HEXAGON

Hexagon Energy Materials Ltd

Pedirka Blue Hydrogen Project

ASX: HXG, March 2021

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Contents

HEXAGON

Pedirka Blue Hydrogen Project

Hexagon Energy Materials

01

Corporate Overview

HEXAGON ENERGY MATERIALS LTD

0 3 Mar 2020–2 Mar 21

ASX Code	Share Price (02/03/21)	Market Capitalisation	Shares on Issue
HXG	**A$0.095**	**A$28.6M**	**301.2M**
Options/Rights	52 week high	52 week low	Average daily volume
4M	**A$0.14**	**A$0.013**	**562,791**

TOP FIVE SHAREHOLDERS

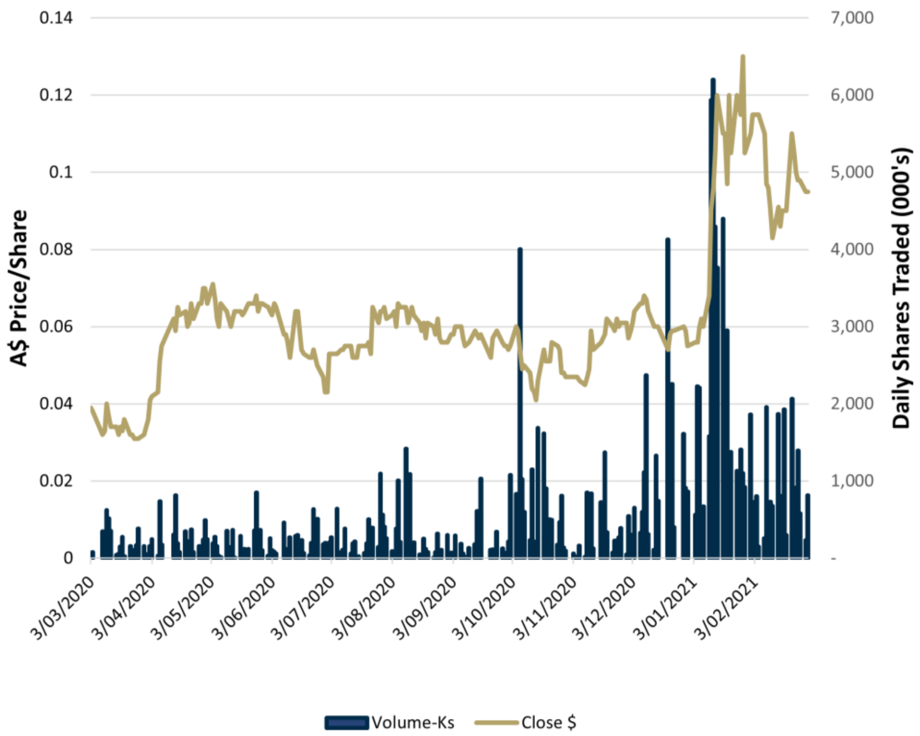
As at 26 February 2021

Holder	Shares (Millions)	Holding %
Citicorp Nominees Pty Ltd	**21.90**	**7.27**
UBS Nominees Pty Ltd	**19.16**	**6.36**
HSBC Custody Nominees (Aust) Ltd	**13.62**	**4.52**
Custodial Services Ltd Beneficiaries Holding A/C	**10.52**	**3.50**
HSBC Custody Nominees (Aust) Ltd	**9.92**	**3.30**

Substantial Shareholder: Tribeca Investment Partners Pty Limited (10.75%)

HXG SHARE PRICE

3 Mar 2020–2 Mar 21



Corporate Leadership Team

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Charles Whitfield
Chairman

Clean Energy resource specialist. Undertook turnaround of lithium producer Galaxy Resources Ltd as Executive Director. Former MD in Investment Banking with Citigroup & previously Deutsche Bank.

Adam Bacon
Ebony Energy – Managing Director

Extensive global expertise in the energy, resources and transportation sectors. Having held senior leadership roles within General Electric, UGL and most recently the Andrew Forrest backed Australian Industrial Energy.

Garry Plowright
Non-Executive Director

Extensive experience in the resource sector, having a background in mining law and administration as well as regulatory process and mine development.

Lianne Grove
Commercial / BD

Extensive global expertise in project development and commercial management in Oil & Gas at AWE Ltd and Sea Trucks Group and mining experience at Rio Tinto.

Corporate Strategy

Hexagon's strategy is focused on exploration and development of clean-energy, and energy materials projects

Ownership
100%
(subject to compulsory acquisition)

Project
Pedirka Project

Material
Blue Hydrogen

Ownership
100%

Project
McIntosh Project

Material
Graphite, Nickel & PGE's

Ownership
80%

Project
Alabama Exploration

Material
Graphite

Ownership
100%

Project
Halls Creek

Material
Gold & Base Materials

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Pedirka Blue Hydrogen Project

02

The Pedirka Project

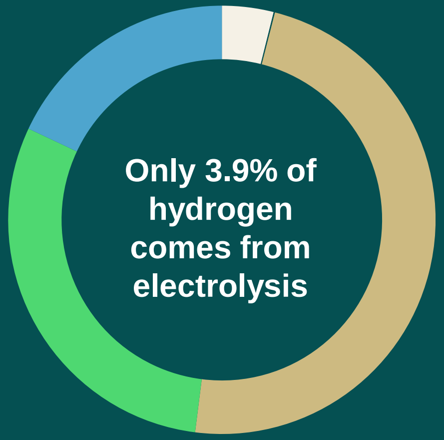
Regionally important Blue Hydrogen

- The development of the Pedirka Project in the Northern Territory basis is 'clean' Blue Hydrogen - that is to say zero carbon emissions.
- Blue hydrogen will provide the gateway for the conversion to hydrogen economies over the coming decades.*
- Hexagon looks forward to developing future green hydrogen projects enabled by providing clean and economically viable blue hydrogen into the current market.

- Only hydrocarbon-based production can currently provide the volumes and cost for viable hydrogen platforms. However, "Grey" or "Brown" producers are going to become sidelined as they fail to meet emission requirements.
- Currently 96% of Hydrogen production is derived from hydrocarbons. The largest component from Gas, followed by oil and then coal.

*IRENA predicts that Blue Hydrogen will still account for 1/3 of Hydrogen production in 2050 ("Hydrogen: A renewable energy perspective" IRENA; 2019)
** "Hydrogen's future: reducing costs, finding markets" December 10, 2019 by Dolf Gielen and Emanuele Taibi
Graph: Martin Khzouz and Evangelos I. Gkanas Sep 2020

HYDROGEN PRODUCTION, STORAGE & INFRASTRUCTURE DEVELOPMENT



Not all off this has a "green" energy source. By some estimates 99% of Hydrogen is produced from fossil fuels (including fossil fuelled electrolysis)**

48% Steam reforming of natural gas
30% Oil/naptha Reforming
18% Coal Gasification
0.1% Other Sources

Ebony Energy's Pedirka Project

Blue hydrogen from coal gasification

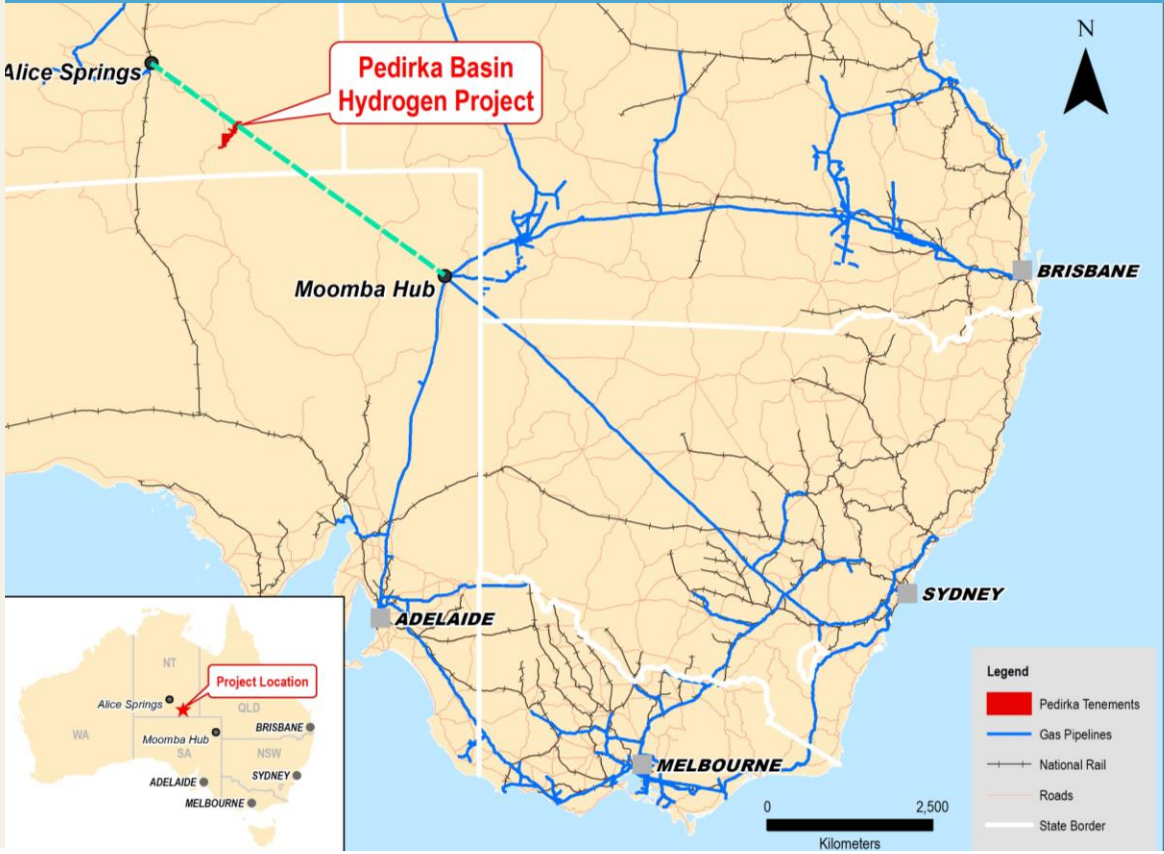
Permits held to explore the Pedirka Basin for coal, drilling and desktop-research on historical drilling undertaken to determine the shape, size and potential of the Basin.

The plan is to extract coal as a feedstock to a gasification plant, converting the coal to produce hydrogen for export or domestic markets

Uniquely located with respect to oil & gas infrastructure to offer unique advantages for large scale hydrogen gas production

Zero carbon emissions through CO2 sequestration and enhanced oil recovery projects

Ideally located near existing infrastructure to transport product and undertake CCUS of CO2



Project Location

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Ideally geographically located

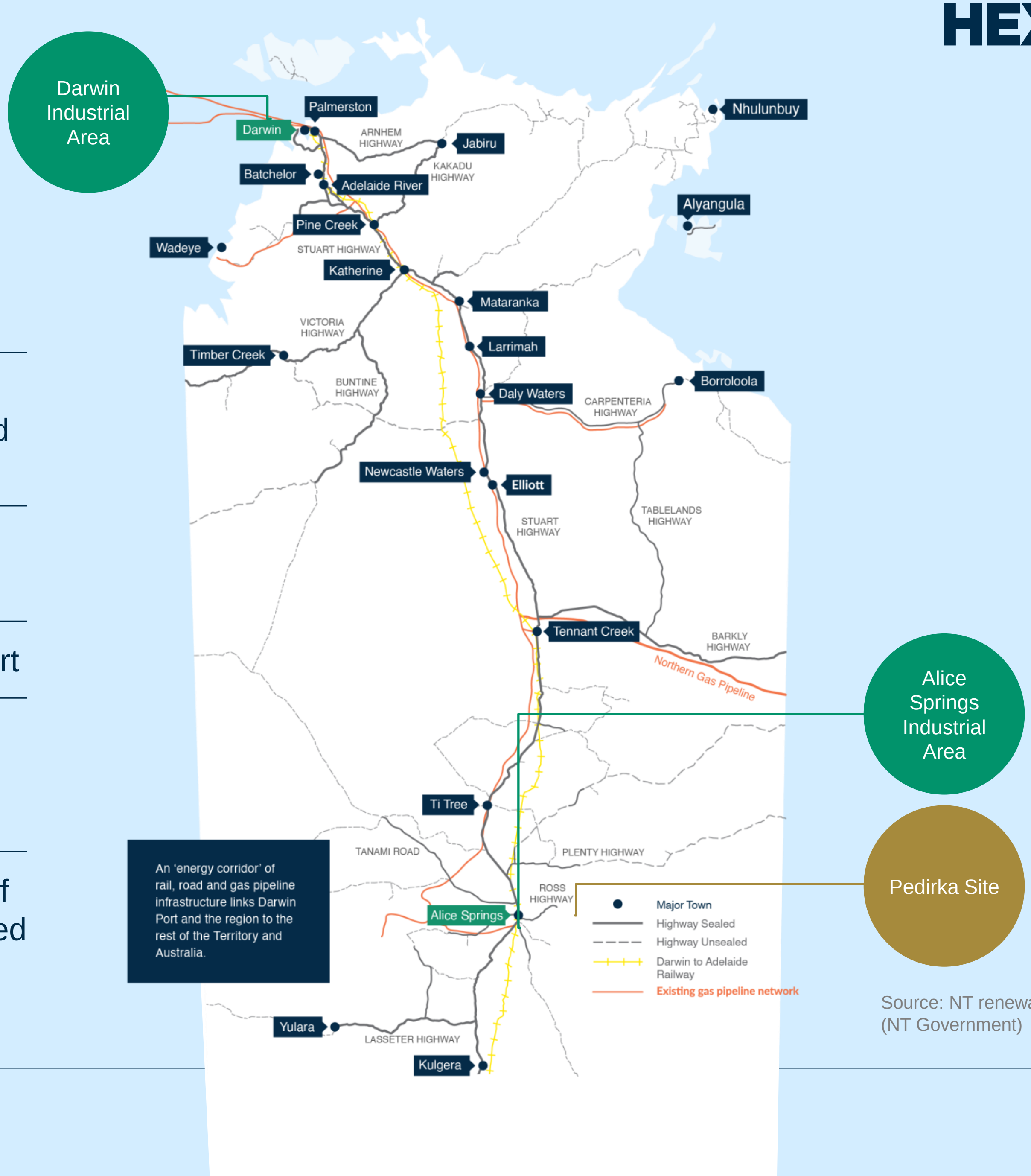
Workforce availability due to the proximity to Alice Springs, with processing plant to be located on the outskirts of the town

Strong indications of support from Federal and State Governments

Potential for both state, federal and NAIF support

Easy access to existing pipeline infrastructure offers a number of options to access undersupplied markets

Underutilised rail is also a supply chain option if hydrogen derivative such as ammonia is produced



Source: NT renewable hydrogen strategy (NT Government)

Pedirka Blue Hydrogen Project

The Hydrogen Market

03

Hydrogen is gaining momentum

Versatility a key positive in global decarbonisation efforts

The use of Hydrogen is very broad, however it is currently mostly used as an industrial gas in ammonia production and oil refining.

Hydrogen can be used as a source of energy or feedstock. When used for energy, the material by-product is water vapour. It can also be transported and used as a gas or a liquid.

Key global drivers include

- Action to reduce GHG emissions, carbon pricing increasing
- Increasing recognition around the limitations of electrification, particularly for industrial sectors
- Air quality
- Fuel security
- Opportunity for downstream, energy-intensive industries
- Opportunity for innovation and technology leadership

Why now?

Underpinned by mature technologies that means market activation can proceed (CSIRO)

Hydrogen is gaining momentum

Hydrogen Council highlighted 228 active projects currently

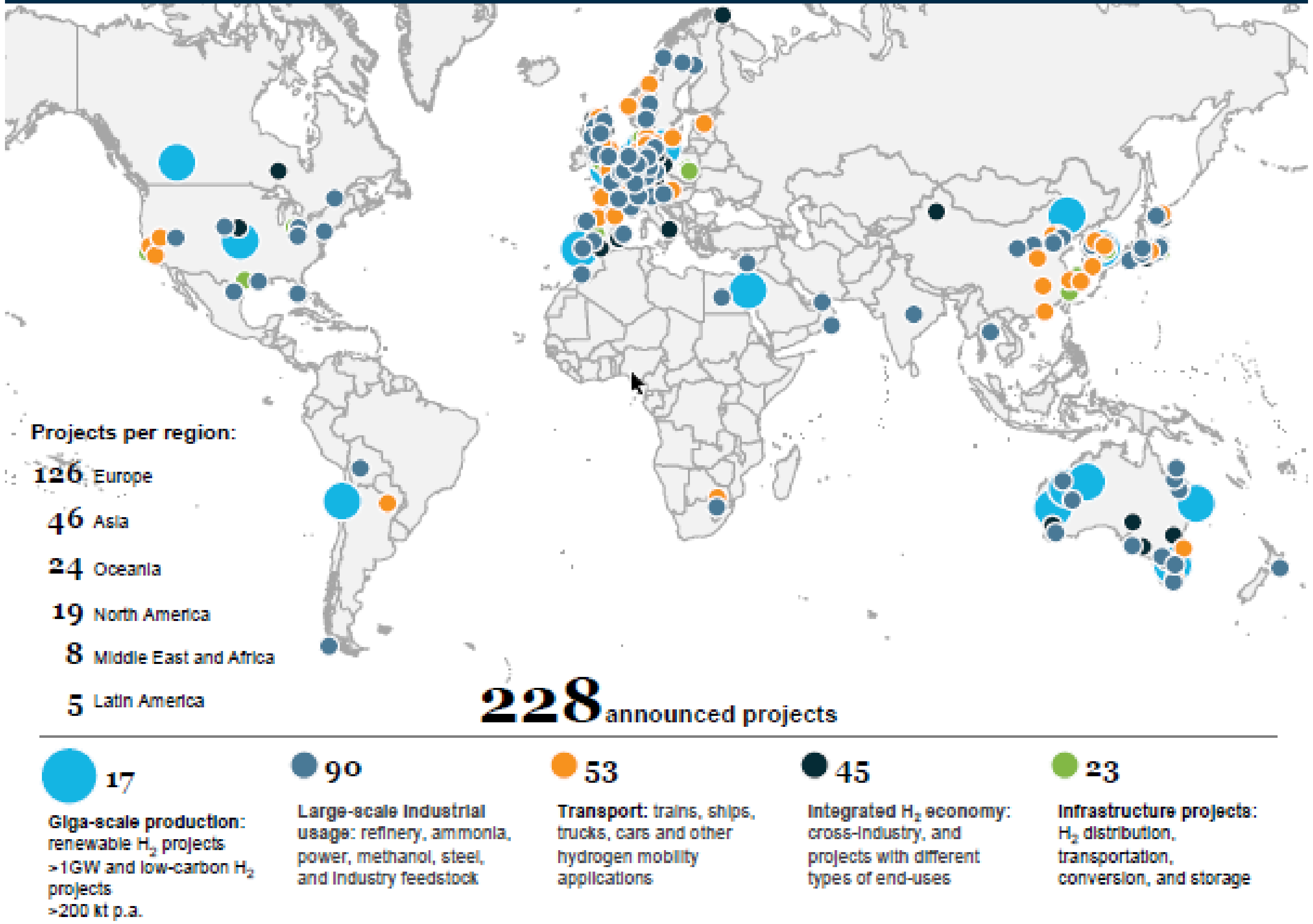
Largest projects in Europe, Australia, Middle East and Chile

Asia and Oceania are 2nd and 3rd in number of projects after Europe

Most of the Asian projects are for usage of hydrogen, rather than production

Critical source of demand for Australian projects

228 HYDROGEN PROJECTS GLOBALLY ACROSS THE VALUE CHAIN



Source: Hydrogen Council

Hydrogen is gaining momentum

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Australian governments have lofty ambitions

Australia launched its National Hydrogen Strategy in Nov-19, with 2030 goals including

- One of the top three exporters of hydrogen to Asian markets
- A destination of choice to international investors
- Major offtake or supply chain agreements in place with importing countries
- Demonstrated capability in all links of the supply chain and economic benefits to the domestic market

States/territories with consistent policies

SA, QLD, WA

TAS, NT, ACT

Intersection with post Covid-19 priorities

- Investment in low emissions technologies
- Gas-fired recovery
- The electricity trilemma (affordability, reliability, security)
- Modern manufacturing
- Fuel security
- National resources and downstream processing
- Future fuels

LARGE SCALE MARKET ACTIVATION FROM 2025

Identify signals that large-scale hydrogen markets are emerging

Build and maintain robust and sustainable export and domestic markets and supply chains

Scale up projects to support export and domestic needs

Enable competitive domestic markets with explicit public benefits

Build Australian hydrogen supply chains and large-scale export industry infrastructure

Supply chain infrastructure includes powerlines, pipelines, storage tanks, refuelling stations, ports, roads and railway lines and any other facilities needed for hydrogen supply.

Source: Australia's National Hydrogen Strategy, Nov-19

Demand forecast to be strong

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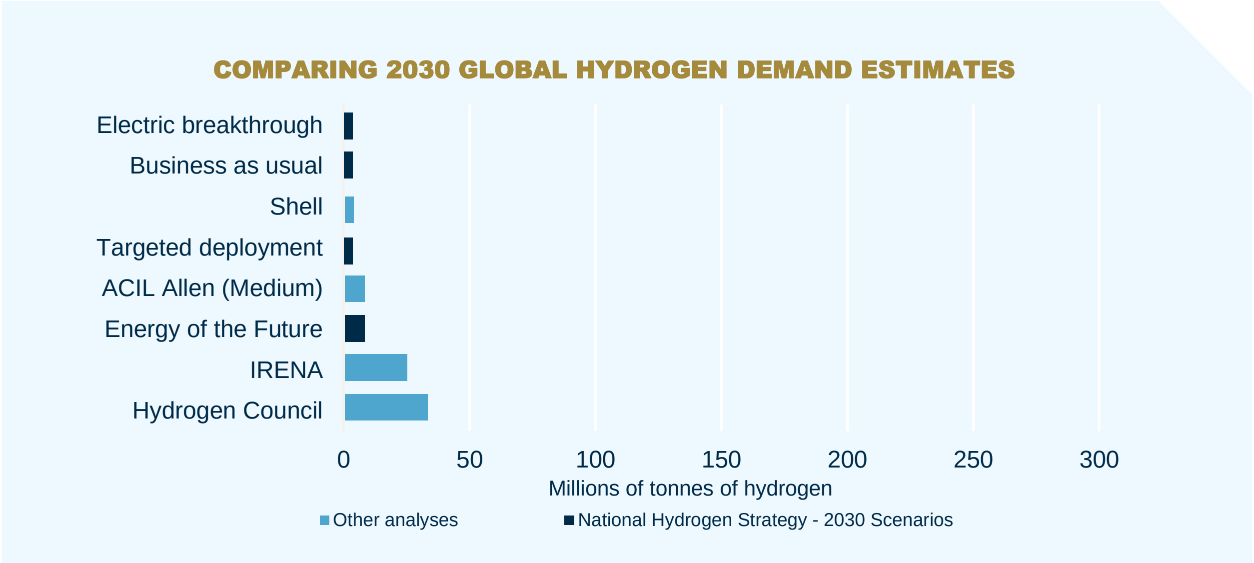
From a current market of ~70mtpa, incremental demand expected to be meaningful

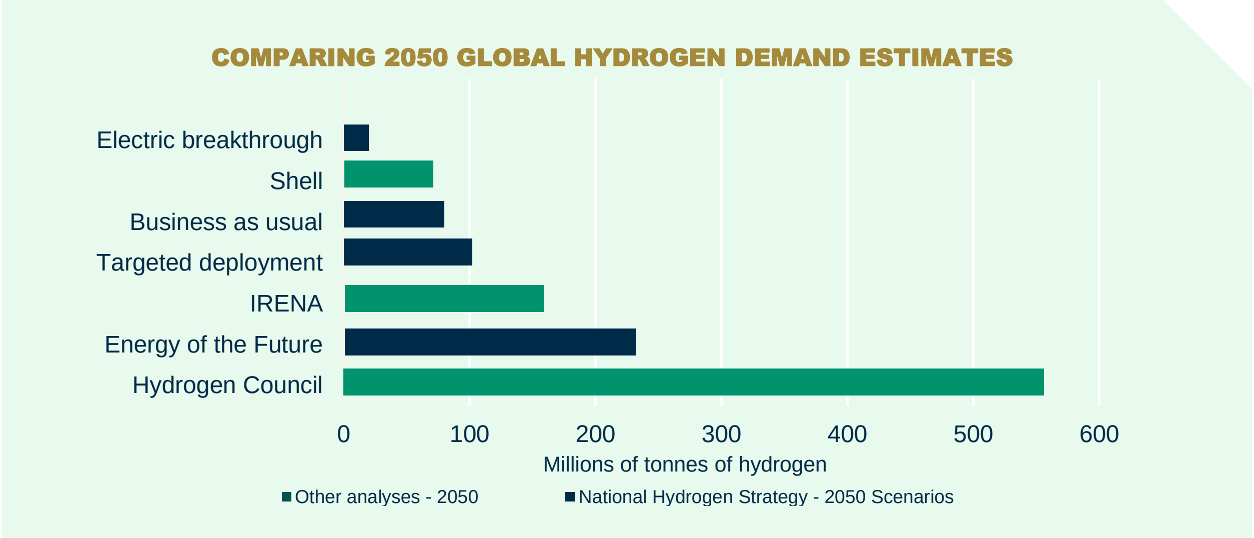
Australia's National Hydrogen Strategy (Nov-19) scenarios highlighted demand pathways as technology adoption and decarbonisation efforts gather pace

- Incremental 2-9mtpa by 2030
- Incremental 20-230mtpa by 2050

It also recognised that there were a wide range of potential outcomes from other sources

- Hydrogen Council includes power generation, transport, industrial energy, building heat/power and new feedstocks





Source: Australia's National Hydrogen Strategy, Nov-19

Demand forecast to be strong

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Australian demand will develop in hubs, but regional demand will be larger

The Australian government is looking to develop hydrogen hubs to de-risk developments and drive domestic benefits

- NT strategy highlights opportunity at Middle Arm Industrial Precinct at Port of Darwin

Japanese utilities demonstrating progress in co-firing ~20% ammonia in coal-fired power plants

- IEA estimated if all Japanese coal-fired plants did so, it would add ~20% to global demand for ammonia (~180mtpa)
- Japan's METI has indicated expected incremental hydrogen demand of ~300ktpa by 2030 and >10mtpa by 2050

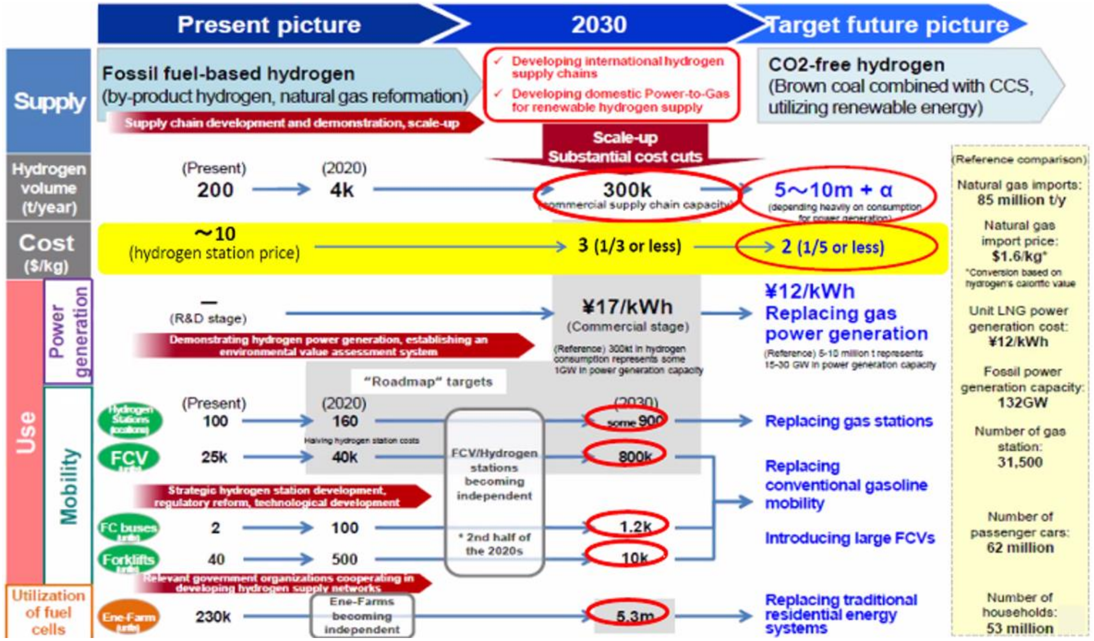
South Korea particularly focused on transport sector applications

- Expects imports of >5mtpa by 2040

Asia fast developing demand for hydrogen, not production

Gas blending is a large potential use-case (see over)

JAPANESE HYDROGEN GOALS FOR 2030 AND BEYOND



Source: Japan's METI (Ministry of Economy, Trade & Industry), CFAA

The role of blue hydrogen

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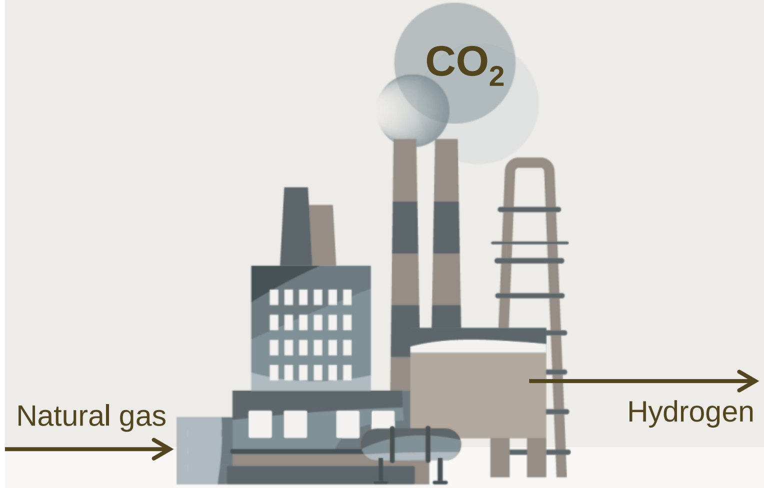
THE DIFFERENT COLOURS OF HYDROGEN

Hydrogen

Brown / Grey

- Most hydrogen produced is derived from fossil fuels
- Most common is steam methane reforming of natural gas, coal gasification common in China



Hydrogen

Blue

- Blue hydrogen uses traditional production method with CCUS (carbon capture, utilisation & storage)
- Increase in hydrogen cost driven by CCUS solution and easier to scale currently
- Ebony has designed a production process that captures CO_2 and also converts CO_2 to syngas and methane

Hydrogen

Green

- Green hydrogen produced from electrolysis of water using renewable energy
- Not yet cost competitive at commercial scale, but a significant focus for governments

2020

2030

The role of Blue Hydrogen

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Required to develop supply chain infrastructure and end-markets

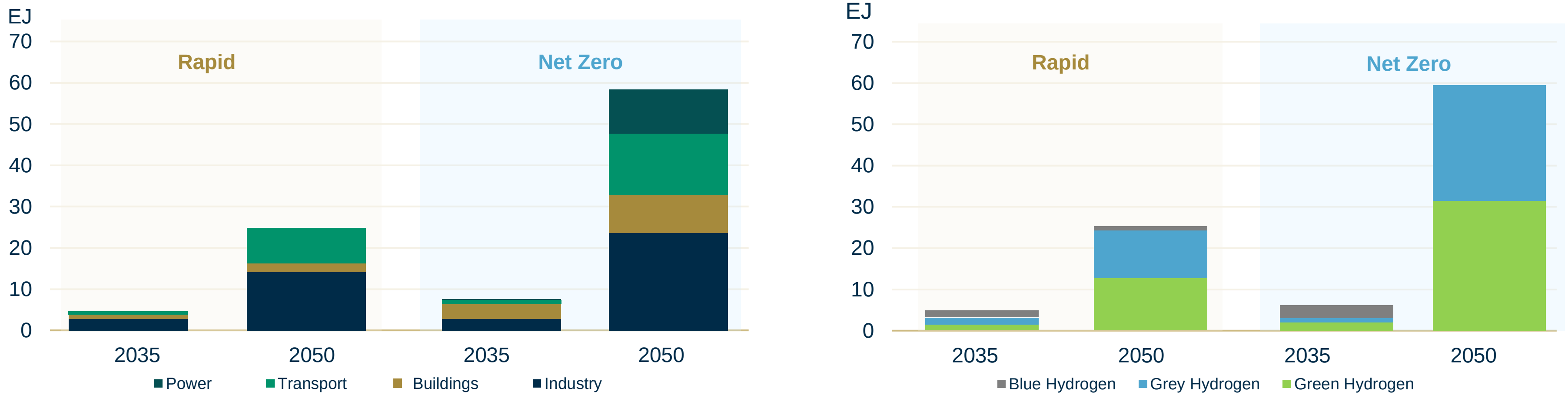
Key end markets such as Japan and the EU highlight the need for blue hydrogen in the near-term

- As above, Japan still sees a need for blue hydrogen post 2030
- EU Hydrogen Strategy (July-20) states low-carbon (blue) hydrogen is needed to "rapidly reduce emissions from existing hydrogen production and support the parallel and future uptake of renewable [green] hydrogen"

Drivers are cost competitiveness and ability to achieve scale

- This is critical for developing supply chain infrastructure and end-markets
- In the medium/long-term, blue hydrogen growth should allow faster ramp-up of overall hydrogen use than green hydrogen alone due to the already significant required increase in renewable energy capacity (source: BP)

HYDROGEN USE BY SECTOR AND HYDROGEN PRODUCTION BY SOURCE



Source: BP

The role of Blue Hydrogen

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Cost competitive immediately with the right incentives

CF Industries and Yara, the top two global producers of ammonia, have both indicated that they are investing in decarbonisation of production

EU Hydrogen Strategy used IEA data to estimate costs of brown/grey hydrogen of €1.5/kg

Compared to blue hydrogen of €2.0/kg and green hydrogen of €2.5-5.5/kg

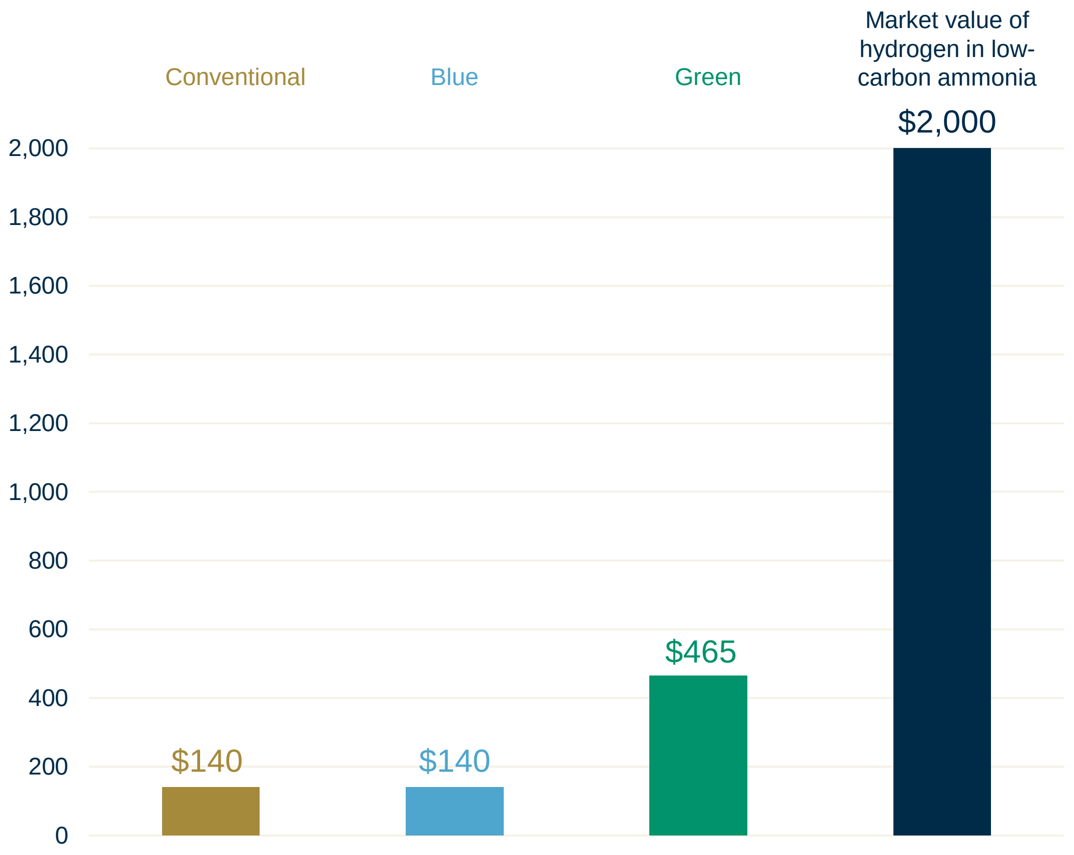
European market is assessing CCUS options using North Sea storage

CF Industries has highlighted that blue hydrogen can be a similar cash cost to conventional production

The key driver is US Section 45Q tax credits, which offset the incremental cost of CCUS.

Note the market value shown is based on the California retail refuelling markets and is unlikely to be reflective of the value received once production is scaled.

AMMONIA CASH COSTS FOR CF INDUSTRIES



Source: CF Industries

Australian developments

Explicit support for CCUS

Low Emissions Technology Statement set two related targets relevant to the Pedirka blue hydrogen project

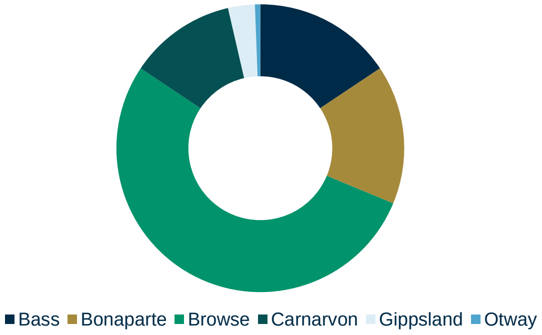
- Reducing hydrogen production costs to $2/kg
- Reducing the cost of CCUS to <$20/t of CO_2
- Santos has highlighted the importance of Australian Carbon Credit Units to business case

Pedirka appears well located

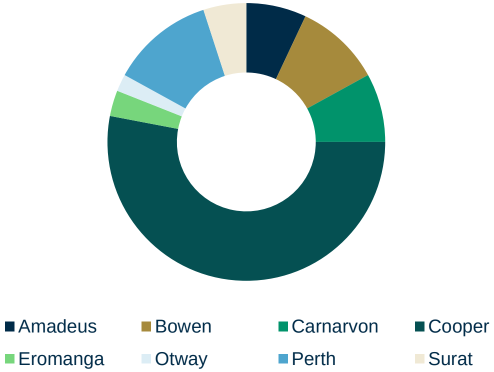
- Green is best onshore CCUS locations
- Cooper Basin has scale storage potential

Australia's offshore and onshore CO_2 storage potential by basin

Offshore potential storage volume
15,591Mt CO_2

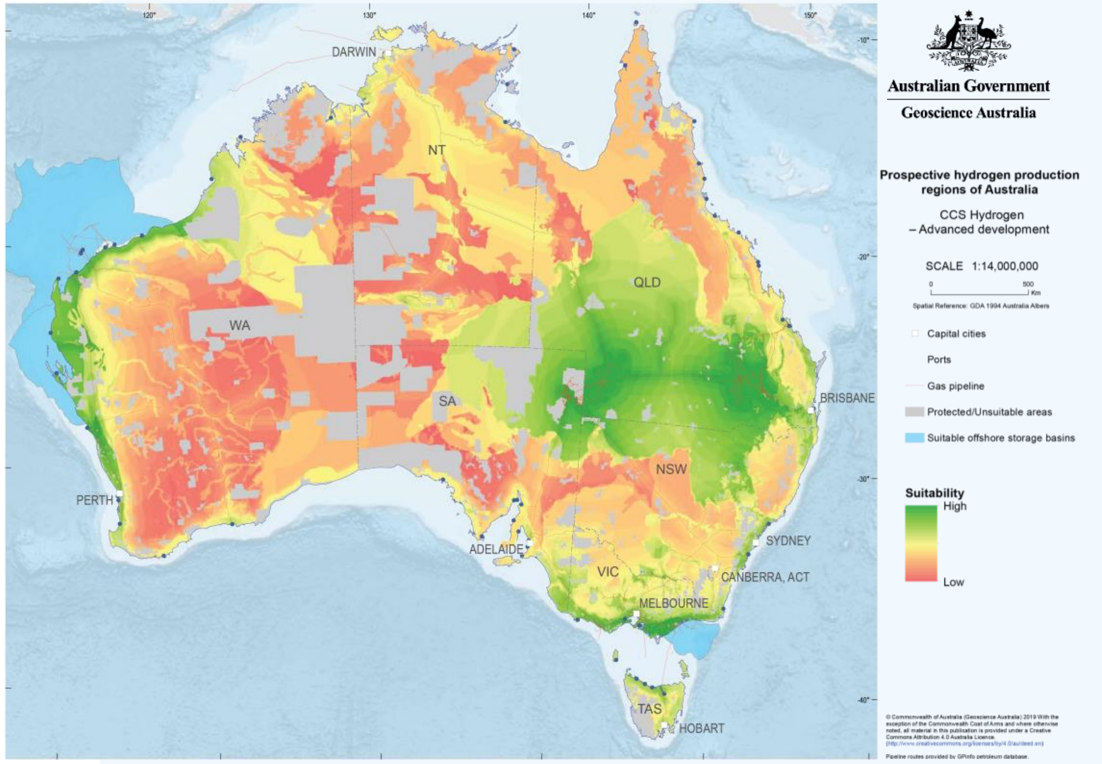


Onshore storage potential
938 Mt CO_2



Source: Australian Carbon Storage Taskforce report, 2009

Australia's most prospective CCUS locations, considering infrastructure availability



Source: Australia's National Hydrogen Strategy, Nov-19

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