



Australia's National
Science Agency

Hydrogen Electrolyser Manufacturing

A strategic guide for seizing Australia's clean-tech
manufacturing opportunity

Executive summary | October 2024



Citation

CSIRO (2024) Hydrogen Electrolyser Manufacturing: A strategic guide for seizing Australia's clean-tech manufacturing opportunity. CSIRO, Canberra.

This report was authored by James Trevorrow, Nicolás González Castro, Rohini Poonyth, Sean Lim, Katherine Wynn, and Vivek Srinivasan.

CSIRO Futures

At CSIRO Futures we bring together science, technology and economics to help governments and businesses develop transformative strategies that tackle their biggest challenges. As the strategic and economic advisory arm of Australia's national science agency, we are uniquely positioned to transform complexity into clarity, uncertainty into opportunity, and insights into action.

Acknowledgements

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.

The project team would like to acknowledge the contributions of all stakeholders that provided input to this project from industry, government and academia. Appendix 5.1 includes a complete list of the organisations that provided input to this project.

Accessibility

CSIRO is committed to providing web-accessible content wherever possible. If you are having difficulties with accessing this document, please contact csiro.au/accessibility

Copyright notice

© Commonwealth Scientific and Industrial Research Organisation 2024. To the extent permitted by law, all rights are reserved, and no part of this publication covered by copyright may be reproduced or copied in any form or by any means except with the written permission of CSIRO.

Disclaimer

CSIRO advises that the information contained in this publication comprises general statements based on scientific research. The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert professional, scientific and technical advice. To the extent permitted by law, CSIRO (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it.



Executive summary

This report investigates Australia's opportunity for hydrogen electrolyser manufacturing (HEM). It seeks to align with Australia's National Hydrogen Strategy and Federal, State, and Territory manufacturing initiatives by stimulating the domestic HEM ecosystem. HEM presents a unique manufacturing opportunity for the nation, combining a:

- **Nascent, rapidly emerging global electrolyser market**, which creates a window of opportunity for Australia to develop its own advanced manufacturing and material supply chains
- **Strong starting position**, with an emerging cohort of Australian electrolyser manufacturers translating innovations from the country's research sector
- **Significant domestic pipeline of projects seeking to produce renewable hydrogen**, with specific electrolyser procurement and maintenance needs, creating a local market and providing the benefits of a geographically aligned supply chain

By 2050, Australia's HEM industry could generate **AUD 1.7 billion** in revenue and close to **4000** jobs. Installation services for electrolysers could add another **AUD 1.2 billion** in revenue and **1000** jobs. Additionally, the manufacturing capabilities developed for HEM could translate to other manufacturing areas, and the raw material entry points could support onshore processing.

HEM activities are already occurring in Australia at different scales. However, scaling up is a challenge. It will require:

- Aggregated demands across adjacent emerging manufacturing opportunities to advance local production of **intermediate materials**
- Building upon the existing manufacturing capabilities being used in other advanced products to support local **component manufacturing**
- Cost-effective **cell fabrication** and **stack assembly**, with support for system testing and validation at scales relevant to commercial deployment
- Leveraging the comparatively lower barriers of **system assembly** as an entry point for overseas manufacturers interested in Australian facilities
- Identifying, preparing and promoting **manufacturing locations** which optimise local strengths such as renewable electricity prices and firming, while offsetting inflexible costs such as labour rates and logistics
- An exploration of **international manufacturing partnerships** that considers high value process and supply chains through to domestic hydrogen production in a way that optimises Australia's long-term sovereign manufacturing capabilities and needs

Further investigations are suggested whilst the 'window of opportunity' is still available. This includes analysis to aggregate manufacturing demands across adjacent clean-tech manufacturing opportunities; provide stakeholder visibility of ecosystem actors and their capabilities; assess cost-effective manufacturing locations; and inform international partnership discussions.

As Australia's national science agency,
CSIRO is solving the greatest
challenges through innovative
science and technology.

CSIRO. Creating a better future
for everyone.

Contact us

1300 363 400
+61 3 9545 2176
csiro.au/contact
csiro.au

For further information

CSIRO Futures
Vivek Srinivasan
Associate Director, CSIRO Futures
+61 3 9545 8057 | +61 477 391 073
vivek.srinivasan@csiro.au

CSIRO Energy
Dr Patrick G. Hartley
Leader, CSIRO Hydrogen Industry Mission
+61 400 101 154
patrick.hartley@csiro.au