Sparc Technologies Green Hydrogen Project

HIGHLIGHTS

- **Sparc Hydrogen JV transaction complete with all conditions met**
- **Fortescue Future Industries' Stage 1 payment to Sparc Hydrogen fulfilled**
- **Project work well underway with key equipment ordered**
- **A preliminary Techno Economic Assessment (TEA) of the technology has commenced**
- **Potential to revolutionise hydrogen production**

Sparc Technologies Limited (**ASX: SPN**) (**Sparc** or the **Company**) is pleased to provide further information regarding the Sparc Hydrogen Joint Venture and its Binding Agreements with global green energy company Fortescue Future Industries (**FFI**) (100% subsidiary of Fortescue Metals Group, ASX: FMG) and the University of Adelaide (**UoA**) as announced to the ASX on 2 February 2022.

Sparc Hydrogen is seeking to deliver a unique process with the aim of producing commercially viable green hydrogen via photocatalysis (**the Sparc Green Hydrogen Project**). The green hydrogen technology has been developed by the University of Adelaide and Flinders University. FFI will now support this important research, development and commercialisation work as emerging world leaders in green hydrogen technology and production.

Sparc Executive Chairman, Stephen Hunt, commented:

> *"Sparc's announcement last week was the culmination of over 4 months of challenging work between the JV partners including detailed technical due diligence, negotiation and execution of a number of key agreements to form Sparc Hydrogen. It is pleasing to now have satisfied all conditions to complete the transaction and to work with FFI and UoA to further progress this exciting project.*
>
> *Furthermore, the inclusion in the JV of world leading green energy company, FFI, adds enormous value to the JV, both in terms of project development, technology and commercialisation capabilities. These attributes combined with UoA's research experience and unique skills with photocatalytic water splitting, together with Sparc's project management and graphene expertise, makes for a formidable combination in this transformational green energy technology."*

Together with this announcement Sparc has released an updated investor presentation on the Sparc Green Hydrogen Project to the ASX. The novel photocatalytic water splitting technology that Sparc Hydrogen now controls has the potential to revolutionise hydrogen production, a market projected to grow 6-fold by 2050[1] from US$150 billion currently to US$1 trillion.

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[1] IEA Net Zero by 2050: A Roadmap for the Global Energy Sector, International Energy Agency

Should the results from the staged research and development program being conducted at UoA progress as planned, Sparc Hydrogen will have an advantageous position over conventional green hydrogen developers not only potentially in terms of cost of production, but also scalability and the ability to produce hydrogen in remote, off-grid locations. Sparc Technologies is aiming to have a commercially ready technology targeting sub $2/kg production costs at the completion of the program.

Table 1: Sparc Technologies Green Hydrogen Advantages (source ASX release 9 Feb 2022)

	Sparc Green H_2	Green H_2	Blue H_2	Grey H_2
Description	Photocatalysis	Electrolysis via renewable electricity	Using SMR with CCUS*	Steam methane reforming (SMR)
Feedstock	✓ Water	✓ Water	✗ Natural gas, Water	✗ Natural gas, Water
By-product	✓ Pure O_2	✓ Pure O_2	• Emissions sequestered	✗ CO_2, NO_x, SO_x, PM
Carbon emissions[1]	✓ Nil	✓ nil	✗ 0.76kg CO_2 / 1kg H_2	✗ 8.5kg CO_2 / 1kg H_2
Location restrictions	✓ Solar resource	✗ Solar +/- wind resource & electrical infrastructure	✗ Gas source and UG storage	✗ Gas source
Requisite scale	✓ Scalable	✗ Very large	✗ Very large	✗ Large

* Carbon capture, use and storage

Following satisfaction of all conditions between the 3 parties, the Stage 1 interests in respect of Sparc Hydrogen JV is; Sparc 52%; UoA 28%; and FFI 20% (refer to Table 1 in ASX release 2 February 2022 for further details).

Additionally, whilst the agreements with UoA and FFI were being negotiated over the past 4 months, project work commenced 1 December 2021. Progress to date includes:

- Key equipment for the project was ordered in December. Delivery is expected in March/April 2022.
- A preliminary Techno Economic Assessment (TEA) of the technology has commenced. This is expected to demonstrate the strong economic potential of the technology subject to the achievement of certain solar to hydrogen efficiency (STH %) improvements from ongoing research and development work.
- Sparc collaborating with the UoA with the aim to develop graphene related materials to enhance the production of commercially viable green hydrogen via photocatalysis.
- The reimbursement from Sparc Hydrogen to Sparc Technologies of $510,000 will be made out of FFI's initial payment.

-ENDS-

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About Sparc Technologies

Sparc Technologies Limited (ASX: SPN) is a South Australian based company that is focussing on the development of innovative technology solutions.

Graphene, which is a major focus for Sparc, can be extracted from graphite, it is a 2-dimensional nano material made of carbon atoms arranged in a hexagonal pattern, giving it unique and powerful properties that, with the right technology, can be imparted on products to improve performance. Sparc is commercialising a number of graphene products in industrial materials applications, as well as health.

Sparc is also focussed on developing thermo-photocatalytic green hydrogen technology that does not require solar and/or wind farms, nor electrolysis as with conventional green hydrogen.

Sparc Green Hydrogen Project

The Sparc Green Hydrogen Project will seek to further develop a process known as Thermo-Photocatalysis, which employs the suns radiation and thermal properties to convert water into hydrogen and oxygen. Adopting this process to produce green hydrogen means that renewable energy from wind farms and/or photovoltaic solar panels and expensive electrolysers are not needed.

As such, capital and operating expenditure is anticipated to be significantly lower than electrolysis and other forms of hydrogen production currently in use. Furthermore, this technology can potentially be adopted remotely and for onsite use, thereby reducing the reliance on long distance hydrogen transportation and/or electricity transmission.

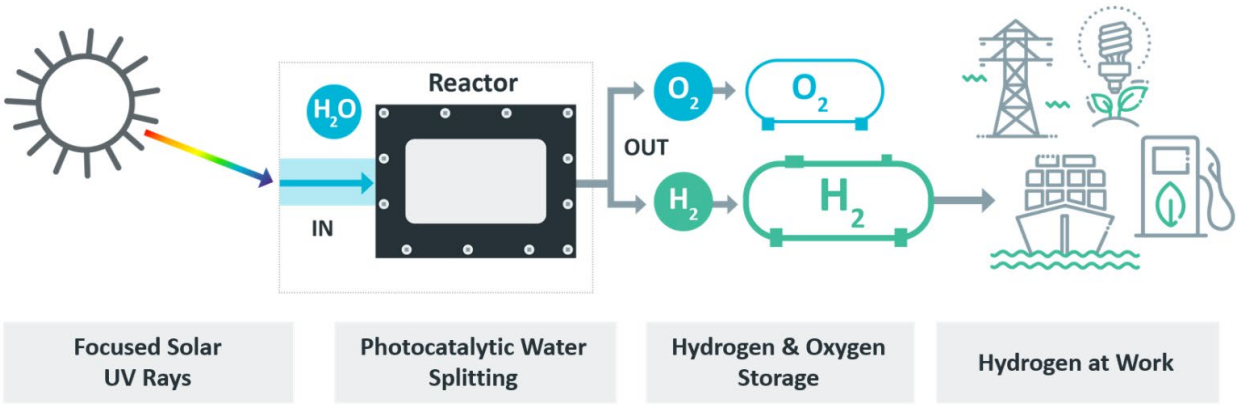

Figure 1: Sparc Hydrogen Green Hydrogen process schematic

Project Timeline

- The technology developed to date was supported by ASTRI (Australian Solar Thermal Research Institute), with contributions totalling A$2.5m over a 4.5-year period from the University of Adelaide and Flinders University.
- Current research is focused on using the entire solar spectrum to increase the STH (Solar to Hydrogen) percentage with laboratory results demonstrating a significant increase in hydrogen production under optimised conditions.
- A provisional patent application (Australian Provisional Patent Application No. 2021900997 – Photocatalytic Apparatus) was filed by University of Adelaide in April 2021 for the use of the entire solar spectrum to increase the Solar to Hydrogen (STH) percentage rate.