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 – Adam Osseiran

We value the support of our Corporate Members and are proud of the contributions which they are making in our transition to cleaner energy, not just in Australia but globally. Welcome to **Gascoyne Green Energy**, our newest Corporate Enterprise Supporter (refer to page 2).

On the 8th of October, the HSA celebrated our **5th (Inter) National Hydrogen and Fuel Cell Day** at Murdoch University in Perth. We had a great series of speakers, and the recordings of the presentations are now available on our website (refer to page 3). One of our HSA initiatives is to help bridge the gap between industry and academia, through a series of online webinars referred to as **Hydrogen Links – Industry Focused Academic Research**. Session 6 was a hybrid event with face-to-face networking at the **Queensland University of Technology (QUT)**, and the presentations broadcast online across the country. This was well attended and served as a platform to kickstart our **HSA Queensland Chapter** and launch the **Australian Hydrogen Research Network (AHRN)**, in collaboration with **H2Q**. Recordings are now available on our website (refer to page 5).

I have recently returned to Perth after several months traveling the globe. First thing I noticed was the number of hydrogen-powered taxis and buses in Europe, where many hydrogen projects are in development. A Swiss startup is investigating the exploration of natural hydrogen in the alpine region. HNAT2023 is also coming to Perth in November (refer to page 10). The Spanish government has so far approved ten major green hydrogen projects. However, in 2030 Australia will top the world by reaching 1.5 million tons of green hydrogen produced yearly. **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 – Gascoyne Green Energy - Gateway to the Gascoyne

The Hydrogen Society of Australia (HSA) is pleased to feature our newest member **Gascoyne Green Energy (GGE)**. GGE is a Western Australian development company in the renewable energy sector scoping the opportunity to develop a tier one multi-gigawatt green hydrogen/ammonia project on **Boolathana Station**, located in the State's **Gascoyne** region.

Gascoyne Green Energy

ACN. 665 382 365
E. admin@ggenergy.au
A. Level 2, 47 Stirling Highway
Nedlands WA 6009
Western Australia

GGE was founded by long-term pastoralist **Adam Hamersley** who runs a cattle operation on Boolathana and has given GGE exclusive rights to explore the green energy potential on Boolathana. The landholding is 1,483km^2, an area more than twice the size of Singapore and is situated on the Indian Ocean coast, only 15km from the town of **Carnarvon**. Boolathana is the gateway to the Gascoyne and the huge renewable energy potential the region holds. GGE aspires to open up the Gascoyne for other pastoralists to participate in renewable energy production with access to the proposed hub on Boolathana's coastline.

The wind resource on Boolathana derives from the "**Roaring Forties**," strong westerly winds that blow from roughly 40 degrees south, and powerful winds caused by the pressure gradient between desert and sea. The station's coastal location and overall geography also positively contributes to the available wind resources. It is envisaged that the available solar energy will be used to fill in intermittent troughs and peaks of wind power – known as 'firming' – to produce a steady electrical energy load necessary for green hydrogen/green ammonia production, proposed to be near the coast.

GGE has been actively involved with government and community engagement to include the local Traditional Owners, the **Yinggarda** and **Baiyungu** people. The feedback has been positive as there is broad understanding that a new clean energy industry will boost the local economy, providing many community benefits to Carnarvon and the Gascoyne region.

GGE is putting the finishing touches on its **Scoping Study** outlining the multi-gigawatt renewable energy potential on Boolathana. As part of these studies, a Red Flag Multi-Criteria-Assessment has confirmed that there are no environmental red flags present that could prevent the project from going ahead. Bejaling Shoals, off Boolathana's coast has been identified as the most suitable site for a deep-water port in June 2023 in a report by **ACIL Allen** and engineering partner **BMT**, commissioned by the **Gascoyne Development Commission**. A multi-user marine facility study on Boolathana has been further commissioned, in response to a growing need for flexible marine infrastructure to facilitate both import and export operations in the Gascoyne region, to be finalised in early 2024.

The international wind experts engaged by GGE have identified that the renewable resource efficiencies present on Boolathana due to its elite wind and solar conditions, in combination with a flat treeless landscape, minimal environmental impacts, a single landowner, positive economic benefit potential to the region and direct access to deep water from the 23km coastline, presents an unprecedented opportunity in Australia and the world.

For further information, contact: **Elena Healy, Manager Corporate Communications, GGE**

Mobile: +61 417 454 288 Email: E. ehealy@ggenergy.au

Australia Hydrogen Day – 5th (Inter) National Hydrogen and Fuel Cell Day – 08 Oct 2023

The **Hydrogen Society of Australia (HSA)** was pleased to facilitate a collaborative event with **Murdoch University and Innovate Australia** on October 08 (**Australia's 5th (Inter) National Hydrogen and Fuel Cell Day**). This was a hybrid event with presentations broadcast across the country and free in-person networking over lunch and refreshments in the exhibition space. The following lineup of speakers shared their knowledge and perspectives on the role of hydrogen in facilitating our energy transition:

- Professor Andrew Deeks, Vice Chancellor of Murdoch University
- Hon. Bill Johnston, Minister for Mines and Petroleum; Energy; Hydrogen Industry; Industrial Relations
- Peter Kasprzak, Chairman, Innovate Australia; HSA Board Director
- GM Shafiullah, Associate Professor of Electrical Engineering, Murdoch
- Furat Dawood, HSA Steering Committee member, H2E
- Professor Peter Klinken, Chief Scientist of Western Australia (video recording)
- Anthony Sutton, Executive Director, Hydrogen and New Energies, DJTSI
- Ghazal Avijegon, Commercial Lead- Renewable Fuels, ATCO Gas Australia; HSA Steering Committee
- David Cavanagh, Managing Director, Integrated Energy Pty Ltd; Chief Hydrogen Officer, Hydrogen West and Davyd Hooper, Top Group
- Patrick Hartley, Leader, CSIRO Hydrogen Industry Mission (video recording)
- Steve Gauld, Managing Director & CEO at Infinite Green Energy
- Andrew McCluskey, Executive General Manager Hydrogen, Siemens Ltd AU NZ; HSA Chairman.

The event began with a **Welcome to Country** from an Indigenous Leader Aunty Marie Taylor and was moderated by Lorie Jones, Vice-President Hydrogen Society of Australia. Many thanks to Peter Kasprzak and Ghazal Avijegon for their efforts in planning for and delivering this event. Recordings of the presentations are now available on the HSA website. Go to our website for more details (click on the link below).

https://hydrogensociety.org.au/product/australia-hydrogen-day-5th-international-hydrogen-and-fuel-cell-day/

The **Australia Hydrogen Day** event began with some opening remarks by Professor Andrew Deeks, Vice Chancellor of Murdoch University (below left), who introduced the Hon. Bill Johnston, Minister for Mines and Petroleum; Energy; Hydrogen Industry; Industrial Relations (below right).

During breaks for lunch and refreshments, hydrogen powered vehicles from ATCO, and from Integrated Energy were on display (refer above). H2E provided an interesting exhibit with a fuel cell electric vehicle model, a hydrogen economy model and a hydrogen volumetric density model. Paul Ventrice and Adam Samara were manning the H2E booth (above right). Lorie Jones concluded the event with **thanks to contributers**: ATCO, CSIRO, Integrated Energy, Aurecon, Siemens, Murdoch Uni, Infinite green, Innovate Australia, H2E, HSA (refer right).

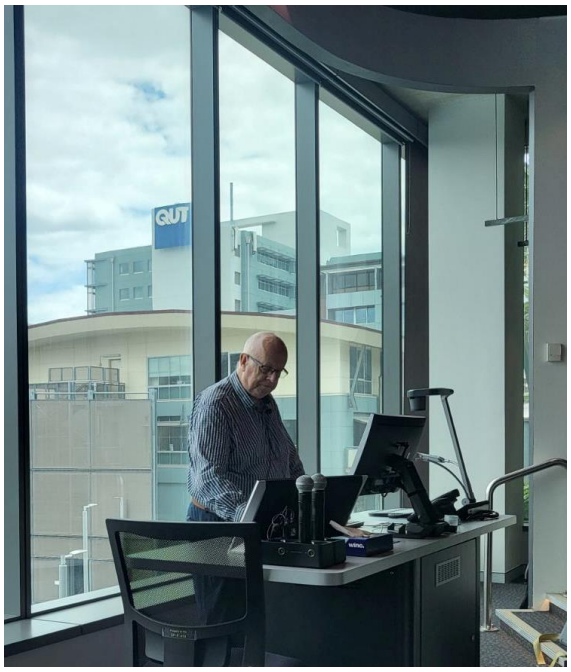
Hydrogen Links: Industry Focused Academic Research - Session 6 on 19 October 2023

Accelerating Australian Hydrogen Industry through Research Collaboration

The **Hydrogen Society of Australia (HSA)** was pleased to facilitate a collaborative event with **Queensland University of Technology (QUT), AHRN and CSIRO** on October 19 (**Hydrogen Links – Industry focused Academic Research Series – Session 6**). This was a hybrid event, with the presentation broadcast online, followed by an in-person networking event over lunch, and tours of the QUT laboratories:

The presenters were:

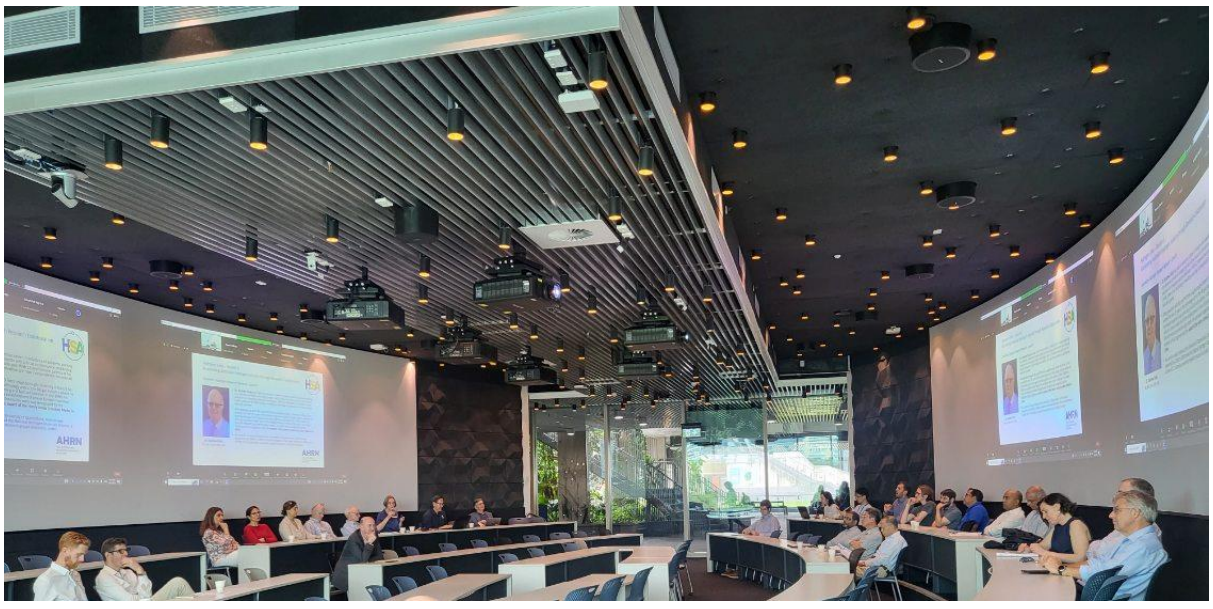
- Prof. Anthony O'Mullane (QUT) – *Topic: Hydrogen activities at QUT - from bench to pilot plant*
- Dr Andrew Dicks (AHRN) – *Topic: Australian Hydrogen Research Network - Launch*
- Dr Patrick Hartley (CSIRO) – *Topic: Australia's Journey so far… and the path ahead*



Dr. Andrew Dick discussed practices and opportunities to accelerate development of the Hydrogen industry in Australia through collaboration. His presentation provided a unique perspective from **Australian Hydrogen Research Network (AHRN)** and valuable insights into the active landscapes of research and collaboration.

The Australian Hydrogen Research Network Ltd became an incorporated non-profit association on 1st July 2023. Over the coming months the network will continue its program of online and in-person research events. The next AHRN event showcasing young researchers will be on 8th November at the **Newcastle Institute for Energy and Resources**. Further AHRN events in 2024 will lead to the next **Australian Hydrogen Research Conference** which will be held in Perth from 4-6th September 2024.

Recordings of this event are now on our website. Click here to access the presentations



Asia Pacific Hydrogen 2023 Summit and Exhibition- Sydney – 26 to 27 October 2023

The **Sustainable Energy Council** in partnership with the **Australian Hydrogen Council** and with the support of Austrade and NSW Government, delivered the **Asia Pacific Hydrogen 2023 Summit and Exhibition** on 26 – 27 October at the ICC in Sydney, Australia. Gathering global hydrogen leaders to meet with the region's policy makers and energy stakeholders, Asia Pacific Hydrogen 2023 provided access to the latest project and technology developments and developed new partnerships to drive the industry forward and establish key supply chains in the region to deliver our **Net Zero** ambitions. The **Hydrogen Society of Australia** was pleased to participate in this event as a key supporting organisation.

Our Chair of the **HSA NSW Chapter Dr Quentin Meyer** partnered with the **Powerfuels** including Hydrogen Network (https://www.decarbhub.au/networks/power-fuels-including-hydrogen-network/), promoted the network and the HSA and all things hydrogen in NSW. The summit was extremely positive, with exciting meetings between the HSA and **Hysata** (Hydrogen Links Session 8, date confirmed for 30 January 2024), **Nedstack** and other organisations in NSW and overseas.

From left to right: Dr Quentin Meyer (HSA chair and fuel cell team lead in UNSW Chemistry), Caitlin MacPhail (Powerfuels including Hydrogen Network Engagement & Communications Officer), Thomas Gao (Business Development Manager, NSW Decarbonisation Innovation Hub), Dr Denny Gunawan (Postdoctoral Research Associate, School of Chemical Engineering, UNSW), Dr Rahman Daiyan (Senior Lecturer, School of Chemical Engineering UNSW) and Prof Rose Amal (School of Chemical Engineering, UNSW).

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/

National Hydrogen Industry Technical Masterclass – 13th – 15 February 2024

The Hydrogen Society of Australia is collaborating with **Engineers Australia (EA)** and the **Australian Institute of Energy (AIE)** to facilitate a 3-day Technical Masterclass in Perth.

This is part of a national hydrogen industry technical training series that will be rolling out across Australia over the coming year. More information about the Perth Master Class will be coming soon, in the meantime save the date in your calendars (13th to 15th February 2024).

This will be an in-person event only, with strictly limited numbers of participants. If you would like to be kept informed as more information becomes available, please register your interest using the following link: Click here to register your interest and stay informed

Upcoming HSA related Hydrogen Events

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, see page 5].

Hydrogen Links - Sessions Upcoming:

- CO2CRC (**David Whittam**) – date confirmed for December 05. Refer to Page 10.
- HYSATA (**Gerry Swiegers**) – date confirmed for January 30.

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); 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

First Natural Hydrogen Worldwide Summit – Fremantle – 27 and 28 November 2023

The Hydrogen Society of Australia has partnered with the organizers of the first natural hydrogen worldwide Summit. The HNAT2023 event will take place on 27 and 28 November at the Esplanade Hotel in Fremantle. The theme of the Summit is natural hydrogen, a source of clean, low-carbon energy that is produced by the earth and can accumulate in geological reservoirs. Western Australia is very well positioned in this field especially with the exploration expertise that Western Australia can boast about. Click here for more information and to register at **Early Bird rates**.

Positioning Hydrogen 2023 – Melbourne - 2023 11 27 to 29

The 3rd Global Hydrogen Energy Conference and Exhibition will bring together participants from the entire hydrogen value chain with the goal of exhibiting solutions and innovations for low-carbon hydrogen production, efficient storage and distribution, safety and emergency services, and applications in a wide range of industries. Industrial experts and decision makers from around the world will talk about and show off the latest technologies, engineering solutions, and future trends. The Hydrogen Society of Australia is partnering with the conference organisers and has secured significantly discounted (50%) registration fees for HSA members – Sign into your HSA membership account and click here to secure your 50% discount coupon. Click here to learn more about the conference

Hydrogen Links – Industry focused Academic Research Series – Session 7 – 05 December 2023

The 7th Session of our HSA Hydrogen Links series will be a collaborative event between **CO2CRC** and **CSIRO**, focussing on hydrogen production technologies and underground hydrogen storage. The hybrid event will take place at the CSIRO Research laboratories in Clayton South Victoria, with online presentations followed by a tour of the **Clayton Hydrogen Technology Cluster** refuelling station. Refreshments and networking over a light lunch will also be provided.

Dr Jonathan Ennis-King is a principal senior research scientist with CSIRO Energy. He received a BSc (Hons) from the University of Melbourne in 1988, and a PhD in Applied Mathematics from the ANU in 1993. He subsequently held postdoctoral positions at the University of Melbourne, Lund University, and the ANU. He joined CSIRO in 1999 to work on the geological storage of carbon dioxide. His general research interests are in the modelling and simulation of multiphase flow and coupled processes in porous media. Since 2019 he has also begun to investigate the potential for underground hydrogen storage. https://people.csiro.au/e/j/jonathan-ennis-king

Dr Sarb Giddey is the Group Leader of the Thermal and Electrochemical Technologies Group in the Energy Technologies Program at CSIRO Energy. He joined CSIRO in 1999 and has over 20 years R & D experience in high and low temperature electrochemistry and hydrogen related technologies. Dr Giddey has been involved with the development of polymer electrolyte membrane (PEM) based technologies (fuel cells and electrolysers) for the last fifteen years. He has strong interests in distributed energy generation and renewable sources of energy and more specifically integration of hydrogen / fuel cell / renewable energy systems. https://people.csiro.au/g/s/sarb-giddey

Due to restrictions on the laboratory tours, in-person attendees will be capped around 25 to 30 people. Registrations will be open soon. In the meantime, save the date in your calendars.

Harnessing Hydrogen's Potential - Kuala Lumpur – 07 to 08 December 2023

For the Asia-Pacific region, there are big questions to answer – not least, how can the region pragmatically shift to hydrogen power? This is a geography with high expectations for its green hydrogen potential and its subsequent role on the global decarbonisation stage, particularly for the powerhouse People's Republic of China. At the same time, however, the Asia-Pacific region is home to a number of emerging economies and developing societies, and it would be unthinkable to switch to 'brand new' fuels and infrastructure overnight. There exists a balancing act to be struck… Accessibility, availability and affordability will all be key factors for hydrogen's anticipated growth in the APAC region. The emphasis will be on the 'transition' in energy transition, but many will also ask, how long can we afford to wait? Click here for further information

The Hydrogen Society of Australia is collaborating with H2View, the organisers of the upcoming conference in Kuala Lumpur. The HSA has been offered three complimentary tickets to the conference, as well as discounted accommodation facilities. We would be pleased to offer these benefits to our corporate enterprise members. Please reach out to **contact@hydrogensociety.org.au** should you wish to explore options.

Other upcoming hydrogen related events around the globe (non-HSA related)

- 2023 11 06 to 10 - Energy Security and Green Infrastructure - UK – Click for more details
- 2023 11 08 to 10 - ESG Strategy Summit – Perth - Click for more details
- 2023 11 23_Global Offshore Wind Summit – Onslo - Click here for more details
- 2023 11 29 to 30 - Climate Smart Engineering Conference – Melbourne - Click for more details
- 2023 12 03 to 05 – 10th International Hydrogen and Fuel Cell Conference – India - Click here for more details
- 2024 02 06 to 09_India Energy Week 2024 – Goa, India - Click here for more details
- 2024 02 19 to 21_EGYPES - Egypt Energy Show – Cairo - Click here for more details
- 2024 02 19 to 20 – H2 Forum 2024 – Berlin - Click here for more details
- 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 to 13 – 3rd Annual Sustainability Week Asia – Bangkok and virtual - Click here for more details
- 2024 03 13 to 15 – AOG Energy – Perth Convention and Exhibition Centre - Click here for more 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 here for further details
- 2024 05 01 to 02 – Sydney Build Expo – ICC Sydney - Click here for further details
- 2024 06 11 to 14 – Australian Energy Week 2024 – Melbourne - Click here fo further details
- 2024 09 04 to 06 – Australian Hydrogen Research Conference - Perth

Snippets of Hydrogen making moves around the world

2023 10 03_Accelerate Hydrogen_Hydrogeninsight.com

- Publication of critical US green hydrogen rules 'pushed back to end of year due to legal concerns'. Developers hoping for clarity on what constitutes green hydrogen in the US might to have to wait until the end of 2023 while the US government makes sure that its hotly anticipated guidelines are legally watertight. Click here for full article
- EU carbon border tax | Companies importing hydrogen and ammonia into the EU will now have to report their greenhouse gas emissions (both direct and indirect) to the European Commission on a quarterly basis, after the initial phase of the bloc's Carbon Border Adjustment Mechanism came into effect. Click here for full article
- Almost half of California's hydrogen filling stations offline after H2 supply 'disruption'. Click here for full article

2023 10 03_The secret behind the first $US1bn green hydrogen start-up_Australian Business Review

Hundreds of companies have promised to produce large amounts of green hydrogen, but none have succeeded. Electric Hydrogen believes the secret to success is finding a better way to split a molecule. Investors believe it too. The company is the green hydrogen industry's first unicorn. It recently raised $US380m ($600m) from backers including BP, United Airlines, Microsoft and iron-ore producer Fortescue Metals. That pushed it over the magical $US1bn mark. Electric Hydrogen's claims will be put to the test soon. It is opening its first large electrolyser factory next year at an emerging clean-energy hub in a converted Army base 30 miles northwest of its lab. The nearly 200,000-square-foot factory will be next door to nuclear fusion start-up Commonwealth Fusion and battery recycling company Ascend Elements. At the factory's full capacity, Electric Hydrogen aims to produce twice as many electrolysers each year as the total amount installed globally in 2022. Click here for full article

2023 10 05_How traders can capture value in sustainable fuels_McKinsey

As countries around the world seek to limit their carbon emissions, sustainable fuels will play an important role. A fascinating but challenging aspect of the sustainable-fuel market is the broad range of categories it encompasses. Biofuels account for the vast majority of the current market, but drop-in sustainable fuels and hydrogen-based e-fuels could reshape the landscape in the coming decades. The development of these fuels will be nonlinear: they will mature at different paces, and their specific uses could replace fossil fuels at different rates. The business case and location choices for e-fuel production are affected by access to affordable renewables, availability of sustainable carbon (e-ammonia, which doesn't contain carbon, is an exception), and integrated production costs of hydrogen derivatives (which are affected by rules such as temporal correlation, requiring storage of electricity or hydrogen to produce compliant fuels). Classifications vary by type of hydrogen (for example, carbon intensity or whether electricity source includes nuclear in addition to renewables) and carbon (such as carbon derived from fossil, biogenic, or direct-air-capture sources) and can affect a product's value in the market. Currently, future producers are concentrating primarily on non-fossil carbon sources such as ethanol, pulp and paper, and waste-to-energy plants. Click here for full article

2023 10 05_Accelerate Hydrogen_Hydrogeninsight.com

- 'We will place the biggest hydrogen bus order in US history because battery-electric can't do the job'. Metro CEO Michael Tree told Lookout Santa Cruz that hydrogen buses have a "fourfold advantage" over battery-electric options. First of all, he said they have a longer range — 300-350 miles (483-563km) versus 175-200 miles; they can be fully "charged" in about 15 minutes, compared to several hours for battery buses; they are lighter and therefore less taxing on roads and bridges; and they will still work if a natural disaster cuts off the electricity to the city. Hydrogen filling pumps can be backed up by diesel generators; although the buses will not work if their hydrogen supply is cut off, as it currently is in much of southern California. Click here for full article
- Additionality rules for US green hydrogen 'are not unreasonable, they're the only way to pass the sniff test'. In the absence of any guidelines defining green hydrogen, a debate is raging in the US over whether the federal government should counterbalance its generous green H2 subsidies with strict EU-style rules demanding additionality and temporal and regional matching of grid-sourced renewable power. The situation has been exacerbated by continued delays from the Department of Energy (DOE) and Treasury to publishing its hydrogen guidelines, which will determine whether projects are eligible for the 45V tax credit of up to $3/kg. [Definitions: "Additionality" means that the green hydrogen would have to be produced from new renewables projects, so that they do not utilise existing clean electricity facilities that would otherwise help decarbonise the power grid; "Temporal correlation" relates to how frequently producers would have to prove that their electrolysers have been powered by 100% renewable energy — usually hourly, weekly, monthly or annually; "Geographic correlation" refers to how close the hydrogen-producing electrolyser is to the source of renewable energy it uses. Click here for full article

2023 10 06_Hydrogen is still very much part of the net zero push; here are some companies with plans to drive its adoption_Stockhead Click here for full article

- **Pure Hydrogen (ASX:PH2)** managing director Scott Brown expressed his belief that large-scale adoption of hydrogen would occur in heavy transport, buses, shipping and possibly aviation. "While battery-electric is good for certain areas, particularly smaller applications – like passenger cars, once you start carrying big loads, it is very difficult to power up a big truck and that's where hydrogen comes in," he said. "Effectively you can still run on an electric platform and have all the advantages that platform offers, the hydrogen and the fuel cell will essentially generate the electricity for you. It just extends range or grants more power to do things.
- **Frontier Energy (ASX:FHE)** is focused on advancing its Waroona solar energy project, which has all major permits, approvals and a connection to the WA electricity network already in place, towards being 'shovel ready' before the end of this year. Stage 1 development of the project will seek to deliver 120MW of power into the grid though approved connections are in place to take this up to 355MW. Total grid connection capacity is much higher at 1.1GW. However, the company also has plans to make a splash in the hydrogen sector with a study underway into the development of a peaking plant that will be the first consumer of the green hydrogen production proposed under its Definitive Feasibility Study. The DFS has proposed the construction of a 72MW electrolyser (in 36MW building blocks) that would fully use the quantum of energy produced by the solar farm.
- **BPH Energy (ASX:BPH)** has increased its stake in Clean Hydrogen Technologies up to 17.5%. The US company is developing its own in-house solution to generate a clean hydrogen product and solid carbon for batteries with no CO2 emissions from natural gas.

2023 10 09_Clean Energy Council calls for $100bn transformation package to turn Australia into renewables superpower_Australian Business Review

The Clean Energy Council, the peak body for the clean energy industry in Australia, has set down its game plan for ensuring Australia gets back on track for 82 per cent renewables by 2030, arguing for a $100bn transformation package to help the nation become a clean energy superpower. The submission released on Monday, titled "Power Playbook – Accelerating Australia's Clean Energy Transformation" is claimed to be a fully integrated plan for seizing the global opportunities in renewable energy. Setting out a structure for the creation of a formalised national masterplan the pitch by the Clean Energy Council includes a raft of recommendations, designed to work together, that include a Clean Energy Transformation Investment Package in the order of $10bn per annum for at least 10 years, or a minimum of $100bn. The submission has also recommended that the government prioritise investment in green hydrogen and minerals processing market opportunities over the next decade. Click here for full article

2023 10 10_Ballard announces orders for over 170 hydrogen fuel cell engines to power Solaris buses in Europe_www.ballard.com

Ballard Power Systems (NASDAQ:BLDP; TSX:BLDP) today announced multiple purchase orders totalling 177 hydrogen fuel cell engines from long-standing customer Solaris Bus & Coach sp. z o.o. ("Solaris"; www.solarisbus.com), a leading European bus manufacturer deploying hydrogen-powered city buses across the continent. Ballard expects limited initial deliveries of the 177 fuel cell engines in 2023, with the remainder to ship from 2024 through 2026. The orders include the supply of fuel cell engines to support the largest announced deployment of a fleet of fuel cell city buses in Europe, with 127 Solaris fuel cell buses to be deployed in Bologna, Italy. Ballard also received orders for a further 50 modules to power Solaris fuel cell buses in Germany and Italy. The number of engines ordered by Solaris year-to-date now exceeds 270, representing substantial growth over the more than 140 fuel cell city buses that Solaris has deployed with customers in Europe to date.

2023 10 10_Accelerate Hydrogen_Hydrogen Insight

- Demand for green hydrogen will skyrocket in the EU after the 27 member states finally approved the long-gestating Renewable Energy Directive, which includes mandatory usage targets for renewable hydrogen and its derivatives (known in EU parlance as Renewable Fuels of Non-Biological Origin, or RFNBOs). This means that 42% of the hydrogen used by industry must be green by 2030 (reaching 60% in 2035), with 1% of all fuel used in transport to be RFNBOs by 2030.
  Click here for full article
- Synthetic aviation fuel derived from green hydrogen must make up 1.2% of all aviation fuel in the EU by 2030, after member states signed off on the ReFuelEU Aviation directive. This EU directive aims to significantly reduce greenhouse emissions from planes by 2050 by forcing flights departing EU airports to use increasing quantities of bio-based sustainable aviation fuels (SAFs) and green hydrogen-based synthetic e-fuels from 2025. Click here for full article

2023 10 17_ Some of the highest concentrations globally': Greenvale's new advanced helium, natural hydrogen play a springboard for growth_Stockhead

Greenvale Energy (ASX:GRV) is to acquire 75% of gas, helium and natural hydrogen project (EP 145) in Central Australia's Amadeus Basin. EP 145 has favourable geology for production of helium, which commands a high price due to its rarity and use in high-tech applications, and natural hydrogen. Proximity to existing infrastructure ensures potential for rapid commercialisation. Helium is an extremely rare, high value gas that is used in semiconductor manufacturing, nuclear energy production, solar panels, optic fibre

and the cooling of superconducting magnets in MRI scanning machines and more. Meanwhile, natural hydrogen – hydrogen found in naturally occurring reservoirs rather than produced by cracking water or methane – is an alternative clean, carbon free fuel that can be extracted for commercial use. Click here for full article

2023 10 17_Accelerate Hydrogen_Hydrogen Insight

- The White House has announced that seven regional clean hydrogen hubs across the US will receive a total of $7bn of government funding, under a scheme set out in the 2021 Bipartisan Infrastructure Law to accelerate the production and usage of low-carbon H2. Most of the hubs will produce hydrogen from two or more sources, with five of the seven including the manufacture of green hydrogen from renewable energy, two making pink hydrogen from nuclear power, while four will controversially see blue hydrogen derived from natural gas with carbon capture and storage. Click here for full article
- World first as Siemens Energy burns 100% hydrogen in industrial gas turbine. The world's first use of 100% hydrogen in an industrial gas turbine has taken place in western France, according to Siemens Energy, paving the way for large-scale H2 -based energy storage projects. While many manufacturers, including GE, Mitsubishi and Kawasaki, have stated an aim of being able to convert their industrial gas turbines to run on 100% hydrogen, Siemens Energy' SGT-400 model is the first to achieve the goal. The German company says 100% hydrogen burn was achieved at the 1MW Hyflexpower demonstration project at a paper plant in Saillat-surVienne, developed by a consortium including Engie, the German Aerospace Centre and four European universities. Click here for full article
- The cost of green hydrogen production can be slashed by up to 40% by installing H2 storage on-site, a commercial power procurement test by Swedish green steel consortium Hybrit (Hydrogen Breakthrough Ironmaking Technology) has found. Hybrit — a collaboration between Swedish utility Vattenfall, mining group LKAB and steel producer SSAB — powered it's 4.5MW of electrolysers at its Luleå H2 storage pilot project in northern Sweden with "fossil-free" electricity bought from the Nord Pool day-ahead and spot market for a month. By using the project's underground storage facility, the partners were able to deliver hydrogen in a steady flow to SSAB, while also cutting costs by 25-40%, Hybrit reported. Click here for full article

2023 10 20_ Pure Hydrogen's fuel cell powered garbage truck is about to hit the road_Stockhead

Pure Hydrogen (ASX: PH2) had reached an agreement with leading domestic waste collection provider JJ's in March 2022 to supply a hydrogen fuel cell side-lift waste removal truck as well as green hydrogen supply and refuelling services. The vehicle is now almost ready for operations following an extensive testing and design phase that was carried out in accordance with Australian Design Rules (ADR) – the national standards for road safety that are administered by the Australian Government under the Road Vehicle Standards Act (2018). It passed criteria for all relevant safety and design standards such as braking, cornering and acceleration, with final approval from the government expected in the coming weeks. Component parts for the body of the truck, including the storage compartment and state-of-the-art waste refuse equipment, are currently being installed and fitted by the Australian division of multinational Swiss engineering group Bucher Industries. Garbage trucks are seen as an excellent application for hydrogen fuel cells as they are more capable of providing the power needed driving around, picking up bins at every household and compacting waste compared to battery power. Click here for full article

2023 10 17_Green energy in Africa presents significant investment opportunities_McKinsey

Africa has the fastest-growing population in the world, and it is set to double by 2050 to reach more than two billion people. Meeting their needs with cost-efficient, sustainable energy sources will be vital to the continent's socioeconomic development as well as to achieving the goals of the Paris Agreement. Richly endowed with wind and solar resources, African countries in the north and southwest of the continent could be highly competitive in supplying green hydrogen for local and global consumption. In an Achieved Commitments scenario, global hydrogen demand could grow sevenfold by 2050 as hydrogen production costs fall and renewable capacity increases. Furthermore, since the global supply and demand for hydrogen are mismatched, Africa has a significant opportunity to export green hydrogen. The establishment of the Africa Green Hydrogen Alliance in 2022, which seeks to foster collaboration between hydrogen-producing countries, could be a boon for African hydrogen. By 2050, the continent could self-supply its full domestic demand potential of between 10 and 18 megatons of hydrogen, while African hydrogen exports could reach around 40 megatons by 2050. McKinsey modelling shows that if the continent's energy mix evolves in this way, Africa's energy carbon intensity could decrease substantially. By 2050, energy emission intensity could fall by 45 percent, driven by the evolution of solar, wind, and green-hydrogen power sources. Click here for full article

2023 10 23_Curtin researchers in green hydrogen win_BN

A project designed to extract green hydrogen from untreated water at a significantly cheaper rate has topped the Curtinnovation awards. Curtin University Professor Zongping Shao and PhD candidate Jiayi Tang received the highest prize at this year's awards for their water electrolysis method on unpurified sources, including seawater. The method uses an alternative catalyst that costs one tenth of the existing process and could produce green hydrogen at 60 per cent of the current cost, according to Curtin University. The water electrolysis method also took home the Griffith Hack Overall Winner. According to the award brief, the method could offer up to a 38 per cent cost saving in hydrogen production. "The two existing methods for extracting hydrogen from water have their limitations: one process requires ultrapure water and an expensive catalyst, the other requires significantly higher energy inputs for the same level of hydrogen production," the brief said. "This exciting development could be a cost effective, plentiful source of hydrogen that contributes to the achievement of global zero carbon goals." Click here for full article

2023 10 25_Carbon harvester to capture Kwinana emissions_BN

A Perth-based startup will chart out a study to sequester carbon from Kwinana's industrial plants offshore in a bid to reduce environmental impact from the 7 million tonnes of emissions generated in the area each year. Sea-Quester was awarded a $500,000 state government grant to work with Discover Geoscience and DORIS Group on a study to determine the commercial viability of disposing CO2 emissions from Kwinana into the South Perth basin. The project would probe the feasibility of using a carbon harvesting vessel developed by Sea-Quester and subsea mooring and injection technology developed by fellow Perth start-up Pivotree, based in the same office. Sea-Quester managing director Chris Merrick said offshore geosequestration of carbon could store emissions from the South West industrial corridor for decades. Kwinana Industries Council Director Chris Oughton said the potential to sequester carbon emissions from Kwinana industrial activity was significant. "The technical merits of carbon sequestration techniques, such as those under investigation for the South Perth Basin, could be a game-changing solution to the complex and challenging issue of emissions reduction for our members," he said. Sea-Quester was among nine organisations to share in the $4.24 million fund. Climate Action Minister Reece Whitby said the projects would help WA reach net zero emissions by 2050. Click here for full article

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https://hydrogensociety.org.au/

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