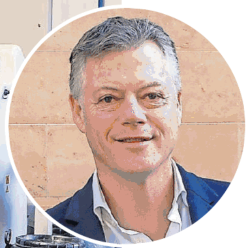
ADVERTISING FEATURE

Green energy projects



Stephen Hunt is executive chairman of Sparc, which is involved in a joint venture exploring novel green hydrogen technology.

Venture's clean hydrogen goal in sight

Globally, so-called 'green' hydrogen is creating huge investor interest as a promising way to store and transport renewable energy, with billions of dollars invested in proposed facilities.

The International Energy Agency forecasts hydrogen demand to rise sixfold (by more than 500 million tonnes) by 2050, when hydrogen-derived fuels will account for about 10 per cent of energy consumption.

Australia is at the vanguard of the green hydrogen revolution, with the sunniest states of Western Australia and South Australia leading the way.

The CSIRO lists 85 hydrogen projects – most of them using water electrolysis – with 18 of them targeting large-scale exports.

Green hydrogen, as it is currently known, involves separating water molecules using renewable energy (water electrolysis), with only oxygen produced as a byproduct.

The trouble is green hydrogen requires large amounts of energy to produce, which means it is a fuel rather than an energy source per se. The cost of renewable energy needs to decline materially for it to be competitive with traditional 'grey' hydrogen, which is sourced from fossil fuels.

But what about 'ultra green' hydrogen that uses no electricity at all? It may sound like a pipe dream, but to ASX-listed Sparc Technologies it's anything but far-fetched.

Sparc is the bourse's only exponent of a technique called photocatalytic water splitting (PWS), technology that has been known about for five decades but has not been commercialised to date.

While Sparc's core business revolves around the use of graphene-based additives for targeted applications within the marine and protective coatings market, the Sparc Hydrogen joint venture is carrying out the cutting-edge energy work to commercialise PWS.

The joint venture consists of Sparc (52 per cent) and the University of Adelaide (28 per cent), with Andrew Forrest's Fortescue Future Industries taking a 20 per cent stake in February this year.

"It's the tail of the company that could well turn into the dog," says Sparc executive chairman Stephen Hunt.

PWS uses the sun's radiation and a highly-engineered photocatalyst material to convert water into hydrogen.

Because it obviates the need for electrolysers – an expensive component of green hydrogen production – the output is expected to be very competitively priced at targeted efficiencies.

The venture's patented 'smarts' relate to the design of the solar reactor that is central to the process. The catalyst is a blend of unnamed minerals, which are commonly found but highly engineered in powder form.

"The core of our IP is the solar reactor design that supercharges the photocatalytic reaction," says Sparc's manager for energy and business development, Nick O'Loughlin.

Serendipitously, the company was introduced to the project after the University of Adelaide asked for help with a problem related to photocatalytic coatings.

Under the watchful eye of Professor Greg Metha from the university's chemistry school, the project had been carried out for four and a half years with now-expired Australian Solar Thermal Research Institute (ASTRI) funding.

> "We are really at the cutting edge of some massive step changes in material usage and energy production."
> Stephen Hunt

"There was the opportunity to fund the project directly and we jumped at the chance because we could see it could be a game changer," Hunt says.

Investor attention is now focused on a technical economic assessment (TEA) that is expected to be released in the current quarter.

The TEA is expected to show the photocatalytic hydrogen production process can be very competitive against conventional green hydrogen via electrolysis, as well as grey hydrogen production assuming certain efficiencies.

Sparc Hydrogen is confident of state and federal government support for a pilot project.

A benefit of the joint venture's approach is that it doesn't have to reinvent the wheel on the big-ticket capital items.

"We are not actually having to design vast amounts of new infrastructure; we are just slotting a unique reactor into an existing solar field," O'Loughlin says.

As well as providing technical support, Fortescue Future Industries ultimately could be a customer as it pursues its target of 15 million tonnes of green hydrogen by the end of the decade.

Hunt says it's apt that Sparc is based in Adelaide, given South Australia's leading role in renewables and hydrogen development.

Currently, the state derives 68 per cent of its power from renewables and by 2030 solar and wind are expected to account for 100 per cent of grid power.

Meanwhile, Sparc has amassed an impressive armoury of patents in the field of graphene-based additives. The key applications include protective coatings to reduce corrosion in the $US40 billion-plus marine and critical infrastructure sectors.

The graphene business also has a strong environmental flavour, as graphene can be used to make materials such as steel and cement lighter and stronger (thus reducing their carbon-heavy footprint) and to improve batteries.

Hunt says Sparc's $50 million market capitalisation doesn't capture the near-term revenue potential of the graphene business, let alone Sparc Hydrogen's unique status as the bourse's only PWS-based hydrogen play.

"We are involved in multibillion industries where we are looking to apply graphene solutions, while hydrogen's role in getting the world to net zero emissions is a multitrillion-dollar task," he says. "We are really at the cutting edge of some massive step changes in material usage and energy production."