

International Hydrogen Research Collaboration Program

RESEARCH FELLOWSHIPS

Expressions of interest sought from the Australian research community

A Low Emissions Technology Project led by CSIRO with DCCEEW and the AHRN

The **Department of Climate Change, Energy, the Environment and Water International Hydrogen Research Fellowship Program** supports research in areas of critical national importance by outstanding early to mid-career researchers in Australia to partner world-class researchers overseas and take up various key positions globally.

Up to 40 Research Fellows will be selected to conduct research across Canada, China, France, Germany, India, Japan, South Korea, Singapore, UK, and the USA between 3-12 months as part of the DCCEEW International Hydrogen Research Collaboration Program ('the Program'). The goal is to build research connections, collaboration, knowledge sharing and international relations between Australian research institutions and leading international hydrogen research organisations.



~40 Research Fellows

selected to conduct research across Canada, China, France, Germany, India, Japan, South Korea, Singapore, UK, and the USA.

Who can apply and who will be selected?

Candidates must meet the following criteria.

Eligibility criteria

1. Applicants must be early to mid-career researchers¹ from an Australian research institution (such as a university, CSIRO, or GeoScience Australia) with experience and achievements aligned with the objectives of the Program (namely, research that will accelerate the development of the Australian hydrogen industry).
2. Hold a doctorate degree, or a master's degree with appropriate experience.
3. Provide evidence of support from employer including continuance of labour costs for travel period.
4. Maintain prospects for sustained activities with the Program beyond the fellowship period.

¹ Early career is 0-5 years;
Mid-career is 5-15 years



Australian Government

Department of Climate Change, Energy,
the Environment and Water



Selection criteria

In 2 pages only, please elaborate on the following selection criteria:

1. **Relevance.** How does your past, and any planned research, align to the objectives of the DCCEEW International Hydrogen Research Collaboration Program (see Appendix)?
2. **Achievements.** How does your research experience and skills demonstrate outcomes that will contribute to development of the hydrogen industry, international trade, investment, policy, or societal aspects of a bilateral research partnership? (Note, the experience and skills required are not necessarily directly related to hydrogen, but applicable to the hydrogen supply chain).
3. **Character.** What skills and examples can you provide where you have worked in a team that fostered a collaborative environment and achieved shared goals?
4. **Written and communications skills.** What evidence can you provide of strong written and verbal communication skills where a high performing team or stakeholders demanded clarity and results from you?
5. **International connections.** Please provide any evidence of current or prospective international research connections (note, this is not essential but may be advantageous).

The post-holder will be expected to:

- Conduct a research project designated by the host institution; or, conduct a research project of the applicant's choosing supported by host institution.
- Disseminate research through publication in scholarly journals, participation in international conferences and seminars, and through other media.
- Engage in knowledge transfer activities.
- Contribute to business development opportunities that help extend the program in high value areas and enable long-term research partnerships.

How fellows will be selected

Research fellows will be selected in a 2-step process

Step 1

Submit by email (i) a 2-page summary addressing the above selection criteria, (ii) evidence of employer support (including labour costs and any current international relations (iii) completed templates provided in the Appendix regarding a) country selection and b) research areas, and (iv) a curriculum vitae (CV) (4-pages max), to int-h2collab@csiro.au by 5 pm, 30 September 2022

Step 2

A sub-committee drawn from the Program's international delegations and working groups will select the Research Fellows and match optimal destinations during October – December 2022. More information may be requested from the committees in Step 2 to clarify experiences and skills and to consider potential project activities. Travel is expected to take place as early as practicable.

Research activities will be considered in a wide range of fields that meet the criteria outlined above. Please refer to the key focus areas listed in HyResearch that are the broad areas to be brought together by participating countries across: Hydrogen production; Storage, distribution, and supply; Hydrogen utilisation; and Cross-cutting RD&D. See HyResearch at, <https://research.csiro.au/hyresearch/projects/>

It is hoped that the majority of Research Fellows for the program can be found from the initial EOI, however later rounds may be needed, and may also include special invitations for highly desired candidates.

How to apply and closing date

Please submit applications to:
int-h2collab@csiro.au

by 5.00pm on 30 September 2022 (AEST)

All submissions will receive notification of their outcome as soon as possible but please make allowances for extended evaluations and planning periods.

What participants will receive

Grants will normally run for 3-12 months. Activities under 3 months may be considered if a special case can be made.

Participants will receive between \$5,000 to \$7,000 AUD per month for air fares, accommodation, meals, health and accident insurance and incidentals. Different amounts are expected for each candidate and each destination.

Funds **cannot** be used to cover salaries.

In exceptional cases grant funds may be used to fund small-scale experiments or modelling activities.

The maximum for a single award is unlikely to be more than AUD\$85,000 though the Program may make higher awards if the project is considered exceptionally high value.

Evidence of contributions from other sources either in cash or in kind may strengthen the application but is not required.

Training in cultural awareness or international relations relating to the country to be visited will also be available to fellows.

EOIs from researchers wishing to build on current international projects or capitalise on the international connections of their organisations is encouraged. Any prospects of this nature need to be made clear in the application and evidence provided from the employer or other relevant organisation(s). Otherwise, the Program delegations governance team will make introductions where possible for potential research fellows to form new research partnerships.

Accessing Funds

Grants will be awarded by the sub-committees drawn from the Program's international delegates and overseen by the Program governance and reporting structure. CSIRO will transfer the grant allocated for each researcher to the research institution directly.

Grantees who are successful in receiving an award are required to provide a narrative report by the end of the grant period directly to the Program management team, as well as mid-project reports showing progress towards agreed goals and key performance indicators (KPIs).

APPENDIX 1 Selected destinations

Please indicate which of the following destinations you are willing to be available for the fellowship program?

(Note. More availability will produce greater matching opportunities)

I am available for any location

- Yes
- No

I am available for the following program locations only

Current focus locations

- France
- Germany
- Japan
- UK
- USA

Potential future locations

- Canada
- China
- India
- Republic of Korea
- Singapore

Other information

Please provide any other information you think is relevant to match your experience and background towards a particular location or region

APPENDIX 2 Program objectives

Objectives and outcomes of the DCCEEW International Hydrogen Research Collaboration Program

The objectives are to:

- increase collaboration within Australia between industry and the research community to realise transformative clean hydrogen industry solutions
- build and strengthen national and international research and industry partnerships and build clean hydrogen export pathways
- advance low emission technology development within Australia to add value and reduce costs in all stages of the hydrogen value chain
- develop capability and solutions to respond to domestic and global clean hydrogen industry opportunities.

The intended outcomes:

- Australian clean hydrogen research and industry is positioned to quickly leverage significant global innovations and investment to advance Australian interests
- new knowledge and skills support the development of the Australian clean hydrogen industry, including:
 - improved understanding of and cost reductions of hydrogen supply chains
 - established long-term domestic and international knowledge sharing mechanisms and networking opportunities
 - deepened relationships with existing and priority trading partners
 - reduced cost of clean hydrogen technologies by commercialisation and scaling up.

APPENDIX 3 H2 RD&D research areas

Please indicate research areas of interest.

Hydrogen production

- Biological hydrogen production
- Biomass and waste conversion
- Direct hydrogen carrier production
- Electrolysis
- Fossil fuel conversion
- Natural hydrogen
- Photochemical and photocatalytic processes
- Thermal water splitting

Cross-cutting R&D

- Water use
- Land use and ecological impacts
- Emissions and atmospheric impacts
- Materials and waste management
- Safety and standards
- Social licence
- Socio-technical risks
- Local communities
- Indigenous culture and communities
- Communication and engagement
- Techno-economic evaluation
- Geographical modelling
- Computational modelling
- Materials modelling
- Energy systems integration
- Sector coupling
- Supply chain integration
- Hydrogen market development
- Policy
- Regulations
- Hydrogen certification schemes
- Land rights
- Separation materials and technologies
- Specialised components and devices
- Advanced manufacturing
- Technology integration process improvement
- Skills and labour market

Storage, distribution, and supply

- Compressed gas
- Cold/cryo compressed
- Liquid hydrogen
- Ammonia
- Hydrides
- Liquid organic carriers
- Synthetic fuels and chemicals
- Adsorbents
- Proton Batteries
- Underground storage
- Pipeline storage
- Pipeline materials and performance
- Pipeline design and integrity management
- Pipeline and network operations
- Hydrogen embrittlement
- Other non-export supply technologies

Hydrogen utilisation

- Electricity**
(includes grid balancing & stability, grid integration, stationary fuel cells, engines & turbines)
- Export potential**
(includes shipping technology development, loading/offloading, infrastructure optimisation from production site to port loading site)
- Gas networks and appliances**
(includes appliance testing, metering, hydrogen gas separation)
- Heat storage**
(covers thermal batteries based on metal hydrides)
- Industrial heat processes**
(includes steel, cement, metals refining, etc.)
- Industrial feedstock processes**
(includes synthetic fuels and methanol production)
- Mobility**
(includes mobile fuel cells, onboard storage, refuelling stations, land, sea, air, mobility forms, vehicle/engine improvements)