ASX ANNOUNCEMENT

24 November 2023

Sparc Hydrogen Completes First Phase of Prototype Testing at CSIRO Energy Centre with Hydrogen Gas Production

HIGHLIGHTS

- **Completion of first phase of on-sun testing of Sparc Hydrogen's photocatalytic water splitting reactor at the CSIRO Energy Centre in Newcastle, NSW**
- **Key objectives of the testing were achieved including advancement of the technology readiness level (TRL) from 4 to 5 and information which will feed into reactor design**
- **Testing data has been collated which will be calibrated and compared with lab performance data**
- **Pilot plant pre-FEED study progressing with completion expected prior to year end**
- **Sparc Hydrogen recently received A$371,655 R&D tax rebate**

Sparc Technologies Limited (**ASX: SPN**) (**Sparc, Sparc Technologies** or the **Company**) is pleased to advise that Sparc Hydrogen, which is a joint venture between the University of Adelaide, Fortescue and Sparc Technologies, has completed the first phase of on-sun prototype testing at the CSIRO Energy Centre in Newcastle, New South Wales. The prototype testing is the first demonstration of Sparc Hydrogen's photocatalytic water splitting (**PWS**) reactor outside of the laboratory.

The key aims of this work included to advance the technology readiness level (**TRL**) of Sparc Hydrogen's PWS reactor from 4 to 5[1] and to provide valuable data and information for pilot plant reactor design. These goals were accomplished with numerous trial runs producing hydrogen gas and the testing highlighted various reactor design modifications which will be incorporated into the next generations of the PWS reactor.

Sparc Technologies Executive Chair, Mr. Stephen Hunt commented:

> *"Sparc is very pleased to have successfully completed this round of prototype testing with our Sparc Hydrogen partners, The University of Adelaide, Fortescue and Flinders University, at the CSIRO Energy Centre in Newcastle. The data and learnings from the repeated on-sun trials are invaluable and will improve reactor design as we continue to scale the technology towards a pilot plant.*
>
> *Completion of this test work is a significant milestone, not only for Sparc Hydrogen, but more widely for the advancement of photocatalytic water splitting, a next generation green hydrogen production technology which does not require capital intensive electrolysers, nor solar or wind farms."*

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

Key aims of the prototype testing, as described in Sparc's prior announcements (ASX Release 3 July 2023 and ASX Release 14 September 2023), were as follows:

Aim / Objective	Commentary
Advance the TRL of Sparc Hydrogen's PWS reactor from 4 to 5 which is one level closer to a commercially deployable product.	**Achieved** - Numerous trial runs were completed producing hydrogen gas.
Provide valuable data and information for pilot plant reactor design.	**Achieved** - The testing highlighted various reactor design modifications which will be incorporated into the next generations of the PWS reactor.
Enable benchmarking of laboratory testing under simulated solar conditions with real world results.	**Pending** - Performance data has been logged and is pending analysis.
Further establish Sparc Hydrogen as a world leading proponent of PWS technology and particularly as having a viable reactor to test new and better photocatalysts under development by leading research groups around the world.	**Ongoing** - Sparc Hydrogen believes this prototyping is a world leading demonstration of photocatalysis under concentrated sun and is confident the company is well placed to attract and collaborate with developers of new photocatalyst materials.

Sparc would once again like to acknowledge the support provided through the CSIRO Kick-Start Program to contribute towards the costs of the prototype testing. The CSIRO Kick-Start program is an initiative designed to support innovative Australian start-ups and small businesses in accessing CSIRO's research expertise and capabilities to foster growth and development. As specified in Sparc Hydrogen's Kick-Start application, the company plans to undertake another round of prototype testing at the CSIRO Energy Centre, likely during H1 2024.

In parallel with the prototype testing, Sparc Hydrogen has been working with an external consultant engaged to complete a pilot plant pre-FEED[2] study. The study is based on a chosen location proximal to Adelaide and will be completed prior to year-end 2023. The study will incorporate a concept flowsheet design, equipment selection, costs, risks and opportunities for a pilot plant which will enable continuous on-sun testing of Sparc Hydrogen's PWS reactor. The pilot plant will reflect the next stage of development for Sparc Hydrogen and, if commissioned, would increase technology readiness to TRL 6. The study will provide valuable information for grant applications and will form the basis for detailed design and engineering in 2024.

R&D Tax Refund

Sparc Hydrogen has recently received a research and development (**R&D**) tax refund totalling $371,655 as part of the Australian Government's R&D tax incentive, relating to the 2023 financial year.

The R&D Tax Incentive scheme is a program jointly administered by the Australian Taxation Office and AusIndustry, under which companies can receive up to a 48.5% refundable tax offset of eligible expenses on research and development activities.

[2] Front-end engineering and design

About Sparc Hydrogen

Sparc Hydrogen is a joint venture (Sparc Technologies 52%, The University of Adelaide 28% and Fortescue 20%), developing next generation green hydrogen technology using a process known as photocatalytic water splitting (PWS). This process is an alternative to producing green hydrogen via electrolysis, using only sunlight, water and a photocatalyst. Sparc Hydrogen's patent pending PWS reactor has the potential to improve the efficiency of PWS to obtain hydrogen from water using concentrated solar. Given lower infrastructure requirements and energy use, the 'Sparc Green Hydrogen' process has the potential to deliver a cost and flexibility advantage over electrolysis.

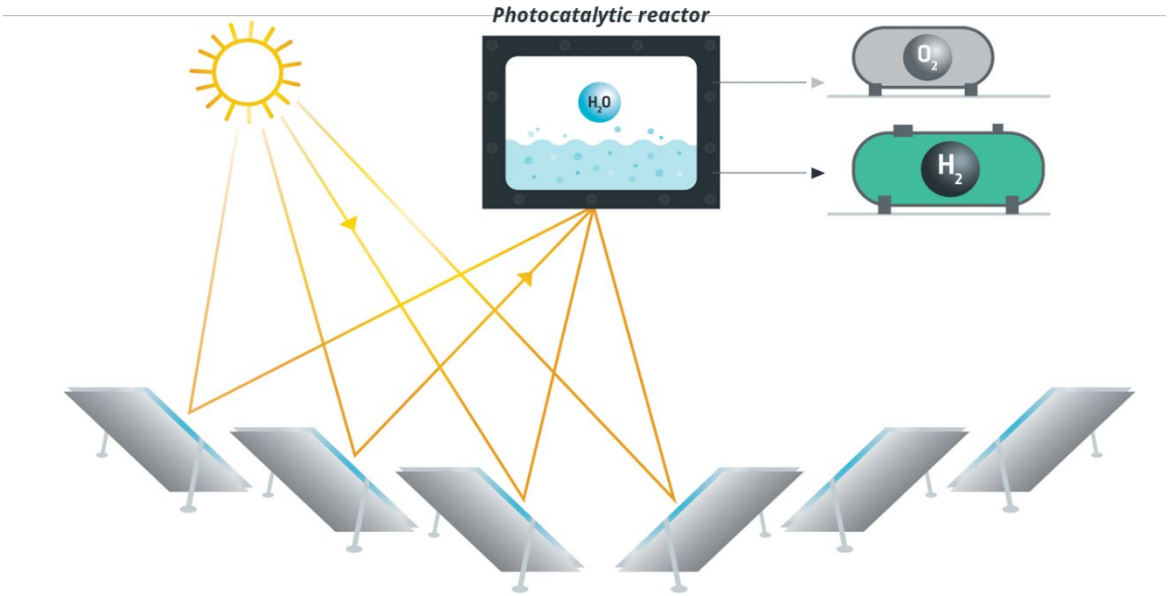

Figure 1: Sparc Green Hydrogen schematic demonstrating combination of concentrated solar and photocatalytic water splitting

-ENDS-

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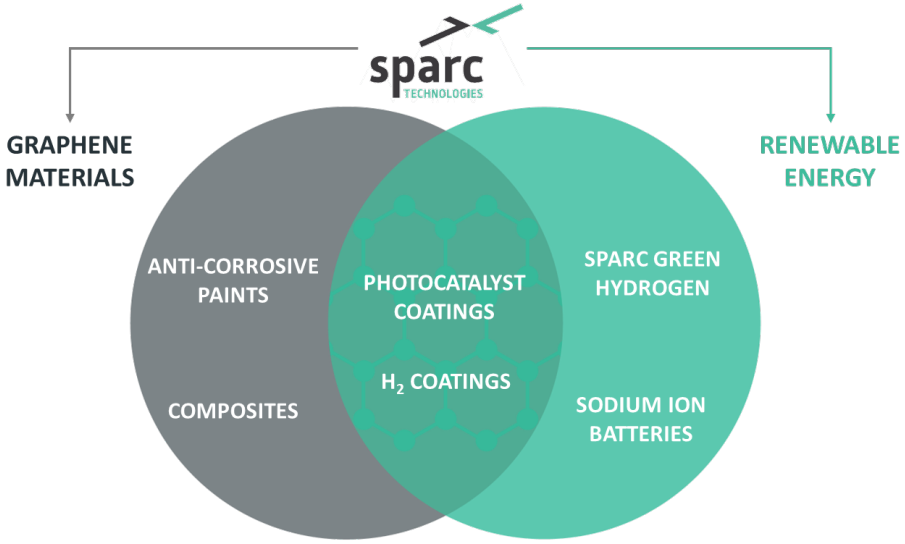
About Sparc Technologies



Sparc Technologies Limited ('Sparc,' ASX: SPN) is an Australian company pioneering new technologies to disrupt and transform industry while seeking to deliver a more sustainable world. Sparc has established offices in Australia, Europe and North America and is focused on three core areas of technology development.

1. Sparc has spent over 4 years developing a **graphene based additive** product, **ecosparc®**, which has demonstrated up to 40% anti-corrosion improvement in commercially available epoxy coatings. Sparc recently commissioned a manufacturing facility to produce **ecosparc®** and is engaging with global paint companies and end users to advance commercial scale trials.

2. Sparc is a majority shareholder of **Sparc Hydrogen** which is a company pioneering the development of **photocatalytic water splitting** ('PWS') green hydrogen production technology. PWS is an alternative to producing green hydrogen via electrolysis, using only sunlight, water and a photocatalyst. Given lower infrastructure requirements and energy use, the process has the potential to deliver a cost and flexibility advantage over electrolysis.

3. Sparc is also developing **sodium ion battery technology** in partnership with Queensland University of Technology.

For more information please visit: sparctechnologies.com.au

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