

Hydrogen RD&D Collaboration Opportunities: Background of the report and spotlight on Australia

As at 31 August 2022



Australian Government

**Department of Climate Change, Energy,
the Environment and Water**



MISSION INNOVATION
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Citation

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Acknowledgments

CSIRO acknowledges the Traditional Owners of the lands that we live and work on across Australia and pays its respect to Elders past and present. CSIRO recognises that Aboriginal and Torres Strait Islander peoples have made and will continue to make extraordinary contributions to all aspects of Australian life including culture, economy and science.

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1 Background to the Hydrogen RD&D Collaboration Opportunities report

*Australia's National Hydrogen Strategy*¹ and the Commonwealth Scientific and Industrial Research Organisation's (CSIRO's) 2019 *Hydrogen Research, Development and Demonstration*² report identified a need to stimulate international research connectivity and knowledge sharing to support industry development and build hydrogen RD&D capability. Further collaboration is needed to develop technology and cross cutting topics such as international standards and certification.

To address this CSIRO and the Australian department of Climate Change, Energy, Environment and Water (DCCEEW) (formerly Department of Industry Science Energy and Resources (DISER)) established the CSIRO-DCCEEW Hydrogen RD&D International Collaboration Program. The program aims to support Australia's clean hydrogen industry and build domestic hydrogen RD&D capability through enhanced collaboration between Australian research institutions and leading international hydrogen organisations (see Table 1). The program builds on recent collaborative efforts between DCCEEW and CSIRO to develop the emerging Australian Hydrogen Research Network (AHRN), established to foster connections across Australia's hydrogen research community.

Table 1: Hydrogen RD&D International Collaboration Program goals

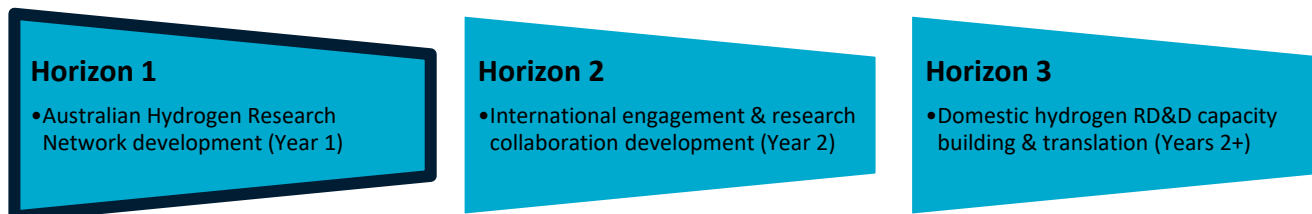
Research Capacity	Access 'state of the art' theoretical and technological aspects of hydrogen research by assisting Australia's hydrogen research community to promote hydrogen RD&D activities, to network domestically, and connect internationally with research leaders across industry and institutions. This will position Australia to rapidly leverage significant global innovations to advance Australian hydrogen industry development.
Technology Opportunities and Industry Awareness	Identify new 'fit for purpose' research and innovation opportunities for industry adoption through exposure to hydrogen technologies and developing industry trends from leading countries.
Strategic Insights	Gain new knowledge to support the development of Australia's clean hydrogen industry through improved understanding of hydrogen research planning and delivery internationally. This includes supply chains and markets, leading to further research engagements supporting industry collaboration between Australia and its partners.
Enhancing Australia's International Profile & Relationships	Raise the profile of Australia's hydrogen research and industry capabilities through the Hydrogen Knowledge Centre, the targeted promotion of Australia's hydrogen RD&D and by developing international collaborations. Strengthened international awareness will deepen relationships with existing trading partners and foster new international relationships (for example, through supporting international RD&D collaborations such as Mission Innovation).

¹ COAG Energy Council (2019) Australia's National Hydrogen Strategy

² Srinivasan et al. (2019) National Hydrogen Research, Development and Demonstration: Priorities and Opportunities for Australia. CSIRO.

The 'Hydrogen RD&D Collaboration Opportunities' report seeks to highlight opportunities for RD&D collaboration with international partners. This forms part of **Horizon 1** of the program which comprises of planning and setting the groundwork for international collaboration. This will be used to inform the engagement activities for **Horizon 2 and 3** of the program.

Figure 1: Australia's Hydrogen RD&D International Collaboration Program high-level plan



Next steps (Horizon 2)

This report and the individual country reports will be combined with on-going engagement to inform **Horizon 2** of the program. This will consist of targeted international engagement and research collaboration development activities. The horizon will support both 'top down' (e.g. research leader) and 'bottom up' (e.g. early career researcher) engagement activities, with a strong focus on joint project development where possible with international stakeholders.

Activities include overseas research delegations to strengthen and build research relations. It will also include the establishment of a competitive fellowship grant program to support placements of early career researchers in key industry and research institutions for up to one year. Overseas researchers will also be invited to visit and conduct research projects in Australia.

An inaugural Australian international hydrogen RD&D conference will also occur as part of the program. This will include Australian visits to from eminent international research leaders as keynote and plenary speakers, and tours of leading RD&D organisations across the country.

Selection criteria for project grants will be developed in line with Australia's strategic priorities, including *Australia's National Hydrogen Strategy*,³ the Australian Government's *Powering Australia Policy*⁴ and the National Reconstruction Fund⁵. Criteria will also be informed by consulting industry, research and government stakeholders.

³ COAG Energy Council (2019) Australia's National Hydrogen Strategy

⁴ Labor (2021) Powering Australia, Labor's plan to create jobs, cut electricity bills and reduce emissions by boosting renewable energy

⁵ Labor (2021) National Reconstruction Fund, \$3 billion commitment to invest in clean energy component manufacturing; hydrogen electrolyzers and fuel switching and other low carbon manufacturing priorities.

2 Australia's hydrogen strategic priorities and drivers

In 2019 the Council of Australian Governments (COAG) Energy Council produced *Australia's National Hydrogen Strategy*⁶ outlining key drivers and strategic priorities in building a national hydrogen industry.

The drivers behind Australia's hydrogen strategy include capturing a share of the global hydrogen export market and the potential for industry and job growth, as well as emissions abatement potential and energy security. Further, Australia has expertise in large scale energy industries, trusted institutions and a strong regulatory and policy environment. It also has significant comparative advantages in renewable and non-renewable resources.

Australia's strategy to grow its hydrogen industry is underpinned by strong investment on the supply side (RD&D investment and production scale-up) and by stimulating demand through large-scale market activation. This is to be supported through the creation of hydrogen hubs across the country and international partnerships such as the Australia - Germany Hydrogen accord⁷. To manage risk and uncertainty in the emerging hydrogen market, Australia intends to adopt an adaptive approach whereby regular monitoring of global market and technology developments informs progress and refinement.

Key action items of the hydrogen strategy fall under the following key themes:

1. **National coordination:** All Australian jurisdictions work cooperatively toward the goal of establishing Australia as a major player in the global hydrogen industry by 2030.
2. **Developing production capacity, supported by local demand:** Building and demonstrating capability across the entire value chain (production, storage, distribution, and utilisation). Supporting hydrogen hubs as an early-stage approach to building demand and achieving the scale needed for a large-scale industry.
3. **Responsive regulation:** Setting clear and consistent regulatory frameworks that are regularly reviewed and reformed. Developing an internationally aligned Guarantee of Origin scheme to underpin the trade of clean hydrogen.
4. **International engagement:** Support the development of bilateral arrangements to indicate our commitment and capability as a hydrogen partner of choice and engage with key markets to harmonise standards and promote trade and investment.
5. **Innovation and R&D:** Targeted support with a focus on international collaboration and Australian priorities.
6. **Skills and workforce:** Establishing consistent training materials and guidelines to do with the production, handling, transport and use of hydrogen and improve workforce skills.
7. **Community confidence:** Growing the industry without compromising safety, cost of living, water availability, land access, environmental sustainability, and maintaining a social licence to operate. Support best practice for community engagement and building community awareness.

⁶ COAG Energy Council (2019) *Australia's National Hydrogen Strategy*

⁷ Australia and Germany are working together to accelerate the development of a hydrogen industry under the 2021 hydrogen accord

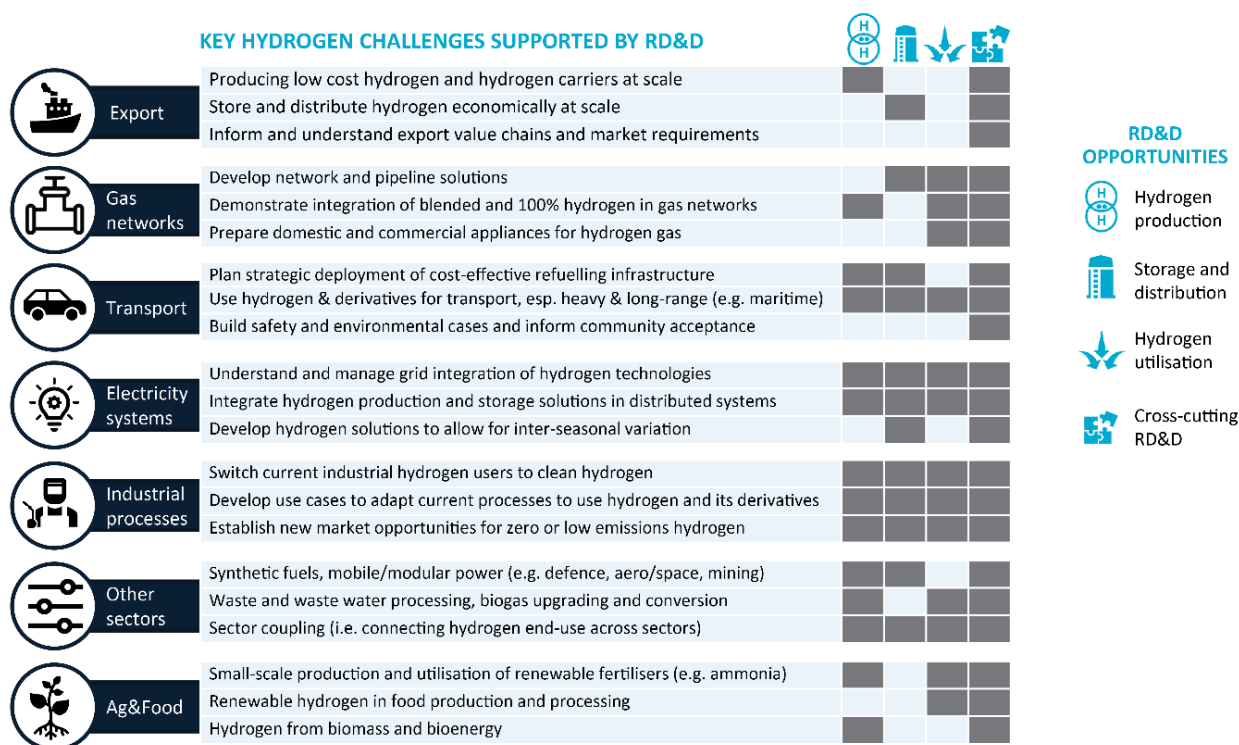
Australia's hydrogen RD&D priorities and opportunities

In 2019, CSIRO produced the *Hydrogen Research, Development and Demonstration: Priorities and opportunities for Australia*⁸ report outlining the technical and non-technical challenges that require or could be supported by RD&D. The analysis focused on supporting hydrogen market activation opportunities related to hydrogen export and hydrogen use in gas networks, transport, electricity systems and industrial processes. The RD&D required for each opportunity was explored in production, storage and distribution, utilisation, and cross-cutting aspects (see Figure 5). A detailed breakdown of sub-technologies identified are included in the Appendix.

Beyond the opportunity specific RD&D priorities, the analysis also identified the following priorities:

1. Deliver cost and efficiency improvements in production, storage, distribution and utilisation.
2. Develop breakthrough technologies that can lead to step-change cost reductions and process improvements.
3. Support RD&D in cross-cutting areas including environmental research, policy and regulation, social licence, safety and standards, ancillary technology and services, and modelling.

Figure 2: Market activation opportunities and RD&D related challenges across the value chain



The following section presents a high level overview of activity in technologies underpinning the hydrogen value chain in Australia, globally and across the innovation spectrum (research, development and demonstration).

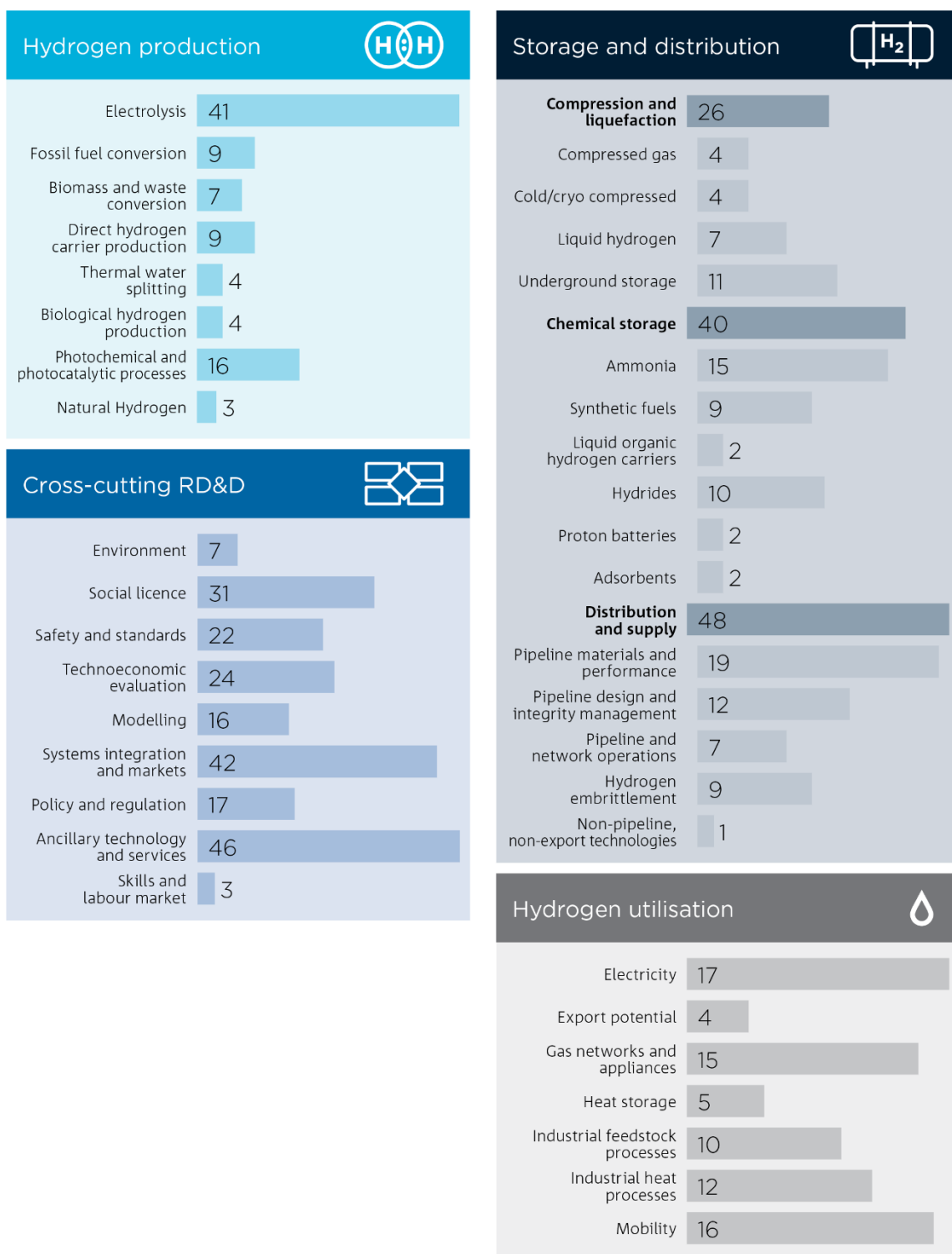
⁸ Srinivasan et al. (2019) National Hydrogen Research, Development and Demonstration: Priorities and Opportunities for Australia. CSIRO.

3 Australia's hydrogen RD&D activity

With respect to RD&D, Australia is active across several technology areas underpinning the hydrogen value chain. The 2019 CSIRO's *Hydrogen Research, Development and Demonstration: Priorities and opportunities for Australia*⁹ report provided a snapshot of active RD&D projects across Australia, however there has been an increase in the number, scale and sophistication of RD&D projects in Australia since then. Figure 9 provides a snapshot of hydrogen RD&D activity collated from the HyResearch projects database as of 31st of August 2022.

⁹ Srinivasan et al. (2019) National Hydrogen Research, Development and Demonstration: Priorities and Opportunities for Australia. CSIRO.

Figure 3: Snapshot of hydrogen RD&D project activity in Australia by category and number of active Australian institutions (as of 31st August 2022)



Australia also engages in cross-cutting RD&D areas, namely social licensing and safety standards, modelling, and ancillary technology and services, which several countries have also signalled an intent to collaborate on.

In 2021, the CSIRO-DISER Hydrogen RD&D International Collaboration Program established an online hydrogen knowledge centre, HyResearch, to provide live RD&D project updates from the Australian hydrogen research community.

HyResearch is a collaboration between CSIRO and the Australian Hydrogen Research Network (AHRN). Its purpose is to enhance connections and collaborations across the research and broader hydrogen communities, domestically and internationally. It collates information on hydrogen-related research activities in Australia into a single online resource in a manner that is easily accessed and navigated. Strengthening national and international research connections and capabilities is a critical enabling measure in the development and deployment of domestic and export-oriented hydrogen pathways.

The HyResearch site can be found at: <https://research.csiro.au/hyresearch/>

HyResearch is a module of the Hydrogen Knowledge Centre, part of the **CSIRO Hydrogen Industry Mission**.

Australia’s hydrogen publications

Basic and applied research usually relates to technologies with a lower technology readiness level (TRL). These are often next generation technologies, with a longer-term commercialisation outlook. Research activity can be shown through publication output, the quantity of research publications. It can also be seen through normalised citation impact (NCI),¹⁰ which relates to the global impact of publications.

Australia has a relatively strong standing with respect to publications in the area of hydrogen storage technologies. As shown in Table 2, Australia ranks highly in both metrics. While Australia ranks 11th overall in quantity of publications, it ranks highly compared to the majority of countries in terms of publication impact for all hydrogen value chain areas. This positions Australia as an attractive partner for hydrogen research. Australia’s top institutions with respect to hydrogen research publications, as at October 2021, are shown in Table 3.

Table 2: Australia's global rank in hydrogen research publication outputs

	Production	Storage	Utilisation	Overall
Publication output	12 th	9 th	13 th	11 th
Normalised citation impact	2 nd	1 st	1 st	2 nd

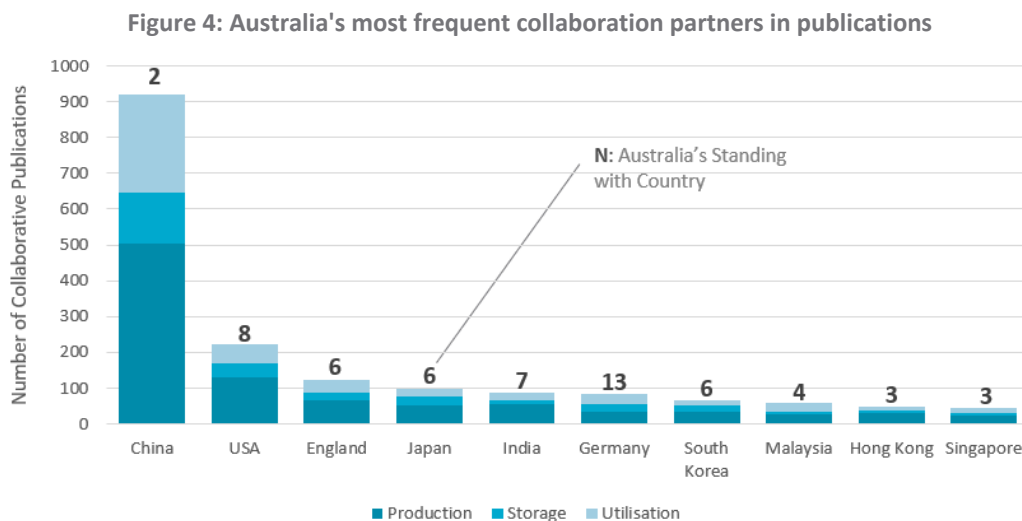
Table 3: Australia's top-ranking institutions by hydrogen research publication output

Production	Storage	Utilisation	Overall
University of Queensland	University of New South Wales	Curtin University	University of Queensland
Monash University	University of Wollongong	Monash University	University of New South Wales
University of New South Wales	Curtin University	University of New South Wales	Curtin University

Data was drawn from the Web of Science (WoS) from Clarivate and inCites by Clarivate Analytics. The search strategy and keywords used can be found in Hydrogen Research, Development and Demonstration: Technical Repository.

¹⁰ Normalised Citation Impact is calculated by dividing the count of citing items by the expected citation rate for that document type, year and subject area.

Australia has historically collaborated on hydrogen publications with a number of research institutions across several active countries. Figure 9 illustrates Australia’s existing collaborative relationships based on past co-publications in hydrogen production, storage and utilisation. In light of country strengths in terms of output volume, Australia already collaborates with countries that have high levels of hydrogen research outputs (China, US, England, Japan, India, Germany and the Republic of Korea).



Australia’s hydrogen patents

Patent data gives an indication of research and development activity occurring at a higher TRL. These are usually cutting-edge technologies that have potential for demonstration, scale-up and commercialisation in the short- to medium- term.

In support of this report, IP Australia developed the *Patent analytics on hydrogen technology*, an interactive visualisation tool that provides insights on global hydrogen patents in specific hydrogen technology areas. Data extracted from the tool shows Australia is most active in hydrogen production compared to storage and utilisation. Australia’s global ranking and top industry players by number of patent families and top patent assignees from 2010 to 2020 (data at December 2021), are shown in Table 4.

Table 3: Australia's global IP rank and top patent assignees by number of patent families

	Production	Storage	Utilisation
Global Rank	15 th	17 th	15 th
Top patent assignees	Aquahydrex, CSIRO, Monash University, University of Wollongong, Koch Industries, Linc Energy, University of Queensland, Hazer, Neometals, NewSouth Innovations, Reenergi, Southern Green Gas	Hydrexia, Linc Energy	CSIRO, Monash University

IP Australia patent analytics on hydrogen technology

IP Australia has developed an interactive visualisation tool to provide hydrogen insights to the Australian research, academics, business and policy sectors. For more hydrogen IP statistics including key destination markets, origin profiles, applicant profiles, collaborations and specific patent searches, refer to IP Australia's Hydrogen Patent Landscape tool:

<https://www.ipaustralia.gov.au/tools-resources/publications-reports/patent-analytics-hydrogen-technology>

Australia's hydrogen projects: demonstration and commercial-scale

While commercial scale initiatives are outside the scope of this report, project data (including feasibility studies, demonstrations and commercial projects) give an indication of activity in technologies with high technology readiness levels (TRL). It should be noted that technologies used on domestic projects may have been developed domestically or obtained from an overseas technology provider. In either case, project activity can speak to the potential for knowledge sharing in relation to skills, trades and implementation 'know-how'.

The following projects (Table 5) are collated from the HyResource projects database as of 31st of August 2022.

Table 4: Current projects in Australia (feasibility, demonstration and commercial-scale)

Technology	Sub-technology	Further detail	Number of Projects	
Production	Electrolysis		85	
	Fossil fuel conversion		6	
	Biomass and waste		5	
Storage and supply	Compression		2	
	Liquification		5	
	Chemical Storage	Ammonia		22
		Methanol		4
		Methane		1
Chemical and metal hydrides			3	
Utilisation	Gas blending		13	
	Transport		25	
	Electricity generation		16	
	Industrial processes		5	

The scope of this report is on RD&D projects. For information on commercial hydrogen projects, see *HyResource*, an online knowledge sharing platform across the hydrogen community, led by CSIRO, Future Fuels CRC, NERA and the Australian Hydrogen Council.

HyResource provides a directory of publicly available databases and information sources on international projects: <https://research.csiro.au/hyresource/projects/international/>

Public funding mechanisms for hydrogen RD&D

Australia has well-established RD&D funding mechanisms, many of which are administered by government bodies and funding agencies including the ARC and ARENA. Key funding mechanisms, including funding calls administered by government agencies, are outlined in Table 6 below.

Table 5: Australian federal government (Commonwealth) funding for hydrogen RD&D

**Most Australian funding programs require the international participants to have either an Australian Business Number (ABN) (set up as an Australian subsidiary) or partner with an Australian organisation. Situations where this does not apply are where the funding explicitly states that the purpose is to create international partnerships, and/or names a country who the partnership is with.*

Provider/funding mechanism	Details	International eligibility to participate
Advancing Hydrogen Fund - Clean Energy Finance Corporation (CEFC) Public funding	Hydrogen Specific Funding The CEFC Advancing Hydrogen Fund is aiming to invest up to AU\$300 million to support the growth of a clean, innovative, safe and competitive Australian hydrogen industry ¹¹ . Eligible projects can include advancing hydrogen production, developing export and domestic hydrogen supply chains and establishing hydrogen hubs. The fund can also consider investing in infrastructure for a hydrogen export industry as well as projects that assist in building domestic demand for hydrogen.	Yes*
Advancing Renewables Program - Australian Renewable Energy Agency (ARENA) Public funding	ARENA's Advancing Renewables Program supports a range of development, demonstration and pre-commercial deployment projects. This includes opportunities to optimise the transition to renewable electricity, commercialise clean hydrogen and support the transition to low emissions metals ¹² . Since 2018 AU\$65.7 million of program funds have been awarded to Australian green hydrogen feasibility studies and pilot or demonstration projects.	Yes*
HyGATE - Australian Renewable Energy Agency (ARENA) Public funding	Hydrogen Specific Funding The HyGATE Initiative is intended to support real-world pilot, trial and demonstration projects along the hydrogen supply chain and to facilitate collaboration between Australian and German partners. Australia and Germany have respectively committed up to AU\$50 million and €50 million to establish HyGATE ¹³ . ARENA is administering the HyGATE initiative on behalf of the Australian Government.	Potential research collaboration (applications for funding closed June 2022)

¹¹ <https://www.cefc.com.au/where-we-invest/special-investment-programs/advancing-hydrogen-fund/>

¹² <https://arena.gov.au/funding/advancing-renewables-program/#:~:text=The%20Advancing%20Renewables%20Program%20supports,transition%20to%20low%20emissions%20metals>

¹³ <https://arena.gov.au/funding/german-australian-hydrogen-innovation-and-technology-incubator-hygate/>

Provider/funding mechanism	Details	International eligibility to participate
Australian Research Council (ARC) Public funding	Hydrogen Specific Funding The ARC is a Commonwealth entity in place to support the highest-quality fundamental and applied research and research training in Australia ¹⁴ . Since 2018 at least AU\$44.7 million in ARC grants has been awarded to hydrogen related research.	Yes. International researchers can apply for all funding schemes of the <i>National Competitive Grants Program (NCGP)</i> . International organisations can collaborate on projects through several schemes of the NCGP. Further information is detailed at the ARC website ¹⁵ .
Australia-Singapore maritime partnership - CSIRO Public funding	The Australia-Singapore maritime partnership is in place to accelerate deployment of low emissions fuels and technologies like clean hydrogen to reduce emissions in maritime and port operations. Australia and Singapore will each commit up to AU\$10 million over five years to fund industry-led pilot and demonstration projects with at least AU\$10 million of additional investment expected to be leveraged from industry. CSIRO will administer the partnership on behalf of the Australian Government.	Future potential for research collaboration and industry engagement.
CSIRO Hydrogen Industry Mission Public funding	The CSIRO Hydrogen Industry Mission focuses on leveraging CSIRO's hydrogen research capabilities in partnership with government, industry and the research community ¹⁶ . AU\$7.8 million has been provided from the Commonwealth towards the mission.	Research collaboration
CSIRO Hydrogen Research Development & Demonstration International Collaboration Program Public funding	AU\$5 million provided to CSIRO for the Hydrogen Research Development & Demonstration International Collaboration Program ¹⁷ .	Research collaboration

¹⁴ <https://www.arc.gov.au/>

¹⁵ <https://www.arc.gov.au/about-arc/strategies/international/opportunities-international-research-collaboration>

¹⁶ <https://www.csiro.au/en/about/challenges-missions/hydrogen>

¹⁷ [https://www.csiro.au/en/news/news-releases/2021/csiro-to-lead-\\$5m-international-engagement-program-to-boost-hydrogen-capabilities](https://www.csiro.au/en/news/news-releases/2021/csiro-to-lead-$5m-international-engagement-program-to-boost-hydrogen-capabilities)

Table 6: Australian State and Territory funding for hydrogen RD&D

*Some State and Territory funding programs require the international participants to have either an Australian Business Number (ABN) (set up as an Australian subsidiary) or partner with an Australian organisation. Situations where this does not apply are where the funding explicitly states that the purpose is to create international partnerships, and/or names a country who the partnership is with.

Provider/funding mechanism	Details	International eligibility to participate
Australian Capital Territory		
Renewable Energy Innovation Fund Public funding	AU\$12 million to support renewable energy research and development activities inclusive of hydrogen ¹⁸ .	No data.
New South Wales		
NSW Hydrogen Strategy Incentives program Public funding	Hydrogen Specific Funding AU\$3 billion of incentives to support hydrogen industry development as part of the NSW Hydrogen Strategy ¹⁹ . The program covers exemptions for green hydrogen production from government charges and incentives for green hydrogen production such as NSW's Renewable Fuels Scheme.	Yes*
Net Zero Industry and Innovation Program Public funding	AU\$1.05 billion program to support and partner with industry to reduce emissions and help NSW businesses prosper in a low carbon world ²⁰ . The program features three focus areas that provide opportunities to invest in green hydrogen initiatives: <ul style="list-style-type: none"> - AU\$195 million Clean Technology Innovation - AU\$475 million New Low Carbon Industry Foundations including the <i>AU\$150 million Hydrogen Hubs Initiative</i> and <i>AU\$10 million Hume Hydrogen Highway Initiative</i> (both opportunities discussed further below) - AU\$380 million High Emitting Industries 	Yes*
Renewable Manufacturing Fund Public funding	AU\$250 million fund that will make strategic co-investments with the private sector to establish and expand local supply chains for renewable energy content, including hydrogen electrolyser ²¹ . This fund was set up as part of the response to the early closure of Eraring Power Station.	Yes*

¹⁸ <https://www.climatechoices.act.gov.au/policy-programs/renewable-energy-innovation-fund>

¹⁹ <https://www.energy.nsw.gov.au/nsw-hydrogen-strategy-drive-investment-create-jobs-and-power-prosperity>

²⁰ <https://www.energysaver.nsw.gov.au/reducing-emissions-nsw/net-zero-industry-and-innovation>

²¹ <https://www.energy.nsw.gov.au/nsw-response-to-closure-of-eraring-power-station#:~:text=To%20capture%20these%20job%20opportunities,up%20to%20500%20new%20jobs>

Provider/funding mechanism	Details	International eligibility to participate
Hydrogen Hubs Initiative Public funding	Hydrogen Specific Funding AU\$150 million in grant funding ²² as part of the <i>Low Carbon Industry Foundations Fund of the Net Zero Industry and Innovation Program</i> . Funding will be used to develop hydrogen hubs focussed on the Hunter and Illawarra regions. This will support the establishment and growth of hydrogen industries across NSW.	Potential for research collaboration and industry engagement. (expressions of interest for funding have closed).
Hume Hydrogen Highway Initiative (East Coast Renewable Hydrogen Refuelling Network) Public funding	Hydrogen Specific Funding AU\$10 million ²³ as part of the <i>Low Carbon Industry Foundations Fund of the Net Zero Industry and Innovation Program</i> . NSW and Victoria are each committing AU\$10 million to build hydrogen refuelling infrastructure along the Hume Highway and to support a fleet of hydrogen trucks. This initiative forms part of the tri-state MoU between NSW, Victoria and Queensland to build an East Coast Renewable Hydrogen Refuelling Network.	Yes*
Northern Territory		
Northern Territory Hydrogen Master Plan Public funding	Hydrogen Specific Funding AU\$5 million to support the Northern Territory's Renewable Hydrogen Master Plan to accelerate and expand the Territory's hydrogen industry ²⁴ .	No data.
Remote Hydrogen Program Public funding	AU\$1 million under the AU\$2 million Renewable Remote Power (RRP) program ²⁵ . The RRP will facilitate private investment in remote power system services to communities supplied by Indigenous Essential Services, target an aggregate 70% renewables penetration in remote communities, and canvass investor interest in innovative renewable energy technologies such as renewable hydrogen.	No data.
Queensland		
Queensland Renewable Energy and Hydrogen Jobs Fund Public funding	AU\$2 billion fund, including a \$350 million <i>Industry Partnership Program</i> , to support job-creating industries like renewable energy, hydrogen, resource recovery, business, manufacturing and catalytic infrastructure in Queensland ²⁶ . AU\$43.9 million has so far been awarded to hydrogen related projects.	Yes. Eligibility requires that an application is made by an energy Government Owned Corporation.

²² <https://www.energysaver.nsw.gov.au/reducing-emissions-nsw/net-zero-industry-and-innovation/hydrogen-hubs>

²³ <https://www.environment.nsw.gov.au/news/hydrogen-highways-to-link-australias-east-coast>

²⁴ https://newsroom.nt.gov.au/article/_nocache?id=61d5611364bd3ce194d941d7c4e03a3b

²⁵ <https://newsroom.nt.gov.au/article?id=34413>

²⁶ <https://www.epw.qld.gov.au/about/initiatives/hydrogen/investment-funding>

Provider/funding mechanism	Details	International eligibility to participate
<p>Hydrogen Industry Development Fund</p> <p>Public funding</p>	<p>Hydrogen Specific Funding</p> <p>AU\$35 million to drive investment and accelerate development of hydrogen projects in Queensland²⁷. AU\$17.4 million has so far been awarded from the fund and has been allocated to projects featuring a variety of domestic renewable hydrogen applications such as transport, gas-blending, off-grid storage and wastewater treatment.</p>	<p>Potential - no funding round currently open. For possible future rounds an applicant may be a private or public company or partnership (with an Australian Company Number (ACN)) or government owned corporation. Consortiums may apply but one organisation must be identified as the applicant and administrator of the project.</p>
<p>South Australia</p>		
<p>Hydrogen Jobs Plan Fund</p> <p>Public funding</p>	<p>Hydrogen Specific Funding</p> <p>AU\$593 million towards the construction of a hydrogen power station, electrolyser and storage facility within the Whyalla City Council²⁸. The Plan targets the construction of 250 MWe of electrolysers, 200 MW of power generation (powered by the electrolysers) and hydrogen storage for 3,600 tonnes of hydrogen, or the equivalent of two months of hydrogen consumption for power generation. The facility is expected to be operational by the end of 2025.</p>	<p>No data.</p>
<p>Renewable Technology Fund</p> <p>Public funding</p>	<p>AU\$150 million to support investment in the next generation of renewable technologies and demand management technologies that will improve the reliability and security of the South Australian electricity network²⁹. AU\$18.1 million has so far been awarded to hydrogen projects.</p>	<p>No data.</p>
<p>Tasmania</p>		
<p>Tasmanian Renewable Hydrogen Industry Development Funding Program</p> <p>Public funding</p>	<p>Hydrogen Specific Funding</p> <p>AU\$50 million fund to develop domestic and export hydrogen opportunities in Tasmania³⁰. The fund consists of AU\$20 million for projects under the <i>Tasmanian Renewable Hydrogen Fund</i>, AU\$20 million provided in concessional loans, and up to AU\$10 million in support</p>	<p>No data.</p>

²⁷ <https://www.statedevelopment.qld.gov.au/industry/priority-industries/hydrogen-industry-development/hydrogen-industry-development-fund>

²⁸ <https://www.energymining.sa.gov.au/industry/modern-energy/hydrogen-in-south-australia/hydrogen-jobs-plan>

²⁹ <https://www.energymining.sa.gov.au/industry/modern-energy/hydrogen-in-south-australia>

³⁰ https://recfit.tas.gov.au/future_industries/green_hydrogen/tasmanias_funding_and_investment_strategy


Provider/funding mechanism	Details	International eligibility to participate
	services. AU\$2.6 million has so far been awarded under the program for three feasibility studies that investigated large-scale renewable hydrogen projects in Tasmania.	
Victoria		
Breakthrough Victoria Fund Public funding	AU\$2 billion fund to invest over the next 10 years in innovation across a number of priority sectors including health and life sciences, advanced manufacturing, digital technologies, agri-food and clean economies including hydrogen ³¹ .	Yes, but applicants must be Victorian based or willing to relocate to Victoria.
Hume Hydrogen Highway Initiative (East Coast Renewable Hydrogen Refuelling Network) Public funding	Hydrogen Specific Funding AU\$10 million to build hydrogen refuelling infrastructure along the Hume Highway and to support a fleet of hydrogen trucks ³² . Victoria and NSW are each committing AU\$10 million to this initiative. This initiative forms part of the tri-state MoU between NSW, Victoria and Queensland to build an East Coast Renewable Hydrogen Refuelling Network.	Yes. Must have an Australian Business Number (ABN) to apply.
Western Australia		
Renewable Hydrogen Fund (RHF) Public funding	Hydrogen Specific Funding AU\$15 million to support renewable hydrogen feasibility studies and capital works projects across four strategic focus areas: export, remote applications, hydrogen blending in natural gas networks, and transport ³³ .	Yes, but only open to primary applicants with an Australian Business Number (ABN)
Hydrogen Fuelled Transport Program Public funding	Hydrogen Specific Funding AU\$10 million ³⁴ under the AU\$50 million <i>Renewable Hydrogen Development and Demand Stimulation fund</i> (under the AU\$61.5 million Renewable Hydrogen Development 2021-22 Budget funding). This program will provide financial support to a project that includes the procurement and operation of hydrogen or green ammonia fuelled transport, and the installation of one or more refuelling stations.	Yes, but only open to primary applicants with an Australian Business Number (ABN)

³¹ <https://breakthroughvictoria.com/>

³² <https://www.energy.vic.gov.au/grants/hume-hydrogen-highway>

³³ <https://www.wa.gov.au/government/publications/western-australian-renewable-hydrogen-fund>

³⁴ <https://www.mediastatements.wa.gov.au/Pages/McGowan/2021/10/10-million-dollars-to-accelerate-hydrogen-fuelled-transport.aspx>



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