ASX ANNOUNCEMENT

5 December 2025

Sparc Hydrogen Pilot Plant Reaches Key Milestone

HIGHLIGHTS

- **Sparc Hydrogen's first-of-its-kind green hydrogen pilot plant achieves sustained hydrogen generation via photocatalysis under concentrated solar conditions**
- **Key milestone marks completion of commissioning and transition to operational testing**
- **Initial pilot plant testing will focus on benchmarking across a range of solar concentrations, temperature and pressure conditions**

Sparc Technologies Limited (**ASX: SPN**) (**Sparc, Sparc Technologies** or the **Company**) is pleased to announce that Sparc Hydrogen has achieved sustained hydrogen generation at its first-of-it-kind green hydrogen pilot plant in Roseworthy, South Australia. The milestone marks the transition from commissioning to operational testing under concentrated solar conditions — an important step towards commercialisation of Sparc Hydrogen's photocatalytic water splitting (**PWS**) technology.

Sparc Hydrogen is a joint venture between Sparc Technologies, MIH2 Pty Ltd – a wholly owned subsidiary of Fortescue Ltd – and the University of Adelaide, which has been developing patented photocatalytic water splitting reactor technology since 2022. Transitioning to operational testing at Roseworthy reinforces Sparc Hydrogen's leadership position in the PWS field, a potential pathway to low-cost green hydrogen production in a market expected to be worth US$1.4 trillion per year in 2050 [1].

Figures 1 & 2: Production testing at Sparc Hydrogen's green hydrogen pilot plant, Roseworthy, South Australia

[1] Green hydrogen: Energizing the path to net zero, Deloitte's 2023 global green hydrogen outlook (figures have been expressed in Australian dollars). As with any target addressable market, there are barriers to accessing a target addressable market, including manufacturing capacity, regulatory requirements, distribution and logistical hurdles, intellectual property protections and barriers to competition. Investors are cautioned that there are no guarantees that a target addressable market can be converted into revenue, and the target addressable market should not be mistaken for a guidance on potential revenue.

Sparc Managing Director, Mr Nick O'Loughlin commented:

> *"Sustained hydrogen generation at Roseworthy is a significant milestone for Sparc Hydrogen and the broader green hydrogen and photocatalytic water splitting industries. Successful commissioning of this first-of-its-kind plant is the culmination of over 12 months of hard work since the commencement of the FEED study and positions Sparc Hydrogen at the global forefront of this emerging direct solar-to-hydrogen technology. I congratulate the project team and our partners, Fortescue and the University of Adelaide, on this significant achievement and look forward to showcasing the pilot plant as an example of the simplicity and scalability of Sparc Hydrogen's reactor technology and how it can potentially unlock low-cost green hydrogen."*

Roseworthy Pilot Plant

The Roseworthy pilot plant represents a major step towards scaling and commercialising Sparc Hydrogen's patented PWS reactor technology – enabling next generation green hydrogen production that is scalable, modular, and importantly, requires limited electricity. The facility enables testing of different reactor designs and photocatalyst materials under real world conditions supporting and validating laboratory testing. Sparc Hydrogen is not aware of any similar facilities for testing and scale up of PWS under concentrated solar conditions.

With commissioning complete, the R&D team is now focussed on testing Sparc Hydrogen's PWS reactors with an initial focus on benchmarking across a range of solar concentrations, temperature and pressure conditions using photocatalyst materials from Shinshu University, Japan. Sparc Hydrogen is actively engaging with other photocatalyst developers with a view to conducting testing under real-world concentrated solar conditions at the Roseworthy pilot plant. Sparc Hydrogen expects the facility to become a globally significant site for R&D and commercialisation of PWS, reinforcing its first mover position in this emerging direct solar to hydrogen production technology.

The key objectives of the pilot project, include:

- **Advancing** Sparc Hydrogen's PWS reactor technology from TRL-5 to TRL-6/7[2] via semi-continuous operation of a PWS plant utilising commercially available concentrated solar mirrors.
- **Demonstrating** and benchmarking the operation of Sparc Hydrogen's PWS reactor technology under real-world conditions.
- **Establishing** a **globally leading facility** for R&D and commercialisation of photocatalytic water splitting.
- **Strengthening** Sparc Hydrogen's leading position in the development of concentrated solar based PWS reactors and as the go-to partner for photocatalyst developers.
- **Showcasing** Sparc Hydrogen's PWS technology to new and existing stakeholders and funding bodies.

Advantages of Photocatalytic Water Splitting (PWS)

Sparc Hydrogen's novel utilisation of PWS technology sets it apart from conventional approaches in the production of green hydrogen. Crucially, PWS removes the reliance on solar and/or wind farms and expensive electrolysers, to produce green hydrogen from water. This addresses a fundamental issue in the nascent green hydrogen industry - the cost of renewable electricity. Sparc Hydrogen's pioneering technology employs a photocatalyst and sunlight to produce green hydrogen directly from water. Hydrogen produced from PWS can serve as a clean fuel or feedstock to decarbonise hard-to-abate industries, including as a replacement

[2] ARENA, Technology Readiness Levels for Renewable Energy Sectors, Commonwealth of Australia (Australian Renewable Energy Agency) 2014.

green solution for the current market uses for hydrogen, totalling ~100Mtpa[3].

Through utilisation of the Roseworthy pilot plant, Sparc Hydrogen will aim to test and demonstrate the following potential advantages of producing green hydrogen via PWS over solar PV with electrolysis, which include:

- Photocatalysis does not use electricity to split water into hydrogen and oxygen, decoupling green hydrogen production from power costs.
- The simplified direct solar to hydrogen process offers the potential for very low production costs.
- Sunlight is the sole energy input into the PWS reactor, delivering emissions free hydrogen and industrial heat.
- Sparc Hydrogen uses commercially available, scalable and flexible concentrated solar infrastructure.
- PWS has a comparative advantage over electrolysis in off-grid and remote locations.

		Sparc Hydrogen Photocatalysis	Solar PV Electrolysis	Implications for potential end uses
Use case determinants	High solar resource	✓	✓	• Lowest cost production is suited to high solar (DNI) regions
	Remote and/or off-grid	✓	✗	• Photocatalysis can serve mine sites, remote power & refuelling, agriculture where electrolysis can't
	Flexible scale & modularity	✓	✗	• Photocatalysis is better suited to onsite / near site industrial uses
	Comingled gas product	✓	✗	• Suits combustion use cases assuming safety can be managed
	Industrial heat co-product	✓	✗	• Dual H2, heat product users may include alumina, paper & pulp, ammonia

Figure 3: Comparison of Sparc Hydrogen's PWS process and solar PV coupled with electrolysis by key end use determinants.

-ENDS-

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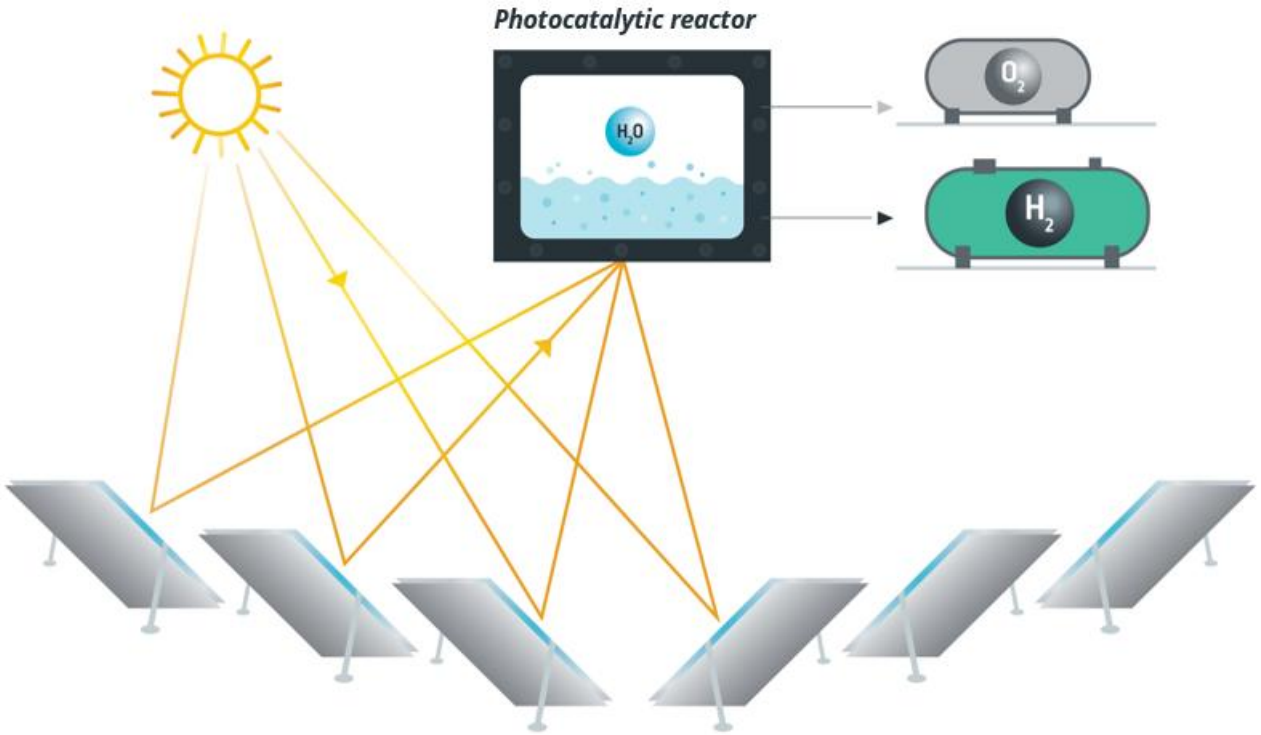
[3] IEA, Global Hydrogen Review 2025, (https://www.iea.org/energy-system/low-emission-fuels/hydrogen).

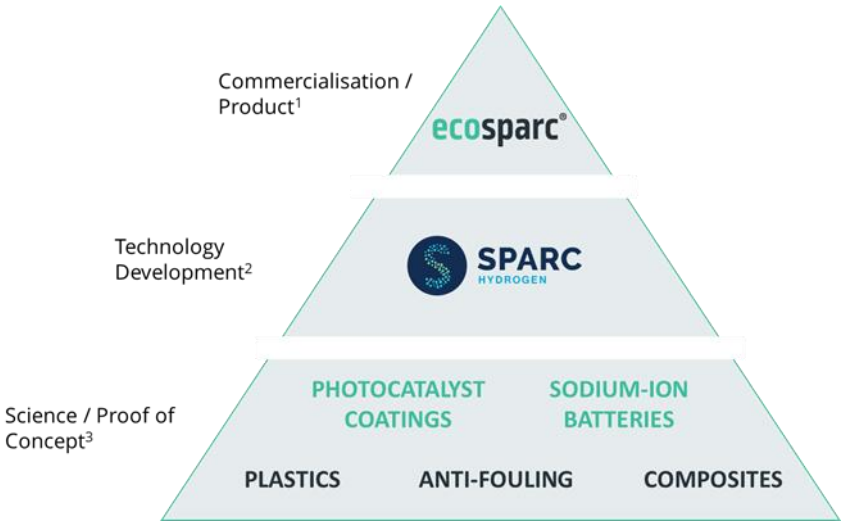
About Sparc Hydrogen

Sparc Hydrogen is a joint venture between Sparc Technologies, the University of Adelaide and Fortescue developing next generation green hydrogen technology using a process known as photocatalytic water splitting. This process requires only sunlight, water and a photocatalyst to produce green hydrogen, without an electrolyser. Sparc Hydrogen's patented reactor utilises concentrated sunlight to improve the economics of PWS and to deliver a modular, scalable system. Given lower infrastructure requirements and electricity use, PWS has the potential to deliver a cost and flexibility advantage over electrolysis.



Sparc Hydrogen schematic demonstrating combination of concentrated solar and photocatalytic water splitting

About Sparc Technologies



Sparc Technologies Limited ('Sparc', ASX: SPN) is an Australian technology company developing solutions that enhance environmental and sustainability outcomes for global industries. Sparc has two transformative technology areas in which it works: green hydrogen and graphene enhanced materials. Sparc conducts research and development in-house and has extensive engagement and relationships with the university sector in Australia and globally.

1. **Sparc Hydrogen** is a joint venture between Sparc Technologies, Fortescue Ltd and the University of Adelaide which is pioneering next-generation green hydrogen production technology. Photocatalytic water splitting (PWS) is an emerging method to produce green hydrogen without electrolysers - using only sunlight, water and a photocatalyst. Given lower infrastructure requirements and energy use, PWS has the potential to deliver cost and flexibility advantages over existing hydrogen production methods.

2. Sparc has developed and is commercialising a **graphene based additive** product, **ecosparc®**, which at low dosages significantly improves the performance of commercially available epoxy-based protective coatings. Sparc has commissioned a manufacturing facility to produce **ecosparc®** and is engaging with global coatings companies and large asset owners on testing, trials and commercial partnerships.

For more information about the company please visit: sparctechnologies.com.au

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