



# FEnEx CRC Newsletter

## December 2023

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### **An Exhilarating Year of Activity**

As we approach the end of 2023 and before we turn our attention to the research, development and engagement planned for the year ahead, I wanted to take the time to reflect on our collective achievements and engagement with you.

It was an exhilarating period of activity, growth and new initiatives for FEnEx CRC. We reached a total of 40 partners with world-scale companies like BP, Rio Tinto (Hamersley Iron), JX Nippon Oil & Gas Exploration Corporation, Mitsui O.S.K Lines Ltd, Osaka Gas Co. Ltd and Low Emissions Technology Australia newly participating, together with the Australian not-for-profit Clean Marine Fuel Institute and international affiliate Imperial College London. The capacity building of the CRC also continued with one of the Foundation Fellows, Dr Karamjit Kaur, being appointed as a permanent academic at the University of South Australia where she continues to help drive Program 3. New Foundation Fellows came into the team with Dr Mahboobeh Shahbazi commencing work at QUT and Dr Rebecca Morgan starting at UniSA. This increased research capacity helped grow further the FEnEx CRC's portfolio with 10 new projects launched and eight new PhDs joining the team.

A formal feedback process was also implemented for the first time this year, with a Stakeholder survey and Participant interviews carried out. The responses provided useful input into the Strategic Research Review conducted mid-year, which helped update priorities and hone the focus to ensure the work targets areas of importance where the CRC can help make the biggest difference. All four Commonwealth Milestone Reports due in 2023 have been completed, with the one on [fugitive emissions of methane](#) being particularly timely. Following substantial input and feedback from CRC Participants, this report has been reviewed by the Department of Climate Change, Energy, Environment and Water. It is also being fed into the development of the international Measurement Monitoring, Reporting and Verification (MMRV) Framework led by

the US Department of Energy through the CRC's participation in the Stakeholder Representative Group.

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## **Creating and Deepening Networks**

The FEnEx CRC was a member of the delegation to the Offshore Northern Seas conference led by the WA Government. Outcomes included a new engagement with [SINTEF](#) (one of Europe's largest independent research organisations) and plans to hold an international carbon, capture and storage (CCS) workshop in Perth, which ran subsequently in March 2023 at the University of Western Australia with the support of the Western Australia Department of Jobs, Tourism, Science and Innovation (JTSI) and the Australian Petroleum Production & Exploration Association (APPEA). The 110 attendees included 15 expert speakers from Norway, Japan, Singapore, UK and across Australia. A report summarising the presentations and listing key recommendations generated by the workshop attendees is now available on the CRC website.

Several other workshops were run by the CRC during the year, generating significant interest and helping to identify new opportunities and priorities. Topics ranged from Solid Oxide Electrolysis Cells (September), Liquid Hydrogen Research (April) to the Public Acceptance of Hydrogen (November). About 80 people attended the latter Melbourne-based workshop organised and co-funded by Queensland University of Technology and Swinburne University.

These collaborative events culminated in the FEnEx CRC's 2nd annual conference, which was held at the Adelaide Convention Centre on May 11th and 12th. Approximately 95 people attended each day and 75 attended the conference dinner at the Adelaide Museum with Art Gallery of South Australia. Highlights included presentations or speeches by Alan Finkel, Saul Kavonic, Gerry Swiegers and Keelan O'Neil who debuted the CRC's Hydrogen Pathways App. All the CRC PhD students at the conference who presented talks or posters, as well as the finalists of the 3-minute thesis competition, gave truly impressive performances. The CRC is very pleased with the positivity of the feedback received from participants about the conference, as well as the appreciable media coverage it generated.



*FEnEx CRC 2023 Conference in Adelaide*

The Kwinana Energy Transformation Hub also made substantial progress during the past year. Multiple briefings of federal and state politicians were organised and the FEED study for the full facility was completed by Valmec Kent. The FEnEx CRC was informed that its Investment Attraction Fund grant application to the Western Australian government had been successful, and a funding assistance agreement for \$15 million has been finalised, enabling further progress during the coming year.

The outreach activities of the FEnEx CRC went to a new level in 2022-23. As CEO I was selected as an industry mentor within the Department of Industry, Science and Resource's Timor Leste LNG Fellowship program and worked with a mid-career professional from Timor Gap EP looking at LNG decarbonisation technology options. The FEnEx CRC also became the first major sponsor of the SPE-WA-Timor Student Chapter. At its launch in Dili, President Ramos-Horta emphasised the importance of the new Chapter to the country and the significant opportunities to his people arising from its scholarships.



*SPEWA Scholarship Awardees visiting Perth*

I also had the privilege to travel to Germany in October 2022 as part of the first Australian Hydrogen Research Network (AHRN) delegation, and FEnEx CRC Foundation Fellow Saif Al Ghafri was part of the AHRN delegation that toured Singapore in June. Engagement with the AHRN further strengthened during the year as the FEnEx CRC was a plenary sponsor of the inaugural Australian Hydrogen Research Conference held in Canberra, with many of FEnEx CRC researcher's presenting on the progress they have made. The next AHRC will be held in Perth from 4-6 September 2024 and will be co-chaired by Professor Peta Ashworth of Curtin University and myself.

Engagement with SMEs continued to be fostered through several existing and new mechanisms established in the last year. These include: partnering with established SME network groups to share knowledge and enable collaborative research projects, in particular Asset Institute, MIMOSA (a not for profit organisation dedicated to open standards for asset interoperability and digital transformation), APPEA, Clean Marine Fuels Institute and Sustainable Built Environment; complementary attendance and participation in our annual conference and monthly colloquiums; and direct participation of SMEs through project agreements.

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## **Decarbonisation and Australia's energy transition at the heart of our partnerships and research**

Amongst all this activity, the CRC also got on with the job delivering research and commencing new important work. The Net Zero Australia project (which is supported by the FEnEx CRC) had a very eventful year, holding its public launch in August 2022 with an attendance of about 200 people in person and over 1000 online. Then in late April, the final results were presented to a similar sized audience, after multiple briefings had been given to a very broad range of stakeholders. The project really has set detailed, specific boundaries regarding what it will take to fully decarbonise Australia's energy export system in the next few decades, and it provides a strong intellectual foundation upon which the CRC's priorities can be honed over the coming years. Follow-up work is now being planned by the Net Zero Australia team.

Commercialisation and utilisation of research conducted through the FEnEx CRC also increased as the first phase of research projects began delivering outcomes. The CRC uses a flexible approach to IP to minimise barriers to collaboration and maximise the likelihood of research project outcomes being utilised and/or commercialised. A key principle of the FEnEx CRC's approach to IP is to have a single owner, with other contributors to the Project having utilisation licenses and revenue sharing agreements. The IP owner should be the Project participant best able to commercialise the outcomes and this is often influenced by the details of any background IP brought to the project. A spin out company was established (Jovian Tech Pty Ltd, ACN 663 325 415) based on a patent covering ortho-para hydrogen sensing filed by the University of Western Australia. The Hydrogen Pathways App was released on the CRC's website and the CRC is exploring ways to commercialise the modelling capability that underpins it.

Looking ahead, the outcomes and potential of the research FEnEx CRC now has underway in the project portfolio are particularly exciting:

- Simulation and testing of cryogenic ortho-para conversion in hydrogen liquefaction processes: a capability to measure conversion kinetics at cryogenic temperatures has now been established and process simulation tools to incorporate the results developed.

- A technical, economic and environmental assessment of clean marine fuel options and industries for Australia is examining the how the adoption of different prospective low carbon fuels will perform technically, economically and environmentally in an Australian context.
- Open specification for analytics interoperability pilot implementations of the new interoperable standards developed over the last two years are now underway.
- Low pressure, low temperature CO<sub>2</sub> shipping technology is a project put together from May 2022 involving Japanese, Korean and Australian participants to develop and demonstrate a key technology for large scale intercontinental CO<sub>2</sub> transport. This technology will be a critical part of decarbonising Australia's future energy export and the project kicks off in September 2023.



Launch of the Low pressure, low temperature CO<sub>2</sub> shipping technology project

More extensive descriptions of all the current FEnEx CRC projects are on the [website](#).

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## **Thank you**

As always, this progress and the FEnEx CRC's exciting prospects are a direct result of the sustained, highly effective and efficient efforts of the small but hard-working executive team. I would like to extend my thanks to the Board for their guidance, and to the many individuals from Participant organisations who gave time and effort to the CRC. The spirit of collaboration is truly central to the CRC program, and particularly important to the ongoing success and effectiveness of the Future Energy Exports CRC.

Wishing you all a safe and restful holiday season.

**Eric May**

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## **About FEnEx CRC**

The Future Energy Exports Cooperative Research Centre (FEnEx CRC) is an Australian not-for-profit organisation striving to decarbonise liquefied natural gas exports and grow clean hydrogen production.

Established in 2020 as a research-driven charity, the FEnEx CRC brings together 35 industry, government and university partners with resources of \$163 million to conduct industrial-scale research that supports LNG and Hydrogen exports from Australia.

FEnEx CRC research is supported by a grant from the Commonwealth Department of Industry, Science and Resources through the Cooperative Research Centres program.