ASX ANNOUNCEMENT

12 March 2025

Sparc Hydrogen Commences Pilot Plant Construction

HIGHLIGHTS

- **Sparc Hydrogen commences construction of first-of-its-kind green hydrogen pilot plant in South Australia**
- **The pilot plant employs a photocatalyst material to produce green hydrogen directly from water using solar energy – without electrolysers**
- **Sparc Hydrogen has engaged an EPCM contractor to manage construction activities, with plant commissioning expected in mid-2025**

Sparc Technologies Limited (**ASX: SPN**) (**Sparc, Sparc Technologies** or the **Company**) is pleased to announce that construction of Sparc Hydrogen's first-of-its kind photocatalytic water splitting (**PWS**) pilot plant has commenced. Construction of the pilot plant demonstrates strong progress towards the development of next generation green hydrogen production by the Sparc Hydrogen joint venture partners, Sparc Technologies, Fortescue Limited and the University of Adelaide.

Commencement of pilot plant construction at the University of Adelaide's Roseworthy Campus follows several key milestones having been delivered by Sparc Hydrogen during Q1 2025 including manufacture of the linear Fresnel concentrated solar field in Europe (currently in transit), execution of an engineering, procurement and construction management (EPCM) contract with Incitias Pty Ltd, receival of planning consent from the Light Regional Council and commencement of reactor manufacturing. In addition, Sparc announced the granting of the first patent for Sparc Hydrogen's exclusively licensed PWS reactor technology in January 2025.

Figure 1: Site preparation activities, Roseworthy, South Australia

Sparc Managing Director, Mr Nick O'Loughlin commented:

> *"It is very rewarding to see progress being made both at Roseworthy and in the factory towards delivering a globally leading facility for green hydrogen production via photocatalytic water splitting. In an environment where major challenges exist for hydrogen projects due to the high cost of power, the requirement for new solutions to unlock low-cost green hydrogen without relying on electrolysers has never been higher."*

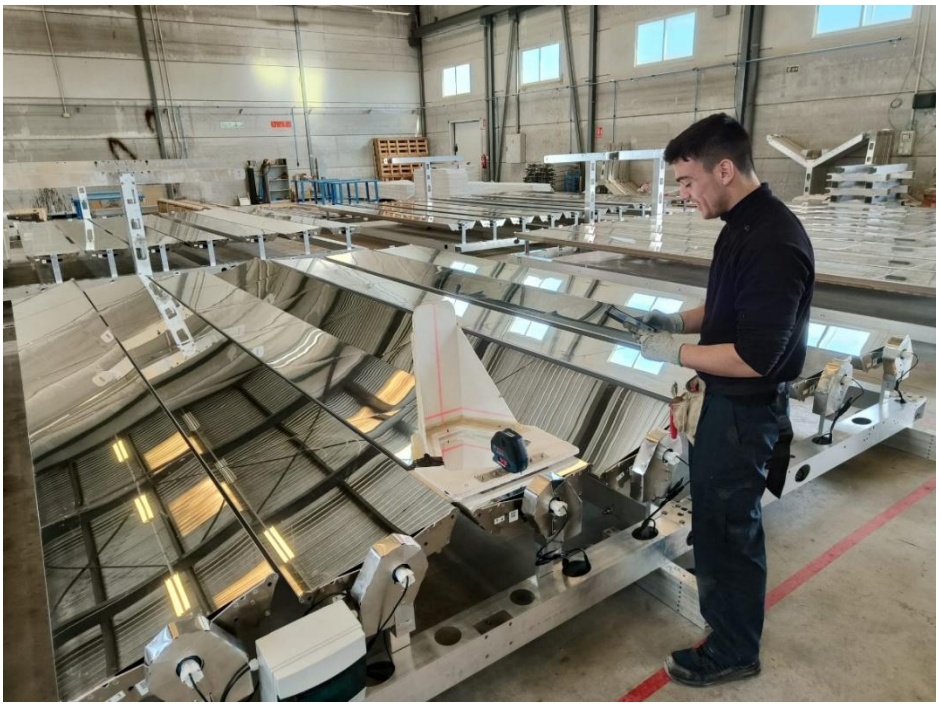

Figure 2: Factory based calibration of linear Fresnel solar field modules ahead of containerisation and shipping

Sparc Hydrogen believes that the Roseworthy pilot plant will represent a globally leading facility for R&D and commercialisation of photocatalytic water splitting reinforcing Sparc Hydrogen's first mover position in this emerging direct solar to hydrogen technology. Development of the pilot plant has been progressed materially during Q1 2025 with the following key milestones achieved:

- EPCM contract executed with global engineering and commercial service provider, Incitias Pty Ltd.
- Planning consent received from the Light Regional Council allowing construction to commence.
- Manufacturing of the linear Fresnel (**LFR**) concentrated solar system is complete with delivery to site expected during April 2025.
- Manufacturing of Sparc Hydrogen's pilot scale PWS reactors has commenced. These reactors will tie-in to the off-the-shelf LFR field.
- Lease agreement term sheet between Sparc Hydrogen and the University of Adelaide executed.
- Mobilisation of civil contractors and commencement of site works.
- A first patent for Sparc Hydrogen's exclusively licensed PWS reactor technology was granted in January 2025 with 17 other jurisdiction-based reviews in progress.

Based on the current construction schedule provided by Incitias, pilot plant commissioning is expected in mid-2025. When built, the pilot plant will allow Sparc Hydrogen to independently and concurrently test different reactor designs and photocatalyst materials. Sparc Hydrogen is not aware of any similar facilities for testing and scale up of photocatalytic water splitting under concentrated solar conditions. The key objectives of the pilot plant are the same as described in the Stage 2 announcement released 7 January 2025:

- Advance Sparc Hydrogen's PWS reactor from TRL-5 to at least TRL-6[1] via semi-continuous operation of an 'on-sun' pilot plant using concentrated solar mirrors.
- Real world demonstration of a concentrated solar field integrated with photocatalytic water splitting for green hydrogen production.
- R&D tool allowing on-sun testing of Sparc Hydrogen's PWS reactors, alternate photocatalysts and balance of plant.
- Benchmarking photocatalyst performance and durability under concentrated solar conditions against laboratory testing.
- Verify detailed optical, thermal and production modelling.
- Understand design and engineering issues to guide further scale up.
- Understand operability of key equipment.
- Establish safety protocols and operating procedures.
- Guide further patenting opportunities.
- Showcase technology to new and existing stakeholders and funding bodies.
- Facilitate engagement with key equipment suppliers.
- Solidify Sparc Hydrogen's leading position in the development of concentrated solar based PWS reactors with ability to test under real world conditions.

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 does not rely on renewable electricity sources such as solar or wind farms, nor expensive electrolysers, to produce 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 photocatalyst materials 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. The key potential advantages over electrolysis that will be tested and demonstrated by the pilot plant include:

- Photocatalysis does not use electricity to produce hydrogen from water thereby decoupling green hydrogen and electricity costs.
- The simplicity of PWS being a direct solar to hydrogen production system drives potential for very low costs.
- Sunlight is the only energy input driving the process delivering emissions free hydrogen.
- Sparc Hydrogen utilises concentrated solar infrastructure which is inherently flexible and scalable.
- 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 PWS and electrolysis using solar PV by key end use determinants

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

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.

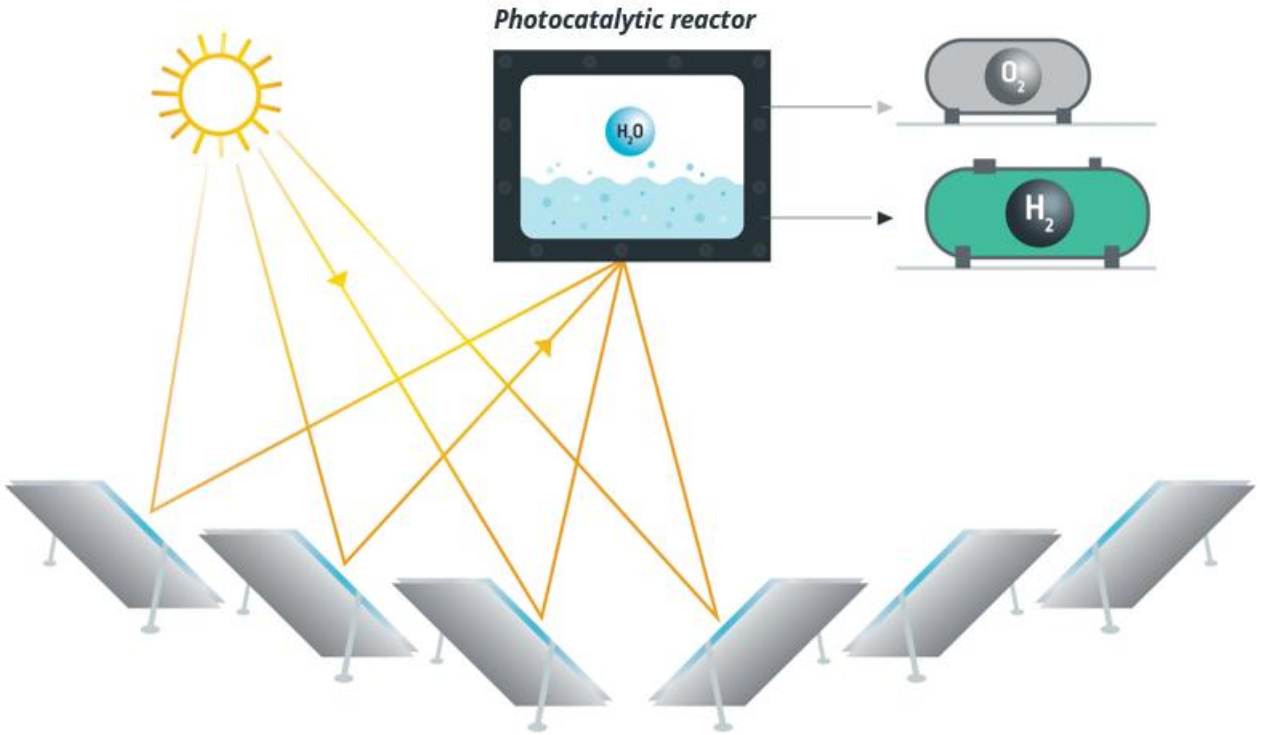

Figure 4: Sparc Hydrogen schematic demonstrating combination of concentrated solar and photocatalytic water splitting

-ENDS-

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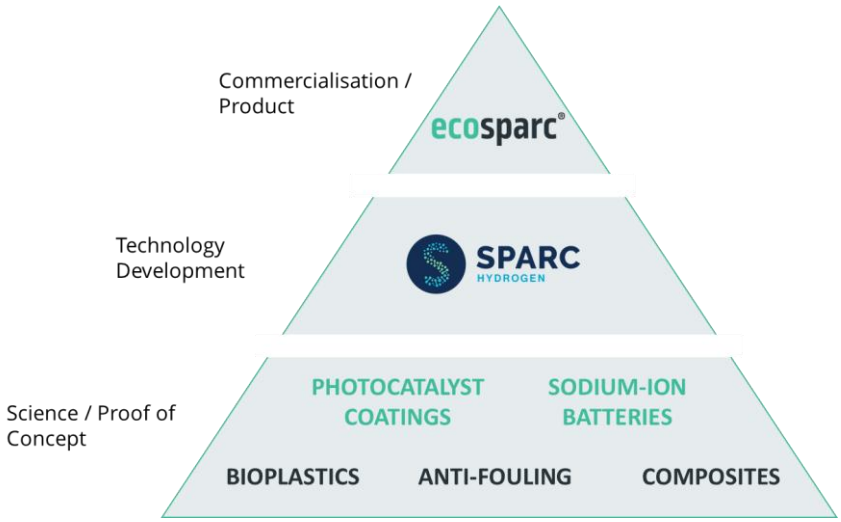
About Sparc Technologies



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 Limited 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

For more information about Sparc Hydrogen please visit: sparchydrogen.com

For more information about **ecosparc®** please visit: ecosparc.com.au