be participating as an **Association Partner** in the upcoming **Connecting Green Hydrogen APAC 2024 (CGHA2024)** which is the largest and most influential Green Hydrogen event in Australia and the APAC region. This momentous gathering will take place at MCEC Melbourne, uniting clean energy enthusiasts and industry leaders under one roof. With over 3,000 attendees, including 150+ world-class speakers and 1,000+ decision-makers, and a powerful presence of 100+ exhibitors and sponsors, Connecting Green Hydrogen APAC 2024 serves as a premier platform to connect Australian and global hydrogen leaders.

HSA members will receive a **20% discount** on registration fees. Login to the Members Portal on the HSA website and [click on this link](#) to receive your discount coupon code. Then register on the event website link below using your discount code.

<https://www.apac.gh2events.com/>



Snippets of Hydrogen making moves around the world

2023 12 14_Driving Climate Action and Growth_McKinsey at COP28

Negotiations at COP28 have concluded with a final agreement made on global “transition away from fossil fuels.” This is the first time the shift away from fossil fuels has been explicitly included in a final agreement at a COP. Further work is now needed to translate this commitment into action and to take the steps necessary to keep the 1.5°C target within reach. Two things are clear for leaders: momentum toward net zero continues to build but significantly more is needed, both to increase ambition and to deliver on existing pledges and commitments.

2022 12 14_What could buses and sewage treatment plants have in common?_Inside Water

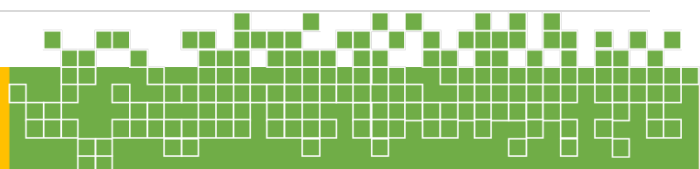
The co-location of hydrogen production by electrolysis at a wastewater facility produces hydrogen for fuel cells to run buses and oxygen to feed beneficial bacteria in the treatment tanks. The Queensland University of Technology (QUT) research team of Rickey Donald, Dr Fanny Boulaire and Associate Professor Jonathan G Love developed a simulation model. The goal was to determine the environmental benefits of integrated hydrogen production and wastewater treatment. The team published its findings in the Journal of Environmental Management. The paper was titled “Contribution to net zero emissions of integrating hydrogen production in wastewater treatment plants.” The modelling showed that by around 2031, about 2,000 tons of carbon emissions would be prevented each year,” said Donald. “The proposed new integrated system will have better emissions outcomes than simply building solar PV to offset WWTP grid electricity usage and diesel use in buses. As the electricity grid becomes more decarbonized in the future, the benefits accelerate when using renewable electricity for hydrogen production and oxygen for wastewater treatment.” [Click here for full article](#)

2023 12 18_Frontier and Waroona combine to create giant renewable energy company_Stockhead

Back in October, the company announced its plans to acquire Waroona, which has a namesake project adjacent to its Bristol Springs renewable energy project in WA. The merger means the company would have a generation capacity of more than 1GW. The projects share the benefits of nearby infrastructure – including secured connections to the South West Interconnected System – for green hydrogen production and supply. The company continues to assess multiple value-added initiatives that potentially uplift solar energy valuations, including a green hydrogen fuelled peaking power plant study due for delivery in Q1 24. [Click here for full article](#)

2023 12 21_WA projects on \$2bn hydrogen funding shortlist_BN

The list of renewable hydrogen projects eligible for a share of \$2 billion worth of Commonwealth funding has been whittled down to six, with two Western Australian projects making the cut. BP’s H2Kwinana project and Copenhagen Infrastructure Partners’ (CIP) massive proposed Murchison hydrogen renewables project near Kalbarri have each been invited to submit full applications for a share of the funds available under the Hydrogen Headstart initiative. H2Kwinana was the recipient of \$70 million worth of federal funding in November. Siteworks are underway at the project, which will initially feature a 100-megawatt electrolyser with potential to expand to a total of 1.5 gigawatts hydrogen production. Once operational, H2Kwinana could produce over 14,000 tonnes of green hydrogen each year. CIP’s project is easily the largest on the national shortlist, with an aim to produce more than 1.6MW per annum in the state’s Mid-West. The project would feature an onshore wind and



solar farm, a desalination plant and a green hydrogen production facility with a plan to convert the hydrogen to ammonia for export to global markets.

2023 12 19_ 'Nearly €9bn' | France unveils plan for 6.5GW of 'low-carbon electrolytic hydrogen' by 2030 in draft update of national H2 strategy_Accelerate Hydrogen

France aims to install 6.5GW of “low-carbon electrolytic hydrogen” production capacity by 2030, rising to 10GW in 2035, according to a draft update of France’s national H2 strategy. The document, which commits “nearly €9bn” to support decarbonised hydrogen, also unveils a new subsidy for French-made equipment, new plans on imports and natural hydrogen, and an aim to use electrolyzers to help balance the grid. It also confirms that France will spend €4bn on subsidies — in Contracts for Difference-style auctions — to support the deployment of 1GW of “electrolytic production” over the next three years. [Click here for full article](#)

2024 12 21_EIB to start providing grants for green hydrogen production in developing countries after Germany adds €434m to fund_Accelerate Hydrogen

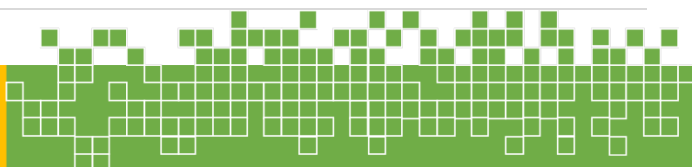
Germany is providing €434m (\$475m) to the European Investment Bank’s (EIB) Green Hydrogen Fund, enabling the EU’s lending arm to start providing investment grants for renewable hydrogen production in developing countries. The EIB will now expand the scope of the fund from merely providing strategic advice and technical assistance to providing investment grants — a move that will be “crucial in advancing projects often perceived as too risky by traditional investors”, according to the bank. The move creates the third European pot of funding for foreign green hydrogen projects, after the Germany-led H2Global programme and the European Commission's Global Gateway initiative. [Click here for full article](#)

2023 12 23_UK ban on boilers in new homes rules out hydrogen as a heating source_The Conversation

Boilers will be banned in new-build homes in the UK from 2025, according to a long-awaited government consultation on energy efficiency standards in the housebuilding industry. The report said that there is “no practical way” that installing boilers of any type will “deliver significant carbon savings and ‘zero-carbon ready’ homes”. What’s more surprising is that hydrogen has also been ruled out as a potential heating source. Previously, hydrogen had been touted by both the government and the energy industry as a logical replacement for the natural gas (a fossil fuel and contributor to climate change) that is pumped through the national grid and burned in boilers throughout the UK. [Click here for full article](#)

2024 01 2_EPA backs BP’s Kwinana biorefinery_BN

The Environmental Protection Authority gave the go ahead for the \$1 billion renewable fuels project on the site of BP Australia’s mothballed refinery south of Perth. That approval came with a caveat, however, recommending strict conditions to ensure BP’s net-zero by 2050 targets would be met. The biorefinery would be capable of turning vegetable oils, animal fats and other biowaste into up to 10,000 barrels of biofuel and sustainable aviation fuel per day. The EPA recommendation is another win for BP’s Kwinana Energy Hub, which in November attracted \$70 million from the federal government to progress a hydrogen plant co-located in the precinct. [Click here for full article](#)



2024 01 04_Review of 2023 | The key developments and trends in the global hydrogen sector_Accelerate Hydrogen

To understand where the global clean hydrogen sector is heading in 2024, it is first necessary to understand what happened in 2023. This is not some glib philosophical statement about how history can predict the future, but a simple recognition that many of the policies and plans put in place by governments and companies last year — including billions of dollars of subsidies — will begin to come to fruition in 2024. To read the two-part special report on all the key developments and trends in 2023 (the first part being related to hydrogen production, with the second on usage), click [here for Part 1](#) and [here for Part 2](#).

2024 01 09_Hydrogen energy back in the vehicle conversation at CES 2024_Activatrade

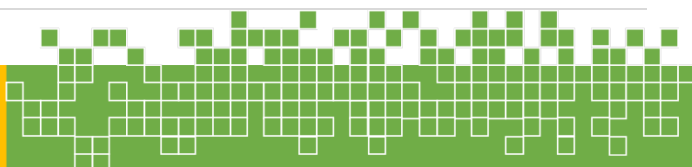
While electric vehicles are gaining the lion's share of the attention for carbon-neutral technology at CES 2024, hydrogen energy has snuck its way back into the conversation thanks to two automotive giants. Hyundai spotlighted its plans for utilizing hydrogen energy at the sprawling tech and gadget show in Las Vegas. Beyond making vehicles powered by hydrogen-powered fuel cells, the South Korean automaker signaled that it could work toward aiding a "hydrogen society" by expanding into energy production, storage and transportation.

2024 01 09_Hydrogen Exports – Big wave of Orders for New Ammonia Tankers underway, but will any of them ever carry NH3?_Accelerate Hydrogen

Orders are flying in for massive ships that can carry vast quantities of ammonia — the hydrogen derivative that enables the production and intercontinental export of low-carbon H₂ — suggesting that shipping companies are betting big on ammonia-capable carriers to future proof their cargo businesses. But despite some buyers' claim that the early moves into big ammonia carriers indicates investment in zero-carbon industries, serious questions remain about whether the ships will ever carry NH₃. Hydrogen is technically difficult and very expensive to transport long-distance, on account of its low volumetric energy density, and the cost of liquefaction. As a result, many prospective low-carbon H₂ producers are counting on converting hydrogen to ammonia via the Haber-Bosch process to transport it to customers across the world's major sea routes. [Click here for full article](#)

2024 01 10_Global Energy Perspective 2023: Sustainable fuels outlook_McKinsey

The outlook for sustainable fuels between 2019 and 2050 is projected to differ due to segment-specific factors. **In passenger cars**, battery electric vehicles (BEVs) could gradually become the dominant option. However, sustainable fuels also present a viable alternative, particularly to decarbonize legacy internal combustion engine vehicles. For **commercial vehicles**, BEVs have varying use cases and are well suited for short-to medium-range trucks, while hydrogen could see a significant increase after 2030. In **aviation**, sustainable aviation fuels (SAFs) are considered by the industry as the only option today to replace fossil fuels in wide-body long-distance planes from a technical point of view, as hydrogen and battery options are currently still in early stages of development. In **maritime**, sustainable methanol, renewable or synthetic natural gas, and non-carbon containing hydrogen derivatives (ammonia), are seen as the alternative energy sources to replace fossil fuels. And in **buildings**, renewable natural gas can be used interchangeably with natural gas, while the use of electricity for heating and cooking could see a significant increase after 2030. [Click here for full article](#)



2024 01 11_Green hydrogen production will grow more slowly than expected everywhere apart from China, says IEA_Accelerate Hydrogen

The International Energy Agency (IEA) has drastically cut its estimates for how much new wind and solar will be built to power green hydrogen production over the next five years, implying that less renewable H2 will be produced than previously expected. In its new report published today, Renewables 2023: Analysis and forecast to 2028, the IEA projects that 45GW of new renewable energy capacity will be built for green hydrogen production by the end of 2028, or just 7% of what developers have announced. Last year's edition had predicted 50GW of hydrogen-linked renewables would be installed by the end of 2027. [Click here for full article](#)

2024 01 12_Draft laws usher in compulsory climate risk disclosure_BN

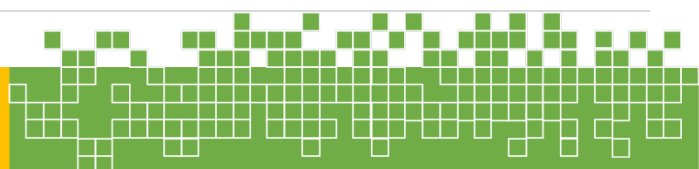
Compulsory climate risk reporting will be phased in this year, starting with big companies and financial institutions. Draft laws released by Treasurer Jim Chalmers requiring companies to disclose climate-related risks change the landscape for Australian investors, banks and corporations by elevating climate reporting to the same level as traditional financial disclosures. The mandatory climate risk disclosure is slated to cover large companies from 2024- 25 as the first step in a proposed federal reporting regime that will cover around 20,000 organisations.

2024 01 12_Batteries vs hydrogen for energy storage in the NEM_Energy Insights

Australia has committed to reducing its greenhouse gas emissions. One of the ways in which this commitment is being realised is through a shift towards variable renewable energy (VRE) within Australia's National Electricity Market (NEM). Given the unpredictability of solar and wind resources, consideration must be given to technologies which can address short-term and long-term mismatches between resource availability and demand. In this article, time sequential simulations of the NEM with a custom-built model have been undertaken to find the optimal firming technology plant mix for a zero emissions grid. The conclusion is that some form of fuel-based technology (most likely hydrogen) will probably be required, even if that fuel is very expensive. In conclusion, a diverse mix of firming technologies will be required. Governments need to scale investment in zero emissions (renewably powered) technology by working with the domestic industry and OEMs to increase the deployment of very high penetration green hydrogen or biogas turbines. The introduction of Green Gas Targets modelled on Australia's existing Renewable Energy Target to drive investment in hydrogen production should also be considered. [Click here for full article](#)

2024 01 16_Who were the winners of India's first green hydrogen and electrolyser subsidy auctions?_Accelerate Hydrogen

The results of India's first auction for green hydrogen and electrolyser subsidies have been published, with industrial conglomerate Reliance — run by Asia's richest man — a big winner in both tenders. The green hydrogen auction, which offered a per-kilogram maximum of 50 rupees (\$0.60) in the first year, 40 rupees in the second, and 30 rupees in the third, awarded subsidies to eight companies out of 13 bidders. Meanwhile, the auction for electrolyser manufacturing subsidies, which offered a maximum incentive of 4,440 rupees per kilowatt of capacity sold, assuming local content and domestic sales conditions are met, was even more competitive. However, the subsidy per kilogram is extremely low compared to those offered in the US and Europe, with analysts cautioning that in order to compete with grey, the cost of both round-the-clock renewable electricity and electrolyser prices must fall. [Click here for full article](#)



2024 01 17_Frontier Energy tags a battery to its Waroona energy project following WA policy change_Stockhead

Frontier Energy has much to cheer about after a major change in WA State Government policy regarding battery energy storage systems delivered improved returns for Stage 1 of its Waroona renewable energy project. Waroona is a key plank in Frontier Energy's (ASX:FHE) plan to become a significant renewable energy provider in WA, with plans in place to have a generation capacity of more than 1GW – enough to power more than 1 million homes. The company also owns two grid connections, which will be capable of exporting >1GW renewable energy to the grid, and freehold landholding of 868ha ideal for solar, hydrogen and other renewable energy opportunities following its merger with Waroona Energy last year.

FHE has now started preliminary debt financing work which it expects to release more detail on prior to completion of the DFS. It also continues to assess additional opportunities to both produce and sell green hydrogen as part of its renewable energy strategy. Progress has been made on its study of a 120MW hydrogen-fuelled, dual-fuel peaking power plant which – following discussions with suppliers – will also consider a leasing option to reduce the initial capital cost compared to the owner/build option.

2024 01 18_Green hydrogen | 'Electrolysers have not fully demonstrated that they are compatible with intermittent renewables': BNEF_Accelerate Hydrogen

Electrolysers have not yet fully proved that they can work effectively with variable renewable energy, according to a new analyst note from research house BloombergNEF. For green hydrogen to be affordable, “electrolysis systems need to be compatible with intermittent renewables — a feature the century-old technology has yet to fully demonstrate”, writes BNEF's San Francisco based hydrogen analyst, Xiaoting Wang. She adds that protocols to test electrolysers' flexibility “have yet to emerge”.

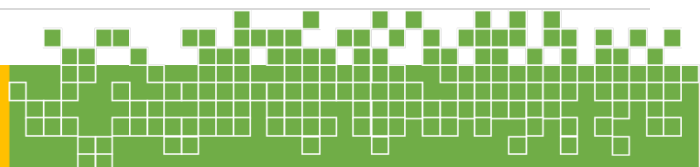
[Click here for full article](#)

2024 01 18_Natural Hydrogen News Highlights_H-NAT Monthly Update

- **South Africa's Natural Hydrogen - A Solution to Energy Crisis:** South Africa explores natural hydrogen reserves as an energy crisis solution, assessing feasibility and potential impacts for addressing pressing energy challenges. [Click for full article](#)
- **Funding the Future - France's Bold Investment in Natural Hydrogen:** French President announced substantial funding for natural hydrogen production, positioning it as a key component of the nation's energy future. [Click here for full article](#)
- **Hyterra reports maiden hydrogen, helium estimate:** HyTerra Ltd discloses a maiden hydrogen and helium resource estimate in Kansas, USA. Projections indicate significant potential, reinforcing confidence for decarbonization efforts in the Midwest. [Click here for full article](#)
- **Natural Hydrogen Has Been Underestimated:** The 2023 AGA report highlighted natural hydrogen's potential, initially dismissed. Geologists found sources globally. USGS plans a 2024 map, suggesting a hydrogen revolution, offering abundant, low-emission, cost effective fuel. [Click here for full article](#)

2024 01 18_Why electric trucks are our best bet to cut road transport emissions_The Conversation

Transport is likely the hardest economic sector to decarbonise. And road vehicles produce the most greenhouse gas emissions of the Australian transport sector – 85% of its total. Freight trucks account for only 8% of travel on our roads but 27% of transport emissions. A new study shows battery electric trucks are the best road transport option for getting closer to net-zero emissions. As the shift to



renewables continues and batteries become more durable, these trucks are expected to deliver the largest and most certain emission cuts of 75-85% over their entire life cycle. Hydrogen-powered (fuel cell) trucks also provide large emission cuts (50-70%, on average) but not as much as battery electric trucks. Their future performance is the most uncertain at this stage, due to a general lack of data and information for this technology. Using the available evidence, the study suggests policies to cut Australian trucking emissions should focus on promoting battery electric trucks wherever possible. [Click here for full article](#)

2024 01 23_H2 Green Steel secures €4.5bn of additional funding for world's first large-scale green hydrogen-based steel plant_Accelerate Hydrogen

H2 Green Steel has secured an additional €4.5bn (\$4.89bn) of funding to help build the world's first large-scale green steel project, which will incorporate about 1GW of electrolyzers, making it the biggest green hydrogen facility in Europe. The Swedish start-up, founded in 2020, now has close to €6.5bn of financing in place, and is expected to soon take a final investment decision on its plant in Boden, northern Sweden, which will use a combination of green hydrogen and renewable electricity to produce near zero-emission steel. [Click here for full article](#)

2024 01 24_Major hydrogen project referred to EPA_BN

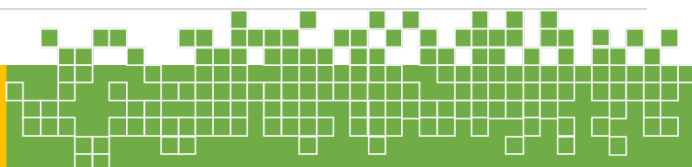
Perth-based Province Resources has referred its ambitious plan to build a large-scale green hydrogen and ammonia project in the Gascoyne to the environmental watchdog. The ASX-listed company is proposing to develop a hydrogen and ammonia gas production and export facility powered by renewable energy near Carnarvon, to be named HyEnergy. To be situated within a more than 595,000-hectare development envelope, the developer is proposing to build the three-component project across six pastoral stations on Crown land. According to the development proposal before the Environmental Protection Authority, the proposed project would be split across three separate areas and constructed in a phased approach. Two areas would accommodate the 12 gigawatts worth of wind turbines and solar arrays, and the third would house the downstream gas production and export operation near the coast. The renewable power would then be transported to the production plant to power the production of hydrogen gas through electrolysis. Province said it would be targeting the production of up to 600,000 tonnes per annum of hydrogen, which would be processed to produce 3.35 million tonnes per annum of ammonia. Although hydrogen processed into ammonia would be the likely export product, Province said it was considering the option of compressed hydrogen.

2024 01 25_Australia poised to jointly fund a €400m H2Global green hydrogen subsidy auction with German government_Accelerate Hydrogen

Australia looks set to join the H2Global green hydrogen subsidy auction scheme, following talks with the German government to jointly fund a €400m (\$436m) auction for the import of Australian renewable hydrogen to Germany, the company managing the H2Global auction programme has confirmed to Hydrogen Insight. Berlin is currently in discussions with Australian officials over its proposal, proffered late last year, which envisages each country contributing €200m each. [Click here for full article](#)

2024 01 29_Toyota is pushing hydrogen cars but will they ever be as cheap to run as EVs?_ABC News

Toyota is betting on a take-off in coming years, and is pouring money into hydrogen development at a time when other established automotive companies are pledging to go all EV. Yet some analysts say hydrogen will never win this race. Just six hydrogen fuel cell vehicles were brought here in 2023, all of



them Toyota Mirais accessed through leasing arrangements — compared to more than 87,000 new EVs and even more hybrids. Toyota's Andrew Willis says a lack of refuelling infrastructure is holding up wider adoption. There are only about a dozen hydrogen refuelling stations nationally, including the one owned by Toyota in Melbourne, which can only produce enough hydrogen daily for about a dozen cars. The federal government has committed half a billion dollars towards EV charging infrastructure, compared to \$80 million matched by the states towards hydrogen refuelling, mostly for bigger vehicles like trucks. Some proponents of hydrogen have been arguing that this is where the focus should be because bigger vehicles like trains or buses will always struggle to be powered purely by heavy batteries. [Click here for full article](#)

2024 01 30_Aviation H2 orders final components to complete test engine modification_AviationH2

Aviation H2 has ordered the final parts required to complete the modification of a test jet turbine to run with a carbon-free fuel, liquid ammonia. Aviation H2 has strategically chosen liquid ammonia as its preferred hydrogen carrier. By converting existing jets to utilise liquid ammonia, the Company aims to overcome the challenges associated with hydrogen storage and transportation. Liquid ammonia has several advantages over gaseous or cryogenic hydrogen, including a higher volumetric hydrogen content, easier handling and storage, and existing infrastructure for its production and distribution. This strategic choice positions Aviation H2 at the forefront of innovation, as no other industry players are currently exploring this novel solution. [Click here to learn more](#)

2024 01 30_Japan to allocate clean hydrogen subsidies from \$20bn pot to producers by the end of this year: report_Accelerate Hydrogen

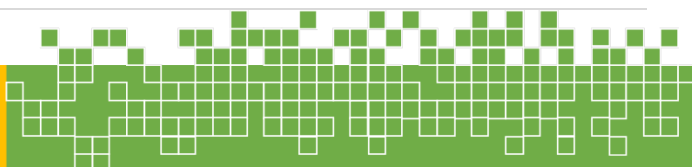
Japan will make a decision on which companies will be in receipt of subsidies from its massive ¥3trn (\$20.3bn) fund for clean hydrogen supply by the end of 2024, Japanese newspaper Nikkei reported. Domestic producers and importers of low-carbon hydrogen are hoping for a slice of the government's Contracts for Difference-style (CfD) subsidy programme, announced in December, that aims to plug the cost gap between "clean" H2 and fossil equivalents. [Click here for full article](#)

2024 01 31_The Whyalla steelworks has received a \$63m federal grant to go green on steelmaking_The Australian Business Review

The Whyalla steelworks has received a \$63.2m federal government grant to help fund its switch from coal-based steelmaking to using electricity, with that transition expected to cost hundreds of millions of dollars. The Whyalla funding will go towards the purchase and commissioning of an electric arc furnace which will replace the current coal-powered blast furnace at the steelworks. Liberty has an ambition to transition to carbon-neutral steelmaking globally by 2030 and in April last year announced it would invest up to \$500m in a new electric arc furnace and an-eventually hydrogen-fulled direct reduction plant at Whyalla. The state government is also developing a \$593m green hydrogen precinct adjacent to Whyalla, which will include what will be the world's largest hydrogen electrolyser once complete. [Click here for full article](#)

2024 01 31_ Hazer achieves first hydrogen and graphite at commercial demonstration plant_HazerGroup

Hazer Group Ltd ("Hazer" or "the Company") (ASX: HZR), a leading clean-technology developer, is pleased to announce the start-up of its Commercial Demonstration Plant ("CDP") and first production of hydrogen and graphite. The Company introduced feed gas to the reactor at Hazer process conditions today and subsequently achieved first hydrogen and Hazer-produced graphite at the facility.



The Company expects to ramp up operations through the 1st half of CY2024, safely executing the performance testing program to deliver data that demonstrates its commercial readiness. The performance testing program will focus on demonstrating continuous operation at a commercial scale and be leveraged into Hazer's global commercial project portfolio. [Click here for latest announcements](#)

2024 02 01_Final investment decision on 100km hydrogen pipeline between France and Germany to be taken 'very soon'_Accelerate Hydrogen

A final investment decision on a 100km hydrogen pipeline between France and Germany will be taken "very soon", Sandrine Meunier, CEO of France's main gas transmission system operator GRTGaz told a Paris conference. The MosaHYc project will connect the Moselle department in northeast France to steelmaker Stahl-Holding-Saar's (SHS) facilities in the neighbouring German state of Saarland. (\$2.85bn) of state aid from the German government to SHS, which will go towards replacing existing blast furnaces and oxygen with two electric arc furnaces and a hydrogen-fired direct iron reduction plant. The draft update of France's 2020 national hydrogen strategy — which was unveiled in December, ahead of sign-off this spring — called for 500km of hydrogen pipelines "in the short term" to connect forthcoming industrial hydrogen hubs to large H2 storage facilities. GRTGaz operates all the gas transmission pipelines in France, apart from an area in the country's southwest that is run by a company called TIGF. [Click here for full article](#)

2024 02 05_GTT, TotalEnergies, LMG Marin and Bureau Veritas reach a new milestone in liquefied hydrogen transport_Bureau Veritas

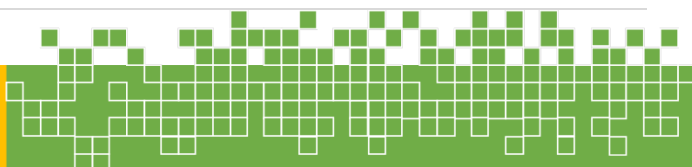
On the occasion of the Hyvolution Summit 2024 trade show (Paris – 31 January 2024), GTT, TotalEnergies, LMG Marin and Bureau Veritas announced the success of their Joint Development Project (JDP), which resulted in two Approvals in Principle (AIP) from Bureau Veritas. The first approval concerns the design of a cryogenic membrane containment system for liquefied hydrogen (LH2) developed by GTT. The second is for the preliminary design of a 150,000 m3 Large-Scale LH2 Carrier equipped with the GTT containment system. These approvals are part of the JDP announced in April 2023, paving the way for the maritime transport of hydrogen. The ability to transport very large volumes of hydrogen in liquefied form, at -253°C, is one of the technological challenges to be met to establish a reliable, efficient and competitive hydrogen supply chain and, therefore, to enable an energy transition towards a carbon-free future. <https://marine-offshore.bureauveritas.com/>

2024 02 05_Hydrogen hybrid aircraft the future of flying_The Australian Business Review

The future of flying has landed, in the form of a low cost, emissions-free aircraft capable of travelling 1000km non-stop with up to six people on board. Invented by AMSL Aero chief engineer Andrew Moore, the Vertiiia is a hydrogen hybrid, vertical take-off and landing aircraft unlike almost anything else in the market. Mr Moore said Vertiiia's range, 300km/h speed and payload capabilities put it ahead of electric vertical take-off and landing aircraft (eVTOL) which were largely limited to distances of 100km to 150km before their batteries needed recharging.

2024 02 06_Hydrogen vehicle registrations are flatlining across most of Europe — with hundreds more filling stations on the way_Accelerate Hydrogen

Registrations of new hydrogen fuel cell vehicles (FCEVs) are flatlining across most European markets, a Hydrogen Insight investigation can reveal — despite new EU legislation that mandates the construction of hundreds of new refuelling spots by 2027. Data from every European country with at least one



hydrogen refuelling station shows that in all but three, registrations of FCEV have either crashed or stagnated. [Click here for full article](#)

2024 02 06_BP increases hydrogen pipeline to 2.9 million tonnes a year, laying the foundation for green hydrogen production in the late 2020s_Accelerate Hydrogen

Oil supermajor BP grew its low-carbon hydrogen pipeline by more than 60% last year — from 1.8 million tonnes annually to 2.9 million, new CEO Murray Auchincloss revealed while presenting its 2023 financial results. BP's 105MW H2Kwinana green hydrogen project in Western Australia was shortlisted for up to A\$2bn (\$1.35bn) of federal government subsidies in December. BP is also the largest shareholder in the partnership planning the Australia Renewable Energy Hub project in Western Australia, which is set to be powered by 26GW of wind and solar in order to produce about 1.6 million tonnes of green hydrogen a year. However, that landmark project made little progress in 2023. [Click here for full article](#)

2024 02 09_BHP, Rio back push for electric smelting plan_BN

Western Australia's iron ore giants have inked a deal with Australia's largest steelmaker which could see the country's first electric smelter built in an effort to realise green steel ambitions. Rio Tinto and BHP revealed they had undertaken an agreement with BlueScope Steel to investigate the viability of an electric smelting furnace (ESF) pilot plant. The study would draw on substantial industrial know-how from the three companies to chart a path forward where Pilbara ores could be processed using a renewables-powered smelter as early as 2027. BlueScope's main Australian manufacturing plant is in Illawarra, NSW, where it employs some 3,000 staff and produces more than three million tonnes of steel per year. The company is investigating a process known as Direct Reduced Iron (DRI) which removes oxygen from iron ore in its solid state using chemicals such as hydrogen.

2024 02 09_Lasers liberate hydrogen from ammonia water_C&EN

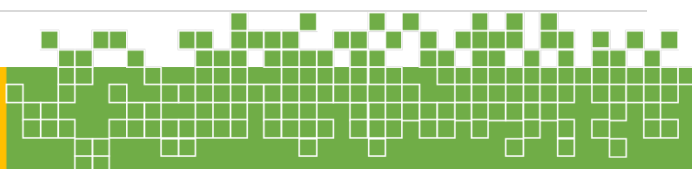
Light pulses offer an alternative approach to harnessing ammonia as a carrier for green Hydrogen. Laser pulses that can shred ammonia molecules dissolved in water may offer a way to generate hydrogen gas without using heat, pressure, or catalysts. The proof-of-principle work by researchers at Sun Yat-sen University demonstrates an unusual way to exploit ammonia as a carrier for green hydrogen, an idea that is quickly gaining traction in many industries. [Click here for full article](#)

2024 02 13_Huge boost for green hydrogen exporters as Germany allocates €3.5bn to H2Global auction subsidies_Accelerate Hydrogen

The German government is to transfer more than €3.5bn (\$3.8bn) to the country's pioneering green hydrogen purchasing programme, H2Global, in order to fund further subsidy auctions for renewable hydrogen and its derivatives this year. The €3.53 grant from the Federal Ministry for Economic Affairs and Climate Action will be used by the Hydrogen Intermediary Network Company (Hint.co) to subsidise green hydrogen imported from outside the EU in a "double-sided" auction scheme. The Netherlands has additionally agreed to jointly fund a €600m auction with the German government. The Australian government is also in talks to jointly fund a €400m auction with Germany — although this is still not yet confirmed — and a similar discussion is under way with officials from the United Arab Emirates. [Click here for full article](#)

2024 02 16_Clean Hydrogen Policies – Another Step Towards Deployment_World Hydrogen Leaders

Over the past few years, many countries created their own hydrogen strategies and made commitments towards this sector - and most recently, close to 40 nations signed a Declaration of



Intent on the Mutual Recognition of Certification Schemes for Renewable and Low-Carbon Hydrogen and Hydrogen Derivatives at COP28. Now, the focus is on introducing the policies and regulations that will establish and drive the market. This report explores and compares the policies and regulations that were adopted over the past year and a half by some of the biggest hydrogen devotees among nations. [Click here for full report](#)

2024 02 19_ 'Green' or 'blue' hydrogen – what difference does it make? Not much for most Australians_The Conversation

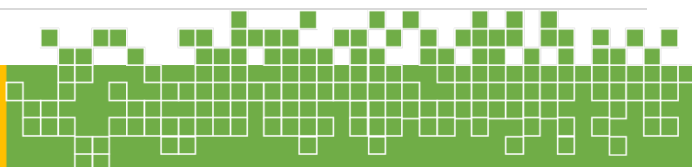
Hydrogen can play a key role in Australia's energy transition by giving us additional ways of storing and moving energy around. As the world shifts towards cleaner energy production, there's a push to make hydrogen production cleaner as well. In Australia, low-emission hydrogen is produced in two main ways. One method produces what is known as "green hydrogen". It uses electricity produced from renewables – such as solar, wind or hydro – to "crack" water into separate streams of hydrogen and oxygen. The other method produces "blue hydrogen". This process separates the hydrogen from a gas mixture obtained from fossil fuels (coal or natural gas), using carbon-capture technologies to deal with the emissions. While different colours are used to describe these methods, the resulting product is the same: colourless hydrogen. Both methods are technically viable options. Our survey found only a slight difference in public attitudes to the two methods when they were described without the colour "labels". The method of production had little impact on people's willingness to accept different uses of hydrogen. As the industry grows, current public beliefs suggest it will be increasingly important to demonstrate that using hydrogen is safe and effective, and won't compete with other renewable energy technologies. [Click here for full article](#)

2024 02 19_Target Set for \$140m Pilbara hydrogen hub_BN

The state and federal governments aim to achieve production from a long-mooted Pilbara hydrogen hub by 2028, having formalised a \$140 million funding agreement. The hub is pitched as a major centre for hydrogen production and export, with the potential to create an Australia-made green steel and iron region. It first received a \$70 million state government funding commitment in November 2021, followed by a federal commitment to match the funding in April 2022. Premier Roger Cook and federal Climate Change and Energy Minister Chris Bowen have now formalised that arrangement. The funding will help build infrastructure to support the sector, including a pipeline between the Maitland and Burrup strategic industrial areas to support production of up to 492,000 tonnes of hydrogen per year. The government said the pipeline capacity would be enough to decarbonise ammonia production on the Burrup Peninsula, where Yara Pilbara is currently producing and where Perdaman is building a \$6 billion urea plant. Yara has partnered with Engie and Mitsui on the construction of a renewable hydrogen project on the Burrup, the first of its kind in Australia. The Pilbara hub is one of two supported by the federal government's Regional Hydrogen Hubs program. The other is at Kwinana, where \$70 million of federal investment was confirmed in November 2023.

2024 02 20_Infinite Green partners with Axpo_BN

Infinite Green Energy has signed a binding joint development agreement with Switzerland-based Axpo, in a bid to develop the Valle Peligna hydrogen project. Located in the Abruzzo region of central Italy, the project was launched more than 18 months ago, and is tipped to come online during the second half of 2025. It is expected approximately 12 tonnes of renewable hydrogen will be delivered each day from the project site to a mixture of 'hard to abate' - which could include industries such as steel,



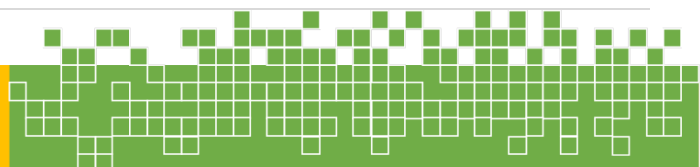
cement and chemical - and mobility sectors. As it stands, Infinite projects there will be a carbon dioxide emission saving of 67,000 tonnes per annum.

2024 02 20_Ultra-high density hydrogen storage holds twice as much as liquid H2_New Atlas

A nanoporous material that holds hydrogen at twice the density of cryogenic liquid H2 could address the challenges of large-scale liquid and gas storage that have held this clean fuel back. Hydrogen is finding plenty of applications as a clean fuel – in trucking and commercial vehicles, short range aviation and shipping, for example, where it carries considerably more energy per weight and volume than lithium batteries and can deliver superior range figures and quick refueling. You can burn it more or less like gasoline, or run it through a fuel cell to generate electric power. It has the highest energy per mass of any fuel, but it's a pain to store. Keep it in gas tanks and you'll need some 700 atmospheres' worth of compression. Keep it as a liquid, and you'll need to maintain cryogenic temperatures just 20 degrees above absolute zero. And even when squashed into a supercooled liquid, it might be lightweight, but it takes up a surprising and inconvenient amount of volume, making it both energy-hungry and tough to package where space is an issue. Now, Korean researchers say they've created a material that stores hydrogen at double the density of its cryogenic liquid form. "Our innovative material represents a paradigm shift in the realm of hydrogen storage, offering a compelling alternative to traditional approaches," said Hyunchul Oh, from the Ulsan National Institute of Science and Technology (UNIST), lead author on this new research. [Click here for full article](#)

2024 02 21_Trillions of tons of buried hydrogen: Clean energy gold rush begins_New Atlas

There's enough natural hydrogen trapped underground to meet all projected demands for hundreds of years. An unpublished report by the US Geological Survey identifies it as a new primary resource, and fires the starter pistol on a new gold rush. In short, there are as many as 5.5 trillion tons of hydrogen in underground reservoirs worldwide. It may have been generated by the interaction of certain iron-rich minerals with subterranean water. In some cases, it may be mixed in with other gases such as methane, from which it would need to be separated. But it's there, in such extraordinary quantities that analysts are expecting a gold hydrogen rush at a global scale. Gold hydrogen won't hog renewable energy like electrolyzers, or divert it away from other decarbonization opportunities. In that sense, you could argue it'll have the potential to be significantly greener than green hydrogen. On the other hand, if tapping it releases methane into the atmosphere, that's a serious issue; methane is around 85 times more powerful a greenhouse gas than carbon dioxide over a 20-year time frame. Resources companies haven't been looking for hydrogen for long, so they're only just beginning to find it and work out how to cleanly and efficiently extract it. But the opportunities here are absolutely immense, and already attracting serious investment. Over the coming months and years, we'd expect to hear plenty more about the technology and techniques involved. [Click here for full article](#)



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