

ARENA International Engagement Program: Year 1 Summary

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ARENA

EXECUTIVE SUMMARY

The International Engagement Program (IEP) was designed and created by ARENA to support Australia's participation in international platforms and accelerate innovation and technology development to drive commercialisation. This is further enabled by the program's function to coordinate the wider distribution and exchange of knowledge with international partners. Since the IEP's inception in early 2018, the program has yielded many positive outcomes and represented a gateway of opportunities for the local development of a range of renewable energy technologies. In the first year of funding, the program has enabled Australian experts to attend approximately 97 meetings across the world and deliver approximately 137 outputs for industry and the public on the latest international knowledge in these renewable technologies. The IEP has contributed to the participants' ability to increase Australian representation of experts and researchers in international fora, develop new research projects (Tasks) relevant to the Australian experience, and take on leading roles in existing Tasks. A key challenge related to international governance was commonly cited by program participants.

INTRODUCTION

In 2018, the Australian Renewable Energy Agency (ARENA) established the IEP to provide [\\$5 million funding](#) to support knowledge sharing on renewable energy technology with researchers and industry leaders around the world across twelve projects ('participants') (Appendix 1). Increasing Australia's access to world-leading information through the program can improve Australian research outcomes and the commercialisation of technologies. The main vehicles taking part in this program are Australian representatives in eligible International Engagement Agency (IEA) Technology Collaboration Programs (TCPs) and eligible Mission Innovation Challenges (MICs). By enabling participation in these activities, ARENA is extending its impact beyond Australia and seeks to continuously develop valuable international partnerships and relationships.

The key objectives of the IEP are to support Australian national Task leaders to act as representatives in their respective TCPs/MICs. The aim for Australian representation in these forums is to increase Australia's access to international knowledge in renewable energy innovations, enhance and promote sharing this knowledge with the relevant Australian sector(s), and to develop international relationships that improve Australia's capacity to innovate. The full program guidelines can be found on the ARENA website¹.

Since the program launched a year ago, funding recipients have now reported back on their successes and challenges, including how ARENA funding has enabled Australia to be positioned as a proactive participant and an international leader in many of these technology spaces and the valuable lessons learned along the way.

ARENA FUNDING ENABLING INTERNATIONAL LEADERSHIP

ARENA funding through the IEP has enabled organisations to take on more active leadership roles and participate in additional activities that may not have been accessible without the funding. Many IEP participants have played an active role in proposing and establishing new Tasks and take leading positions, which has enabled these participants to help shape the international agenda to manage research and industry engagement. Having participants take part in crafting the international strategy within their respective portfolios, and leveraging these leadership positions, ensures that topics and issues that are relevant to Australia's experience are included - maximising relevancy and outcomes for Australia. Task leaders are also better enabled to bring valuable international knowledge back to the relevant wider Australian sectors while simultaneously promoting Australian industries, research, and policy developments.

¹ ARENA (2017) *International Engagement Program: Program Guidelines*. Retrieved from: <https://arena.gov.au/assets/2017/11/International-Engagement-Program-IEP-Guidelines.pdf>

Highlight: Australia's leadership in PV power systems

The IEA Photovoltaic Power Systems Programme (PVPS) TCP was established in 1993 and Australia is one of 32 member nations and organisations. PVPS participants conduct a variety of collaborative projects in the photovoltaic conversion of solar energy into electricity.² ARENA funding has extended Australia's role in this programme from the Executive Committee and Task 1 (Strategy and Outreach) to now include expert participation in six more Tasks including taking leadership on a new Task 18 (Off-Grid and Edge-of-Grid PV Systems). A key highlight for the Australian representatives in this programme was hosting the IEA PVPS Task 12 (PV Sustainability) workshop, where module recycling is becoming increasingly relevant to Australia's experience. Hosting this workshop gave Australian experts a unique insight into the solutions that can be applied in Australia and areas where Australia has capacity to contribute to international knowledge.

INCREASED ACCESS TO INTERNATIONAL KNOWLEDGE

The IEP provides Australian representatives and researchers valuable access to international success stories and lessons learned, technologies, experts, and best practices. The valuable knowledge that Task leaders bring back to Australia can benefit local industry groups and researchers by providing access to the latest international developments and collaborative efforts currently underway. In many cases, international experiences encountered throughout the IEP have informed Australian developments across a range of activities, such as contributing to Australian best practices and standards. Additionally, there is a need to access these international experiences, especially from more mature markets, to increase the understanding of the environmental, social, and economic impacts of certain technologies and activities in Australia. The exposure to these international lessons represent further opportunities for Australia throughout the whole lifecycle of renewable energy technologies, such as end-of-life, decommissioning, and recycling processes.

SHAPING CONVERSATIONS AND ENGAGEMENT

Increased Australian representation in Task-leading roles enhances the ability to shape the TCP and MIC's focus and strategy to develop new Tasks that may be more relevant to the challenges that face Australia. ARENA funding has enabled more Australian experts to access, attend and participate in these important forums with deeper engagement, which enables more international relationships to be fostered. This also helps ensure Australian efforts do not duplicate international efforts and effective knowledge sharing and innovation can take place. Sharing these experiences and knowledge through deep collaboration has played a part in guiding the strategic direction for the Australian sector in some of these technology areas.

Further, in many cases the ARENA funding was integral to attend key IEA meetings and conferences, and has enabled the representation of additional Australian researchers and academics in international Task meetings. This increased Australian representation means more seats at the table for Australia to participate in key discussions and forums and that effective information exchange can occur. In turn, this has enabled improved international collaboration and informed Australian industries on a range of international policy and technology developments. Additionally, access to funds to attend these important meetings enables Australia to leverage research, technology, policy, and market expertise from international experiences.

INCREASING PUBLIC PROFILES OF RENEWABLE ENERGY TECHNOLOGIES

Many of the IEP participants have noted a renewed interest in their technology areas which may be driven by governments' pursuit to reduce emissions across the economies. Australia's experience in becoming a global leader in some of these technologies, such as our world leading experience with high penetration of distributed energy resources (DER), has positioned Australian representatives and experts in these international fora to receive support and take lead positions to develop international standards. Australia's maturity in many of these industries position our experts as leaders when collaborating with other countries to develop resources, such as webinars, surveys, fact sheets, and generally disseminating information. This renewed interest is welcomed by the international community and has even brought international attention to some Australian companies, however effectively coordinating international stakeholders to match the renewed interest in these technologies has been a recurring challenge for some of these participants.

2 IEA (n.d.) *IEA Photovoltaic Power Systems Programme*. Retrieved from: <http://www.iea-pvps.org/index.php?id=4>

Highlight: Hydrogen and Australia's leadership in new Tasks

The IEA Hydrogen TCP was established in 1977 and Australia is one of 29 member nations and organisations. Its mission is to accelerate hydrogen implementation and utilisation to optimise international environmental protection, energy security, and economic development outcomes.³ Hydrogen has experienced significant renewed interest globally, and funding made available through the IEP has enabled consideration of the establishment of three new Tasks, which Australia will lead: 'Hydrogen Export Supply Chains', 'Hydrogen Application in the Mining and Resources Sectors', and 'Hydrogen in Agriculture Sectors'. This funding also provided support to host the 1st Task Definition Workshop - Hydrogen Applications in the Mining and Resources Sector which enabled important contact with stakeholders within this industry and the mining sector to discuss hydrogen technologies and applications.

INTERNATIONAL GOVERNANCE

IEP participants have reported varying experiences on effective international governance within their portfolios. Mature and more established portfolios which have operated for decades were less likely to report governance as a challenge. Newly established portfolios; those with significant renewed interest; and/or a growing number of participants may be factors that impact effective coordination and governance. Many international representatives, experts and leaders are time poor and under-resourced, particularly for administration support. However, many IEP participants have acknowledged that taking part in the program helped to establish new relationships with other countries, universities, and institutions and organisations with alignment and strong collaboration.

Highlight: International collaboration success stories

HYDROPOWER

The IEA Hydropower TCP aims to encourage the sustainable use of water resources for the development and management of hydropower through awareness, knowledge, and support, where Australia is one of ten participating countries and organisations.⁴ A key highlight noted by Australian representatives is the ongoing participation and collaboration with member countries and organisations within the TCP on strategic issues such as valuing the flexibility of hydropower in changing energy systems - particularly in Norway and the United States. Norway's experience and lessons are highly relevant and valuable to Australian hydropower applications and the country's appointment as Operating Agent⁵ of Annex IX⁶ enables participating countries, such as Australia, to leverage the Norwegian experience and expertise in hydropower.

SMART GRIDS

The Smart Grids Mission Innovation Challenge (IC1: Smart Grids) has 21 member nations and organisations and its objective is to enable future grids that are powered by affordable, reliable, decentralised renewable electricity systems.⁷ Over the past year, IC1 has identified and participated in many collaborative efforts to achieve its objective, including collaborating closely with the Affordable Heating and Cooling of Buildings Innovation Challenge (IC7). IC1 has also worked closely with other member nations to facilitate valuable knowledge sharing, such as running webinars and conducting surveys with the United Kingdom and developing an energy storage factsheet with the UK and Canada.

3 IEA (n.d.) *IEA Hydrogen*. Retrieved from: <http://ieahydrogen.org/About-IEA-H2.aspx>

4 IEA (n.d.) *IEA Hydropower*. Retrieved from: <https://www.ieahydro.org/about>

5 *Operating Agent*: Designated Annex lead

6 Annex: A research task

7 Mission Innovation (n.d.) IC1: *Smart Grids*. Retrieved from: <http://mission-innovation.net/our-work/innovation-challenges/smart-grids/>

CONCLUSION

The IEP participants have had a busy first year of the program—delivering and participating in over 230 meetings and outputs, such as presentations, workshops, papers, or other media to share the latest international knowledge in key areas within the renewable energy transition. ARENA funding has contributed valuable resources to these Australian teams to support international engagement by increasing the access to international knowledge, establish and/or strengthen international relationships, promote Australian products, knowledge, industry, and/or expertise, and shape international activities and programs to deliver positive outcomes for the Australian renewable energy sector.

APPENDIX

Appendix 1: List of projects in the International Engagement Program

Project	Lead organisation	Project	Lead organisation
IEA User-Centred Energy Systems TCP	Monash University	Converting Sunlight Innovation Challenge	University of Adelaide
IEA Bioenergy TCP	Bioenergy Australia Ltd	IEA Hydropower TCP	Hydro-Electric Corporation
Off-Grid Access to Electricity Innovation Challenge	University of New South Wales	IEA Solar Power and Chemical Energy Systems TCP (SolarPACES)	CSIRO
IEA Solar Heating and Cooling TCP	Australian PV Institute	IEA Ocean Energy Systems TCP	CSIRO
IEA PV Power Systems TCP	Australian PV Institute	Smart Grids Innovation Challenge	CSIRO
IEA Hydrogen TCP	Australian Association for Hydrogen Energy	Affordable Heating and Cooling of Buildings Innovation Challenge	CSIRO

For any queries regarding the report, please contact knowledge@arena.gov.au or call 1800 804 838.

