AHRN

AHRN Newsletter December 2022

In this newsletter:

Hydrogen Research Conference, 8-10 February 2023

**** Christmas Special - Extension of Early Bird registration date ****

If you have had an abstract accepted for presentation at the conference, this is your last chance to register at the early bird rate. We urge you to do this as soon as possible!

We have well over 100 abstracts submitted for the conference and the final program should be announced before the end of the year, with three full days of plenary sessions and three concurrent sessions each day. In addition to presentations, there will be discussion panels focused on collaboration with industry, key issues for science and public policy issues. On the 7th February we are planning site visits that include the ATEW/AGL hydrogen filling station, EVO Energy's hydrogen test facility, and the facilities at the headquarters of Geoscience Australia.

With the emphasis of the conference on international collaboration, we can confirm that that the first 2023 Executive Committee (ExCo) meeting of the International Energy Agency Hydrogen Technology Collaboration Program (https://www.ieahydrogen.org /) will be held in Canberra on 6th and 7th February. This will bring over 10 international hydrogen experts to Canberra for the event and an opportunity for Australian researchers to get an update on hydrogen technology research around the world.

RESEARCH FELLOWSHIPS
International Hydrogen Research Collaboration Program

As mentioned last month, an expression of interest (EOI) for the Australian Government International Hydrogen Research Collaboration Fellowship Program is available for download here.

The program is open to all Australian early to mid-career researchers wishing to further their careers in hydrogen by spending 3-12 months in world class labs and institutions overseas currently being identified by the Australian Hydrogen Research Network (AHRN).

Please feel free to publish or share the EOI in any newsletters, communication outlets or other networks you might be involved in. EOIs should be emailed to **int-h2collab@csiro.au**

The EOI will remain open until spaces become full.

If you have any questions, please do not hesitate to contact the program manager, Dan O'Sullivan @ **dan.osullivan@csiro.au**

Survey of members

A survey was emailed to members recently. If you have not received the email, you can complete the survey online here: https://docs.google.com/forms/d/e/1FAIpQLSfbCY-PMBhleu-CoCRdpy_USKfapc2qy4GLyB5xYfW3xSDouA/viewform?usp=sf_link

As we move in to 2023 with the AHRC in February it is important that we understand what you value most of the AHRN and what you would like to see roll out next year. We had overwhelming support to establish the AHRN as an independent representative body for hydrogen researchers in Australia, and now is the time to share your views on how this is done. The survey is open to all hydrogen stakeholders, researchers, practising energy and engineering professionals, and government officers.

Update of RD&D Report

In December 2019, a team led CSIRO produced reports on "Hydrogen research Development and Demonstration – Priorities and opportunities for Australia". Two versions of the report were published including an Executive Summary and a technical appendix. The latter provided a list of projects undertaken in Australian universities and institutions, together with a proposal for an online 'Technical Repository. Fast track to now and the idea of a Technical Repository has morphed into the online HyResearch portal which is proving to be a useful source of information on Australian hydrogen research for our own researchers and others including potential international partners. The portal will be further developed in 2023 to include more information on facilities and resources. We IT experts from CSIRO are also exploring online research tools to add to the arsenal available to Australian hydrogen researchers.

Much has changed since the 2019 CSIRO RD&D reports and we are working on an updated document that will complement the accessibility of HyResearch and serve to highlight the strengths of the present Australian Hydrogen Research Network. **To provide this update, it is important that**

all researchers visit HyResearch portal and check that the information on your projects is as up to date as possible. If there are any changes to make, or any new projects that you would like to include in the database or updated report, please email Peter Grubnic (p.grubnic@futurefuels.com.au) or Andrew Dicks (adicks@ah2rn.org.au) as soon as possible. Our aim is to produce the updated report for presentation at the February conference.

Seminars in 2023

Our regular online research seminars will continue next year starting after the February conference in March with a presentation from Washington University HYPER laboratory, on Cool Fuel, followed by a seminar on advanced electrolysis headed by researchers from RMIT. Dates for these seminars will be announced in our January newsletter. If you have ideas for further online or in-person events next year we would love to hear from you. Contact adicks@ah2rn.org.au.

Other Australian News

Many of you will have been involved in workshops for the proposed Scaling Green Hydrogen CRC Bid. Although there has been much discussion of the CRC, no one predicted that Round 24 of the Cooperative Research Centres programme wouldn't open in 2022. The team bringing the potential new CRC together, championed by interim CEO Paul Hodgson, has been ready to submit the bid since mid 2022.

It is now expected that Stage 1 of Round 24 will open in the second quarter of 2023 with an expected submission deadline of June or July. However, these dates won't be confirmed until the Commonwealth Government makes the announcement. In the meantime it is becoming abundantly clear that there is a mismatch between reality and ambitions for hydrogen. For Australia to have one terrawatt of green hydrogen electrolysis by 2040, we will need the equivalent of 800,000 of the largest electrolysers currently in operation in the country, the 1.25 MW plant at Tonsley in South Australia. Time is of the essence and the bid team is determined to establish the CRC as soon as possible.

If you would like more information on the CRC bid, please contact Paul Hodgson paulhodgson@consultingis.com.au.

Australian Institute of Energy/Engineers Australia – Hydrogen Industry Technical Series 2023 The AIE Victoria branch and Engineers Australia will present a series on in-person seminars aimed at raising the awareness of the current technical status of hydrogen technologies and projects with a key focus on real world engineering education and practical learning. This initiative will assist in the necessary upskilling of hydrogen engineers and other practitioners that are or will be engaged in the design and delivery of hydrogen projects and products. The series includes ten weekly technical sessions held on each Wednesday evening from 15 February to 19 April, 2023 and three hydrogen industry site visits.

Each session will be led by a hydrogen specialist with significant practical knowledge, expertise and experience in the industrial application of a specific hydrogen technology. The series will also provide vital industry information in support of the proposed Engineers Australia's Area of Practice – Hydrogen, the synthesis of an accredited hydrogen training and CPD program and a national hydrogen competency framework.

Attendees can attend individual sessions and site visits but are encouraged to register for the entire ten week series program to maximise their learning experience.

Enquiries can be directed to Alesha Printz **alesh.printz@engineersaustralia.com** or Luigi Bonadio **luigi.bonadio@h2australia.com**. To register your place for the series, please visit the following series webpage:
https://www.engineersaustralia.org.au/learning-and-events/conferences-and-major-events/hydrogen-industry-technical-series

Acoustically-induced water frustration for enhanced hydrogen evolution reaction in neutral electrolytes.

This is the title of a paper published on 4th December by researchers at RMIT and Monash *Universities in Advanced Energy Materials.* To stimulate hydrogen evolution in water electrolysis using neutral electrolytes, the researchers use high frequency (10 MHz) sound waves to 'frustrate' the tetrahedrally-coordinated hydrogen bond network linking water molecules at the electrode/electrolyte surface. There appears to be several benefits that such stimulation offers including substantial decrease electrode overpotential and corresponding increase in current density. A net-positive energy saving of over 27% indicates the potential of the technology for green hydrogen production.

International News

The International Energy Agency (IEA)

For 2022-27, a recent report from the IEA forecasts around 50 GW of renewable capacity to be dedicated to hydrogen production, accounting for 2% of total renewable capacity growth. The report suggest that China leads expansion, followed by Australia, Chile, and the United States and that these four markets account for two-thirds of dedicated renewable capacity for hydrogen production. New capacity is split evenly between PV and onshore wind, with PV making up most of the growth in the Middle East and North Africa region. China is set to deploy more than 18 GW of dedicated renewables capacity by 2027, while Europe will add 7 GW. "Spain is in the lead, accounting for half of Europe's growth, followed by Germany, Sweden, Denmark, and the Netherlands," said the IEA, noting that regulatory and policy uncertainty are the two obstacles to for European hydrogen development.

Hydrogen Council and World Bank report: Sufficiency, Sustainability and Circularity of Critical Materials for Clean Hydrogen

As we scale the technological solutions to combat climate change, we need to ensure that the critical raw materials used for their manufacturing are sufficient, sustainable, and circular. The availability of precious metals and other critical raw materials has increasingly been subject of concern considering the need for scaling up decarbonisation solutions.

The Hydrogen Council and the World Bank today released a new report, *Sufficiency, Sustainability, and Circularity of Critical Materials for Clean Hydrogen,* looking at the raw materials used in the hydrogen value chain, with a special focus on metals.

This study was informed by the data collected by the Hydrogen Council across our membership through a clean room process, covering all relevant potentially critical raw materials used in the hydrogen value chain. The full report can be downloaded **here.**

Biden-Harris Administration announces $750 million to accelerate clean hydrogen technologies
The Biden-Harris Administration, through the U.S. Department of Energy (DOE), has announced its intent to issue $750 million in funding from President Biden's Bipartisan Infrastructure Law to dramatically reduce the cost of clean-hydrogen technologies. The funding is a crucial component of the Administration's comprehensive approach to accelerating the widespread use of clean hydrogen and will play a vital role in supporting commercial-scale hydrogen deployment. Hydrogen is a key pillar in the emerging clean energy economy and will be essential for achieving the President's goal of a 100% clean electrical grid by 2035 and net-zero carbon emissions by 2050. The US's blanket incentives to produce hydrogen are already luring European manufacturers to construct factories there. In recent conversations between Washington and Brussels, the subject became a flashpoint.

Collaboration in the USA
Nikola Corporation, a maker of battery-electric and hydrogen-electric vehicles, and hydrogen technology company Plug Power Inc, recently announced a major collaboration. As part of the partnership, Plug will buy 75 Nikola Tre fuel-cell electric vehicles (FCEVs) over the next three years with first deliveries in 2023. It will use these hydrogen-powered trucks to deliver green hydrogen to customers in North America. The trucks will be combined with Plug's liquid hydrogen tankers.

The collaboration will also see Nikola purchase a liquefaction system from Plug for its recently announced hydrogen hub project in the City of Buckeye, Arizona. The liquefaction system will be for the first phase of the hub and will have a capacity of 30 tonnes per day with potential to reach 150 tonnes per day.

In addition, the companies have signed a green hydrogen supply agreement. From January 1, 2023, Plug will be supplying green hydrogen to Nikola with volumes gradually increasing to up to 125 tonnes per day by the end of 2026 as Plug's green hydrogen production network comes onstream. Eighty percent of this maximum volume is under a take-or-pay contract.

Australian Hydrogen Events 2022/23

- 8-10 February 2023, The first Australian Hydrogen Research Conference, ANU, Canberra
- 20-22 February 2023, Hunter Hydrogen and Energy, Newcastle
- 21 April 2023, Finals of the Horizon Hydrogen Grand Prix, Gladstone
- 15-18 May 2023, APPEA 2023 Conference and Exhibition, Adelaide
- 25-26 July 2023, Connecting Green Hydrogen APAC, MCEC, Melbourne
- 30 August, Energy Transition Summit, Sydney
- 6-7 September, 2nd Annual Hydrogen Connect Summit, BCEC, Brisbane

Best wishes for an enjoyable and relaxing Christmas and a happy, healthy and prosperous New Year

Andrew Dicks
Coordinator, AHRN

If you have news or items of interest that you would like to share with the Australian Hydrogen Research Network, please send them to adicks@ah2rn.org.au