



Low-Carbon Heat Storage for Industry

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1414 Degrees

Silicon technology for fossil fuel replacement in industry

South Australian publicly listed company (ASX:14D)

Focus on TES for decarbonising hard-to-abate heavy industrial sector

Major company partners for funding and production - Woodside, Refratechnik

Product development for clean heat and hydrogen supply to industry

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A BETTER
FUTURE



REFRATECHNIK



CLEAN
INDUSTRIAL
HEAT™



Prototype (2016)

Silicon heat store with Stirling Engine
Regenerating 30KW electricity



TESS-IND (2018)

6 MWh-th TES connected to a gas
turbine Regenerating 180KW electricity



GAS-TESS (2019)

Biogas powered 6 MWhth storage coupled to gas turbine
Installed at SA Water's Glenelg WWTP



SiBox Module (2023)

Contains SiBrick™ latent heat battery
outputting up to 900°C stable hot air

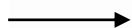
SiBox[®] Demonstration Module

Robust and reliable de-risked technology for clean heat supply from variable electricity supply

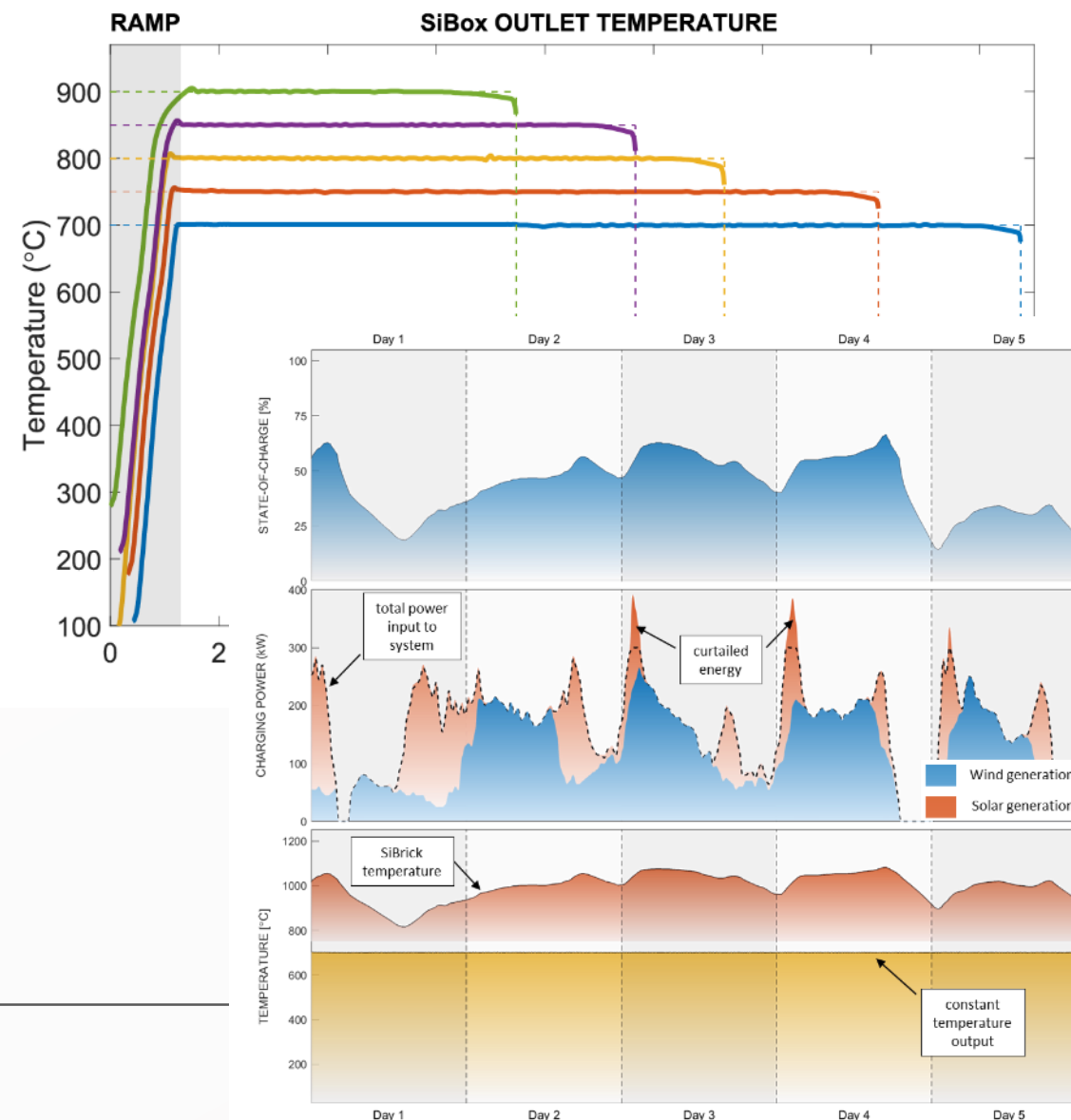
A\$6m+ project **operational** since March 2023

Proven **consistent** supply of clean hot air up to **900°C**

Proven **scalability** – SiBrick modules can be replicated for GWh storage



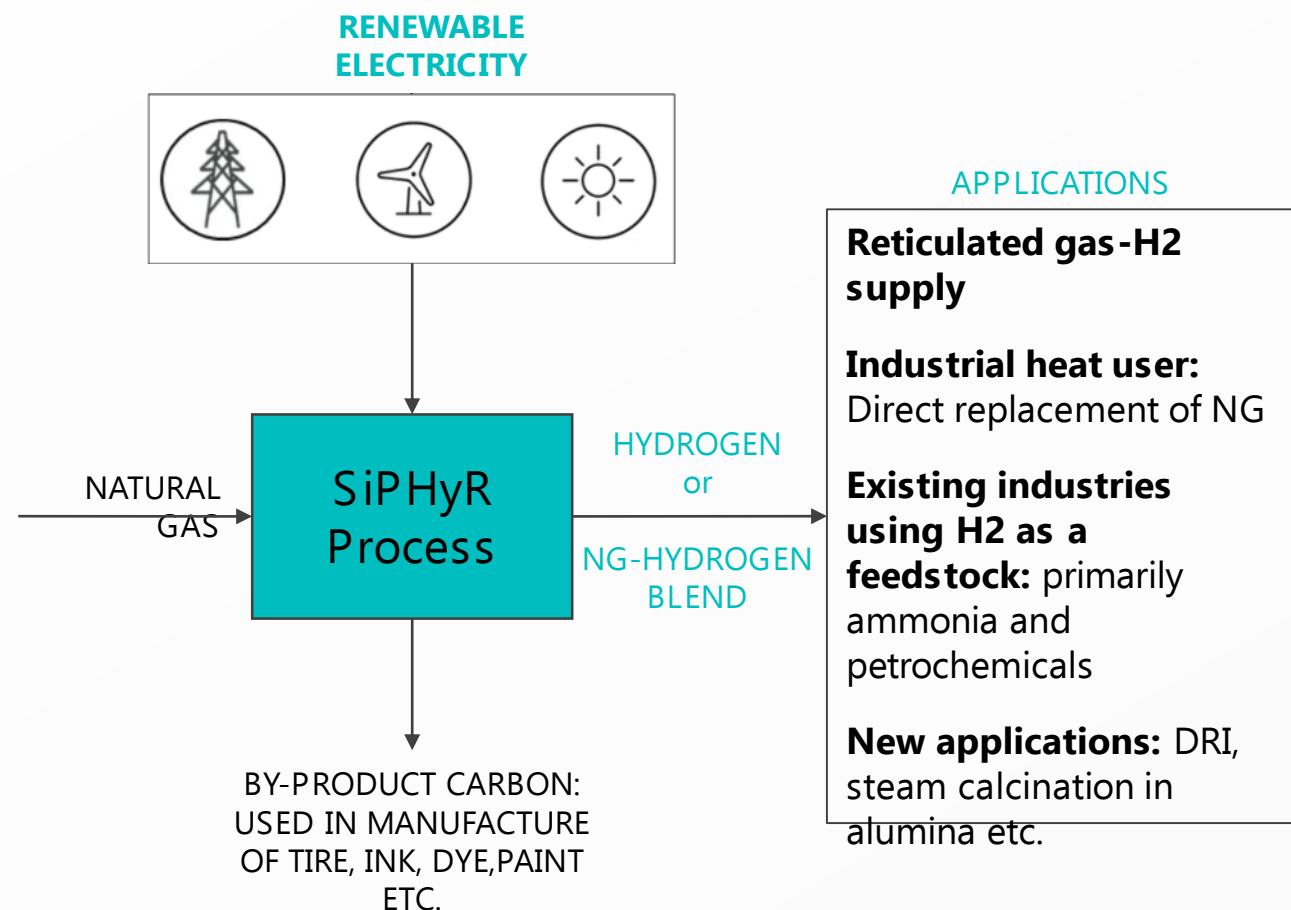
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SiPHyR™ – **Si**Brick integrated **Py**rolytic **H**ydrogen **R**eactor



Combining SiBrick and a novel bubble column reactor technology to deliver decarbonised natural gas for industries



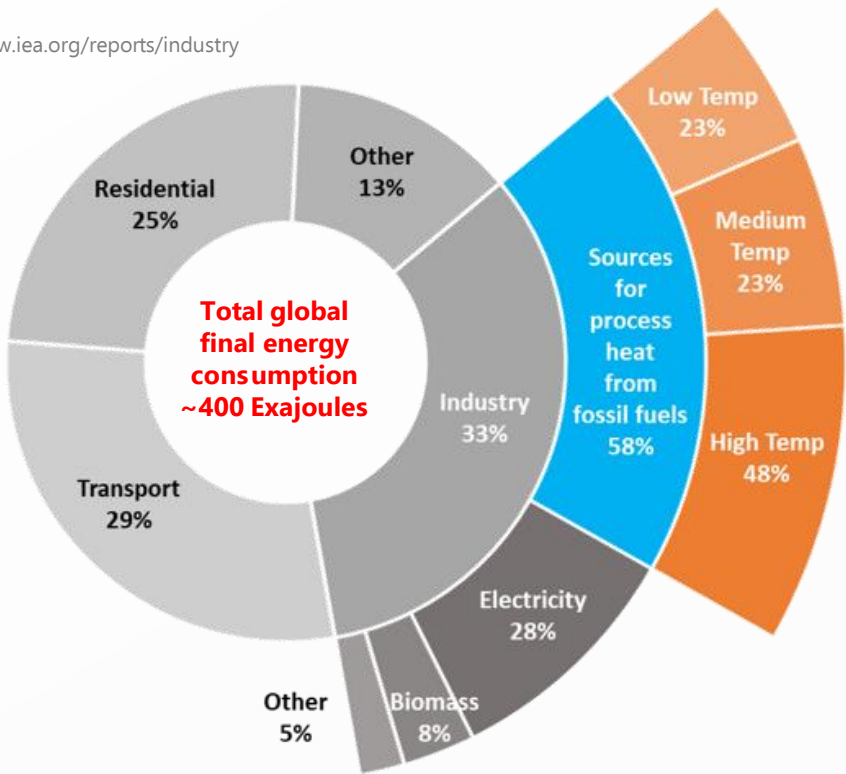
- Low-emissions H₂ could supply 25% of world's energy needs and become a EUR 10 trillion market by 2050, if <US\$2/kg price point is achieved
- **Turquoise H₂** – potentially lower cost and more attractive alternative to blue or green H₂. Leverage existing infrastructure to scale up. Faster path to scale-up
- \$5.2 million project with \$2.5M funded through the Australian Government's CRC-P scheme
- Project partners include Woodside, Kanthal, U. Adelaide and RMIT. 14D has exclusive license to commercialise SiPHyR

Decarbonisation is a global problem



20% of global energy-related CO₂ emissions come from industrial heat *i.e. excluding electricity**

*www.iea.org/reports/industry



Clean heat potential from SiBrick™



8 Million GWh addressable market for 14D energy storage in range 100–1000°C (equivalent to displacing ~1.5 Gt-CO₂ emissions annually). 14D products have a key advantage in 2 Million GWh from 500–1000°C range.

High temperature clean heat applications - target segments



Difficult to decarbonise industries form hundreds of billion \$ market for LDES

SiBrick® / SiBox® / SiPHyR™

steam hot air
power carbon-
hydrogen capture



low-emissions



alumina, cement, iron and steel,
hydrogen, fertilizers, grid services





Thank you.

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