

# Accelerating the commercialisation of the Direct Solar-to-Hydrogen technology

This Project received funding from the Australian Renewable Energy Agency (ARENA) as part of ARENA's Transformative Research Accelerating Commercialisation Program.

## ABSTRACT

The direct solar-to-hydrogen (DSTH) system is an innovative technology that integrates solar cells and catalytic electrodes within a single module, bypassing energy conversion stages.

We aim to transition this technology from a successful laboratory prototype to a market-ready product.

Through this project, we will develop commercial-scale DSTH modules and systems. The end product is expected to demonstrate solar-to-hydrogen conversion efficiencies above 15%, long-term stability and levelised cost of hydrogen production (LCOH) defeating competitors.

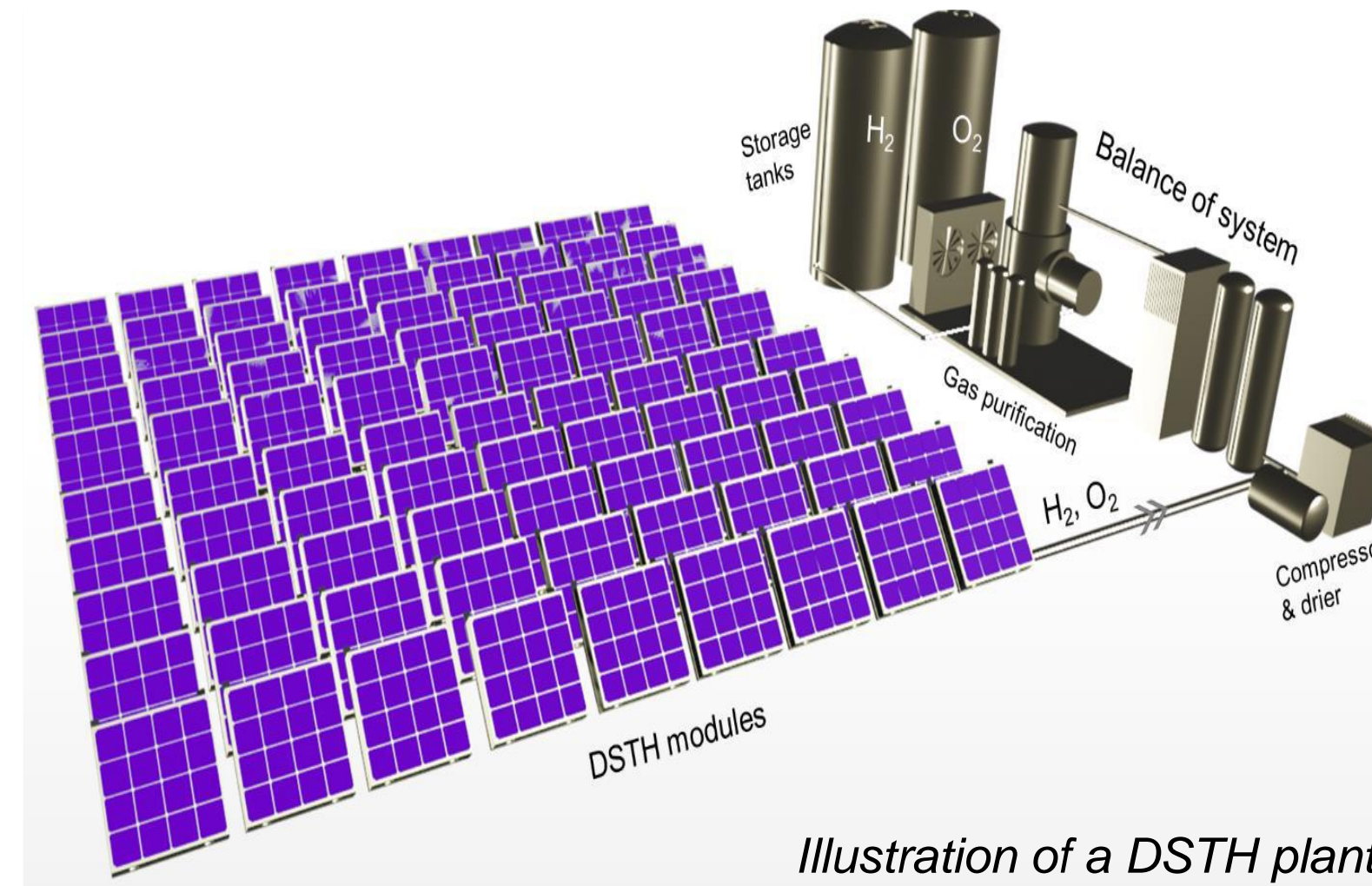
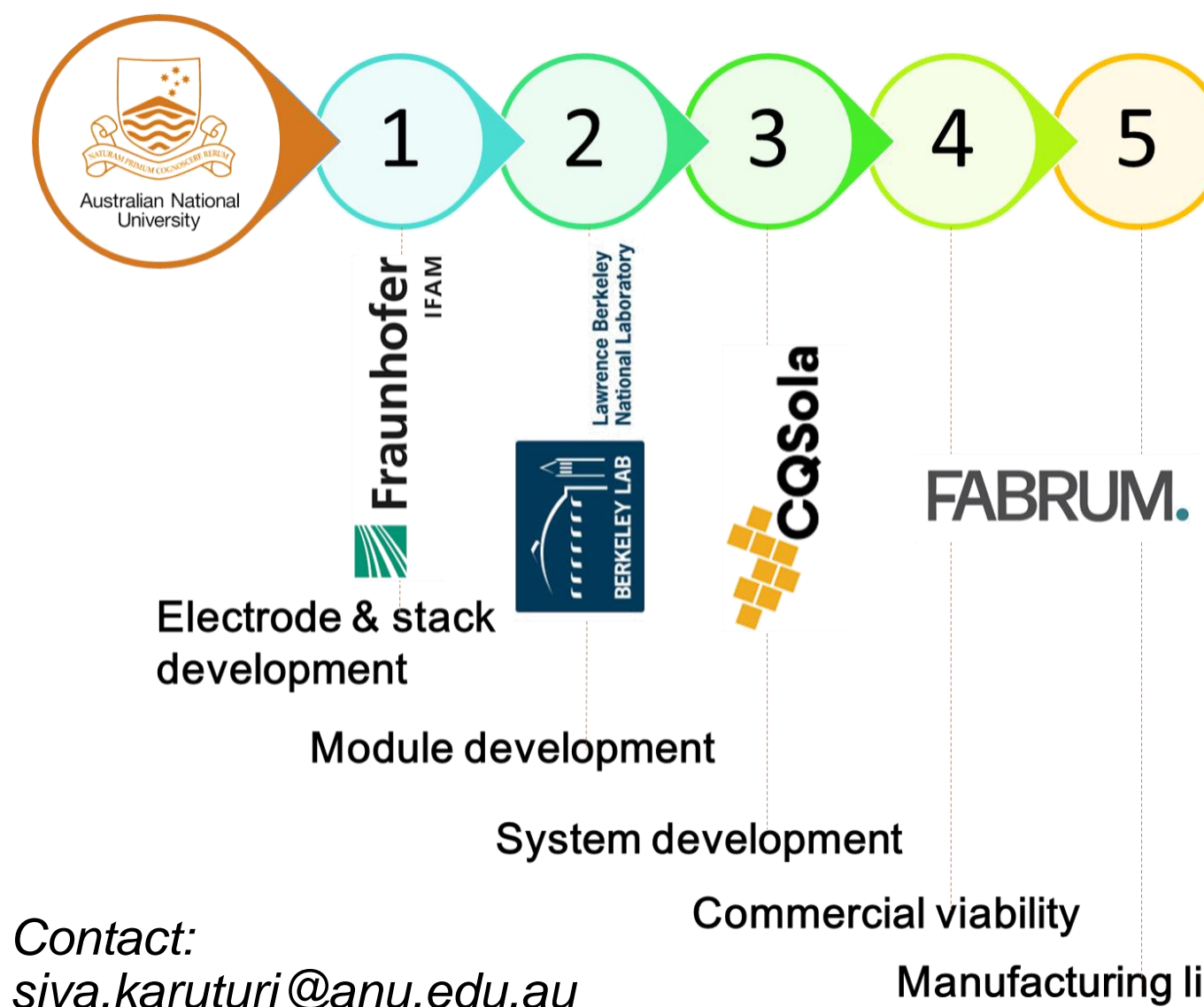


Illustration of a DSTH plant.

## OBJECTIVES & OUTCOMES

- Large-scale DSTH module, based on earth-abundant materials, with efficiency > 15% and stability > 250 h.
- Engineering design of a DSTH pilot plant capable of producing 1,000 kg<sub>H<sub>2</sub></sub>/day.
- Techno-economic analysis report highlighting a path to a LCOH of \$1/kg<sub>H<sub>2</sub></sub>.
- Conceptual design of a DSTH manufacturing line.

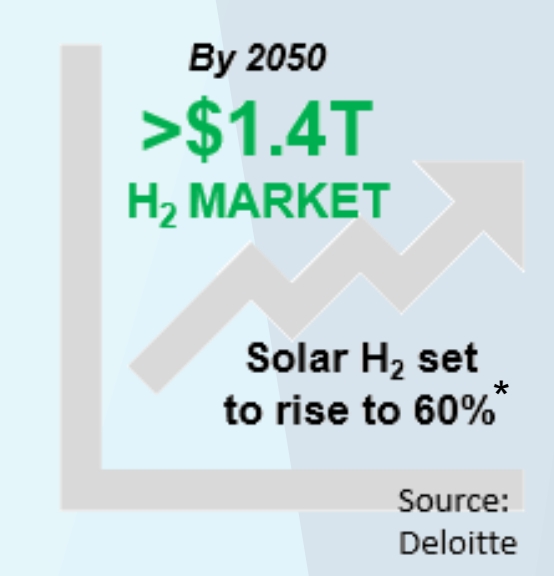
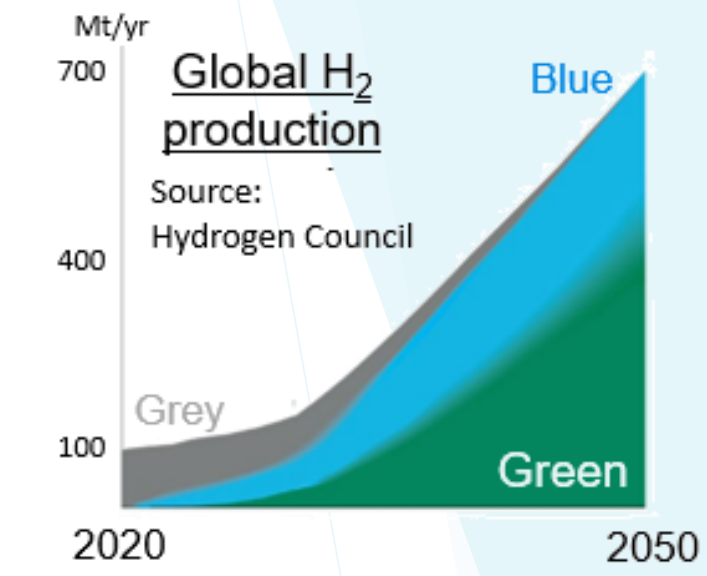
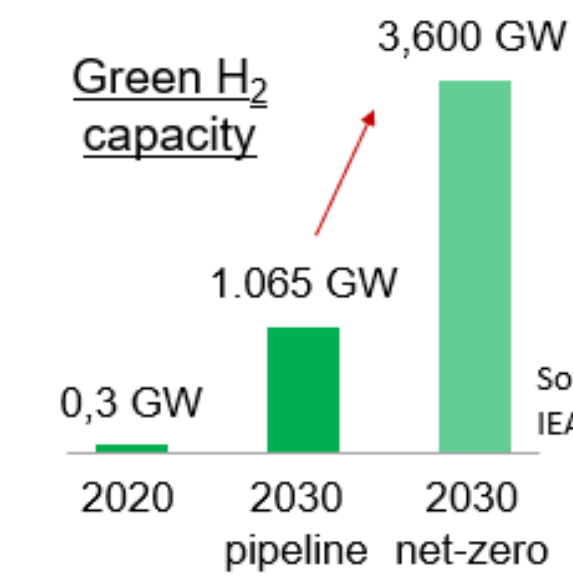
## PARTNERS & ACTIVITIES



Contact: siva.karuturi@anu.edu.au

## CONTEXT

\* Solar H<sub>2</sub> refers to solar-generated H<sub>2</sub> supply, including but not limited to DSTH. Share of total H<sub>2</sub> market.



Current renewable hydrogen production approaches using electrolyzers encounter low conversion efficiencies and high production costs, limiting green hydrogen's broad adoption.

## RESEARCH PLAN

