

## Newsletter



Hydrogen  
Society  
of Australia

Looking backwards, looking forward!

Hydrogen is marching on – will you join us?

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### Message from the HSA President – Adam Osseiran

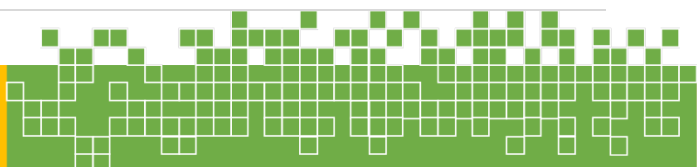
We value the support of our Corporate Members, and are proud of the contributions which they are making in our transition to cleaner energy, not just in Australia but globally. **Integrated Energy Pty Ltd** is a great example of an SME punching above its weight – refer to our Members Spotlight (Page 2). The HSA is very pleased to acknowledge the initiatives of Siemens, our largest corporate supporter (refer to Page 6).

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**. The objectives of this initiative are to raise the level of industry awareness and expertise and deepen the relationships between industry and academia within the HSA. Session 4 was a hybrid event with face-to-face networking at Edith Cowan University (ECU), and the presentations broadcast online across the country (refer to page 3 and 4). An overview of the upcoming hybrid event at UNSW (Session 5) is provided on Page 5.

We invite our readers to keep us informed about clean hydrogen initiatives in your region (ie; career opportunities, conferences, and future developments) for knowledge sharing in our newsletters. We also invite you to be involved in organising the celebration of the next **Australia Hydrogen Day 2023** on Sunday 8 October 2023 in your Capital City. Get involved and reach out on [contact@hydrogensociety.org.au](mailto:contact@hydrogensociety.org.au)

**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 – Integrated Energy Pty Ltd

### *How Australia can influence global hydrogen initiatives through thought leadership.*

David Cavanagh is Managing Director of **Integrated Energy Pty Ltd** and Chief Hydrogen Officer of **Hydrogen West** and **Hydrogen East**. In addition to his involvement on a range of West Australian and Australian projects, and related Australian standards, David has contributed to many international hydrogen initiatives, which illustrate the influence we can have on the global stage as individuals and independent companies.



**David Cavanagh**

These contributions have included supporting Australia's presence at the **United Nations COP 27 International Environmental Conference** at Glasgow, UK in 2020 through providing virtual reality experiences of Hydrogen West Hydrogen Refuelling Stations, H2X hydrogen vehicles, Hydrogen Production Facilities, as well as video flythroughs and material for display on the Australian stand.

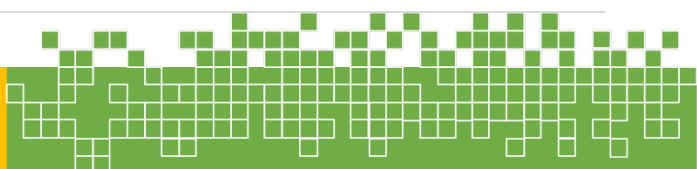
David represented Australia on the **International Standards Organisation (ISO)** working party for hydrogen refuelling, including at the global gathering in Germany at the factory of IVECO where hydrogen trucks are being manufactured. A key opportunity was to provide input to the requirements for Australian road transport (ie. including long distance, heavy loads, sustained high speeds, high temperatures and remote areas) to raise the awareness of the global working group, representing not only Australia but also the southern hemisphere as a whole. This was very well received, leading to an invitation to present at the Korean international conference on hydrogen research and standards. The ISO work continued in Versailles, France the following year.

David again supported the Australian presence at the **United Nations COP28** in Sharm El Sheikh Egypt, contributing and presenting as part of UN workshops on the future of transportation, with VR experiences also at the related "Green Investment" Conference. Whilst in Egypt, he engaged with an Egyptian company and as a result Integrated Energy have successfully exported some of our own Australian hydrogen hybrid technology which is well suited to the marine fleet in the region.

At COP28 the ongoing dialogue with our **Federal Minister for Climate Change & Energy** as well as our **Federal Minister for the Environment**, and other Australia companies like **FFI** proved very constructive and it was very encouraging to see the \$2bn support package included in the Federal budget the following year. Following COP28 David represented Australia in Monaco, at the **Inaugural Green Hydrogen for Transport Conference** hosted by Prince Albert. He also visited the Australian Embassy in Bangkok, briefing Australia staff, followed by an invitation from the **United Nations** to provide an intervention as an expert in the area of hydrogen in Asia Pacific.

David was also engaged by **Australian Department of Foreign Affairs and Trade (DFAT)** for their South East Asia Hydrogen Study tour of Australia, in Brisbane, to share knowledge with other nations including Laos, Indonesia, Vietnam and Philippines, which led to requests for support. He recently gave a short course for the **World Trade Organisation** to address the topic of "Trade in Green Hydrogen, Hype, Hope or Reality?" to more than 50 staff at their headquarters in Geneva, as well as meeting with **United Nations Industrial Development Organisation** in Vienna, which led to requests for support in Asia Pacific (thanks to Mount Gibson Iron for allowing use of a client case study).

These experiences demonstrate the value for Australian companies, and for the world, in global collaboration in decarbonization and hydrogen, including safety, standards, know-how and trade.



## Hydrogen Links: Industry Focused Academic Research Session 4: Hydrogen Geo-storage, Challenges and Opportunities [delivered on 2023 August 31]

The **Hydrogen Society of Australia (HSA)** was pleased to facilitate a collaborative event with **Edith Cowan University (ECU)**, Centre for Sustainable Energy and Resources on August 31 (**Hydrogen Links – Industry focused Academic Research Series – Session 4**). This was a hybrid event, with the presentation broadcast online, followed by an in-person networking event over lunch, and tours of the following ECU laboratories:

- **Chemical Engineering Laboratory** - one of Western Australia's leading facilities in membrane technologies and material synthesis and characterization (**Dr Masoumeh Zargar**, m.zargar@ecu.edu.au)
- **Renewable Energy Laboratory** - offers outstanding facilities to drive innovation and leading-edge research to support Australia's green energy future including a hydrogen fuel cell (**Prof Iftekhar Ahmad**, i.ahmad@ecu.edu.au)
- **Sustainable Energy and Resources Laboratory** - features state-of-the-art equipment and unique capabilities unrivalled in Australia, enabling research in carbon capture and underground hydrogen storage to deliver real-world solutions to the complex challenges facing the upstream oil and gas industries (**Dr Alireza Keshavarz**, a.keshavarz@ecu.edu.au).



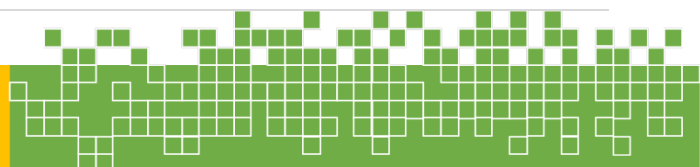
**Dr. Alireza Keshavarz** is the Discipline Coordinator of the “Chemical, Energy, and Resources” program and the Deputy Director of the “**Centre for Sustainable Energy and Resources**” at ECU. His research is focused on sub-surface energy systems, energy sustainability and security, hydrogen geo-storage, and CO<sub>2</sub> sequestration. Dr. Keshavarz has authored over 200 technical articles in top-tier journals and conference proceedings within his field. He has led and served as a chief investigator on numerous industry-sponsored projects. Prior to joining ECU, Dr. Keshavarz worked as a Research Scientist in CSIRO's Energy Business Unit, where he concentrated on the development of subsurface energy resources and CO<sub>2</sub> sequestration.

### The Centre for Sustainable Energy and Resources at

ECU School of Engineering focusses on large-scale hydrogen storage in geological formations. Such geologic storage containers can in principle store very large quantities (>1 million tons); however, fundamental understanding of the feasibility of such geo-projects is very limited. We thus perform research at the most fundamental level to advance this understanding, and to aid in the implementation of large-scale hydrogen storage solutions and a fully decarbonized fuel economy. Our hydrogen and biomass utilization research also includes hydrogen production, with a particular focus on salt-water electrolysis.



**The key takeaways from Session 4 are highlighted below (on page 4):**



In our journey towards energy transition, it's evident that current energy storage methods fall short of meeting the demands of a sustainable hydrogen economy. This underscores the pressing need for innovative solutions in large-scale hydrogen storage facilities.



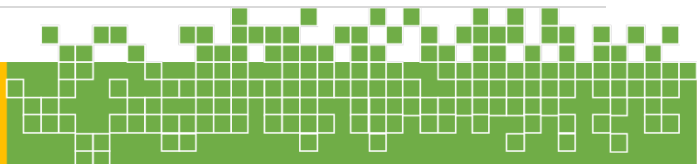
One of the most promising avenues being explored involves storing hydrogen in subsurface geological formations, including: salt caverns; aquifers; depleted oil and gas reservoirs; and hard rock caverns. The potential storage capacity of these underground facilities is substantial and economically viable. However, the concept of geological hydrogen storage is relatively novel, leading to a scarcity of data for realistic storage conditions.

During the event, Dr. Keshavarz discussed the various opportunities presented by underground hydrogen storage and addressed the challenges that accompany this approach. He presented the latest findings from their research group on the intricate interactions between hydrogen, rock, and reservoir fluids. He also highlighted the impact of reservoir organic acids and microbial activities on rock wettability, H<sub>2</sub> adsorption, and diffusion, along with their implications for the feasibility of hydrogen geo-storage.



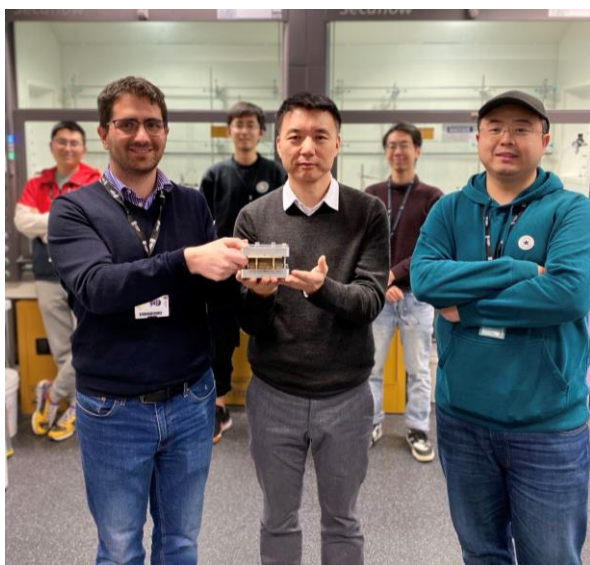
The event shed light on the exciting potential of underground hydrogen storage whilst acknowledging the hurdles that need to be overcome. It's a thrilling journey towards making hydrogen a pivotal player in our future energy landscape.

The Hydrogen Society was pleased to collaborate with ECU to deliver this engaging and informative event.



## Hydrogen Links: Industry Focused Academic Research Session 5: Challenges and Opportunities for Green Hydrogen Production from Water Electrolysis [21 September] [Register now](#)

Amidst the burgeoning landscape of hydrogen in the clean energy sector, UNSW researchers are taking on the challenges that currently impede its widespread adoption within the industry. Hydrogen fuel cells, driven by chemical reactions to generate electricity and water, stand apart from conventional batteries, eradicating the need for lengthy recharging processes. With refuelling times clocking in at just minutes, hydrogen fuel cells offer a rapid, eco-friendly, and hassle-free alternative to traditional fossil fuels, holding immense promise for hydrogen industry experts. However, hydrogen fuel cells rely on expensive elements such as platinum, which costs up to \$100,000 per kg! While alternatives are being developed using iron-based materials, the poor stability of these materials is a significant challenge.



*UNSW Research team, with Dr Quentin Meyer,*

*Prof Chuan Zhao and Shiyang Liu*

UNSW Sydney researchers, led by HSA Steering committee member Dr Quentin Meyer, and his research colleagues Prof. Chuan Zhao and Shiyang Liu, are redefining the potential of low-cost hydrogen fuel cells, which is hugely exciting! Their breakthrough work, recently published in the Journal of [Energy & Environmental Science](#), investigated why these materials are not stable in real-time, which allows them to figure out how to fix the problems. Their current focus is towards catalyst enhancement achieved through the synergistic combination of multiple metals. This innovative approach not only holds the potential to significantly improve catalyst performance but also opens avenues for broader and more feasible real-world applications. A link to the UNSW Sydney press release by Lilly Matson, reproduced on 30 news websites around the world can be found [here](#). The team is dedicated to enhancing the scalability of the cost-effective, platinum-free hydrogen fuel cell catalyst.

Their goal is to transition this technology from the laboratory setting to a market-ready solution capable of powering real devices. Ultimately, their efforts are aimed at enabling the future use of this technology to power transportation systems on our roadways.

Our fifth session of **Hydrogen Links – Industry focused Academic Research** will be a hybrid event delivered on 21 September at UNSW Sydney. Water electrolysis is a cornerstone technology for the hydrogen economy, which requires highly efficient, low-cost, and robust catalyst materials to reduce its current energy consumption and cost. However, there is currently a gap between lab-scale research and industrial-scale water electrolysis, due to catalysts, cell design, and operating conditions challenges. This presentation by Professor Chuan Zhao will highlight the current challenges and opportunities for water electrolysis from a material perspective and showcase the Zhao's group efforts in developing electrocatalysts for the oxygen evolution and hydrogen evolution reactions in alkaline and acid electrolytes, as well as their investigations of the catalytic processes and the gas bubble behaviours. The commercialisation of some of the Zhao's group work for the water electrolyser industry also will be introduced to highlight the significance of material design from atomic to macroscopic to industrial scale. [Click here for more details and to register](#)

**Members Spotlight - Siemens: *Beyond 1% - Accelerating digitalization for sustainability:***

Siemens hosted a special cocktail function at the Perth Optus Stadium on 22 August for invited guests, including members of the HSA Steering Committee. We enjoyed an evening of celebration and thought-provoking discussion about how technology and digitalization can accelerate WA's and Australia's ambitions around important topics such as climate change and economic growth. Special guest speakers and panelists included:

- **The Hon Bill Johnston MLA**, Minister for Mines and Petroleum; Energy; Hydrogen Industry and Industrial Relations
- **Peter Halliday**, The CEO of Siemens Australia and New Zealand
- **Professor Peter Klinken AC FAHMS FTSE CitWA**, Chief Scientist of Western Australia
- **Pia Turcinov AM**, Director, Fund WA
- **Iain Mackenzie**, Chief Electrical Engineer at Woodside Energy



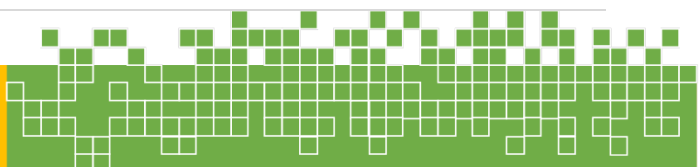
**Andrew McCluskey - Exec GM – Hydrogen AU NZ**  
**Chair, Hydrogen Society of Australia**

Dr Alan Finkel in his recent book 'Powering Up' said that *"the Clean Energy Transition is humanity's biggest ever economic challenge. The clean energy transition is all about reaching Net Zero, which is also arguably Australia's biggest ever economic, social and environmental commitment. The nation's aim is to address the 1% of emissions we are globally responsible for"*. Siemens message delivered by Andrew McCluskey was that Australia can do much more than this. *"By accelerating technology and digitalization we can go 'Beyond 1%' and at the same time supercharge business, the economy and Australia's climate change contributions to the world"*.



Left:  
**Peter Kasprzak**  
**Innovate Australia**  
**HSA Board**

Right:  
**Lorie Jones HSA**  
**Vice-President**



## Career Opportunities:

There are a number of academic and employment opportunities highlighted in our 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/>

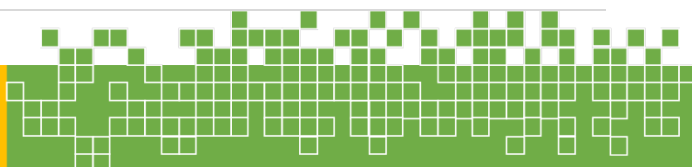
For the full list of opportunities currently advertised on the HSA website, [click on this link](#)

### Member Benefit – WA Business News Subscription (free guest access and discount)

The Hydrogen Society of Australia (HSA) has an established relationship with Business News (BN), to explore and collaborate on opportunities to promote hydrogen initiatives to professionals and the broader community. Business News is a respected, trusted, and credible independent news source for WA businesses and for any Australian with an interest in commerce, politics, and industry. Business News would like to offer HSA members guest access for 4 weeks to explore our full content and features so that key individuals can gain a better insight into why Business leaders choose to engage with us year on year.

If you are interested to have free guest access for 4 weeks to explore Business News, please select the WABN subscription product within our HSA Members Only portal:

<https://hydrogensociety.org.au/product/hsa-members-benefit-wa-business-news-subscription/>



### 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.

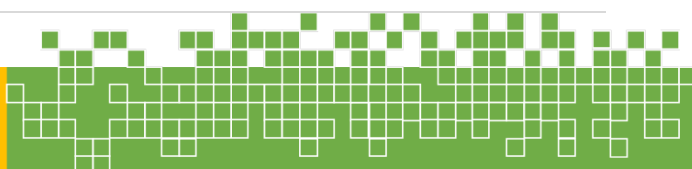
Subscribers will have access to a global, regional and country specific overview on a host of topics outlined in various government hydrogen roadmap strategies, such as funding arrangements, R&D interests, infrastructure commitments, fuel cell vehicle targets, electrolyser capacity commitments, trade agreements and more. The Hydrogen Society of Australia arranged for a demonstration of the Global Hydrogen Platform on **Wednesday 26 April, from 5:00pm to 5:30pm AWST**. The recordings of the April update are available on our website at the following link: <https://hydrogensociety.org.au/product/hsa-member-benefit-subscription-discount-hydrogen-global-governance-platform-by-the-hydrogen-standard/>

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/>. HAS 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

### 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 this Issue 19, page 3 and 4].

#### Hydrogen Links - Sessions Upcoming:

- UNSW (**Chuan Zhao**) – Challenges and Opportunities for Green Hydrogen Production from Water Electrolysis [September 21]. For more information, refer to this Issue 19, page 5. [Registration open now](#)
- AHERN (**Andrew Dicks**) – date confirmed for October 19. Registration will open soon.
- HYSATA (**Gerry Swiegers**) – date confirmed for January 30. (Refer to article on Page 13).

[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 U Tube at the following link: [Click here for GlobH2E webinars](#)

### Second Annual Hydrogen Connect Summit – Brisbane – 06 to 07 September 2023

The HSA was proud to have supported the first Hydrogen Connect Summit in Brisbane as an Endorsing Association. Following the Summit there have been myriad State, Federal and private sector initiatives to provide funding, stimulate investment, accelerate off take and address the skills challenge. Click here to view the White Paper <https://hydrogenconnect.com.au/latest-news/white-paper/> Dates are locked and loaded for the 2nd Annual Hydrogen Connect Summit 2023 (6-7 Sept 2023) at the Brisbane Convention & Exhibition Centre). **HSA members have access to an exclusive 20% discount off Summit registration.** <https://hydrogenconnect.com.au/>

### ErLaw event – Annual Conference 2023 – Melbourne – 06 to 08 September 2023

The Hydrogen Society of Australia is collaborating with **Energy & Resources Law Association (ErLaw)** and has arranged a **20% discount for our members** to participate in the Melbourne Hydrogen Forum 2023 to be held at W Melbourne Hotel, 408 Flinders Lane, Melbourne. The theme of this year's conference is **Resourcing the Future: Sustainable Solutions for the Energy and Resource Industries**. Leading experts will share practical insights on global trends across our two-day program. Key items of discussion will include:

- skills development, industry collaboration and best prospective use cases for Hydrogen in Australia;
- new adapted planning, environmental and permitting regimes that will be needed to accelerate hydrogen projects in Australia;
- key commercial, legal and risk issues in structuring hydrogen projects and developing contract terms for this novel market; and
- proposed Australian certification and accreditation arrangements, including the Guarantee of Origin work.

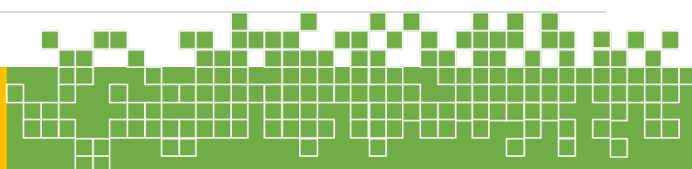
Sign into your members portal and check out our Member Benefits and Discounts page to obtain the 20% discount code for this conference. Use the code at the following registration link [Click here to register](#)

### SPE Asia Pacific Hydrogen Week – Perth - 18 to 22 September 2023

As the world transitions toward cleaner and more sustainable energy sources to achieve net-zero goals, hydrogen is an emerging key player in the energy mix. The SPE Asia Pacific Hydrogen Week comprises three main components – a training course, symposium, and forum. This event will facilitate opportunities for the energy community to network, gather insights and keep abreast of the hydrogen economy, production, operations, and supply chain through discussions on the latest research, developments, market outlook and technological advancements. Industry experts will strategically deliberate on the future of hydrogen and offer insights into key opportunities to scale up infrastructure development and new investments, optimise existing infrastructure for clean hydrogen supplies while addressing key challenges in policies, regulations and low-cost production. <https://www.spe-events.org/apachydrogenweek/about>

### 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, are delighted to announce that the [Asia Pacific Hydrogen 2023 Summit & Exhibition](#) will be taking place on **26 – 27 October** at the **ICC in Sydney, Australia**. The Hydrogen Society of Australia is pleased to participate in this event as a key supporting organisation and proud to inform that HSA members receive an exclusive 15% discount off registration. The discount code is available in our [Members Benefits and Discounts portal](#) or by [clicking here](#).



**Australia Hydrogen Day – 5<sup>th</sup> (Inter) National Hydrogen and Fuel Cell Day – 08 October 2023**

On the 8th of October, as the world marvels at the significance of the number 1.008 – the atomic weight of Hydrogen – we in Australia will celebrate our vision, our commitment, and our journey in leading the hydrogen revolution.

In 2015, the United States lit the beacon, marking the inauguration of **the National Hydrogen and Fuel Cell Day**. Four years later, in 2019, **Innovate Australia** picked up that mantle, pioneering the first **Australian Hydrogen and Fuel Cell Day** under its **Hydrogen Society of Australia (HSA)** program. The HSA initiative blazed its own trail, becoming an independent entity and taking the solemn pledge to organize and champion the October 8th events year after year.

Our national ambition is crystal clear: by 2030, we envision Australia not merely as a participant but as a beacon of leadership in the hydrogen domain. We're dreamers with blueprints in hand. Our strategies are adaptive, innovative, and tangible. Our hydrogen hubs are the crucibles of transformation, breeding innovation and synergizing our various energy sectors. And at the core of it all is an unwavering commitment to safety, sustainability, and shared prosperity.

Following on from a very successful AHD event in 2022 held in Western Australia (in collaboration with Murdoch University), the Hydrogen Society of Australia is planning to promote a nationwide series of events this year, building upon our State Chapter structure. The coordinated planning for this series of events will require setting up a Working Group with priority. HSA members are invited to put their hands up to assist with this working group as a Volunteer. Further information about this process is forthcoming.

The planning for this event is well underway in Western Australia, in collaboration with Murdoch University and Innovate Australia, building on our successful event in 2022. The event will take place on Sunday 08 October 2023, from 11:00am to 4:00pm AWST, at the Kim Beazley Lecture Theatre at Murdoch University.

We have approached an interesting lineup of speakers, with further details to be available soon. Please get in touch with our AHD Working Group Leaders **Peter Kasprzak** ([peter@innovateaustralia.org](mailto:peter@innovateaustralia.org)) or **Ghazal Avijegon** ([ghazal.avijegon@atco.com](mailto:ghazal.avijegon@atco.com)) should you be interested in sponsoring this event.



**AUSTRALIA HYDROGEN DAY**  
Australia's 5th (Inter)National Hydrogen and Fuel Cell Day  
**8<sup>TH</sup> OCTOBER**  
**2023**  
Fuelling a Brighter Tomorrow, Today



**HSA** Hydrogen Society of Australia **MU Murdoch University** **INNOVATE AUSTRALIA**

## Snippets of Hydrogen making moves around the world

### 2023 07 29\_What is happening to gas in Victoria and will the rest of the country follow suit?\_ABC

The Victorian government announced on 28 July that gas connections in new homes will be banned from next year. From January 1, 2024, any new residential build, including subdivisions and public and social housing, will be exclusively connected to electricity. Banning gas is a conversation all Australian state governments are having, said **Adjunct Professor Bill Grace** from the **Australian Urban Design Research Centre at University of Western Australia**. "Victoria has been the first to launch but in the meantime there's been activity at a lower scale," he said. [Click here for more details](#)

### 2023 08 01\_State not considering gas ban\_BN

**Premier Roger Cook** has ruled out following the lead of Victoria in banning the use of gas in new homes from 2024. Mr Cook referenced the viability for existing gas infrastructure to transport hydrogen as part of a potential energy mix for the future. "You can imagine the future is going to be a very exciting one," he said. "Not only the use of green, renewable power, but also the use of hydrogen, for instance, as part of a reticulated gas network which we've already incorporated into our natural gas network". "The future is an exciting one but we need to make sure we step through that process carefully, rather than making big announcements now which we might come to regret later." [Click here for full article](#)

### 2023 08 01\_The top ten US hydrogen hubs most likely to win \$7bn of government funding\_Accelerate Hydrogen

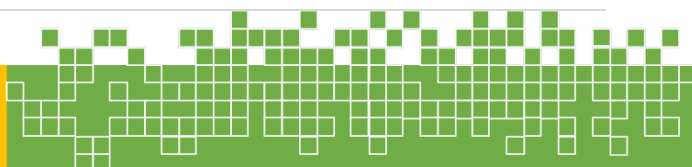
A total of \$7bn is due to be allocated across six to ten US clean-hydrogen hubs by the US government in the coming weeks, with the initial 79 proposals having been whittled down to 22 known projects. But on what basis will the cash be awarded? And which hubs will be successful? **Rystad Energy** has identified the ten proposals it believes are the most likely to make it over the finishing line, and has shared its findings with Hydrogen Insight. [Click here to read the full story](#)

### 2023 08 02\_ \$10bn hydrogen plan for Mid West\_BN

A South Korean consortium is aiming to build a hydrogen project at Narngulu industrial estate near Geraldton, saying it can't wait for land at Oakajee to be developed. The consortium is aiming to invest about \$10 billion in hydrogen and ammonia plants with capacity of 1 million tonnes per year. The project, also known as **Western Giga Energy**, includes wind and solar farms able to produce 3 gigawatts of renewable energy to run the hydrogen electrolyser. The consortium's local partner is **Progressive Green Solutions (PGS)**, a business name of **Pilbara Green Steel Pty Ltd**. The state government said it had brokered a land use solution to accommodate the project at Narngulu industrial estate, 12 km south-east of Geraldton. It added this solution would "pave the way for a new renewable energy cluster in Geraldton to complement the planned hydrogen hub at Oakajee". [Click here for full article](#)

### 2023 08 02\_ Queensland toughens wind farm development criteria amid local opposition\_Australian Business Review

Queensland will require developers of wind farms to clear a higher threshold in order to secure licences amid local opposition, despite the sunshine state setting an ambitious target for transitioning away from its dependency on coal. Queensland last year announced a plan to have renewable energy provide 80 per cent of the state's electricity by 2030, which will require 22 gigawatts of new wind and solar power in renewable energy zones across the state. Queensland's plan detailed it would need about 25,000MW of large-scale



renewable generation and around 7,000MW of new rooftop solar generation to meet forecast demand in 2035. The scale of the challenge would be further heightened if hydrogen proves commercially viable or there is wholesale electrification of Australia, it added. [Click here for full article](#)

#### **2023 08 08\_Five key action areas to put Europe's energy transition on a more orderly path\_McKinsey**

In 2021, the EU market was the third-largest source of greenhouse-gas emissions, behind only China and the United States. Within the European Union, emissions were highest in Germany, with 23 percent of the total, followed by Italy and Poland, with 11 percent each. The majority of these emissions come from five sectors: transportation (about 28 percent), heavy industry (about 25 percent), power (about 22 percent), buildings (about 13 percent), and agriculture (about 12 percent). Fossil fuel combustion accounts for 80 percent of EU emissions. McKinsey research has identified five action areas that EU nations could consider to accelerate the energy transition in an orderly manner. [Click here for full article](#)

#### **2023 08 11\_Lhyfe explores offshore green hydrogen, ocean reoxygenation\_American Chemical Society**

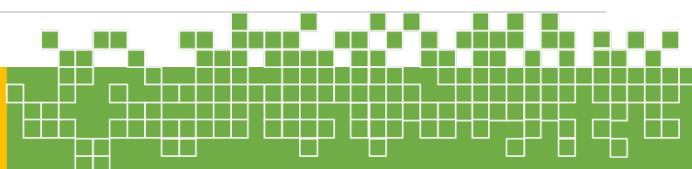
While most of the green hydrogen world is understandably focused on hydrogen, the project developer **Lhyfe** is also looking at the other product of water electrolysis: oxygen. The firm is funding research into the potential to use oxygen made at its planned offshore hydrogen plants to combat the deoxygenation of seawater, an environmental problem linked to climate change. Lhyfe is actively developing a handful of green hydrogen projects on land and at sea. Since the fall of 2022, the company has been testing a 1 MW offshore hydrogen plant that runs on wind power and can produce up to 400 kg of hydrogen per day. Building on successful results from that pilot plant, Lhyfe recently won a \$22 million grant from the European Commission to build a 10 MW offshore hydrogen plant that would make 4 metric tons of hydrogen per day. [Click here for full article](#)

#### **2023 08 14\_Australian start-up Hysata to commercialise 'ultra-efficient' hydrogen electrolyser, backed by government funding\_Accelerate Hydrogen**

Australia's **Hysata** has today (Monday) received A\$20.9m (\$13.6m) from the government to test and develop a 5MW version of its "capillary-fed electrolyser" — which has reached 95% system efficiency in testing, compared to about 75% for incumbent technology. This theoretically enables about 20% more green hydrogen to be produced from the same amount of electricity than is possible with today's alkaline and PEM electrolyzers. The start-up, which spun out of the **University of Wollongong**, will develop and manufacture a 5MW version of its electrolyser at a manufacturing facility in Port Kembla which also opened today. Hysata's technology could be able to produce hydrogen at \$1.60/kg — compared to \$2.10/kg for alkaline electrolyzers — by 2030, according to internal company calculations. [Click here for full article](#)

#### **2023 08 15\_Government weighs up green tariffs for steel, cement\_BN**

**Climate Change Minister Chris Bowen** told an Australian Business Economists forum in Sydney on Tuesday policies were needed to ensure a level playing field for Australian firms. "The decarbonisation task is most acute for large industrial facilities, frequently in hard-to-abate sectors and subject to competition in international markets," Mr Bowen said. He said now that Australia had in place a safeguard mechanism to improve incentives and confidence for facilities to invest in decarbonising their operations, it was time to examine how best to prevent "international carbon leakage risks". The European Union is developing a "**carbon border adjustment mechanism**", which will mean from 2026 key importers into the EU will need to purchase certificates equivalent to the carbon price of their emissions trading scheme. The European scheme applies to imports in five emissions-intensive sectors deemed at greater risk of carbon leakage: cement, iron and steel, aluminium, fertilisers, and electricity. Mr Bowen said his department would work with academics



on a review to assess carbon leakage risks, develop some policy options, and look at the feasibility of an Australian carbon border adjustment mechanism, particularly in relation to steel and cement. [Click here for full article](#)

#### 2023 08 15\_Premier's pitch on WA's new superpower\_BN

**WA Premier Roger Cook** believes the state has only “just scratched the surface” of its renewables potential as he outlines his vision for WA to become a global green energy superpower. “Last month the WA government revealed it would support 40 innovative and job creating projects through our **Investment Attraction Fund**,” Mr Cook said. “Nearly \$150 million has been put towards diversifying our economy. “The fund is supporting projects like high battery chemicals, windows that generate solar energy, green hydrogen, advanced manufacturing, to name just a few”. The state government will host an energy transition summit in the near future with industry, peak bodies, entrepreneurs, service providers and unions to chart a path forward on green energy. [Click here for full article](#)

#### 2023 08 18\_National Hydrogen Strategy Review\_Engineers Australia submission

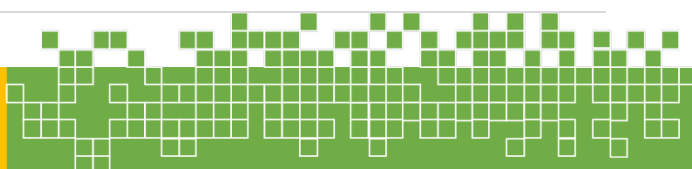
The **Department of Climate Change, Energy, the Environment and Water** are reviewing the **National Hydrogen Strategy**, first published in 2019. Engineers Australia's submission to the review includes information about the potential for hydrogen to be an important contributor to our transition to net zero through use in industry, transport, grid firming, chemicals and metals production. [Click here to access the full report](#)

#### 2023 08 21\_Power a focus in Cook's Kwinana agenda\_BN

**Premier Roger Cook** says business in his home electorate of Kwinana and the surrounding corridor will be supported with power infrastructure to thrive through the carbon neutral shift. Speaking at a Kwinana investment conference this morning, Mr Cook highlighted the development and output of the **Western Trade Coast**, which generated \$18.2 billion, or 1 per cent, of the nation's GDP in 2021/22. The WTC covers an area spanning industrial ground from the **Australian Marine Complex** down to the **Rockingham industry zone**. The premier listed a range of policy decisions he said would benefit the area, including the role the \$2.8 million commitment to green energy spend on the **South West Interconnected System** revealed in May's state budget would play in securing the region's energy future. The \$2.8 billion spend was committed to a range of projects in May, including \$2.3 million towards batteries at Collie and Kwinana, as well as SWIS transmission upgrades and a suite of renewable energy production projects. “As the world shifts towards a carbon neutral future, it represents an immense opportunity for Kwinana to grow,” he said. Active major industry players in the Kwinana region include **BP, Alcoa, Tianqi Lithium, IGO** and Andrew Forrest's **Wyloo Metals** and Wesfarmers' **CSBP**. [Click for full article](#)

#### 2023 08 22\_Pure Hydrogen Announces Fuel Cell Waste Collection Vehicle\_H2Q.com.au

**Pure Hydrogen** recently signed a deal to provide a hydrogen fuel cell (HFC) electric waste collection truck to **Solo Resource Recovery** for the servicing of municipal contracts including **Tweed Shire Council** in northern New South Wales. The agreement will allow for a six-month trial of a side-loading general household waste collection vehicle, during which time Pure Hydrogen will deliver maintenance services and supply 99.97% purity hydrogen fuel for refuelling purposes. The HFC waste collection truck will output zero greenhouse gas emissions from the tailpipe under operating conditions, resulting in better air quality for local communities. It is reported to be quieter than conventional waste collection trucks and is expected to significantly reduce neighbourhood noise. [Click here for the detailed article](#)



### 2023 08 22\_Project plight highlights hydrogen's challenge\_BN

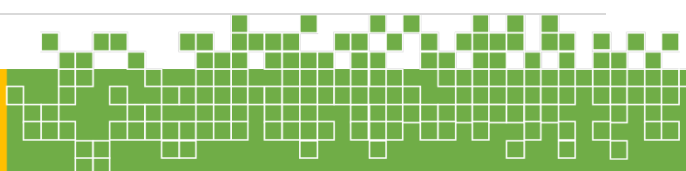
The decision by Canadian infrastructure group **ATCO** to abandon a \$53 million green hydrogen project 250 kilometres north of Perth shows how challenging the transition from fossil fuels is likely to be. On the face of it, a lot stacked up for the **Clean Energy Innovation Park** project south of Eneabba, especially as Australia heads towards the self-imposed 2030 deadline for vast cuts in CO2 emissions. Hydrogen, while by no means a perfect replacement for natural gas, has some strong parallels in its transport and use. ATCO operates the gas reticulation network in the South West, so it has a very good reason to invest in alternatives like hydrogen. It already runs a small pilot operation from Jandakot. With wind being the intended energy source, this was genuine green hydrogen. ATCO had also secured **Australian Renewable Energy Agency** approval for a \$28.7 million grant for the project. So, what could cause it to cancel this project? ATCO said last week it remained committed to a hydrogen facility in Western Australia but believes it is more feasible to proceed closer to heavy industry, where demand will justify the investment. But that is not the whole story. While the proximity of production to customers may have been an issue that emerged from its deliberations, the fact that ATCO did not have an offtake agreement was ultimately the key reason for the project's death knell. It was a precondition for the ARENA funding. It is notable ATCO is still going ahead with projects in other jurisdictions. [Click here for full article](#)

### 2023 08 15/24\_Capital projects are critical for a green future\_McKinsey

Capital is critical to tackling climate change. According to **McKinsey** analysis, meeting net-zero targets will require spending \$9.2 trillion a year on physical assets between now and 2050, up from \$3.5 trillion today. By then, the energy mix would also include nascent energy technologies such as clean hydrogen; battery storage; and carbon capture, utilization, and storage (CCUS). Capital projects, including those crucial to the energy transition, typically take many years and many hands to design, build, and launch. The number and scale of projects in the current pipeline will not suffice. Labor costs are increasing as raw materials and components remain in high demand, and the global supply chain has strained to keep pace, making the transition to newer technologies with different cost structures even more challenging. And, by definition, nascent technologies don't have a track record of lessons learned to inform cost productivity improvements to accelerate scaling. That said, investment in the energy transition is accelerating. As an example, when the **Inflation Reduction Act** was signed in 2022, the US federal government released \$370 billion in funding to provide tax credits for clean-energy projects. With this in mind, the challenge moving forward will be securing the right people, resources, and physical space while overcoming supply chain constraints and financing for non-established players. The time is now for industry players to fundamentally rethink how they approach projects to deliver them faster, cheaper, and more efficiently than ever. [Click here for full article](#)

### 2023 08 21\_EnergyAustralia pledges \$5bn spend to rapidly develop renewable pipeline\_Australian Business Review

**EnergyAustralia** will spend \$5bn by 2030 to rapidly develop renewable energy generation assets to replace coal power generation, which Australia's third-largest retailer said will drive it to be net-zero by 2050. The \$5bn spend, which EnergyAustralia said will be spent both individually and with partners, comes as the retail giant struggles to accelerate its transition plan in contrast to rivals such as **AGL Energy** and **Origin**. EnergyAustralia will close its **Yallourn coal power station** in 2028 after a deal with the Victorian government ends, which will leave the company with just one additional coal generator. Mr Collette said EnergyAustralia also intends to switch the way it uses its last remaining **Mt Piper coal power station**, where the retailer



leaves the generator idle and only firing it up during periods of renewable drought when the sun is not shining or the wind is not blowing. Mt Piper is scheduled to close by 2040. [Click here for full article](#)

#### **2023 08 23\_WA firm takes lead on CO2 shipping Research\_BN**

A Western Australian firm will play a leading role in the development of safe and efficient processes for industrial-scale shipping of carbon dioxide, under a project announced today. The **LP technology research and development project** will explore low-pressure and low temperature transport of CO2 by ship, with the aim of demonstrating large-scale technical feasibility and operability. Perth-based **Future Energy Exports Cooperative Research Centre** and Brisbane's **Low Emission Technology Australia** are the Australian firms involved, and will team with **JX Nippon Oil & Gas Exploration Corporation, Mitsui O.S.K Lines and Osaka Gas Co** from Japan. Work will be executed by Future Energy Exports CRC, The University of Western Australia, Curtin University, Seoul National University and Perth carbon management company **deepC Store**. Future Energy Exports CRC partners with significant industry players, including **Chevron, BP, Inpex, Woodside, Mineral Resources and Horizon Power**. The firm was recently the recipient of \$15 million through the state government's **Investment Attraction Fund** towards the development of its flagship **Kwinana Energy Transformation Hub**. The hub will be an industrial-scale facility to research, test and demonstrate decarbonisation technology solutions for the energy industry. [Click here for full article](#)

#### **2023 08 24\_Financing Hydrogen Projects in Major Markets\_greenpowerglobal.com**

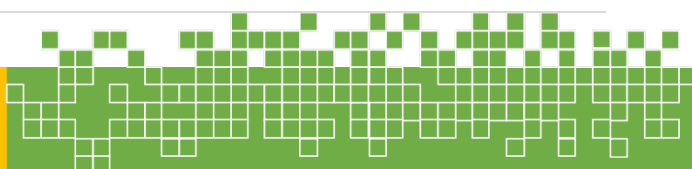
Ahead of the World Hydrogen Finance & Investment virtual conference, taking place on 6 September, The **World Hydrogen Leaders** have published a **Financing Hydrogen report**. Governments around the world are introducing more and more supportive policies for clean hydrogen, which, in turn, are creating renewed momentum in the market to the point where announced projects targeting commercial operation by 2030 already exceed the estimated hydrogen demand for that year, according to Wood Mackenzie's Q1 2023 Global Hydrogen Market Tracker. [Click here](#) to read the full intelligence report to discover how the public and private financing of hydrogen projects is evolving across different geographies.

#### **2023 08 24\_Woodside puts \$1bn energy projects up for sale\_Australian Business Review**

**Woodside Energy** could land a \$1bn windfall after putting two major West Australian oil and gas facilities on the market, signalling it will sever ties with several high-profile BHP-owned assets picked up from its \$40bn merger deal with the mining giant. The energy producer will field offers for its Pyrenees and Macedon oil and gas projects in WA's Carnarvon Basin, the latter of which is a major supplier to the state's domestic gas industry. Both the Macedon and Pyrenees projects were picked up as part of Woodside's blockbuster tie-up with **BHP Petroleum**, a merger which catapulted the company into the top 10 oil and gas producers in the world with assets spread across both the west and east coasts of Australia, the Gulf of Mexico and Trinidad. [Click here for full article](#)

#### **2023 08 25\_Jobs, cost revealed for Kwinana hydrogen play\_BN**

A proposed hydrogen hub in Perth's southern corridor could produce up to 429 tonnes per day and employ more than 1500 people under long-term plans unveiled on Friday. The **GHD**-led feasibility study for BP Australia's **H2Kwinana green hydrogen hub** tested three scenarios – two baseload cases producing either 44 or 143 tonnes per day, and a growth target with a 429-tonne output. An initial 44-tonne operation would be possible with existing power infrastructure. Ratcheting the plant up to 143 tonnes to fulfill identified demand in 2026 would require an expansion of the 132 kilovolt grid to 330 kilovolts. A 429-tonne plant, pencilled in for 2035, would require further studies of the South West Interconnected Grid's capability to provide one gigawatt of power. BP WA hydrogen business development manager **Justin Nash** said government support





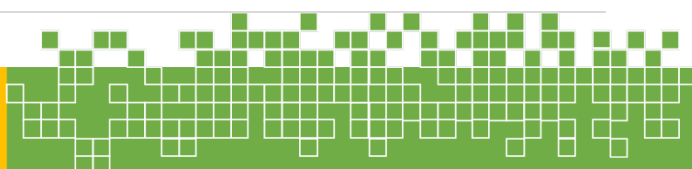
was critical to the project's success. GHD found the plant was feasible and noted the right policy could turn the existing BP refinery into a green hydrogen production hub. **Hydrogen Industry Minister Bill Johnston** said the study brought the project closer to fruition. "Kwinana has been a central hub of fuel operations for the past 65 years, the potential development of a green hydrogen hub would progress the decarbonisation of the **Kwinana Industrial Area**," he said. [Click here for full article](#)

#### **2023 08 29\_The \$3bn plan to future-proof WA energy grids\_BN**

A \$3 billion renewable energy deal designed to future-proof Western Australia's energy grids has been inked between the federal and state governments. Unveiling the landmark **Rewiring the Nation** agreement today, Perth, South West and Pilbara grids will be modernised via loans and equity investment from the **Clean Energy Finance Corporation** into transmission upgrades and new builds. Renewable generation hubs will be plugged into the **South West Interconnected System** - covering most of the population between Kalbarri, Kalgoorlie and Albany – to meet booming demand which is expected to grow five times in the next two decades due to major industrial projects. Improved coordination and investment in the **North West Interconnected System** will boost the uptake of renewables in the myriad standalone networks which pockmark the region, where less than two per cent of power is currently generated from clean energy. **State Energy Minister Bill Johnston** said much of the Pilbara renewable energy generation and infrastructure would be funded by industry, prominent members of which recently committed to a common use electricity agreement, with support from a low-cost finance program. Indigenous communities will be brought into the fold to support investment and participation in projects under the agreement. **Prime Minister Anthony Albanese** said the deal would create new jobs in energy, mining and manufacturing. The agreement is expected to create 1,800 construction jobs. Tuesday's announcement amounts to WA's 15 per cent share of the \$20 billion **Rewiring the Nation program** launched in 2022. [Click here for full article](#)

#### **2023 08\_Global Hydrogen Monitor\_Hydrogen Standard**

The **Global Hydrogen Monitor August 2023** highlights some of the main developments in the hydrogen market that took place in July 2023. First, various governments updated their hydrogen roadmap, with **Germany, Japan and Brazil** three big countries further propelling their hydrogen ambitions. Although smaller in size, South America is slowly also increasing its presence in the hydrogen space with **Chile** at the forefront of rolling out its hydrogen market and other countries reporting notable developments too. On the applications front we have various updates on fuelling stations coming online as well as another hydrogen train making its first journey in **Canada**. **China** introduced the first hydrogen based high-speed train of its own, that reportedly can reach speeds of up to 600 km/h with a range of 1,000 km. At considerable different speeds, hydrogen use in shipping also gets more attention sailing to the green state of California. Finally, the **Hydrogen Council** and **McKinsey & Company** launched another report indicating the pipeline prospects of hydrogen projects, with a stronger focus on Europe and particularly North America. As to date, what is clear that the majority of projects are still early stage with only 10% of investment decisions having past FID. **HSA members can access the Global Hydrogen Monitor at a significant discount. Refer to Page 8 for more information about our HSA member benefits, and** [Click here for more details](#)



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