Transformational Technology for Global Industries

November 2022

ASX: SPN

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WHO IS SPARC?

Sparc is pioneering new technologies to disrupt and transform industry whilst delivering a more **sustainable** world

1. World leading global team and partners including Fortescue Future Industries
2. Seeking to reshape multi-billion dollar global markets by employing exclusive IP*
3. Target markets are driven by ESG transitions including the Construction Materials and Renewable Energy sectors

** Cautionary Note: Access to markets is subject to the Company being able to successfully develop and commercialise its technologies. Sparc does not have any distribution or offtake agreements for graphene in place at this stage. As with any entity seeking to enter into a global marketplace, any product developed by Sparc will have applications that are constrained by market segment, relevant regulations, industrial application and geographical barriers.*

Corporate Snapshot

CAPITAL STRUCTURE

85m Shares on issue*	**$64m** Market Cap*
$0.75 Share price**	**~ $4.9m** Cash*
~45% Top 20 s/holders	**7.7%** UoA shareholding

BOARD

Stephen Hunt
Executive Chairman

Mike Bartels
Managing Director

Stephanie Moroz
Non-Exec Director

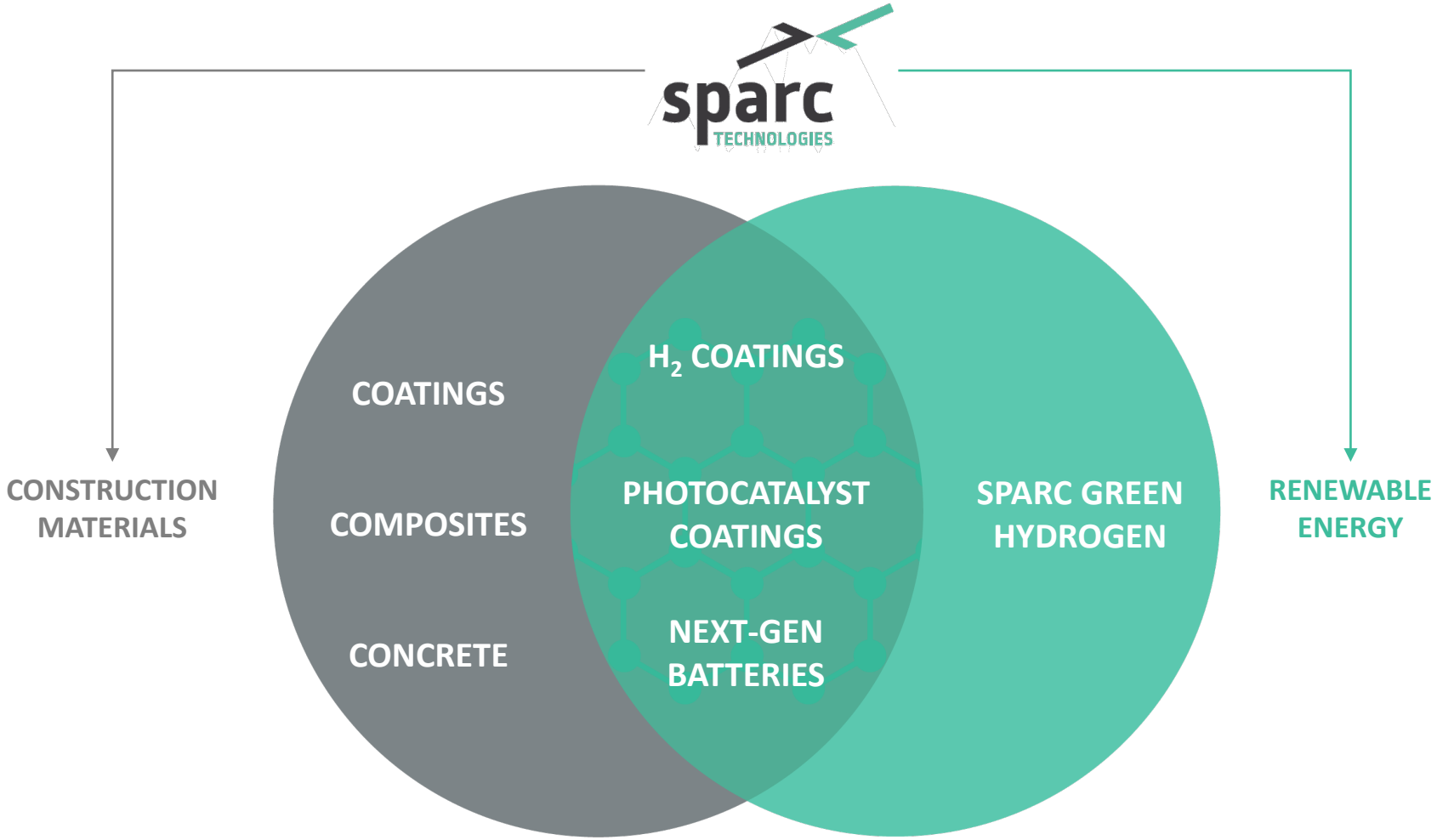
Daniel Eddington
Non-Exec Director

12 Month Share Price

* Approximate post capital raise completion 8 November 2022
** As at 2 November 2022

Technology Portfolio for Growth Markets

- Sparc is developing a portfolio of technologies that target a world increasingly focused on **ESG outcomes**
- Our **expertise in graphene** has realised significant opportunities in the **Construction Materials** and **Renewable Energy** sectors
- Substantial **synergies** being developed across target sectors with projects focused on using our graphene and/or coatings expertise in Hydrogen and Batteries



World Leading Team & Partners

- World-leading team of graphene and coatings specialists coupled with commercial expertise
- Sparc entities are now established in the USA and UK in support of commercial activities
- Sparc has an exclusive licensing and Strategic Partnership Agreement with the University of Adelaide and is working with other world-leading Australian Universities
- Sparc has developed the necessary in-house expertise and facilities to transition emerging technologies from concept through to commercialisation

GRAPHENE

Next Generation
Super-material

Sparc's Unique Graphene Position

Established expertise in **graphene characterisation** – critical when targeting performance based outcomes

Formulation of commercially viable graphene based materials

Comprehensive testing delivering **industry recognised data**

Product development refined and ready for **commercial adoption**

Know-How that supports the safe handling and **commercial manufacture** of Graphene Based Additives

Specialised manufacturing equipment purchased and site located for **production** of Graphene Based Additives

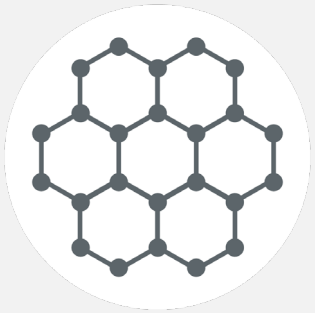
Intellectual Property protected by **Patents**

Demonstrable capability evoking **confidence** now supporting customer adoption of Graphene Based Additives

Next Generation Super-material

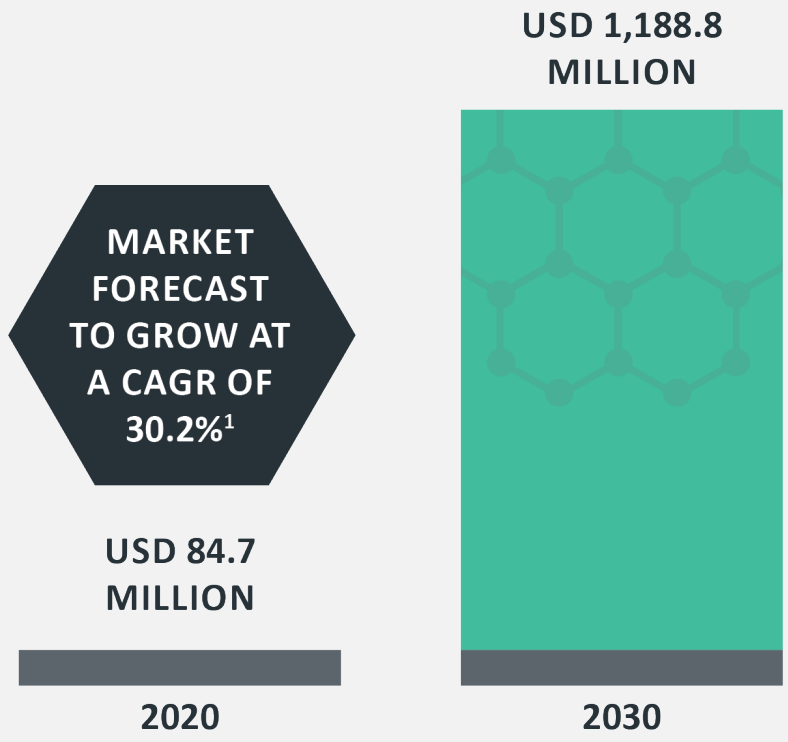
WHAT IS GRAPHENE?

Graphene is a 2D material made of carbon atoms arranged in a hexagonal lattice which creates unique and powerful properties capable of transforming and disrupting global industries.



PROPERTIES OF GRAPHENE

GRAPHENE MARKET



1 https://www.researchandmarkets.com/reports/5128907

Sparc's Target Markets

Construction Materials

COATINGS

- Enhanced **corrosion resistance** in coatings suitable for the Marine & Protective Coatings market
- **US$44bn** addressable market by 2027[1]
- Pursuing significant additional opportunities within the coatings market

COMPOSITES

- Research program underway with Swinburne University for composites (engineered polymeric materials) containing graphene - infinite range of applications

CONCRETE

- Ongoing research to establish / quantify performance enhancements offered by graphene based additives

OTHER

- Additional opportunities for **product enhancement** within the global, high volume Construction Materials sector currently being examined

Renewable Energy

HYDROGEN

- Cost effective storage and transport is a barrier to widescale hydrogen adoption
- Growing interest from asset owners and developers in Protective Coatings for pipelines and storage tanks
- Applications also in developing better photocatalyst coatings

BATTERIES

- Sustainable Hard Carbon Anode Project underway with the Queensland University of Technology
- Goal to produce high performing, low cost, sustainably sourced anode material for next generation sodium ion batteries which have significant potential for grid scale storage and certain mobile applications

[1] www.coherentmarketinsights.com/insight/buy-now/2715 [2] Copp, Tara. DoD: At least 126 bases report water contaminants linked to cancer, birth defects. Military Times, April 2018 [3] www.mining.com/canadian-water-filtration-company-targeting-estimated-1-trillion-worth-of-precious-metals-sitting-in-old-mining-sites-41109/

Sparc's Graphene Based Additives

Sparc has developed *Graphene Based Additives* (and niche Coatings) for targeted applications within the Marine & Protective Coatings market

Sparc's range of Graphene Based Additives will carry the banner

ecosparc

- Sparc's **ecosparc** products for anticorrosive epoxy coatings, deliver a 40% improvement in anticorrosive performance[1]
- The coatings used in testing, to industry standards, are amongst those commercially available from leading coatings manufacturers
- Currently in discussions with global paint companies with the objective to secure formal collaborative technical agreements as the precursor to commercial agreements
- By extending the life of a coating to first maintenance;
  - Significant reduction in installed coatings costs can be realized
  - Serves to support ESG objectives for coatings companies

1 Refer to SPN ASX release 23 December 2021

Commercialisation Pathway

Technology can be monetised via supply of Graphene Based Additives or licensing agreements

- The addressable coatings market for Sparc's **ecosparc** products (for anticorrosive epoxy coatings) is estimated to be US$44bn by 2027
- Manufacturing capability and Know How has been established
- *Graphene Based Additive* Intellectual Property to be protected by patent/s
- Sparc possess coatings expertise and access to target customers – a position further enhanced with the appointment of personnel in the UK and USA
- Currently pursuing collaborative Technical Agreements as a precursor to Commercial Agreements

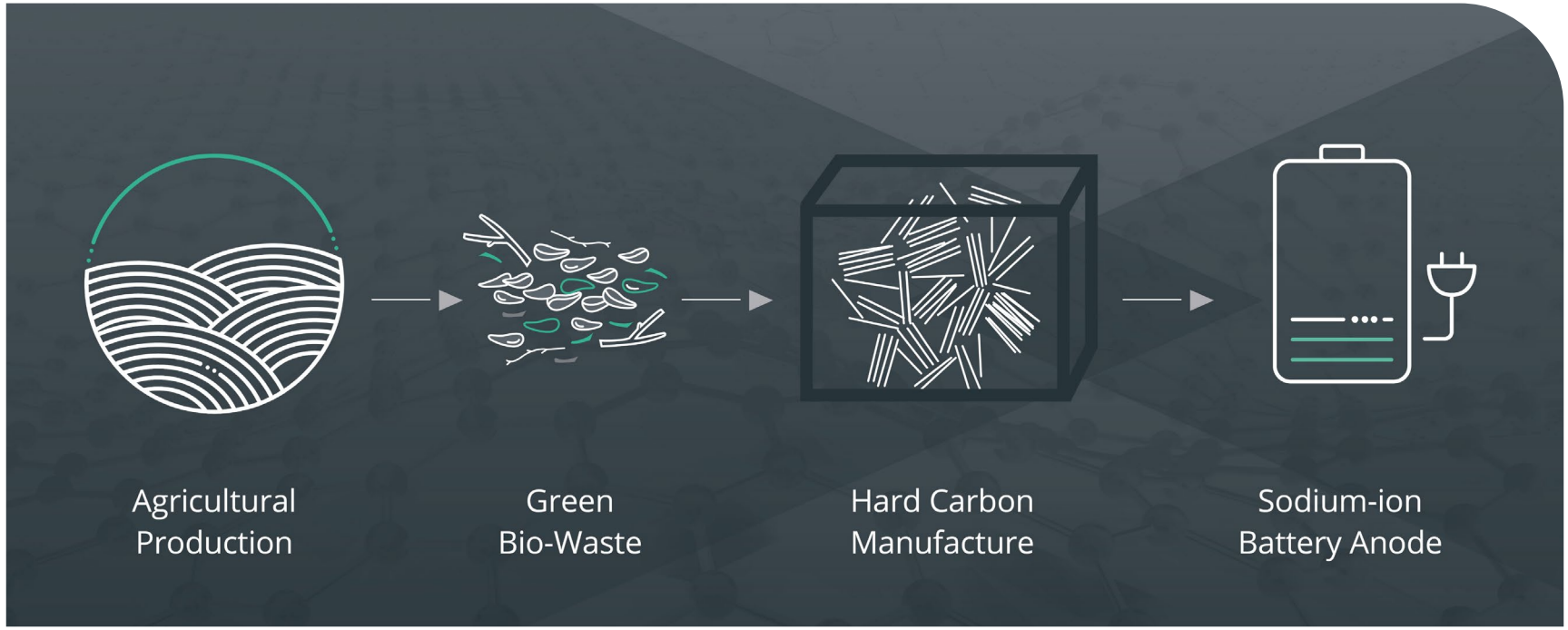
Coatings for Hydrogen Storage & Transport

- Cost effective storage and transport of hydrogen is a significant barrier to widescale adoption as a clean fuel
- Metal embrittlement and leaks at high pressures currently limits utilisation of existing gas distribution infrastructure for hydrogen use
- Sparc has ongoing R&D projects looking at developing protective coatings for high pressure hydrogen storage and transport infrastructure
- Substantial market opportunity exists when considering that 39,000km of high pressure gas pipelines exist in Australia alone

The HypSA Project in Tonsley, South Australia, is blending up to 5% Hydrogen into the local gas network

Sustainable Hard Carbon Anode Project

- Sparc, in collaboration with Queensland University of Technology, is developing a hard carbon material using low cost, sustainably sourced green bio-waste for the sodium ion battery industry
- The project is incorporating a production process which significantly reduces processing time and potentially energy use compared to existing methods
- Sodium ion batteries have been identified by Sparc as an attractive future battery technology with advantages in grid and industrial scale applications



Lower cost and greater availability of raw materials

Safety and ease of transport

Similar manufacturing techniques to Li-ion

SPARC GREEN HYDROGEN

Next Generation Hydrogen Technology

sparc TECHNOLOGIES

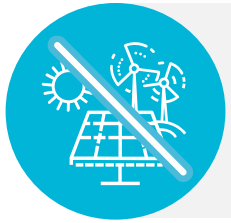
FORTESCUE FUTURE INDUSTRIES

THE UNIVERSITY of ADELAIDE

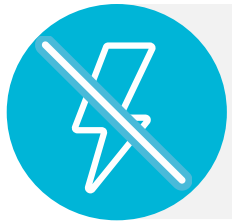
Flinders UNIVERSITY

Technology Highlights

- **Globally disruptive green hydrogen production technology**
- Green hydrogen produced **directly from sunlight and water**
- Best-in-class partners: **University of Adelaide** and **FFI**
- **Preliminary Techno-Economic Analysis (TEA)** completed in Oct-22
  - **Lower infrastructure requirements** and greater flexibility
    - ✓ No large scale wind or solar PV farms
    - ✓ No electrolysers or HV electricity infrastructure
    - ✓ Opportunity for scalable deployment
  - Targeting **efficient water and land use**
  - Targeting a system with **industry leading costs**



No Wind or Solar PV Farms



No Electrolyser

sparc TECHNOLOGIES

FORTESCUE FUTURE INDUSTRIES

THE UNIVERSITY of ADELAIDE

Flinders UNIVERSITY

Preliminary Techno-Economic Analysis

Preliminary Techno-Economic Analysis **completed in October 2022**

Study **confirms the commercial potential** for the Sparc Green Hydrogen process

Targeting **scalable, low-cost** green hydrogen production with **efficient land and water usage**

Based on positive outcomes **pilot plant scoping activities accelerated by ~18 months**

Best-in-Class Partners

sparc TECHNOLOGIES

- 52% Sparc Hydrogen shareholder[1]
- Technology incubator
- Developing graphene applications in H_2
- Strategic partnership with UoA

SPARC HYDROGEN

FORTESCUE FUTURE INDUSTRIES

- 20% Sparc Hydrogen shareholder[1]
- Global leader in green hydrogen
- Substantial project development experience
- Potential future customer

THE UNIVERSITY of ADELAIDE

- 28% Sparc Hydrogen shareholder[1]
- Contributor of IP
- Leading R&D work and facilities
- ~8% shareholder in SPN

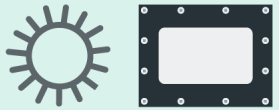
1. Stage 1 shareholdings; refer to SPN ASX release 2 February 2022

The ‘Colours’ of Hydrogen

Sparc Green Hydrogen

The Sparc Green Hydrogen process uses photocatalytic water splitting. Solar radiation interacts with water and a catalyst in a specially designed solar reactor to produce pure hydrogen and oxygen without any electricity or harmful by-products.

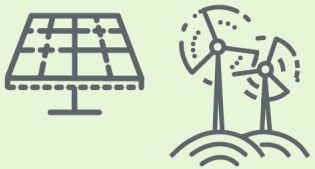
Solar Energy



Photocatalytic Reactor

H_2

Renewable Energy



H_2

Production of conventional green hydrogen requires electricity for the electrolysis of water. When provided by renewable energy no harmful greenhouse gases are released.

Green Hydrogen

Grey Hydrogen

Grey hydrogen is produced using fossil fuels such as natural gas, which is converted into hydrogen and CO_2 at high temperatures (stream reforming).
In the process, CO_2 is released into the atmosphere. Grey hydrogen is therefore not CO_2-neutral.

Green-house gas Co_2 + H_2

Fossil Energy

Carbon-Capture-and-Storage + H_2

Blue hydrogen, like grey hydrogen, is produced from fossil fuels (especially natural gas). However, CO_2 is captured and stored underground (known as carbon capture and storage, CCS). Whilst CO_2 is captured from the steam reforming process, methane and CO_2 emissions are associated with natural gas production.

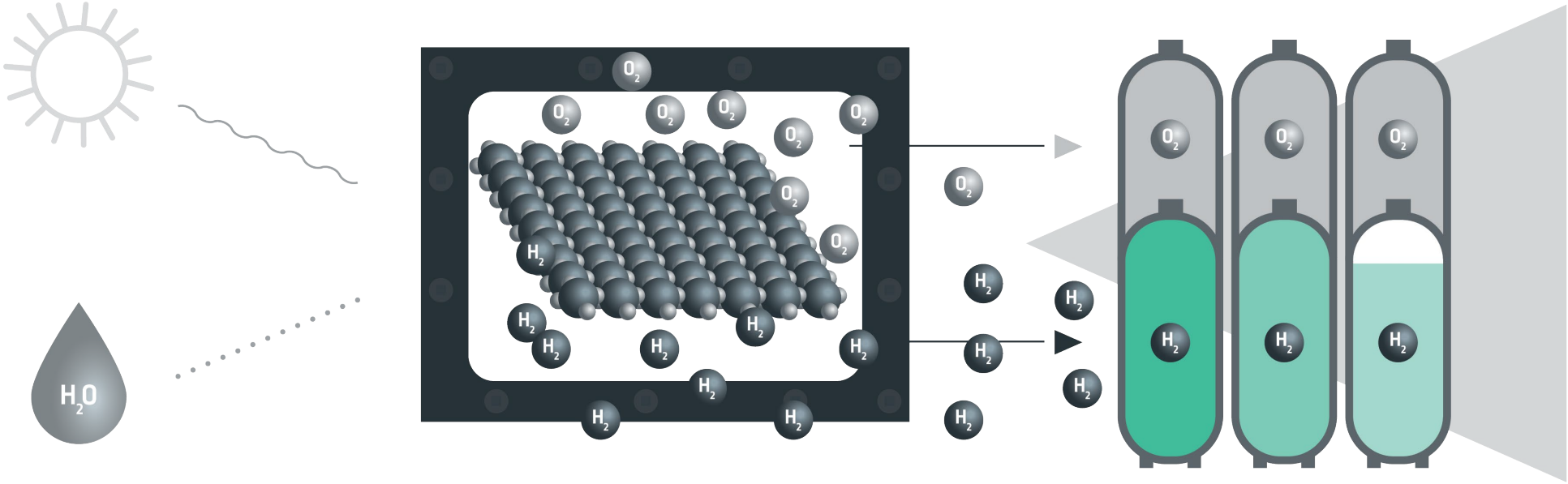
Blue Hydrogen

Hydrogen

Source: International PtX Hub Berlin and peppermint werbung berlin

How Does Sparc Green Hydrogen Work?

The Sparc Green Hydrogen process does not use solar PV and/or wind farms, nor electrolysers as with conventional green hydrogen – only a photocatalyst and solar radiation



Solar Radiation

Photocatalytic Water Splitting

Hydrogen Storage

WATCH SPARC GREEN HYDROGEN VIDEO HERE: https://sparctechnologies.com.au/sparc-green-hydrogen/

Sparc Green Hydrogen Advantages

"Such systems (photocatalytic water splitting) offer great potential for cost reduction of electrolytic hydrogen, compared with conventional two-step technologies." (CSIRO National Hydrogen Roadmap[1])

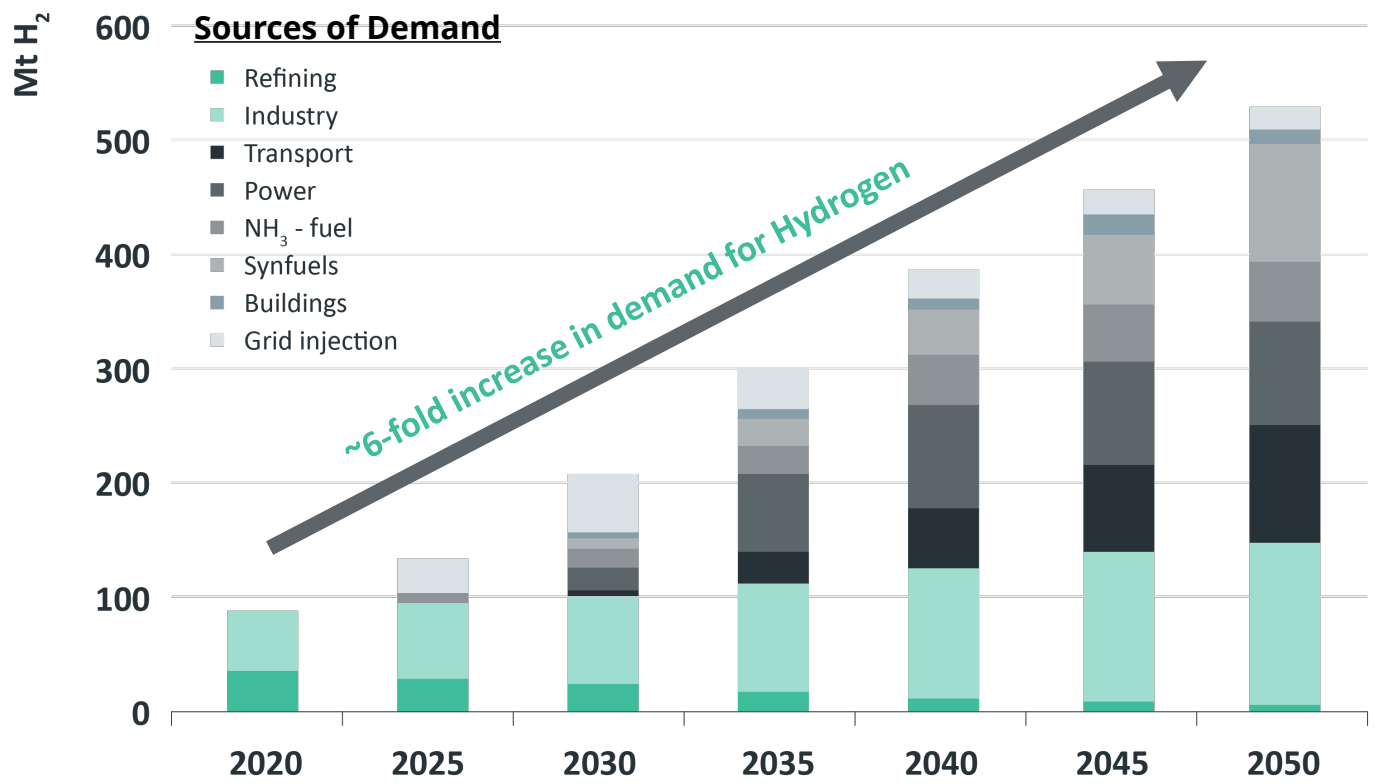
	Sparc Green H_2	Green H_2	Blue H_2	Grey H_2
Description	**Photocatalysis**	Wind and solar farms with electrolysis	Using SMR with CCS*	Steam methane reforming
Feedstock	✓ **Water**	✓ Water	✗ Natural gas, Water	✗ Natural gas, Water
By-product	✓ **Oxygen**	✓ Oxygen	• Emissions sequestered	✗ CO_2, NO_x, SO_x, PM
Scope 1 & 2 emissions[1]	✓ **Nil**	✓ Nil	✗ 0.76kg CO_2 / 1kg H_2	✗ 8.5kg CO_2 / 1kg H_2
Location	✓ **Solar resource**	✗ Solar +/- wind & HV infrastructure	✗ Natural gas source and suitable storage	✗ Natural gas source
Requisite scale	✓ **Scalable**	✗ Very large	✗ Very large	✗ Large

* Carbon capture and storage

1 Commonwealth of Australia Australia's National Hydrogen Strategy, 2019

Hydrogen Demand and Uses

Global hydrogen demand (Mt)[1]



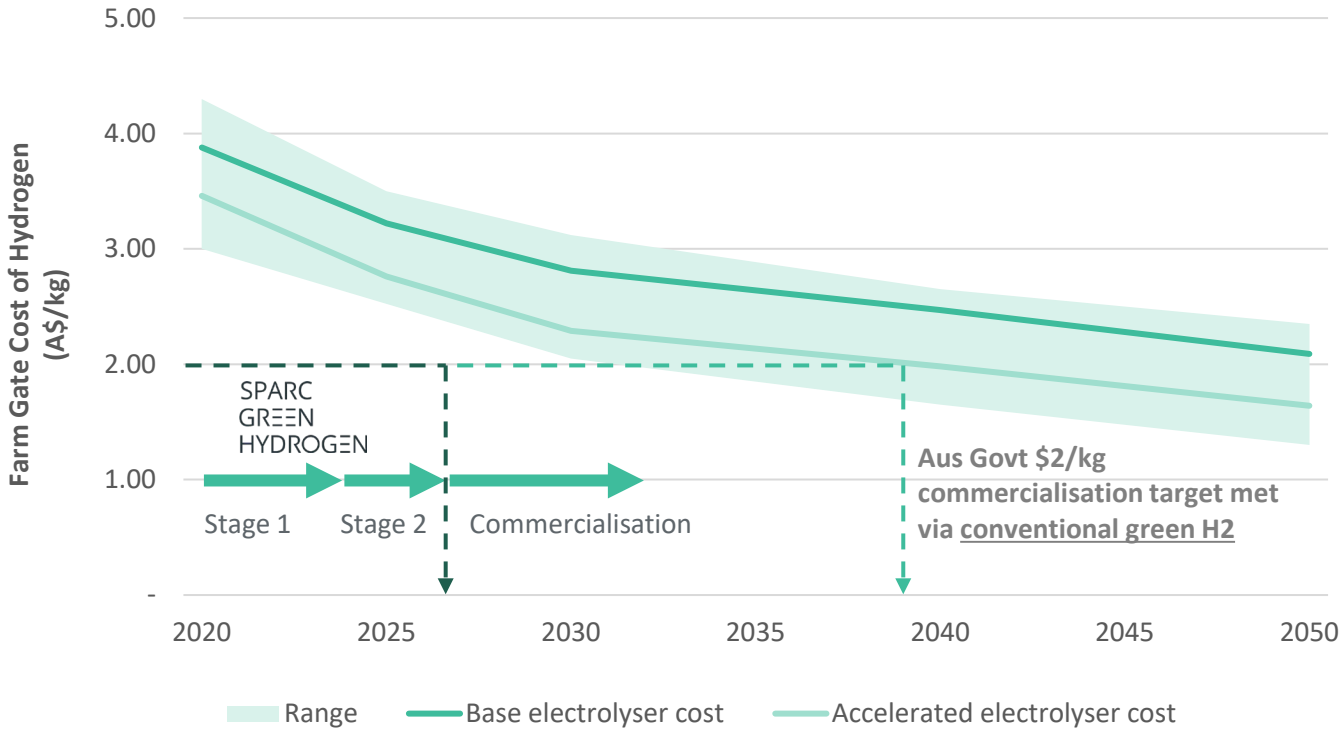
- Demand for hydrogen is expected to grow 6-fold by 2050 under the IEA's Net Zero by 2050 Roadmap[1]
- Clean hydrogen has the potential to aid the de-carbonization of c.45% of global man-made emissions
- Demand for hydrogen from existing 'hard to de-carbonize' sectors including industrial, heating, transportation and power generation industries is expected to be at the forefront of reducing these emissions
- Forecast investment required to reach government production targets and spending projections across the value chain adds up to more than US$300 billion through 2030[2]

1 Net Zero by 2050: A Roadmap for the Global Energy Sector, International Energy Agency
2 Hydrogen Council – Hydrogen Insights 2021 Report (https://hydrogencouncil.com/wp-content/uploads/2021/02/Hydrogen-Insights-2021-Report.pdf)

The Green Hydrogen Race is on…

- Producing clean hydrogen **under $2/kg** is a stretch goal under the Australian Government's Technology Investment Roadmap
- Based on a 2021 report by Advisian 'conventional' green hydrogen (electrolysis) projects are only forecast to reach this mark in the **late 2030s**, at best
- There is a **substantial window of opportunity** for new technologies such as Sparc Green Hydrogen to commercialise low-cost hydrogen production
- Announcement of pilot plant acceleration **~18 months ahead of schedule** demonstrates the JV partners commitment to rapidly progress the technology

Forecast cost of green hydrogen via electrolysis[1]



1 Source: Australian hydrogen market study - Sector analysis summary, Advisian, 24 May 2021

Research & Development

- PCT patent application relating to Sparc Hydrogen’s solar reactor technology published in October 2022.
- Solar reactor developed by UoA and Flinders University over ~5 years has demonstrated the ability to increase reaction efficiencies beyond the baseline performance of a photocatalyst material in the lab.
- Current R&D focus is on developing and testing new solar reactor designs and better photocatalyst materials.
- Key advances which will ultimately deliver low-cost hydrogen production via this process:
  - Sparc Hydrogen's unique solar reactor design secured by exclusive IP;
  - Experimental data supporting optimal reactor conditions;
  - Reducing solar field and BoP costs; and
  - Improving photocatalysts for water splitting.

ASTRI Australian Solar Thermal Research Institute

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Flinders UNIVERSITY

FFI: The Best Partner in Green Hydrogen

Ambition

Targeting 15Mtpa of green hydrogen to the world by 2030

Vision

"Our vision is to make renewable green hydrogen the most globally traded seaborne energy commodity in the world."

Funding

US$730 - $830m forecast expenditure in FY23[1]

Track record

Of transforming industries…

1. Based on FMG's September 2022 Quarterly Production Report

Sparc Green Hydrogen

Disruptive green hydrogen technology

World leading partners in green hydrogen

More flexible and scalable with less infrastructure

Targeting industry leading cost of H_2 production

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Released with the authority of the Board - 2 November 2022