HAZER GROUP LTD

LOW COST - LOW EMISSION HYDROGEN & GRAPHITE PRODUCTION

COMPANY OVERVIEW – MARCH 2018

HAZER GROUP LIMITED

LOW COST
LOW EMISSION
HYDROGEN
& GRAPHITE
PRODUCTION PROCESS

Founded in 2010 to commercialise technology initially developed at the University of Western Australia

Nearly 10 years development, collaboration with leading Australian universities

Listed on ASX since Dec 2015; returned over 3x proceeds to IPO investors

Binding Co-Operation Agreement with $4bn ASX-listed Mineral Resources Ltd for the development of a commercial scale synthetic graphite plant

MoU with Primetals Technologies GmbH (Siemens and Mitsubishi Heavy Industry) to investigate integration of Hazer Process in steel production

Currently undertaking scale up development work with pre-pilot plant constructed / commissioned

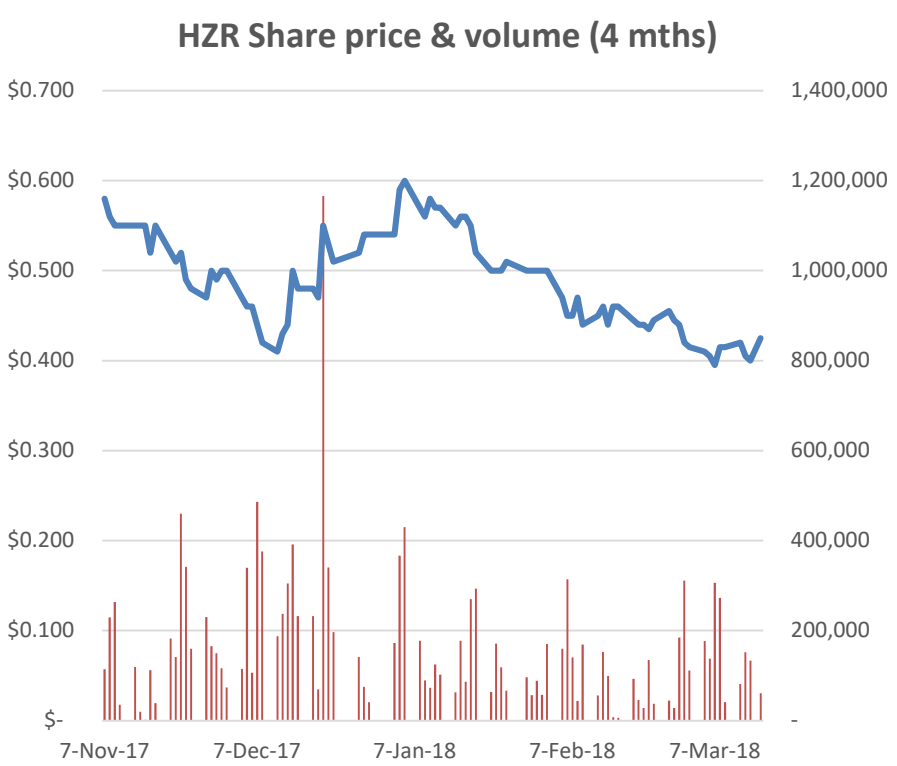
CORPORATE AND MARKET SNAPSHOT

(ASX: HZR, HZRO)

Capital Structure	
Current Shares on Issue	88.1m
Market Capitalisation @$0.45	$ 40m
Cash @ 31 Dec 2017	$ 8.3m
Total Options	55.4m
"In the Money" (ex price <$0.50)	46.8m
Fully Diluted Market Cap (<$0.50 options)	$60m
Total Cash From <$0.50 Options Exercise	$15m
Total Cash From all options	$31m

Substantial Shareholders	
Mineral Resources Ltd	10.3m
Mr Geoff Pocock (MD)	7.2m
Dr Andrew Cornejo (CTO)	6.8m
UWA	1.5m
Total Top 20	**47%**

Share Price & Volume



HYDROGEN & ENERGY MARKETS

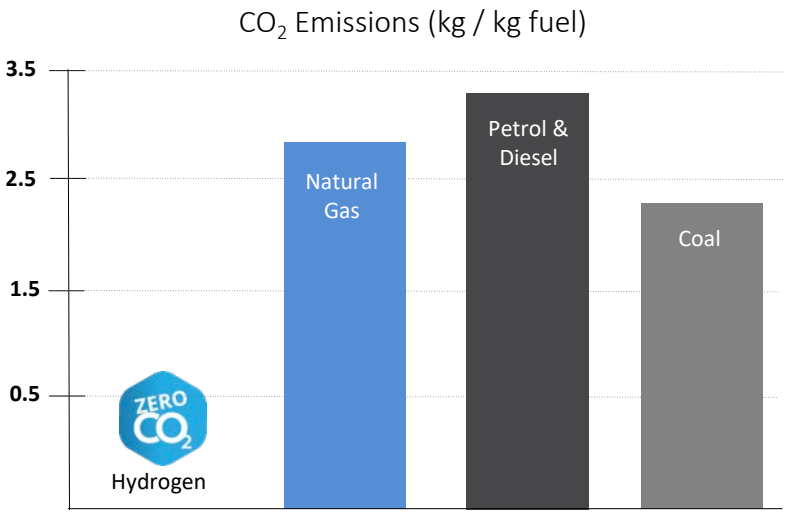
HYDROGEN OFFERS THE IDEAL CLEAN ENERGY SYSTEM

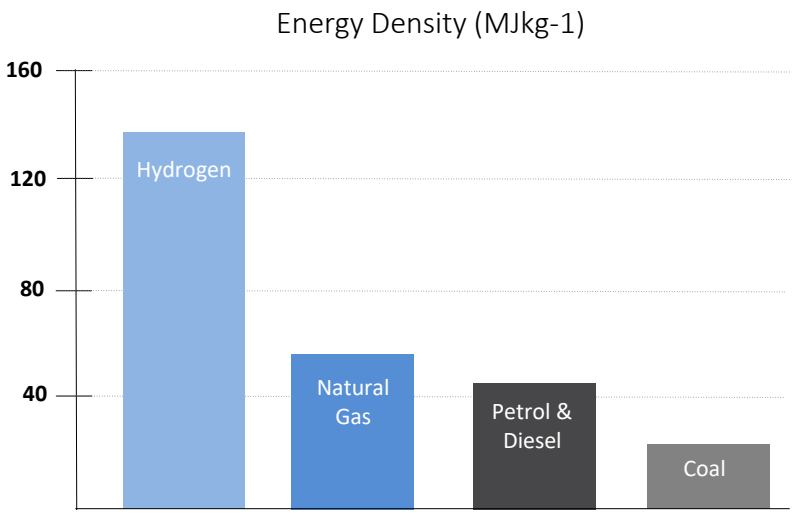
TRUE CLEAN ENERGY

Unlike fossil fuels, hydrogen represents a truly clean energy fuel, as combustion generates energy without CO_2 or other emissions

ENERGY DENSE

Hydrogen is exceptionally "energy dense" – 1 kilogram of hydrogen can generate significantly more energy than a kilogram of other fuels





SIGNIFICANT INDUSTRY, INVESTMENT TAILWINDS

AUTOMOTIVE

GM and Honda team up for cheaper hydrogen fuel cells

Scott Collie | January 31st, 2017

GM Executive Vice President Global Product Development Mark Reuss (left) and President Honda North America Toshiaki Mikoshiba announce a manufacturing joint venture to mass produce an advanced hydrogen fuel cell system (Credit: GM)

VIEW GALLERY - 3 IMAGES

Hydrogen has long been thought of as an ideal alternative to fossil fuels in cars, because it fits in with our current driving habits. Although range is improving, battery electric vehicles still take a long time to recharge, whereas fuel-cell vehicles can be topped up in a matter of minutes. Even so, traditional electric cars tend to dominate the headlines, with few appealing hydrogen options on the market. That could change soon, with GM and Honda investing a combined US$85 million in the mass production of fuel cells.

Toyota, Shell Among Giants Betting $10.7 Billion on Hydrogen

by **John Lippert**
18 January 2017, 08:00 GMT+11 *Updated on* 18 January 2017, 11:23 GMT+11

- Auto and oil companies among 13 members of hydrogen council
- Toyota sees fuel cells as more acceptable among consumers

Toyota Motor Corp. and four of its biggest car-making peers are joining oil and gas giants including Royal Dutch Shell Plc and Total SA with plans to invest a combined 10 billion euros ($10.7 billion) in hydrogen-related products within five years.

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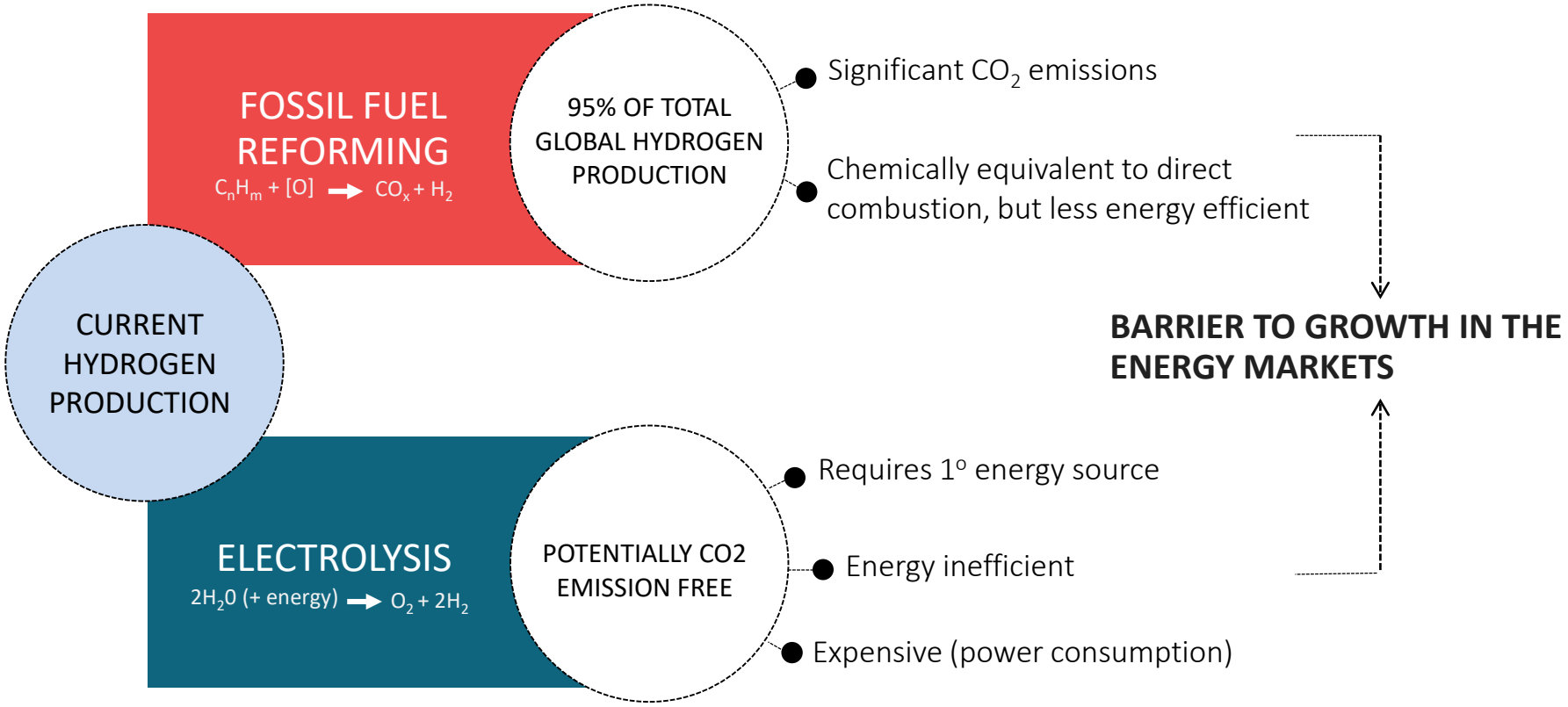
In all, 13 energy, transport and industrial companies are forming a hydrogen council to consult with policy makers and highlight its benefits to the public as the world seeks to switch from dirtier energy sources, according to a joint statement issued from Davos, Switzerland. The wager demonstrates that batteries aren't the only way to reduce pollution from cars, homes and utilities that are contributing to climate change.

THE PROBLEM WITH HYDROGEN

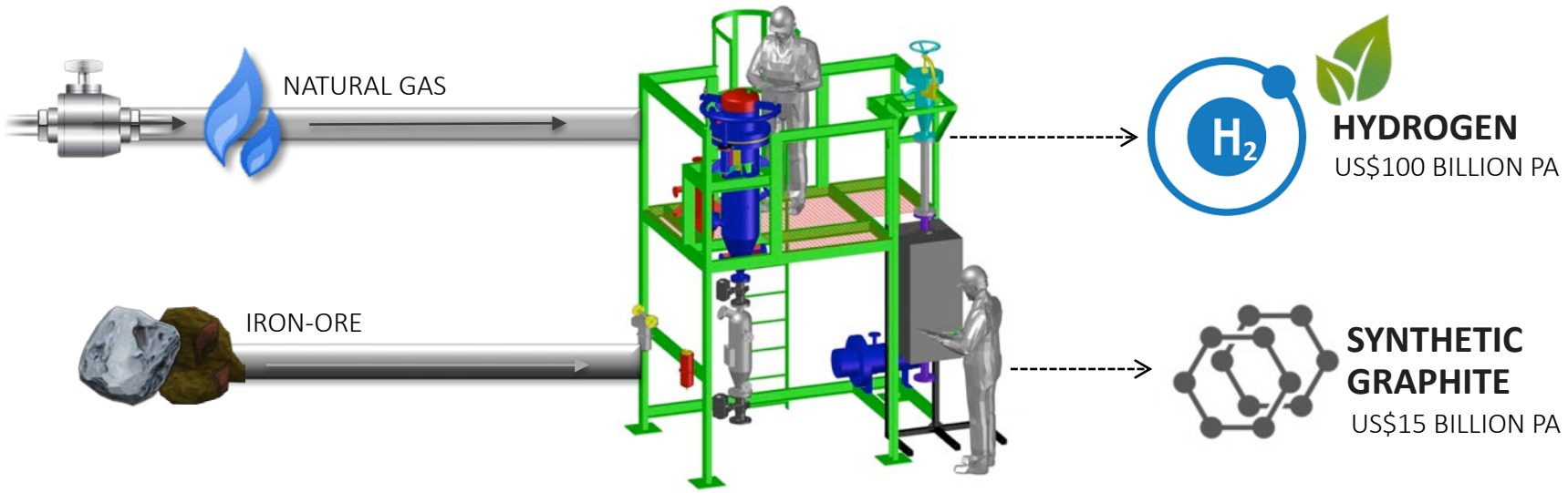
PRODUCTION IS HIGH IN EMISSIONS OR EXPENSIVE



THE HAZER PROCESS

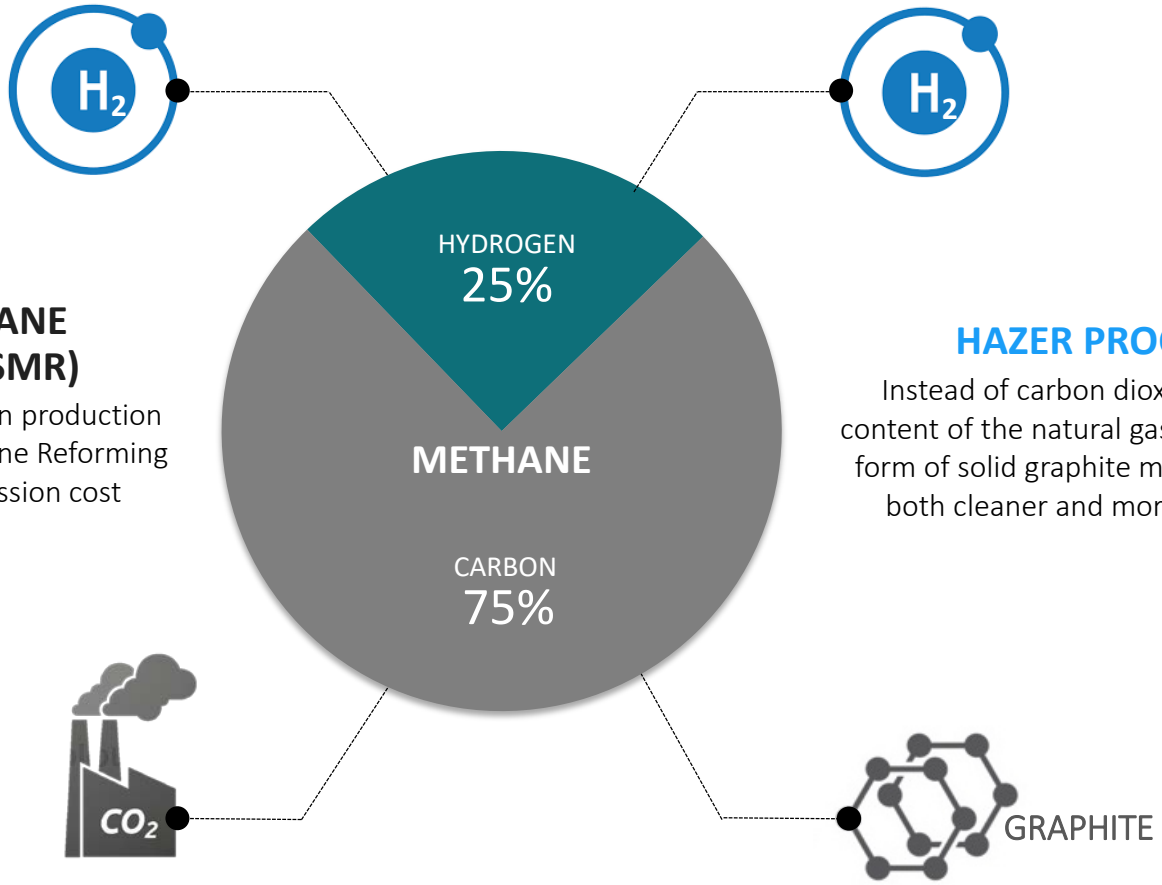
HYDROGEN & GRAPHITE FROM NATURAL GAS

$$CH_4 \rightarrow 2H_2 + C$$



HAZER & HYDROGEN PRODUCTION

DE-CARBONISING & CAPTURING ALL THE VALUE OF FEEDSTOCK GAS



STEAM METHANE REFORMING (SMR)

Current large scale hydrogen production processes like Steam Methane Reforming come at a huge CO_2 emission cost

HAZER PROCESS

Instead of carbon dioxide, the carbon content of the natural gas is captured in the form of solid graphite making the process both cleaner and more cost effective

POTENTIAL MARKETS

OPPORTUNITIES IN THREE MAJOR GLOBAL MARKETS

- **Cheaper and cleaner alternative**
- Oil refining, ammonia production, other industrial chemicals
- Currently primarily addressed by fossil fuel reformation processes
- Hazer has potential to deliver significant cost savings and reduced emissions for industrial hydrogen producers

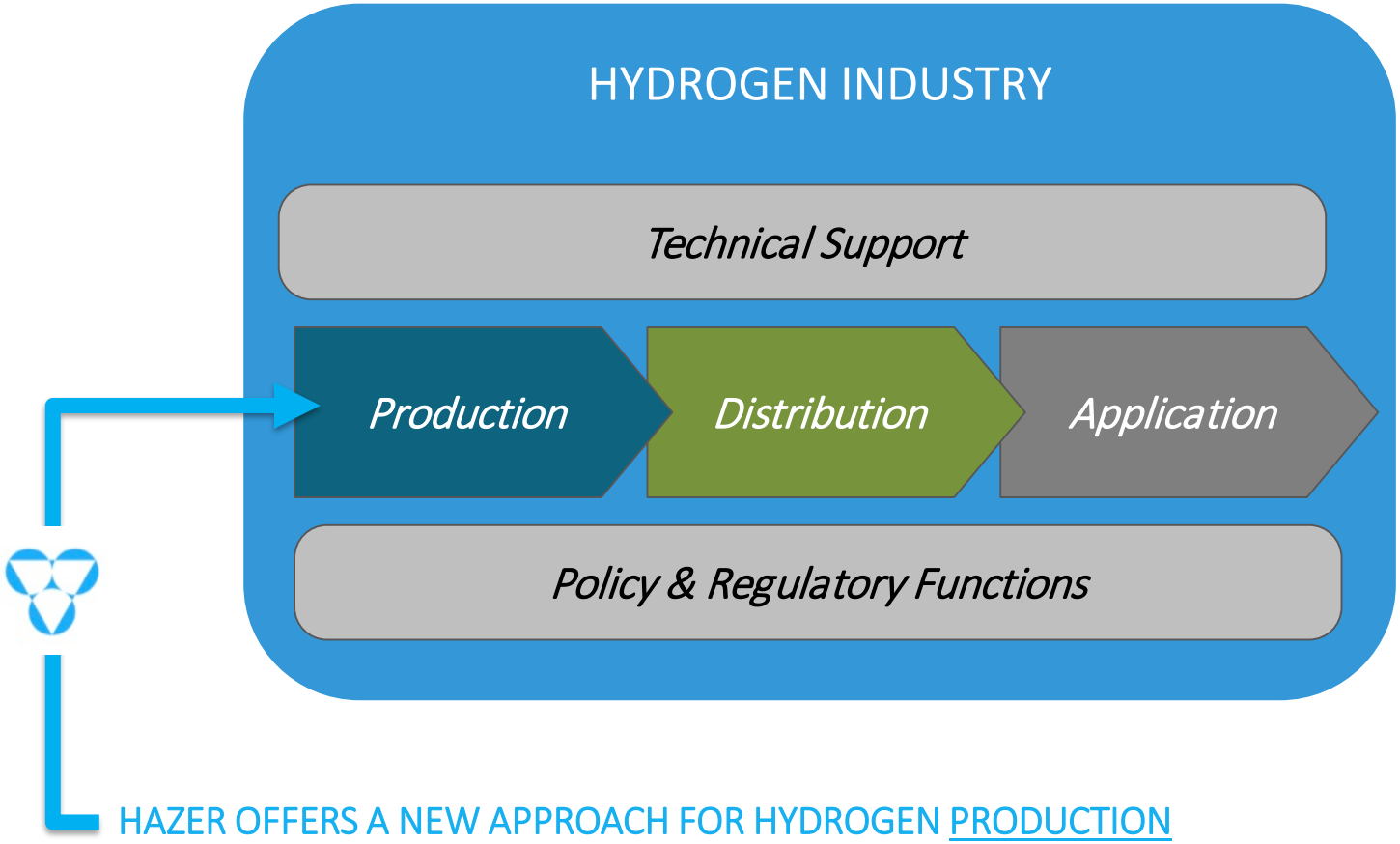
- **Multiple applications**
- Key component of clean energy future (H_2 => H_2O + energy)
- Fundamental cost, energy limitations for existing hydrogen production options
- Fuel cell vehicles, stationary power applications
- Other applications including Carbon Capture and Utilisation (CCU) and synthetic fuels

- **High quality, low cost graphite source**
- Range of industrial materials applications
  - Growth - energy storage (batteries)
- Currently addressed by mining, synthetic graphite production with significant environmental impacts

INDUSTRIAL HYDROGEN & HYDROGEN ENERGY

THE HYDROGEN INDUSTRY

THE HYDROGEN ECOSYSTEM HAS FIVE CORE FUNCTIONS



HAZER vs. SMR

MODELLING FOR HYDROGEN PRODUCTION

- Steam Methane Reforming (SMR) is currently the most commonly used and cost effective conventional hydrogen production process
- SMR also emits significant quantities of CO_2
- Process modeling indicates the Hazer Process could potentially deliver a **75% net commodity cost reduction compared to SMR**
- Modeling also shows Hazer could provide a significant (around 70%) reduction in CO_2 emissions relative to SMR
- This supports the principle that Hazer could have a significant competitive advantage in the global industrial hydrogen market

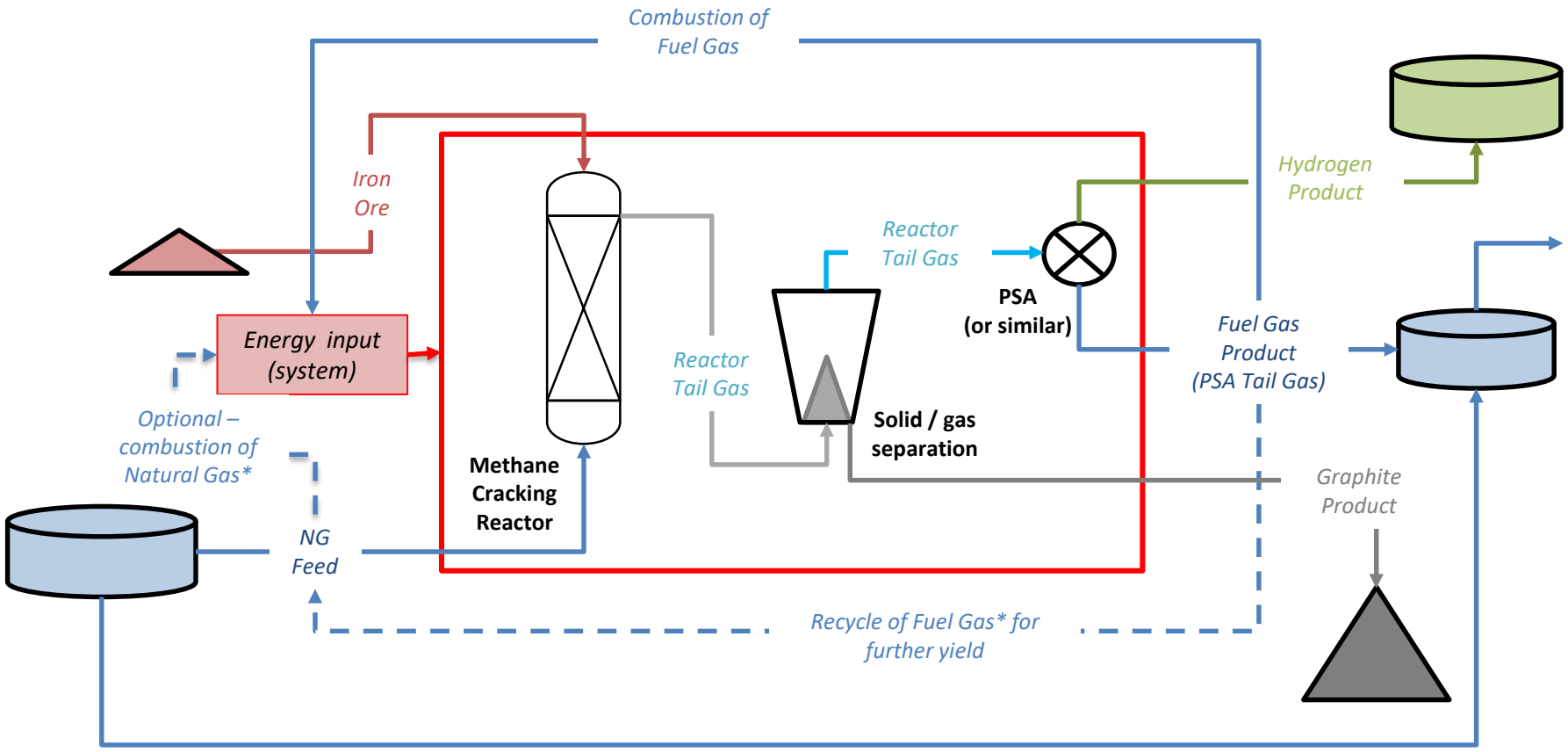
75% commodity cost reduction

70% reduction in co_2 emissions

Note: Results are conceptual in nature and subject to the qualification as described in Hazer's ASX release dated 28th February 2018

SCENARIO MODELLING – OPTION 1

LOWER COST BY UTILISING FUEL GAS FOR SYSTEM ENERGY



SCENARIO MODELLING – OPTION 1

LOWER COST BY UTILISING FUEL GAS FOR SYSTEM ENERGY

Assumptions		
Conversion Assumption[1]	(%)	70%
Gas (NG/FG) to electricity conversion	(%)	50%
Process Inputs (per tonne of H2 product)		
Natural Gas input	(GJ)	380
Iron Ore input	(t)	0.90
Non-Hydrogen Product (per tonne of H2 product)		
Fuel Gas product (net[2])	(GJ/t)	65
Graphite Product	(t/t)	4.4
Comparison – Process Inputs - SMR		
Natural Gas Input	*(GJ)*	*175*
Economic Assumptions		
Natural Gas input cost	(A$/GJ)	A$ 8.00
Iron ore cost	(A$/t)	A$ 100
Non-Hydrogen Product credits		
Fuel Gas Product credit	(A$/GJ)	A$ 8.00
Graphite credit	(A$/t)	A$ 500

1. Process assumption based on some recycling of gas to achieve 70% conversion
2. Fuel gas credit is net of fuel gas consumption for system heat / energy requirements

Hazer operating costs per tonne of H_2[1]

Input Costs		
Natural Gas input cost	(A$)	A$ 3,040
Iron ore cost	(A$)	A$ 90
Gross cost of inputs	***(A$)***	***A$ 3,130***
Less Non-Hydrogen Product credits		
Fuel Gas product credit	(A$)	(A$ 520)
Graphite credit	(A$)	(A$ 2,200)
Total By-Product credits	***(A$)***	***(A$ 2,720)***
Net H_2 Production Cost	**(A$)**	**A$ 410**

Comparison Cost – Steam Methane Reforming (SMR)[1]

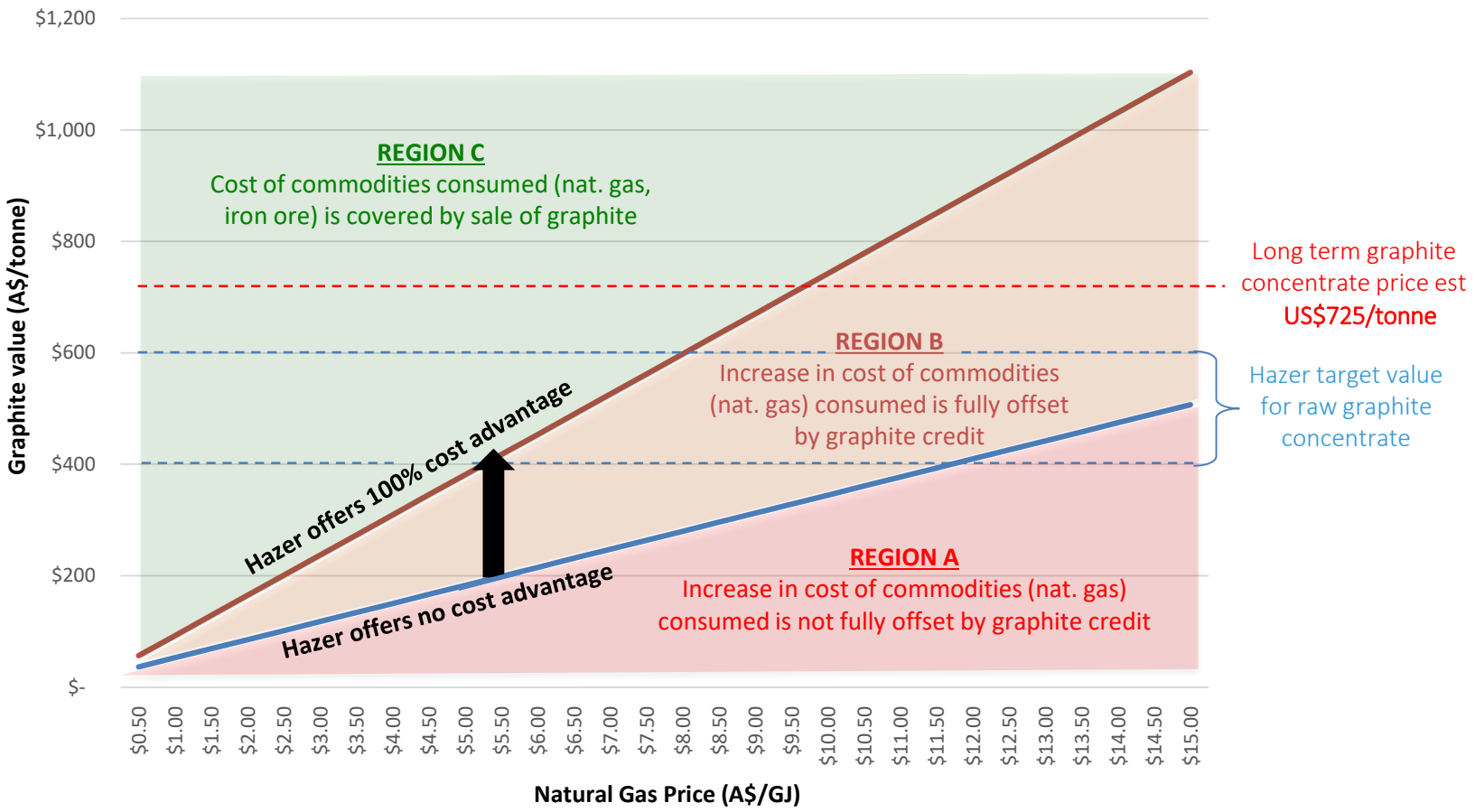
Input Costs – Steam Methane Reforming		
Natural Gas input cost	(A$)	A$ 1,400
Other costs / credits	***(A$)***	***(-)***
Net H_2 Production Cost	**(A$)**	**A$ 1,400**

1. *Operating cost analyses for both Hazer and SMR systems includes principal commodity input costs only, and do not consider additional plant operation costs, (e.g. labour, maintenance, water/steam or other ancillary consumables), depreciation or capital costs*

Note: Results are conceptual in nature and subject to the qualification as described in Hazer's ASX release dated 28th February 2018

SENSITIVITY – SMR COMPARISON

HAZER'S ADVANTAGE IS DRIVEN BY GAS PRICE & GRAPHITE VALUE



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HAZER VS. ELECTROLYSIS

MODELLING FOR HYDROGEN PRODUCTION

- Electrolysis is an alternative hydrogen production process that can use renewable energy and water to produce near zero CO_2 emission hydrogen
- Modelling indicates Hazer could produce hydrogen with **near zero CO2 emissions** if using renewable energy to power the Hazer Process
- This scenario could generate around **6x more hydrogen** compared to electrolysis based production using equivalent renewable energy source
- The costs of commodity inputs (per tonne of hydrogen) are also **significantly lower** than the equivalent costs associated with electrolysis-based hydrogen production
- Lowering the CO_2 emissions associated with hydrogen production is critical for new hydrogen opportunities in the energy industry

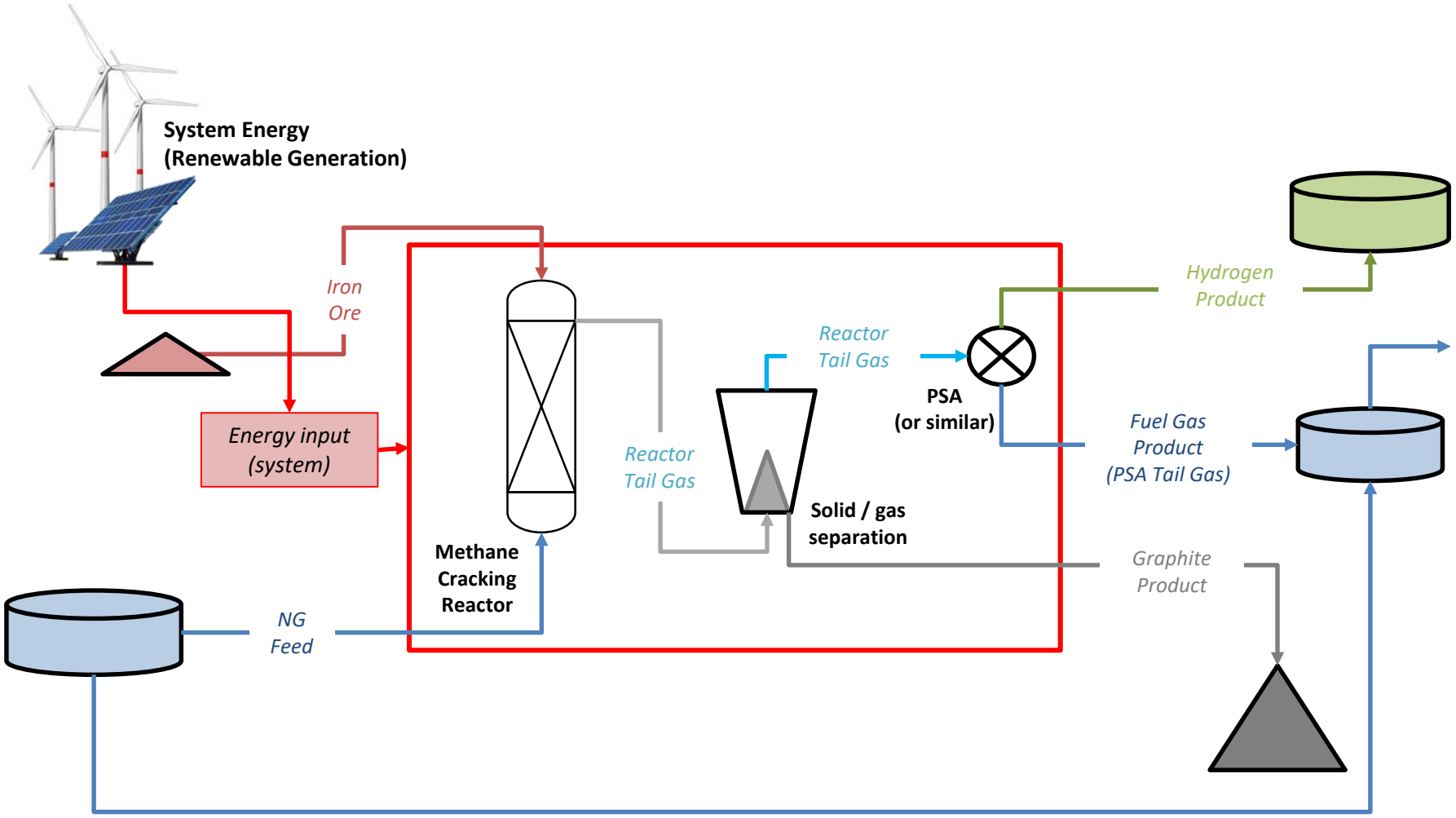
6x hydrogen production with near zero emissions

Commodity cost inputs significantly lower

Note: Results are conceptual in nature and subject to the qualification as described in Hazer's ASX release dated 28th February 2018

SCENARIO MODELLING – OPTION 2

LOW CO_2 EMISSIONS USING RENEWABLE POWER



SCENARIO MODELLING – OPTION 2

LOWER COST & GREATER PRODUCTION THAN ELECTROLYSIS

Assumptions		
Conversion Assumption	(%)	50%
Process Inputs (per tonne of H2 product)		
Natural Gas Input	(GJ)	600
Renewable electricity input	(MWhr)	9.9
Iron ore input	(t)	1.02
Non-Hydrogen Product (per tonne of H2 product)		
Fuel Gas product	(GJ/t)	330
Graphite product	(t/t)	5.0
Comparison – Process Inputs - Electrolysis		
Renewable electricity input	*(MWhr)*	*65*
Economic Assumptions		
Natural Gas input cost	(A$/GJ)	A$ 8.00
Renewable electricity cost	(A$/MWhr)	A$ 100
Iron ore cost	(A$/t)	A$ 100
Non-Hydrogen Product credits		
Fuel Gas product credit	(A$/GJ)	A$ 8.00
Graphite credit	(A$/t)	A$ 500

Hazer operating costs per tonne of H_2[1]

Input Costs - Hazer		
NG Input Cost	(A$)	A$ 4,800
Renewable electricity cost	(A$)	A$ 990
Iron Ore cost	(A$)	A$ 102
Gross cost of inputs	***(A$)***	***A$ 5,892***
Less Non-Hydrogen Product credits		
Fuel Gas product	(A$)	(A$ 2,640)
Graphite Credit	(A$)	(A$ 2,500)
Total By-Product credits	***(A$)***	***(A$ 5,140)***
Net H_2 Production Cost	**(A$)**	**A$ 752**

Comparison Cost – Electrolysis[1]

Input Costs - Electrolysis		
Renewable electricity cost	(A$)	A$ 6,500
Other costs / credits	***(A$)***	***(-)***
Net H_2 Production Cost	**(A$)**	**A$ 6,500**

Note – Hazer system generates 6X H_2 output from same renewable power input

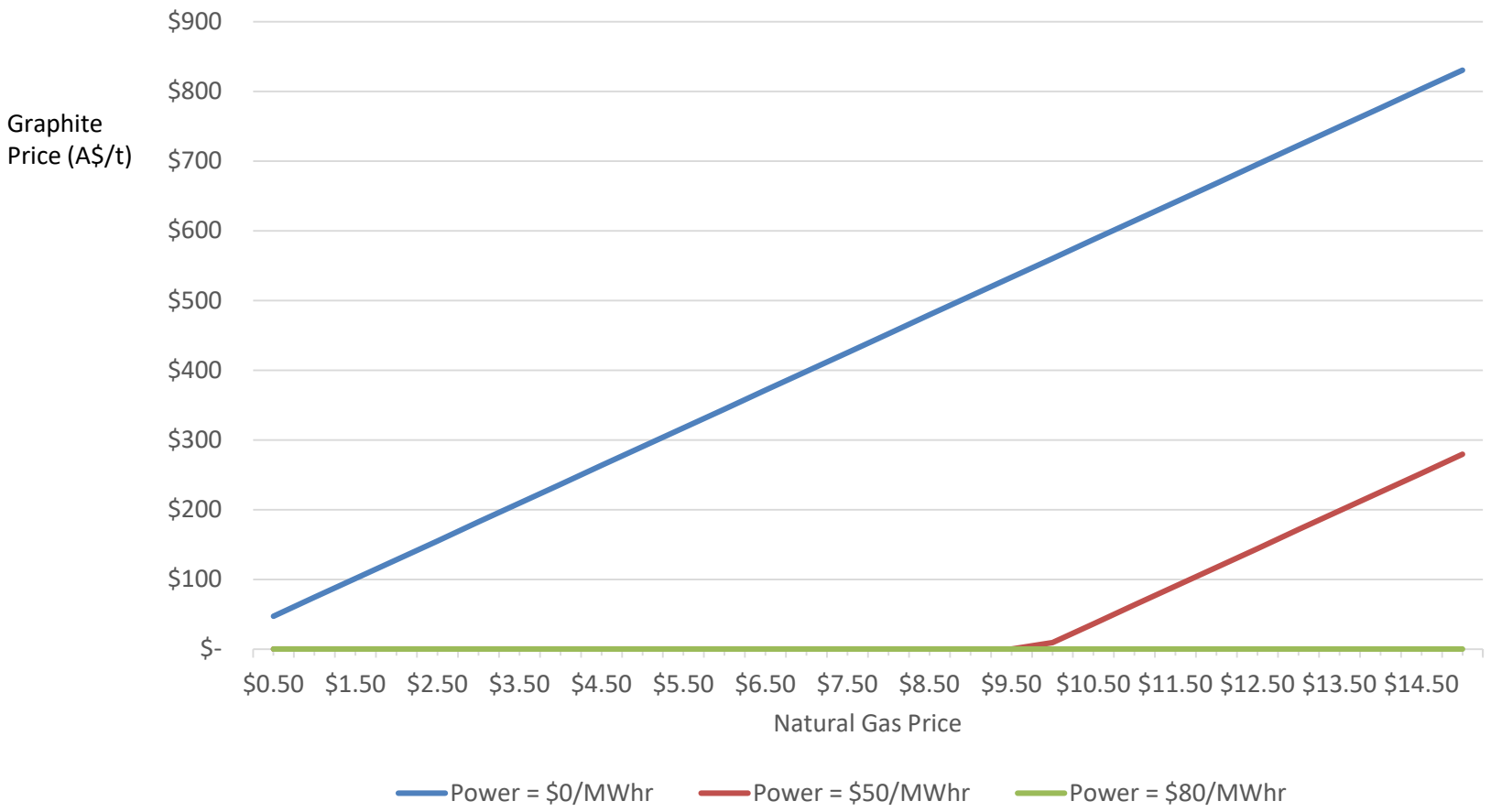
1. *Operating cost analyses for both Hazer and electrolysis systems includes principal commodity input costs only, and do not consider additional plant operation costs, (e.g. labour, maintenance, water/steam or other ancillary consumables), depreciation or capital costs*

Note: Results are conceptual in nature and subject to the qualification as described in Hazer's ASX release dated 28th February 2018

SENSITIVITY – ELECTROLYSIS COMPARISON

HAZER'S OPERATING COST ADVANTAGE OVER ELECTROLYSIS IS INDEPENDENT OF GRAPHITE VALUE WHEN POWER COST IS NON-TRIVIAL

Target graphite price necessary for Hazer cost-equivalence to electrolysis as natural gas price changes



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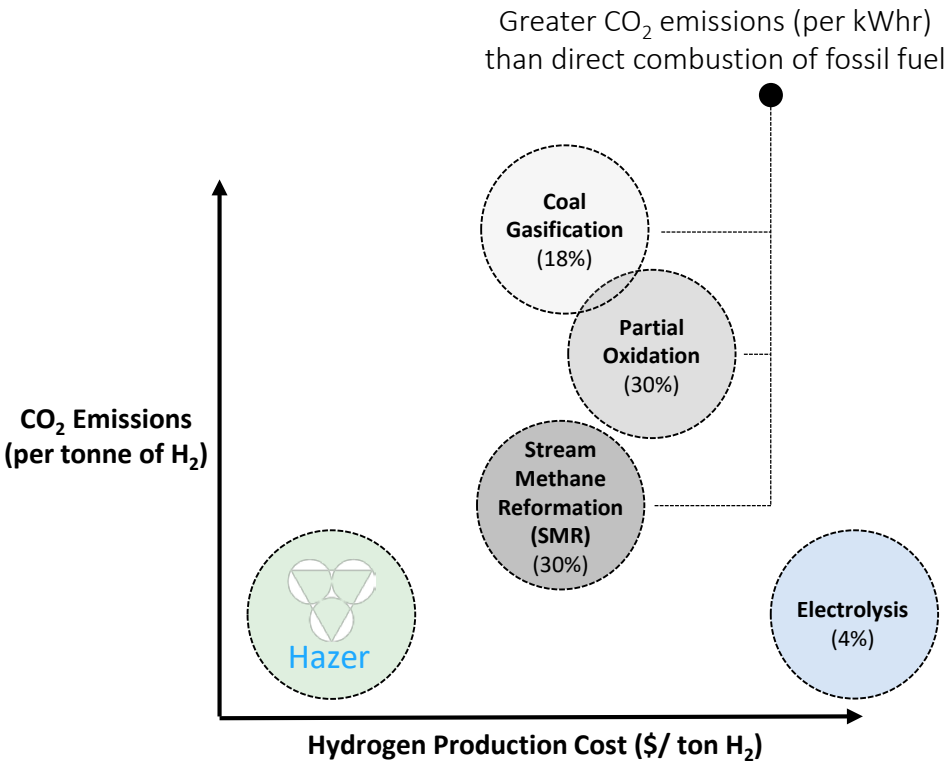
HAZER HYDROGEN

CLEANER AND CHEAPER ALTERATIVE



- **'Clean' and economically completive hydrogen**
- Significant emissions reductions anticipated over alternative fossil fuel based hydrogen production (SMR)
- Emissions can be reduced further by harnessing clean energy options as power source for process energy
  - Process energy (per kg of hydrogen) is significantly lower than electrolysis
- Lower operating cost through graphite sales to enable access to US$100 Billion Industrial hydrogen market
  - Market growing to US$151 Billion in 2021

HAZER HYDROGEN

MULTIPLE CLEAN HYDROGEN APPLICATIONS

- Major vehicle manufacturers developing FCV models
- Fundamental cost, energy and GHG emissions barriers for existing hydrogen production in this market
- Hazer offers unique solution

- An alternative to CCS (Carbon Capture and Storage), where CO2 emissions can be captured and used as feedstock for other chemical products
- Primary products investigated are methanol and liquid fuel (diesel)
- Key additional feedstock is low cost, low emission hydrogen for product synthesis routes

- Low energy requirements potentially offers an option to leverage off traditional clean energy systems
- Use of wind / solar plus self sequestering natural gas has potential to address cost and consistency issues for renewable power generation
- Operating costs may be further reduced through graphite sales

FUEL CELL VEHICLES

AN EMERGING GLOBAL MARKET FOR HAZER

- Fuel cell vehicle (FCV) market estimated USD 18 billion by 2023
- Major vehicle manufacturers are developing FCV models
- Newly created 'Hydrogen Council'
  - Toyota, Shell, BWM, GM among the 13 members
  - Plans to invest $10.7B in hydrogen projects within 5 years
- The Japanese government has ambitions to become the first nation significantly fuelled by hydrogen;
  - Committed $470m towards hydrogen in FY2015 alone
  - Plans to spend $22 billion yen on hydrogen initiatives
  - Aims to have 40,000 FCV's on the streets by the 2020 Olympics
- **UK plans to halt production of petrol cars by 2040**

Source: Global Market Insights December 2016

MOU SIGNED WITH PRIMEMETALS

DEPLOYMENT OF HAZER TECHNOLOGY IN STEEL INDUSTRY

- Hazer has executed an MoU with Primetals Technologies, a leading global engineering company and solution provider for the metals industry
    - Primetals is a joint venture between Mitsubishi Heavy Industry and Siemens

- Agreement to jointly investigate utilising the Hazer Process to reduce the cost and environmental impact of steel production;

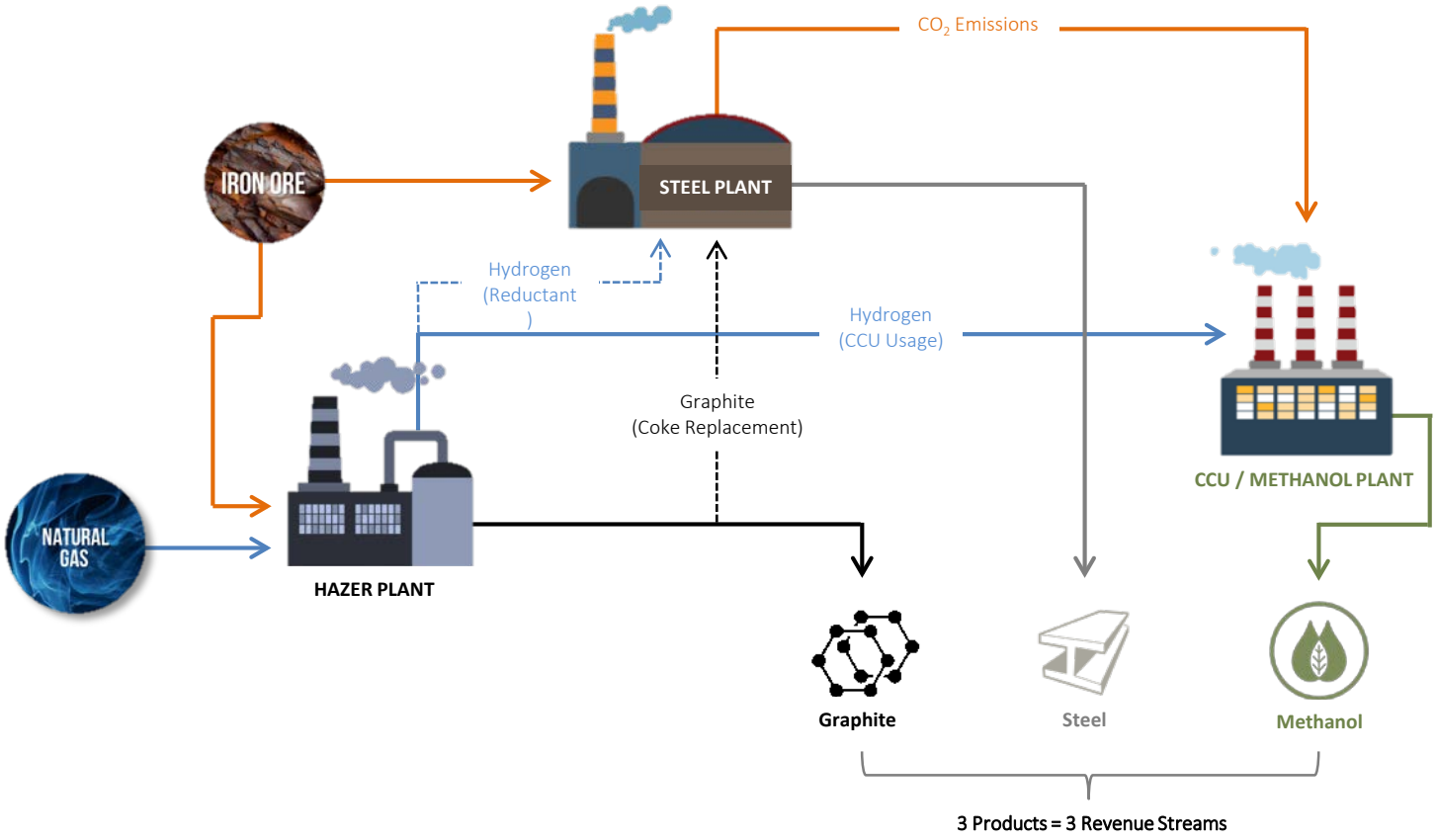
    - Carbon Capture and Utilisation - CO_2 emissions can be captured and chemically converted to valuable downstream products, including methanol or synthetic liquid fuels.

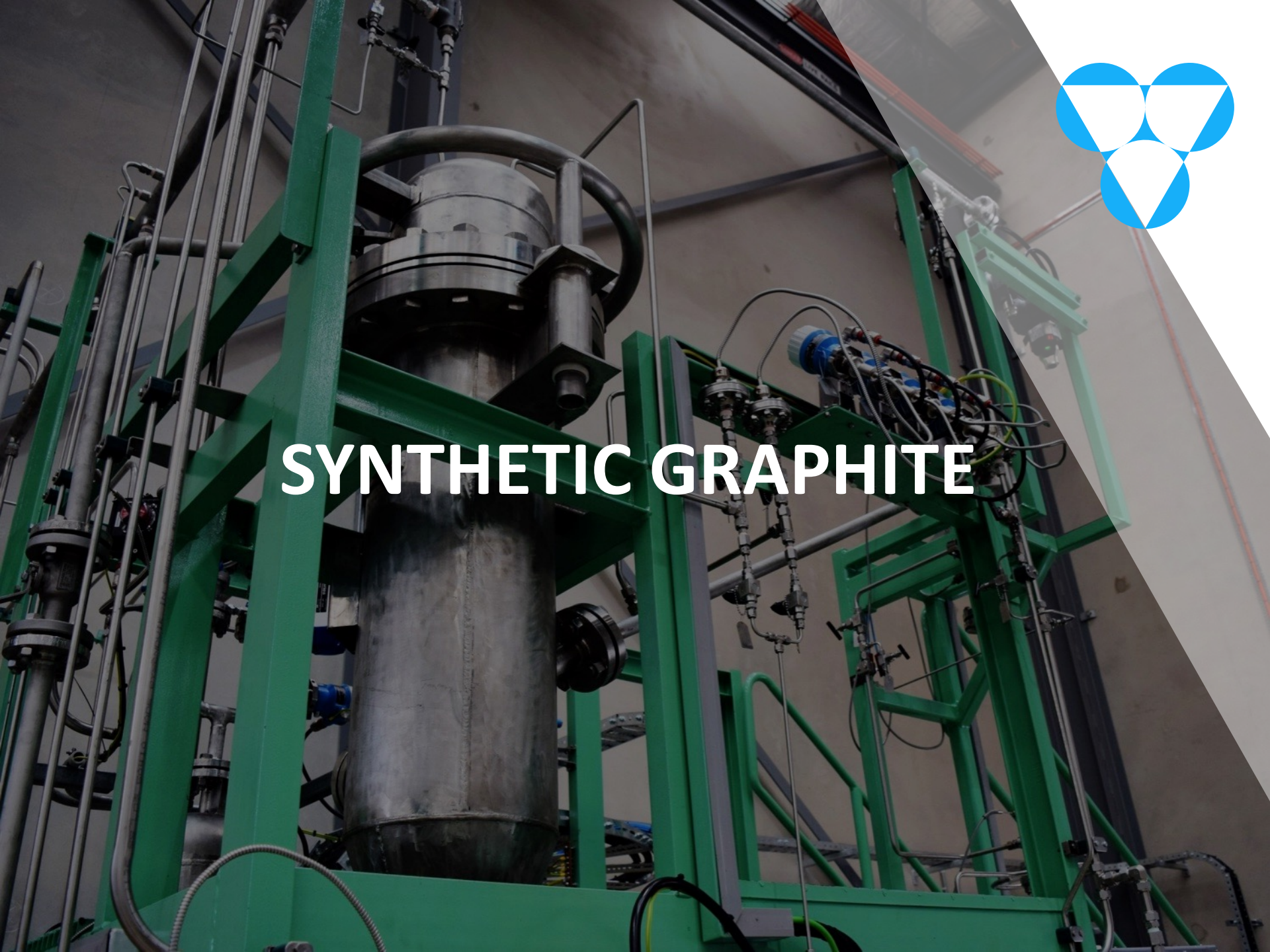
    - Hydrogen as alternative reductant – Use of Hazer's hydrogen as an alternative to carbon-based reducing agents, significantly reducing the CO_2 footprint of steel production

    - Graphite as alternative to coal - Graphite produced by the Hazer process to be used as a co-reductant and carburiser for steel making, reducing the need for coking coal

CARBON CAPTURE & UTILISATION (CCU)

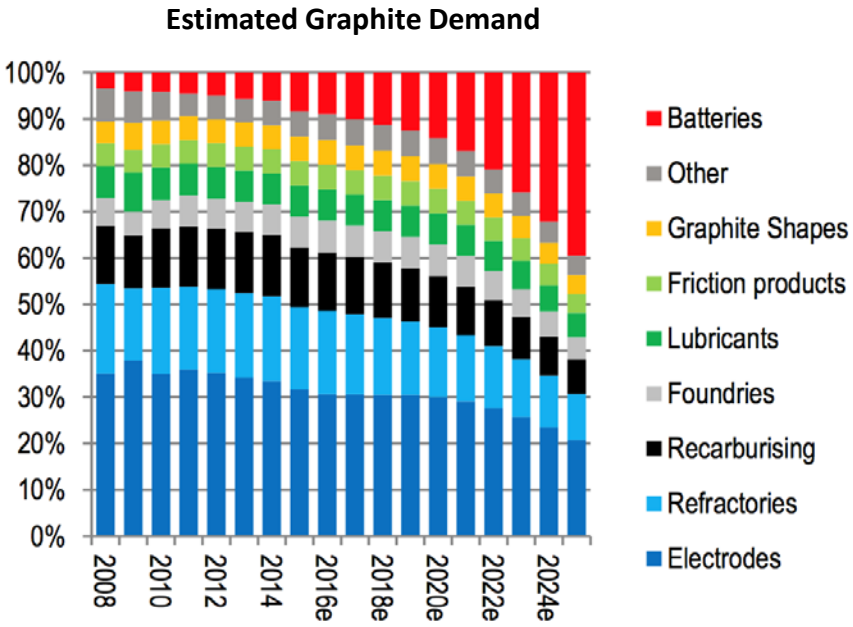
HAZER PLANT INTEGRATED INTO STEEL PRODUCTION





SYNTHETIC GRAPHITE

GLOBAL GRAPHITE MARKET

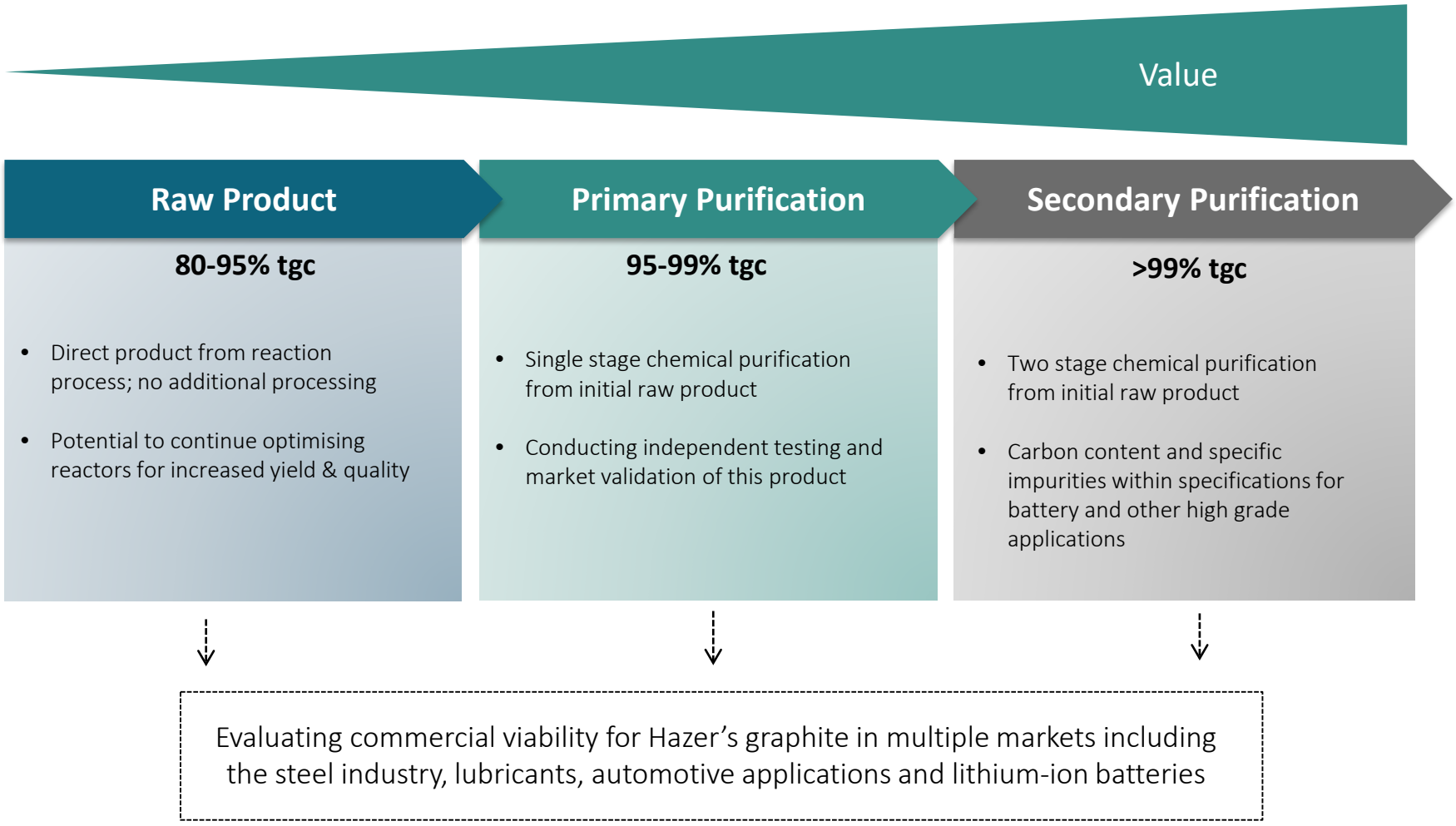


- Total graphite market in 2016 is estimated at 2.4Mt
  - Expected to increase to 4.1Mt by 2025
- **Total value of the graphite market is ~US$ 15 Billion**
- Take-up of EV's and FCEV's is likely to underpin future demand for graphite
  - There is 30-100kg graphite required per electric vehicle – 1kg per kWhr
- Long term price for graphite powder (<100 mm, 94-95% purity) estimated at US$725 per tonne
- Market value is dominated by synthetic graphite products
  - ~60% by tonnage, ~90% of value

Source: Rockill and UBS estimates

HAZER GRAPHITE

PRODUCTION, PROCESSING, VALUE



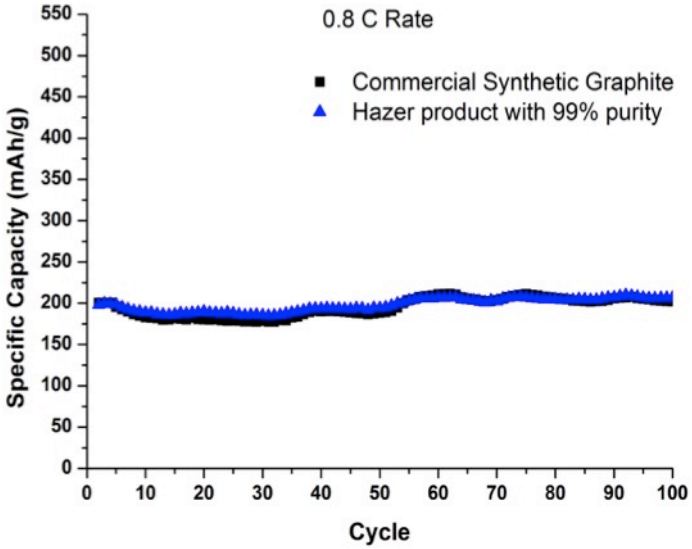
PARTNERSHIP WITH MIN

INVESTMENT AND COMMERCIAL PARTNER

- In March 2017 Hazer completed A$5M strategic placement with ASX-listed mining and mining services provider Mineral resources Ltd
- MIN significantly increased their stake in Hazer to 14%
- In December 2017 Hazer signed a **binding agreement** with Mineral Resources for the potential development of a commercial scale synthetic graphite facility;
    - MIN to fund the commercial development
    - Hazer to obtain royalties from graphite sales
    - Initial target production of 10,000tpa
- Hazer to form part of MIN's growing battery / energy storage materials operations

BATTERY TESTING

PROMISING RESULTS IN LITHIUM-ION BATTERIES



- Preliminary longer-term cycle results indicate virtually no loss in capacity after 100 cycles
- Equivalent performance to commercial synthetic graphite used in lithium-ion battery applications
- Results demonstrate Hazer's graphite has the potential to become a suitable alternative to traditional mined or synthetic graphite in lithium-ion batteries
- Hazer continues development roadmap for;
  - Longer term stability testing
  - Further optimisation for increased graphite quality
  - Additional cycle rate capability analysis
  - Comparing performance against various commercial types of graphite (natural flake)

COMMERCIALISATION AND SCALE-UP

LABORATORY➡ PRE-PILOT PLANT

HAZER HAS MADE SIGNIFICANT PROGRESS SINCE IPO

STAGE 1-2 - LABORATORY
STATIC BED REACTOR
FLUIDIZED BED REACTOR

STAGE 3 – PRE-PILOT PLANT
OPERATIONAL END 2017

STAGE 4
COMMERCIAL PROTOTYPE
(PILOT PLANT)

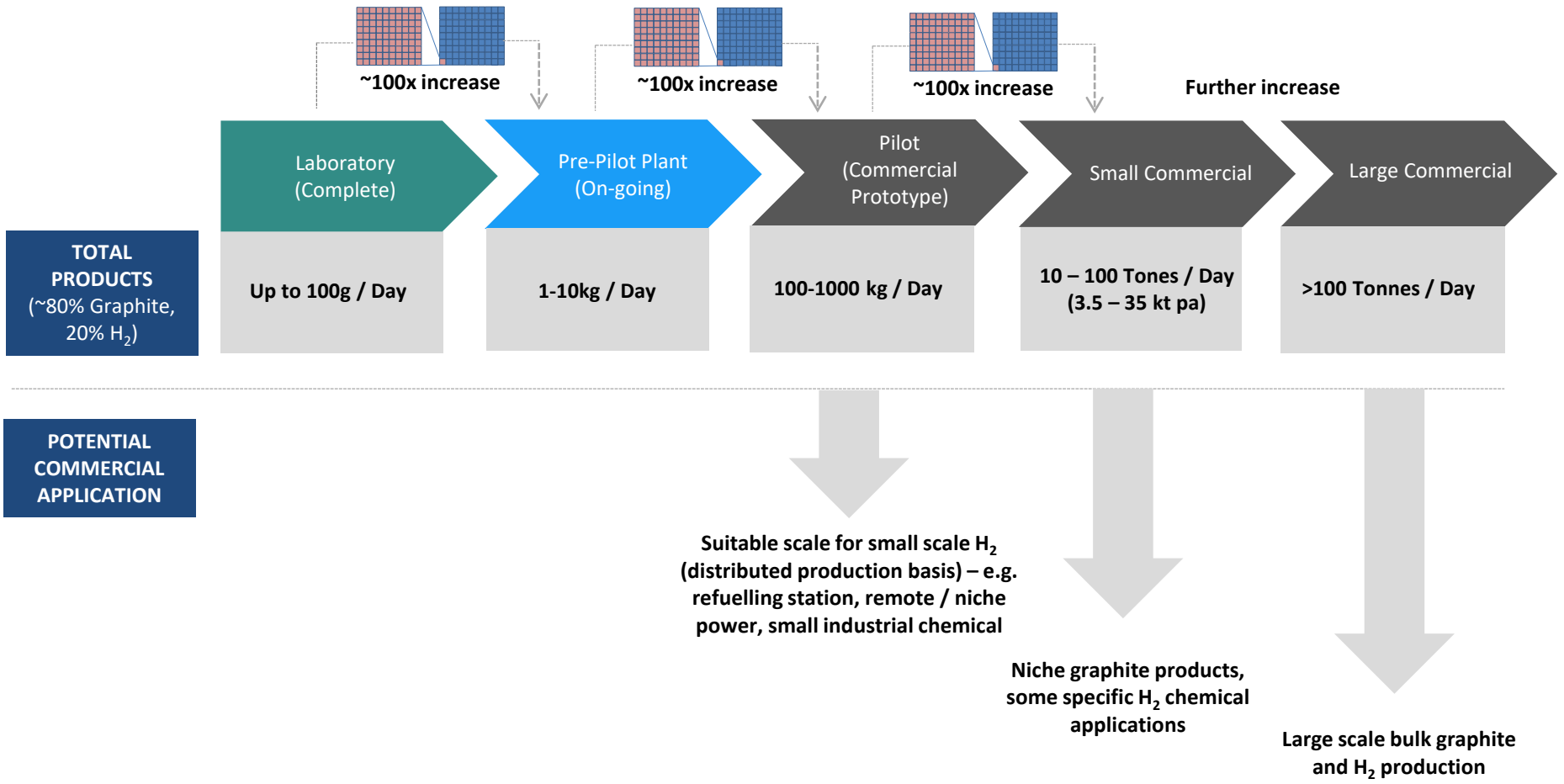
2018
PROJECT
INITIATION

TBC

STAGE 5
FULL COMMERCIAL PLANTS

COMMERCIALISATION PROCESS

STAGED SCALE UP DEVELOPMENT

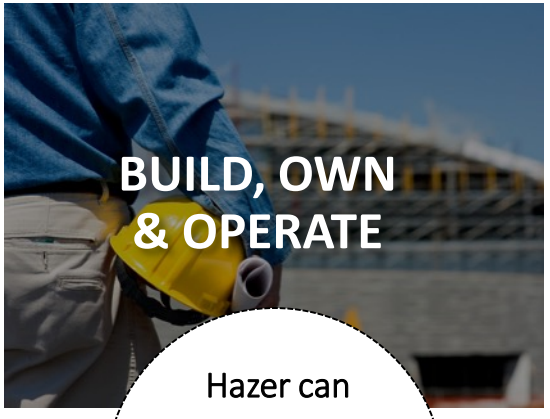


OTHER COMMERCIAL OPTIONS

BUILD DIVERSIFIED REVENUE THROUGH MULTIPLE COMMERCIAL OPTIONS

License IP to 3rd parties and generate high margin royalty

Share capital & operating costs with hydrogen or graphite partners



Hazer can construct own and operate plants and sell products

CURRENTLY INVESTIGATING MULTIPLE OPTIONS ACROSS DIFFERENT BUSINESS MODELS

PROGRESS SINCE IPO

SIGNIFICANT PROGRESS ON COMMERCIALISATION PATHWAY

PROCESS DEVELOPMENT

Successful construction, commissioning & operation of Pre-Pliot Plant

1kg per day production rate from the Pre-Pliot Plant

First successful addition of new catalyst to operating reactor system

GRAPHITE DEVELOPMENT

Demonstrated raw graphite purity at up to 95%

Demonstrated graphite purification to battery grade (99.95%)

Positive preliminary half-cell battery testing

CORPORATE / COMMERCIAL

Strong balance sheet with potential future capital from existing options

Strategic investment and commercial license with Mineral Resources

MoU with Primetals Technologies GmbH (Siemens, Mitsubishi Heavy Industry)

FUTURE GOALS

TECHNICAL MILESTONES

SCALE UP DEVELOPMENT:

- Next generation reactor design and implementation
- Increase production rates and run times
- Begin design process for the next scale of Hazer plant

GRAPHITE DEVELOPMENT:

- Evaluate commercial viability for graphite across additional markets
- New phase of battery testing with 99.95% material
- Battery testing beyond 100 cycles

FUTURE GOALS

CORPORATE & COMMERCIAL MILESTONES

MINERAL RESOURCES:

- Ongoing milestones as collaboration with MinRes progresses

PRIMETALS TECHNOLOGIES

- Technical roadmap to determine preferred development pathway
- Progression to a binding formal agreement and execute roadmap

OTHER COMMERCIAL GOALS

- Progress commercial discussions with potential partners domestically and internationally

EXPERIENCED & CAPABLE TEAM

STRONG CORPORATE, COMMERCIAL AND TECHNICAL EXPERIENCE

Mr Geoff Pocock | Managing Director

- Founder, HazerGroup Ltd
- Over 15 years experience in corporate finance, commercialisation and strategy
- Ex Managing Partner mid tier strategy consulting business
- Tertiary qualifications in Chemistry, Law and Applied Finance

Mark Edwards| Chief Operating Officer

- Decades of experience across a variety of engineering
- Member of an industry technical steering committee for CSIRO
- Previously the AUA Regional Director of Light Metals for Hatch Pty Ltd

Mr Terry Walsh| Chief Development Officer

- Commercial lawyer with 20 years project development experience
- Former General Counsel, Hancock Prospecting Pty Ltd
- Previous roles with Rio Tinto, and leading law firms in Perth and Sydney, focusing on development

Mr Michael Wills| Marketing & Comm's

- 12 years experience in strategic communications and media
- Significant expertise in marketing strategy for ASX listed companies, including crafting communications collateral, implementing brand identity and attracting new investors
- Extensive experience working with high net-worth individuals and investors
- Active investor in ASX-listed small cap companies

STRONG BOARD CAPABILITIES

COMMERCIAL, TECHNICAL & REGULATORY EXPERTISE

Mr Tim Goldsmith| Chairman

- Over 20 years as Partner with global professional services group PwC
- Leader of PwC's Mining Group, and National China Desk leader at PwC
- Over 30 years corporate and commercial experience across international mining and industrial business operations

Ms Emma Waldon| Company Sec / CFO

- Over 18 years global corporate experience.
- Diverse financial, corporate advisory and risk management roles at Ernst & Young, Euroz Securities, Lloyds Banking Group (London) and Deloitte.
- Significant Company Secretary / CFO experience with public companies
- Member, AICA, a Fellow of the FINSIA and a Certificated Member of GIA.

Ms Danielle Lee| NED

- Corporate lawyer with more than 20 years' experience with approximately 9 years as legal counsel at ASX Sydney and Assistant Manager at ASX Perth.
- Main practice areas are corporate advisory, governance and equity capital markets; regularly advises on issues relating to the Corporations Act and ASX Listing Rules

Dr Andrew Harris | NED

- Lead Director of the Engineering Excellence Group, Laing O'Rouke
- Professor of Chemical and Biomolecular Engineering at the University of Sydney
- Previously the CTO of Zenogen, a hydrogen production technology company, and a co-founder of Oak Nano, a start-up commercialising novel carbon nanotube technology.

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