Fortescue Future Industries to Acquire Interest in Sparc Hydrogen

HIGHLIGHTS

- **Binding agreements executed between Sparc Technologies (SPN), Fortescue Future Industries (FFI) and the University of Adelaide (UoA) forming the Sparc Hydrogen Joint Venture (Sparc Hydrogen)**
- **Research Agreement with Sparc Hydrogen and the University of Adelaide signed**
- **Project IP to be immediately licensed from UoA to Sparc Hydrogen and then assigned to Sparc Hydrogen at completion of Stage 2**

Sparc Technologies Limited (**ASX: SPN**) (**Sparc** or the **Company**) is pleased to announce that it has entered into binding Agreements with global green energy company Fortescue Future Industries (**FFI**) (100% subsidiary of Fortescue Metals Group, ASX: FMG) and the University of Adelaide, forming the Sparc Hydrogen Joint Venture. The transaction is the formalisation of the joint venture announced to the ASX on 27 October 2021 as a shareholder of Sparc Hydrogen Pty Ltd (**Sparc Hydrogen**) via a staged investment.

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 (**UoA**) and Flinders University. FFI will now support this important research and development work as emerging world leaders in green hydrogen technology and production.

Following FFI's Stage 1 investment, the initial interest of the parties in respect of Sparc Hydrogen shall be Sparc 52%; UoA 28%; and FFI 20%, with Sparc moving to 36%; UoA 28% and FFI 36% at Stage 2 (refer to **Table 1** below for further details).

FFI CEO, Julie Shuttleworth AM commented:

> *"There is irrefutable scientific evidence that the planet is warming. Green hydrogen is a practical, implementable solution to decarbonise hard to abate sectors, including heavy industry. The research being undertaken by Sparc Hydrogen is important for FFI's growing technology portfolio as we develop technologies to lower emissions globally. We are excited to enter into this agreement and to support this critical research into green hydrogen."*

Sparc Executive Chairman, Stephen Hunt, commented:

> *"Sparc is extremely excited to be working with a company of the calibre of FFI, which has demonstrated its credentials as being a world leading company in green hydrogen. FFI is very well placed to assist the development and commercialisation of Sparc Hydrogen's green hydrogen photocatalytic technology."*

University of Adelaide's Executive Director, Innovation & Commercial, Dr Stephen Rodda commented:

> *"The University of Adelaide is committed to partnering with industry to support the transfer and development of new technologies. Central to this is working with partners that are aligned in the strategic objectives and goals to be achieved. Bringing FFI into the Sparc Hydrogen joint venture is a tremendous outcome and one that the University of Adelaide is proud to be party to. Not only is FFI's hydrogen energy strategy strongly aligned to that of Sparc Hydrogen, but FFI will also bring a high level of capability and expertise to support the successful development of this innovative technology."*

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.

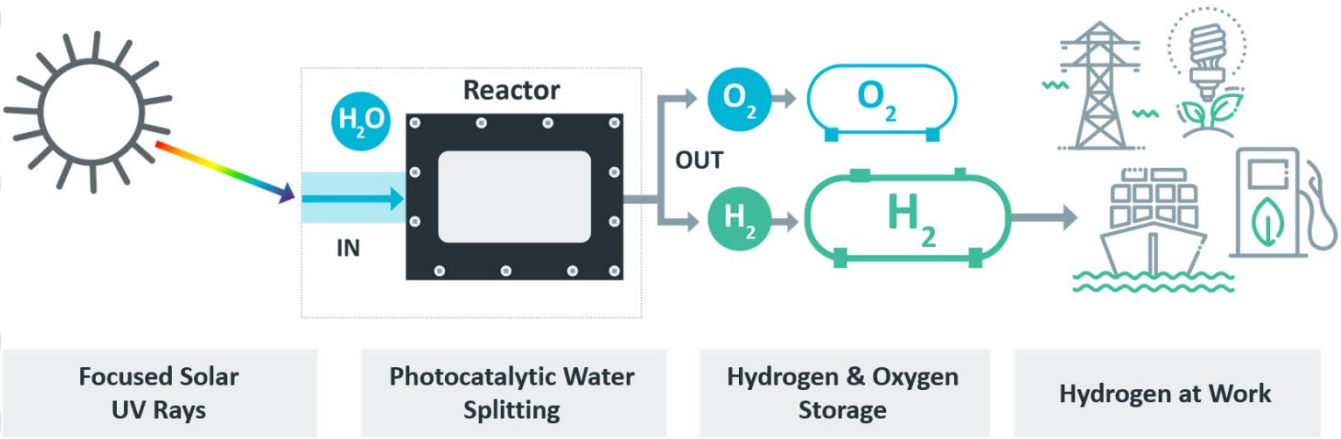

Figure 1: Sparc Hydrogen Green Hydrogen process schematic

Photocatalysis

Photocatalysis is the acceleration of a photoreaction in the presence of a catalyst. In catalysed photolysis, light is absorbed by an adsorbed substrate. In photogenerated catalysis, the photocatalytic activity depends on the ability of the catalyst to create electron–hole pairs, which generate free radicals (e.g. hydrogen) able to undergo secondary reactions.

Photocatalytic water splitting is an artificial photosynthesis process in a photoelectrochemical cell used for the dissociation of water into its constituent parts, hydrogen (H_2) and oxygen (O_2), using light. Theoretically, only light energy (photons), water, and a catalyst are needed. This topic is the focus of much research, but thus far no technology has been commercialised.

Project to date

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.

Research Agreement

The joint venture company, Sparc Hydrogen has entered into a Research Agreement with the University of Adelaide in respect of Stage 1, triggering an initial payment of $962,000 from SPN to Sparc Hydrogen and then to UoA which goes towards SPN's Stage 1 funding commitment (**Initial Funding Contribution**).

Approximately $512,000 will be reimbursed to SPN by the initial funding contributed by FFI for Stage 1.

Licence Agreement

The technology (including all IP) under development is being provided by the University of Adelaide to Sparc Hydrogen under an exclusive licence. The licenced technology will be assigned to Sparc Hydrogen subject to all of the staged financial commitments being met. No royalties are payable by Sparc Hydrogen throughout the Sparc Green Hydrogen Project.

FFI

FFI will subscribe for shares in Sparc Hydrogen under a subscription agreement (**Subscription Agreement**). The material conditions precedent to the Subscription Agreement are:

- SPN making the Initial Funding Contribution under the Research Agreement, which has been satisfied; and
- SPN issuing 3,000,000 Shares to UoA (via Innovation and Commercial Partners Pty Ltd) and Flinders University (Flinders Partners Pty Ltd) (comprising 2,721,000 and 279,000 Shares respectively) (**SPN Share Issue**), which will be completed using SPN's existing Listing Rule 7.1 placement capacity.

SPN intends to issue and complete the SPN Share Issue imminently.

A shareholders agreement pertaining to Sparc Hydrogen (the joint venture entity) has been executed between SPN, FFI and UoA (via Innovation and Commercial Partners Pty Ltd) (**Shareholders Agreement**) and contains customary provisions for an agreement of this nature including governance, and funding provisions.

The parties' respective funding obligations and participating interests under the Shareholders Agreement and Subscription Agreement are set out on a consolidated basis in Table 1 below.

The Shareholders Agreement together with the Research Agreement, Licence Agreement and Subscription Agreement contain the key terms and provisions which underpin the operation of the Sparc Hydrogen joint venture.

Table 1: Funding and Ownership Structure

	University of Adelaide	Sparc Technologies	Fortescue Future Industries (FFI)
Non-binding terms between Sparc and UoA announced to ASX on 27 October 2021	28% in Sparc Hydrogen for: IP contribution	72% in Sparc Hydrogen for: • $2.0m investment for Stage 1 and $2.5m for Stage 2 • $250k cash for operations • 3m shares in SPN*	n/a
Sparc Hydrogen Joint Venture			
Stage 1 Funding close	Remains at 28%	Pays $0.45m and issues 3m SPN shares for 52% interest	Pays $1.80m to earn 20%
Stage 2 Funding close	Remains at 28%	Pays $1.025m and is diluted to 36%	Pays $1.475m cash to earn additional 16%
Total value Stages 1 & 2 = $9.1m	**$2.55m#**	**$3.275m***	**$3.275m**
Ownership	**28%**	**36%**	**36%**

*Includes value of 3m SPN shares issued to UoA (2,721,000) and Flinders University (279,000) @ 60c per share = $1.8m which reflects the share price at the time the terms with UoA were agreed, as first announced to the market on 27 October 2021.
Represents investment by UoA and Flinders University into the Project to date.

Project Milestones

Stage 1 – key milestones over the first 2.5 years of the Project include:

- Develop a Technical Economic Assessment (TEA) for the Project;
- Optimise thermo-photocatalytic reactor conditions;
- Construct and commission a new thermo-photocatalytic reactor for full solar simulation;
- Test existing and new photocatalysts in the thermo-photocatalytic reactor using full simulated solar spectrum irradiation, including determination of photocatalyst longevity and durability; and
- Design a proto-type scale photo-thermal reactor for on-sun operation.

Stage 2 – key milestones over the following 2 years of the Project include:

- Installation and commissioning of proto-type thermo-photocatalytic reactor with on-sun operation; and
- Pre-commercial pilot scale system design, procurement, installation, commissioning and operation of thermo-photocatalytic reactor.

The technology readiness level (TRL) of the Project is expected to advance from TRL-4 to TRL-6 to a level of commercial readiness at the completion of the program.[1]

About Fortescue Future Industries

Fortescue Future Industries (FFI) is a global green energy company committed to producing zero-carbon green hydrogen from 100 per cent renewable sources.

FFI is establishing a global portfolio of renewable green hydrogen and green ammonia projects with a target to supply 15 million tonnes per year of renewable green hydrogen by 2030, rising to 50 million tonnes per year in the decade thereafter.

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.

-ENDS-

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