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# Hazer Group Ltd

Clean hydrogen technology to decarbonise the world

Australian Hydrogen Conference

Panel discussion – Hydrogen's role in decarbonising heavy industry

7 December 2022







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# Disruptive hydrogen production technology

Well positioned to play a substantial role in global decarbonisation.



Rapidly growing demand for hydrogen in a US\$12 trillion market by 2030



A low emission hydrogen technology with strong competitive advantage



Commercial Demonstration
Plant de-risking technology
with production for 2023



Clear pathway to commercial scale at Burrard-Hazer Plant, Canada



**Building global partnerships** across strategic markets and with stakeholders in hard-to-abate industries



Balance sheet strength to fund projects, R&D and business development programs

Highly experienced team and extensive R&D capability

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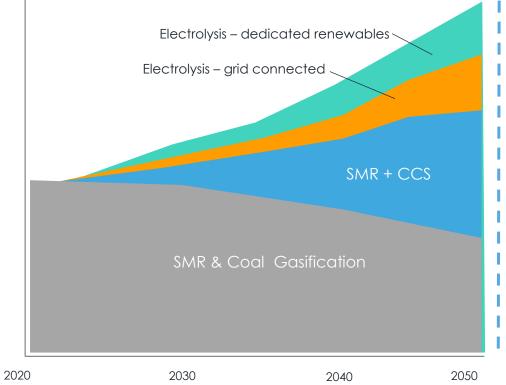
# Building a leading position in a rapidly growing market

200

Current market ~95<sub>MTPA</sub>

500<sub>MTPA</sub> in 2050\*1

in 2050\*1



Addressable Market for Hazer



© Getty Images

Global production of hydrogen as feedstock – in million tonnes p.a.<sup>2</sup>



# Clean H<sub>2</sub> technology with strong competitive advantage

Innovative low emission methane pyrolysis technology designed to produce clean hydrogen and graphitic carbon.

## **Existing Technologies**

## Steam Methane Reforming (SMR)

 $CH_4 + 2H_2O \rightarrow CO_2 + 4H_2$ 

#### Significant CO<sub>2</sub> emissions

- Most widely used process for the generation of hydrogen (~95%)
- High CO<sub>2</sub> emissions
- Requires CCS\* to address emissions; expensive and difficult

## **Electrolysis**

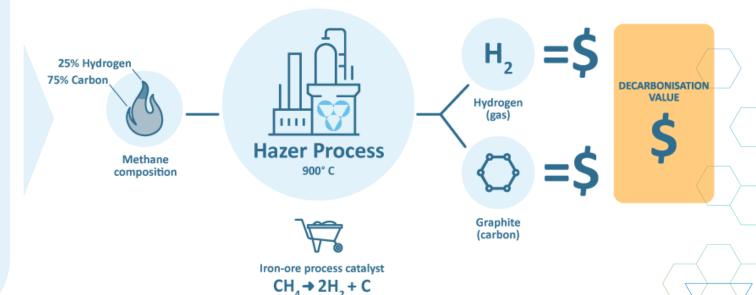
 $2H_2O$  (+ energy)  $\triangleright O_2 + 2H_2$ 

#### **Energy intensive process**

- 7x more energy intensive than SMR
- Only low emission if 100% renewable energy









# Technology upscaling...

Rapid development since company founding.





(~<2 kg/hr\* semi-continuous)



(< 60kg/hr\* continuous)



(<1g\* batch)



2016-present

## Scaled up bench

University of Sydney

scale

· Catalyst kinetics and process research

2017

## Bench scale fluidised bed

- University of Sydney
- Conceptual testing of fluidised bed concept

2017-2021

#### **Pilot Plant**

- Sydney and Kwinana (Perth)
- Fluidised bed with optimized conditions and catalyst injection

2022

## Commercial Demonstration Plant (CDP)

- Perth, Australia
- End-to-end continuous plant with biogas feed

2007-2013

## Bench scale testing

- · University of Western Australia
- PhD (Dr. Andrew Cornejo)
- Concept evaluation



# ...and clear commercial pathway



Maria 2000

May 2020

2023

First hydrogen targeted

ARENA funded (A\$9.4m) using biogas feedstock

2020-2022

Construction completed



25x
CONCURRENT
SCALE-UP



## 100,000tpa+ Commercial Plant

2025+

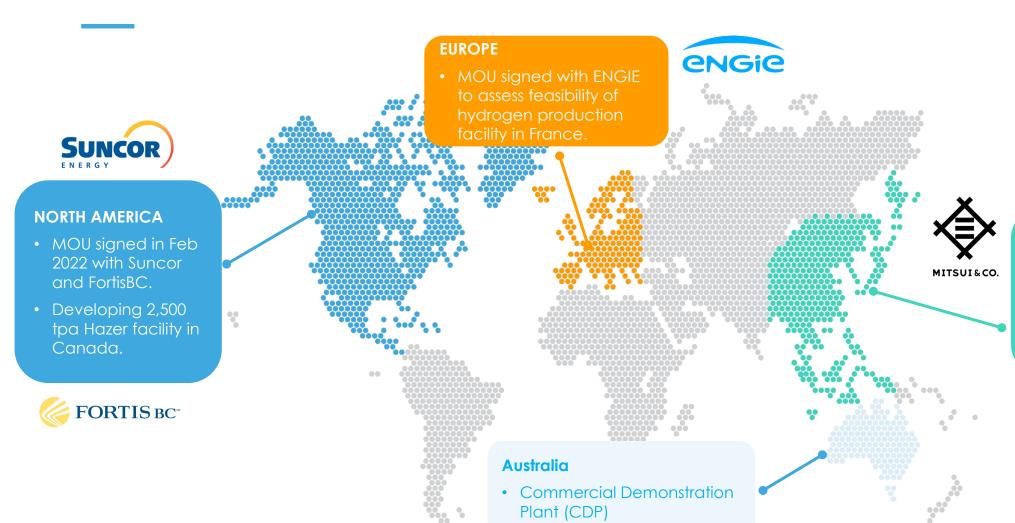
Commercial Scale

Target Markets
North America, Europe, Asia





# Establishing a presence in target markets



## Asia

- Non-Binding MOU signed with Mitsui
- Jointly investigate potential market for Hazer graphite.



# Unlocking the value of our graphite



- Mitsui & Co is a leading international trading and investment group based in Japan.
- MOU signed with Mitsui to jointly investigate the market for Hazer graphite.
- Explore possible customers, applications and partners in Asia, Oceania, Northern America, Europe and the Middle East.
- Focus on hard to abate sectors such as steel making and chemical industries.

# JAPAN Hydrogen & Decarbonisation Strategy



Committed to net zero carbon by 2050,

including hard to abate sectors



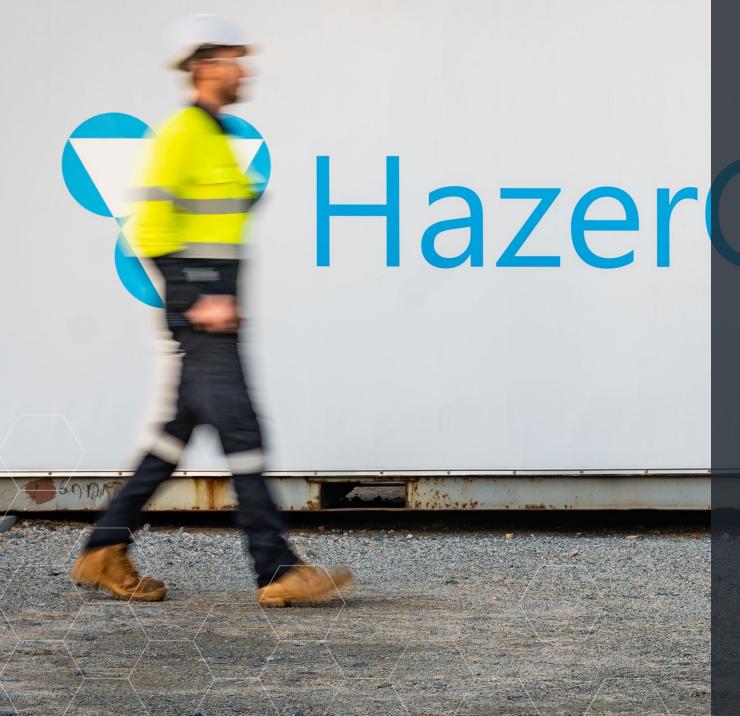
Steel industry accounts for 40% of total

CO<sub>2</sub> emissions from industrial sectors



Launch of Green Innovation Fund

(approx. USD 16 billion)



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