

## Sparc Hydrogen Patent Application Published

### HIGHLIGHTS

- ▶ **International PCT patent application relating to Sparc Hydrogen's exclusively licensed solar reactor technology published in October**
- ▶ **R&D work continues to progress with an improved reactor design developed**
- ▶ **Scoping work for a pilot plant is underway with market update on pilot plant progress to be provided by year end**

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**Sparc Technologies Limited (ASX: SPN) (Sparc, Sparc Technologies or the Company)** is pleased to provide an update on progress at Sparc Hydrogen Pty Ltd (**Sparc Hydrogen**), a joint venture between Sparc Technologies, Fortescue Future Industries (**FFI**) and the University of Adelaide. Sparc Hydrogen is seeking to commercialise photocatalytic water splitting technology with the aim of producing low-cost green hydrogen on a commercial scale (the **Sparc Green Hydrogen** process). In October, an international PCT patent application relating to a photocatalytic solar reactor filed by the University of Adelaide and Flinders University was published. Sparc Hydrogen has an exclusive, royalty-free licence to use this technology. Following completion of the preliminary Techno-Economic Analysis (**TEA**) in October, the project team's focus has shifted to pilot plant scoping activities while the team at the University of Adelaide continues to progress their research.

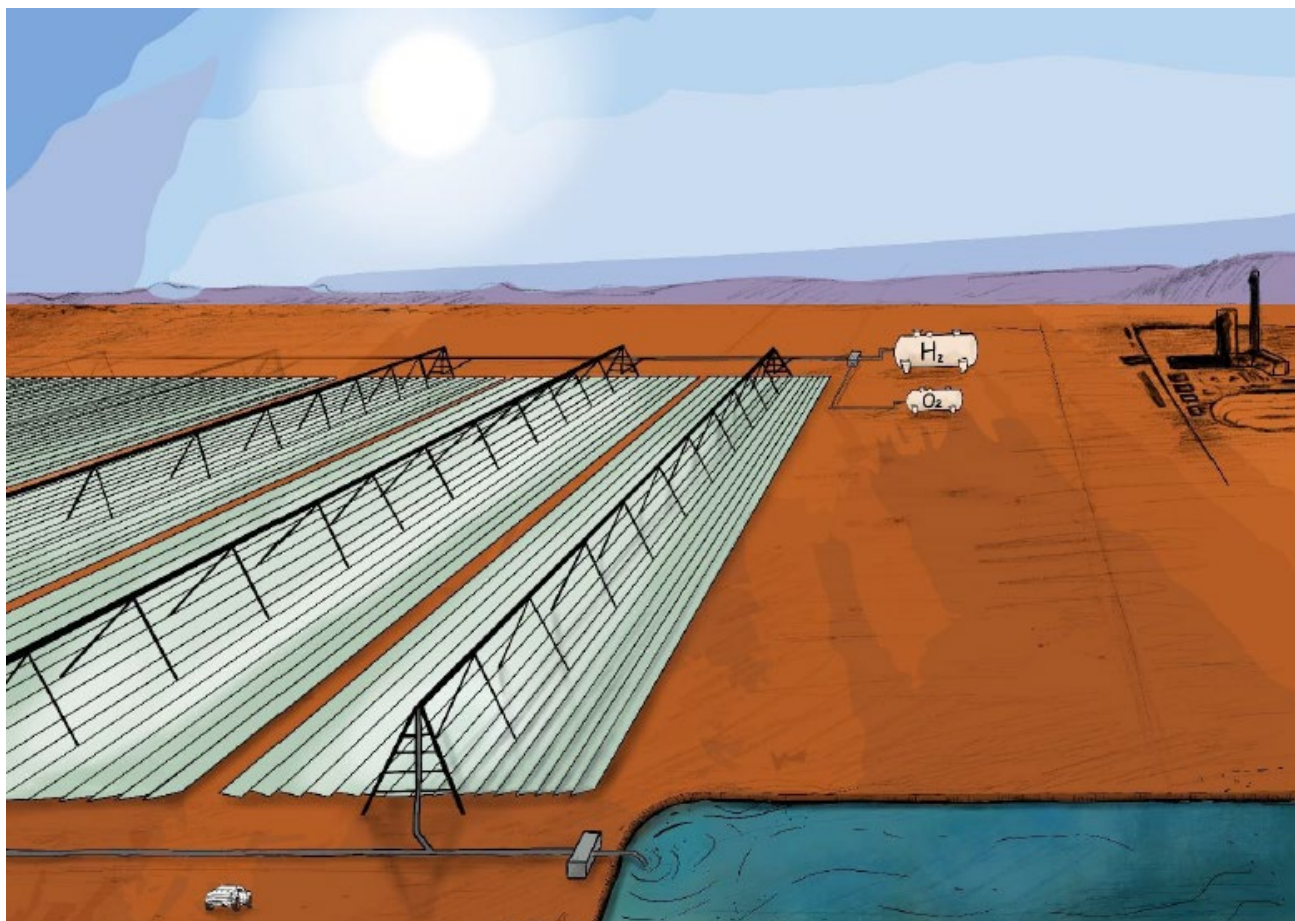
### **Sparc Technologies Executive Chairman, Stephen Hunt commented:**

*"The publication of the patent application is an important milestone for Sparc Hydrogen as it represents a progressive step towards the granting of patents in national jurisdictions. The pending patent application coupled with the positive results of the preliminary Techno-Economic Analysis leading to the acceleration of development of the pilot plant by approximately 18 months, enables Sparc Hydrogen to begin establishing a world leading position in the development of photocatalytic hydrogen production technology."*

The photocatalytic water splitting technology has been developed over ~5 years by the University of Adelaide and Flinders University. During this period, the research team has progressed its understanding and designs of a solar reactor which utilises the sun's radiation and thermal properties to increase reaction efficiencies beyond the baseline performance of a photocatalyst material.

Key elements of the technology claimed in the patent application include the use of the entire solar spectrum to enhance reaction efficiencies along with incorporating concentrated solar radiation via mirror reflectors. Solar concentration provides a dual benefit of increased temperature in the solar reactor which has been shown to increase reaction efficiencies, along with reducing the amount of photocatalyst material required for a given production rate.





**Figure 1: Concept drawing of the Sparc Green Hydrogen process incorporating photocatalysis and linear fresnel concentrators**

Research and development work is ongoing at the University of Adelaide with the development of new and better solar reactor designs and testing under a range of simulated solar conditions. The accuracy and efficiency of testing will be greatly improved with the delivery of a high specification solar simulator due prior to the end of 2022.

In October, a preliminary TEA was delivered through a collaborative effort from the joint venture partners, led by the University of Adelaide, and supported by independent engineering consultant, ITP Thermal. The completion of the preliminary TEA was a significant milestone for Sparc Hydrogen and on the back of the positive outcomes of that analysis, the joint venture partners agreed to accelerate the development of a pilot plant, approximately 18 months ahead of the original project schedule. The pilot plant will be designed to incorporate linear fresnel solar concentrators with a specifically designed solar reactor to facilitate photocatalytic hydrogen production. The project team is currently scoping options for equipment suppliers, engineering providers, locations and funding for the pilot plant.

**-ENDS-**

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## About Sparc Technologies

Sparc Technologies Limited (ASX: SPN) is an Australian company pioneering new technologies to disrupt and transform industry while seeking to deliver a more sustainable world. Sparc Technologies has established offices in Europe and North America.

Graphene, a major focus for Sparc Technologies, is a 2-dimensional material made of carbon atoms arranged in a hexagonal lattice which creates unique and powerful properties that can be imparted on products to improve performance. Sparc Technologies is commercialising graphene in a number of applications including Graphene Based Additives for the Marine & Protective Coatings market along with applications in the renewable energy and construction materials sectors.

Sparc Technologies, via its majority interest in Sparc Hydrogen, is also focussed on developing photocatalytic green hydrogen technology that does not require solar and/or wind farms, nor electrolyzers as with conventional green hydrogen processes.

