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Hazer Group Ltd

Analyst Site Visit

Monday, 9 October 2023





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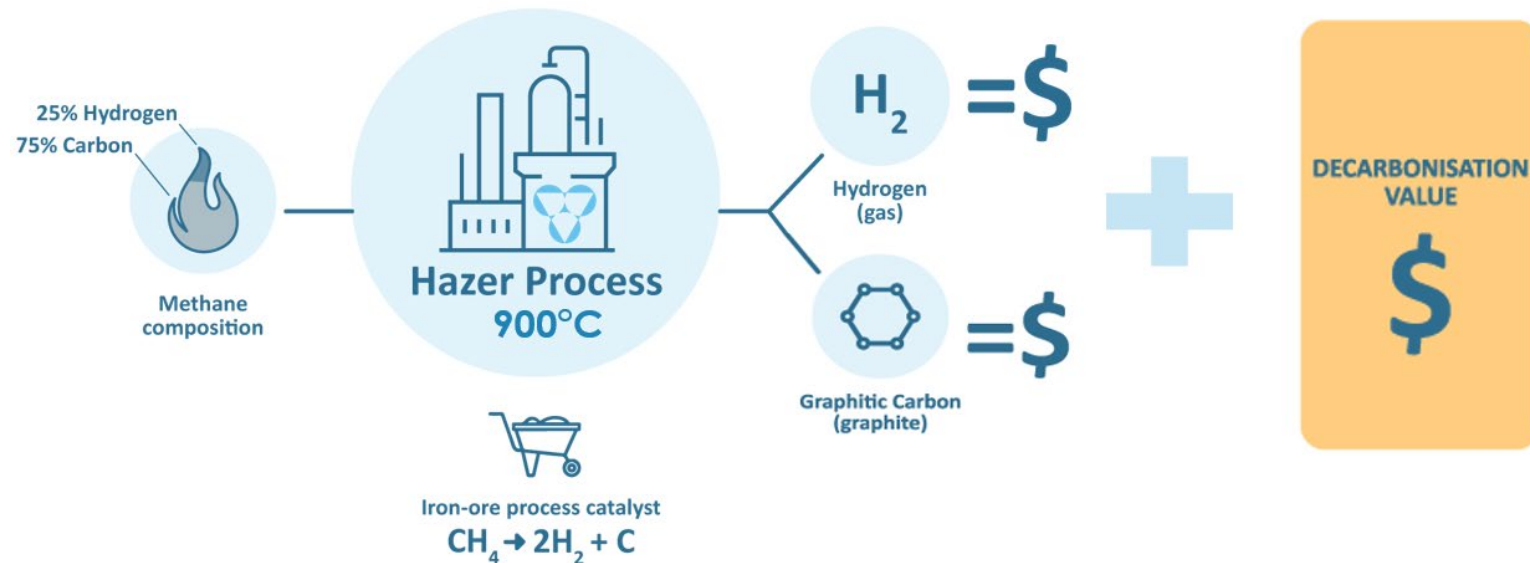
Corporate Overview



Hazer's competitive technology advantage

Innovative low emission, low-cost methane pyrolysis technology producing clean hydrogen and graphite

- Hazer Group Limited is a technology development company undertaking the commercialisation of the Hazer Process
- The Hazer Process enables low temperature conversion of natural gas and similar methane feedstocks, into hydrogen and high-quality graphite, using iron ore as a process catalyst





Executing scale-up strategy in hard-to-abate sectors



HazerGroup™

MONETISE & GROW

Strategy:

- Commercial scale projects in multiple jurisdictions under license agreements
- Expand global portfolio

Enablers:

- Japan & EU Production Facilities
- New Business Projects

SCALE-UP

- Partnerships and scale-up into the target markets of North America, Asia and Europe
- Application in hard-to-abate industries

- 25x Canadian Scale-up
- Japan & France Initially 10 ktpa*

COMMERCIALISE

- Leverage advanced technology readiness into new projects
- Commercial Demonstration Plant (CDP)

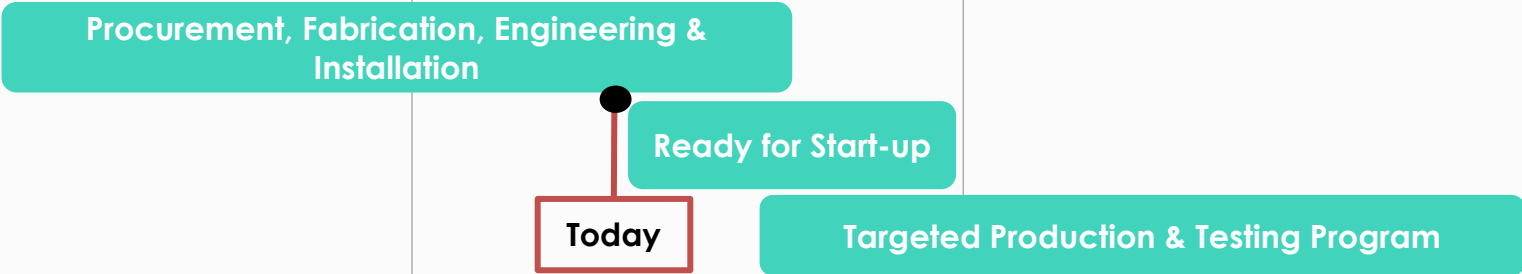
- CDP Ready For Start-up 2H 2023
- Secure graphite offtake

Our Vision

Provide a unique climate technology to transform industry and contribute to a sustainable future for the next generation

* Refers to thousands ('000) of tonne per annum

Key Activities

	CY2023		CY2024
	H1	H2	H1
Commercial Demonstration Plant (100 tpa)	Procurement, Fabrication, Engineering & Installation 		
Hazer-Fortis 2,500 tpa Canada Plant	FEED Studies in Canada and Targeted FID 		
New Potential Projects in Target Markets	  Identify New Commercial Projects Japan France Japan & France Project Development Plans		
Mitsui & Graphite Market Development	Developing Market for Hazer Graphite		Offtake Agreement
Corporate Updates	 ARENA Grants	 R&D Rebates	 Corporate Access Events ARENA Grants

Hazer Investment Highlights



Investment highlights

Low cost, low emissions H₂ production technology company positioned to play a leading role in global decarbonisation

1



Low-cost, Low-emissions, Proprietary Technology

2



Compelling Economics & Returns

3



Global Tier-1 Partnerships Across Strategic Markets

4



Advanced Technology Readiness & Proven Scale-up

5



Clear Commercial Pathway & Capex-lite

6



Graphite Production Diversifies Earnings

7



Rapidly Growing H₂ Demand

8



Government & Policy Support

1 Low cost & low emissions hydrogen

Hazer well positioned as a low-cost, low-emissions hydrogen technology

Existing Technologies

Steam Methane Reforming (SMR)

Significant CO₂ emissions

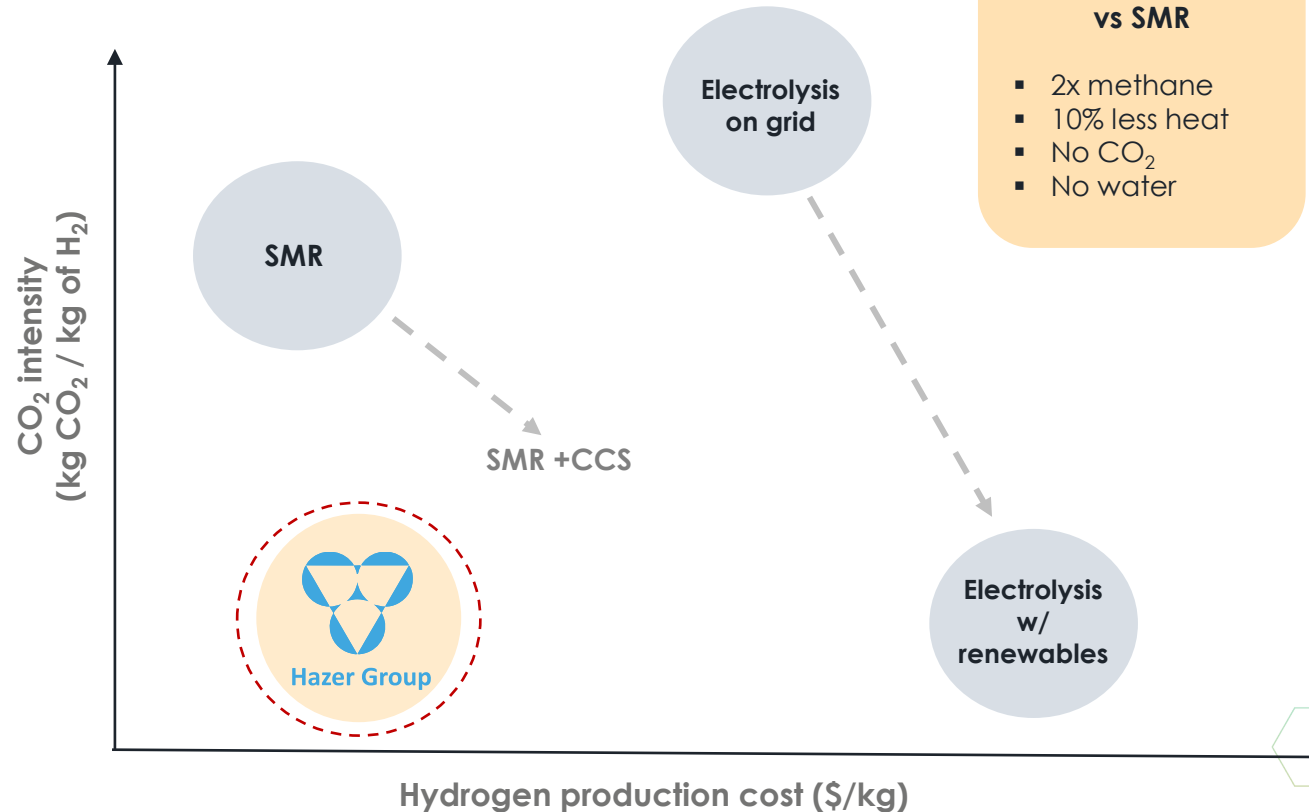
- Most widely used process for H₂ generation (~95%)
- High CO₂ emissions
- Requires CCS* to address emissions



Electrolysis

Energy intensive process

- 7x more energy intensive than SMR
- Only low emission if 100% renewable energy
- Requires significant water and renewable energy



*CCS = Carbon Capture & Storage. Requires geological formations for CO₂ sequestration

1

“Plug-in” technology using existing infrastructure

End-use deployment and application of the Hazer Technology eliminates H₂ transport risk and reduces cost



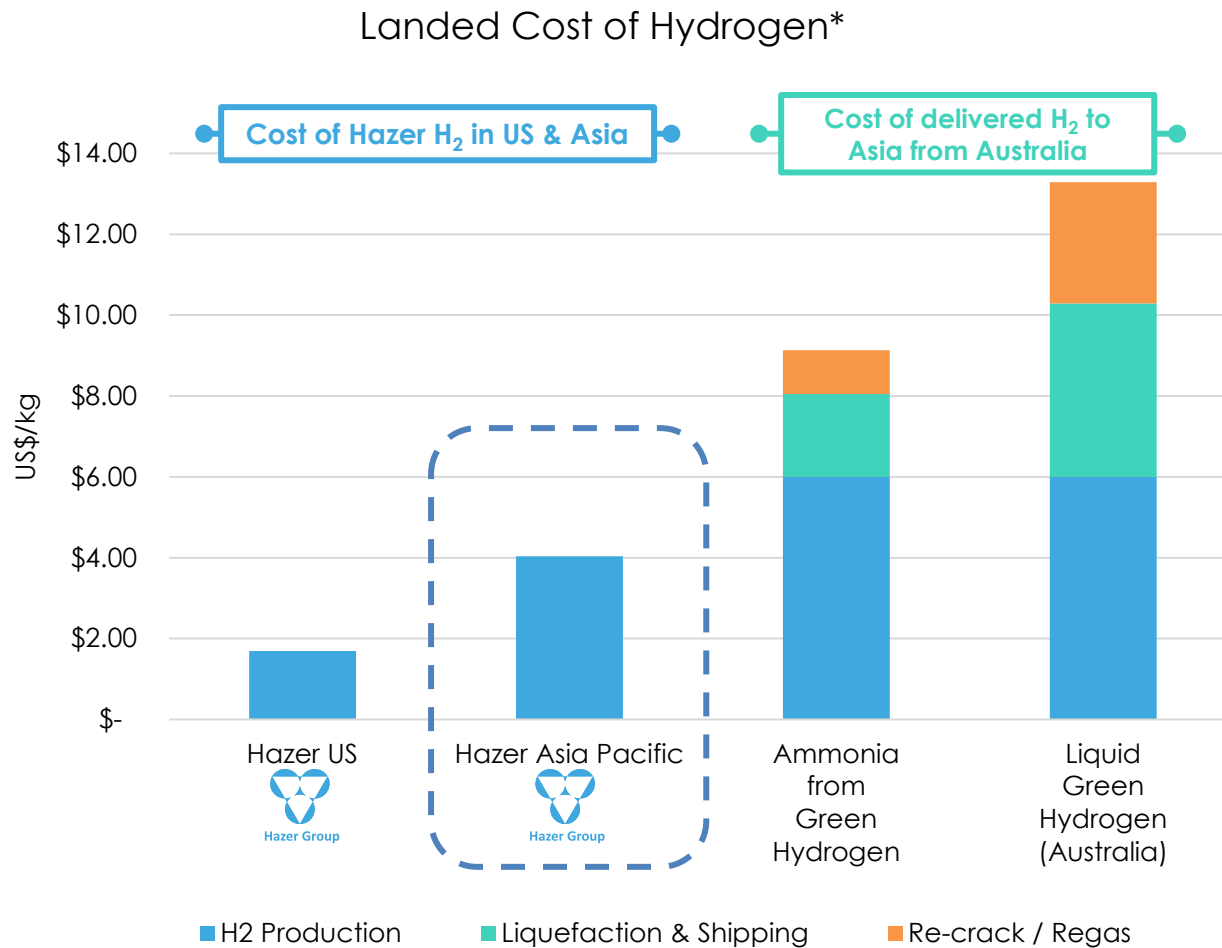
Conceptual design of Hazer facility co-located with 3rd party refinery
(Source: stock image not Hazer infrastructure)

- Eliminates requirement for hydrogen transportation cost and risk
- Co-located with end-user infrastructure – such as LNG facilities, refineries etc.
- Ability for shared services and lower operating cost model



2

Delivered cost of H₂ – Hazer competitive advantage

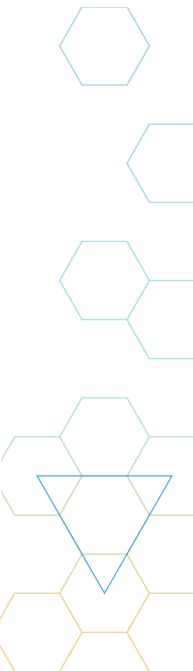


- Hazer co-located at existing infrastructure eliminating requirement for shipping
- Ammonia is transportable however reconversion technology immature and potentially expensive
- Liquified H₂ technology (-253 °C) not available today and economic viability challenged
- Hazer in North America significantly cheaper with low-cost gas and power

* Company aspirations should not be read as forward-looking statements. Hazer does not yet have reasonable grounds to believe the aspirational portfolio will be achieved. See disclaimer - slide 2 and assumptions & notes – slide 26.

3 Global partners & projects

Tier-1 partners developing commercial projects in North America, Europe and Asia-Pacific



4

Advanced technology readiness

Rapid development since company founding and advancing Tech Readiness Level (TRL)

(<1g* batch)



2007–2013

Bench scale testing

- University of Western Australia
- Concept evaluation

(<100g* batch)



2016–present

Scaled up bench test

- University of Sydney
- Catalyst kinetics and process research

(~1Kg* batch)



2017

Bench scale fluid bed

- University of Sydney
- Conceptual testing of fluidised bed concept

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



2017–2021

Pilot Plant

- Sydney and Perth
- Fluidised bed with optimized conditions and catalyst injection

(< 60kg/hr* continuous**)



2022–2023

Commercial Demonstration Plant (CDP)

- Perth, Australia
- End-to-end continuous plant with biogas feed
- Start up planned 2023

2025+

Key Projects

- Canada
- Chubu, Japan
- Montoir-de-Bretagne, France

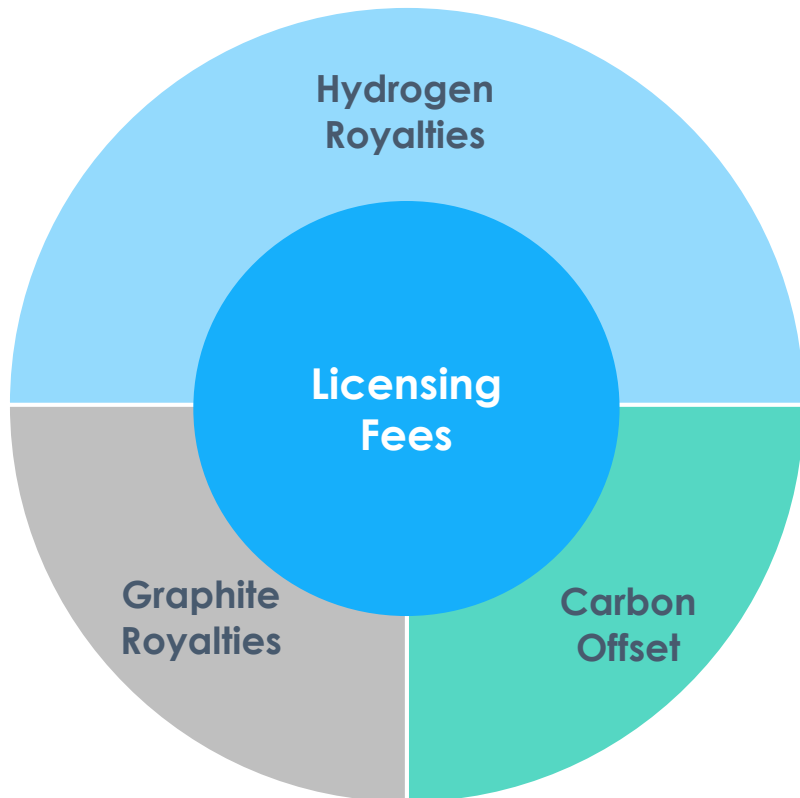
Project Development Pipeline



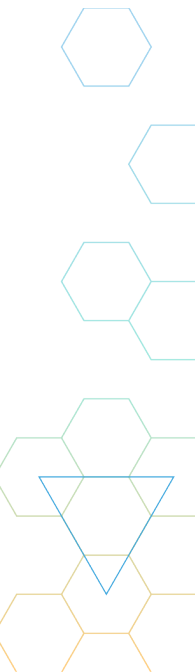
5

“Capex-lite” business model enables early free-cashflow

Hazer business plan premised on licensing and royalty revenues avoiding large-scale capex exposure



- One technology, two valuable markets
- Flexible combination of license fees and royalties
 - Fixed annual license fees commensurate with plant size
 - Royalties a percentage of H₂ and graphitic carbon revenues
- “Capex-lite” approach



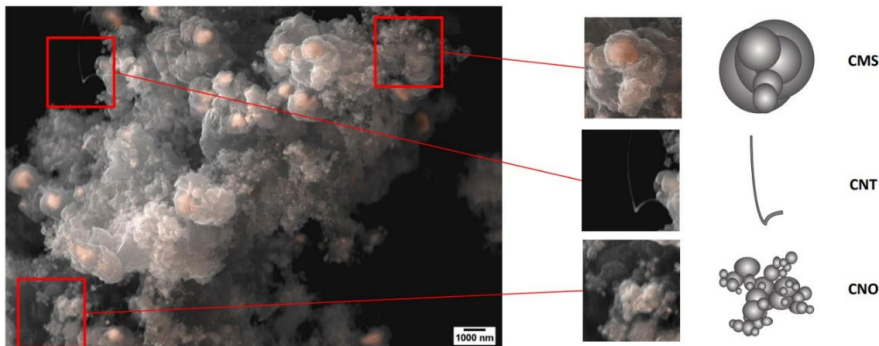
6 Graphite production diversifies earnings

A synthetic, low emissions product with differentiated morphology and properties

- Highly structured vs amorphous carbon black
- Iron inclusions produce magnetic graphite
- Low production emissions
- Up to 95% graphite purity
- High thermal & electrical conductivity
- Low sulphur & low ash content

Mitsui MOU

- A leading international trading and investment group based in Japan
- MOU signed to jointly investigate the market for Hazer graphite
- Exploring possible customers & applications in Asia-Pac, Northern America, Europe and Middle East



7 Building leading position in a rapidly growing market

Hydrogen will play a key role in the decarbonisation of hard-to-abate sectors

Current
market
~95_{MTPA}

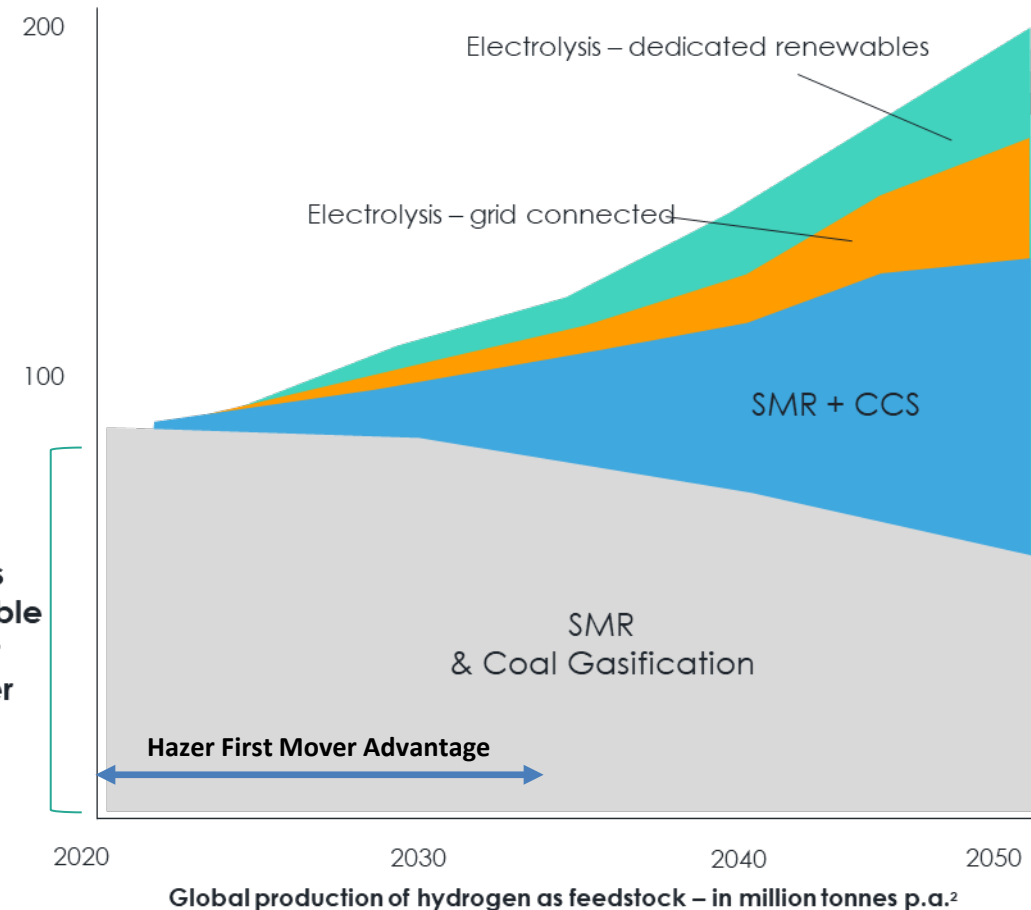


500_{MTPA}
in 2050¹



© Getty Images

Today's
Addressable
Market
for Hazer



¹International Energy Agency (IEA) - The Future of Hydrogen, June 2019: <https://www.iea.org/reports/the-future-of-hydrogen>

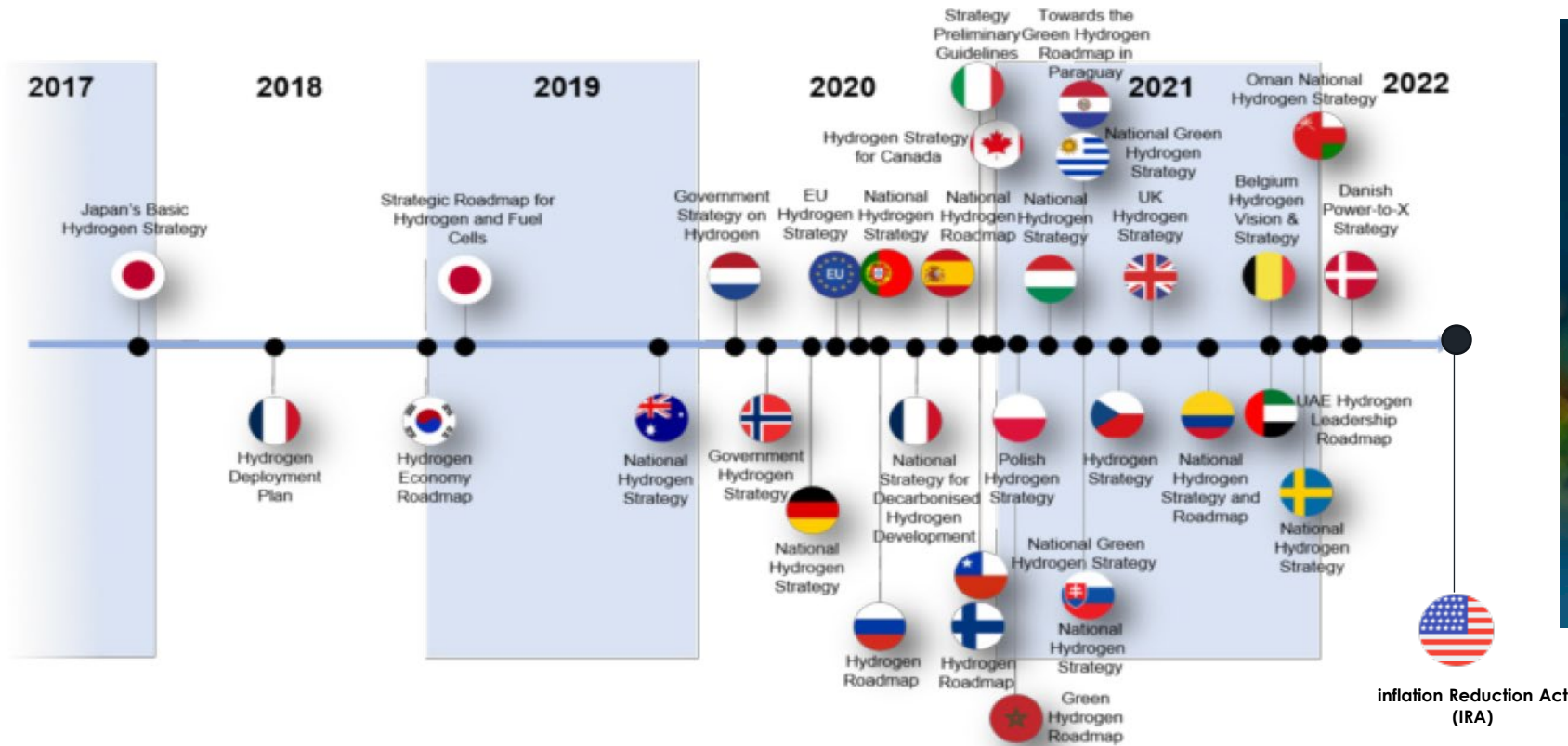
²DNV (June 2022) – 'Hydrogen forecast to 2050':

<https://www.dnv.com/news/hydrogen-at-risk-of-being-the-great-missed-opportunity-of-the-energy-transition-226628>

8

Global policy action gaining momentum

Hydrogen strategies expected in countries representing over 80% of global GDP by 2025



U.S. National Clean Hydrogen Strategy and Roadmap



Commercial Demonstration Plant (CDP)



Commercial demonstration plant confirming scalability

The first fully-integrated demonstration plant of the Hazer Process



CDP Site, Perth, Australia

Project Summary

- 100 tpa H₂ and ~380 tpa graphitic carbon
- Carbon negative process with biogas feedstock
- Construction & Phase1 commissioning completed June 2022
- Ready for startup on-track for 2023.
- Fully funded with ~\$9.4 million grant funding awarded by Australia Renewable Energy Agency (ARENA)



Australian Government
Australian Renewable
Energy Agency

ARENA

CDP on track for start-up in 2023

Key Milestones to Ready for Start-up (RFSU)

- ✓ Phase 1 plant construction
- ✓ Phase 1 commissioning, testing & debugging
- ✓ Heat exchanger materials delivery
- ✓ Mark-1 reactor forging & heat treatment
- ✓ Hot construction planning and contracts
- ✓ Start-up approvals and permits

On-track

- ✓ Hot equipment fabrication and installation
- ✓ Commissioning, RFSU and production

✓ Completed ✓ On-track

Latest Updates

- ✓ Heat exchanger successfully installed
- ✓ Reactor fabrication nearing completion
- ✓ CDP start-up on-schedule



Reactor successfully heat-treated and preparing for final machining and assembly

Leveraging CDP into new commercial projects

Commercial Demonstration Plant (CDP)



Demonstrate Continuous Operation

- Performance testing & process optimization
- Inform commercial design reliability requirements

Validate Scale-up Performance

- Confirm reactor performance to validate commercial scale design

Hazer Graphite Production

- High volume samples for product qualification
- Marketing arrangements

New Commercial Projects



Project Pipeline

Partnerships and scale-up into target markets



Overview of key scale-up development projects



BC, Canada



Nagoya, Japan



Montoir, France

Description	- Utilises existing fuel terminal site - H₂ to be used in gas blending and other industrial applications	- Existing LNG import terminal or power station site - H₂ as fuel for power generation, industry feedstock and mobility	- Existing LNG import terminal site identified - H₂ as fuel for power generation, industry feedstock and mobility
Partners		 	
Expected H₂ Production	- Phase 1 - Phase 2	- Phase 1 - Phase 2	- Phase 1 - Phase 2
Hazer Operating Model	Project partner & licensing	Licensing	Licensing
Targeted Start-up (phase 1)	2025	2027-2028	2027-2028



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Abbreviations and units used

ARENA Australian Renewable Energy Agency

CCS Carbon Capture & Storage

CDP Commercial Demonstration Plan

FID Final Investment Decision

IRR Internal Rate of Return

KTPA thousands of tonne per annum

LNG Liquefied Natural Gas

MOU Memorandum of Understanding

MMBTU Million British Thermal Units (A thermal unit of measurement for Natural Gas)

MTPA millions on tonne per annum

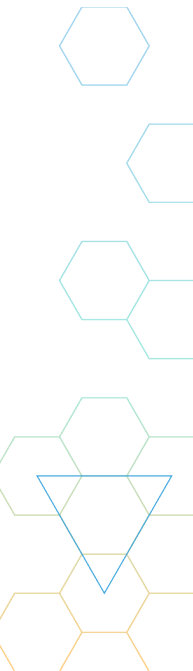
PDP Project Development Plan

PFS Pre-Feasibility Study

ROI Return on investment

SMR Steam Methane Reforming

TPA tonne per annum





Assumptions and notes

Slide 11 – Delivered Cost of H₂ – Hazer Competitive Advantage

1. Hazer US and Asia Pacific costs of H₂ - Company analysis and projections, modelling using an average feedstock gas price for North America of US\$2.20/MMBTU, and US\$12.80/MMBTU for Asia Pacific, ~US\$400/tonne graphitic carbon revenue [offset against operating expense]. Learning curve of 30%.
2. Assume a single pass configuration (no PSA) with value ascribed to unreacted methane (e.g power generation or gas blending use case)
3. Green ammonia cost - Source IRENA, 2020 NH₃ costs of US\$720-\$1,400/tonne, mid-point being \$1,060/tonne. H₂ equivalent is US\$6.00/kg:
<https://www.futurebridge.com/industry/perspectives-energy/green-ammonia-an-alternative-fuel/#:~:text=Cost%20of%20green%20ammonia&text=The%20current%20Price%20of%20green,%2C%20to%20%24%20310%20per%20tonne.>
3. Green hydrogen production cost - Source: IEA Global Hydrogen Review 2022, p.92. 2021 Wind Onshore and Solar PV average price of US\$6/kg.
4. Shipping of ammonia and liquid hydrogen – Source: IEA Global Hydrogen Review 2022 & Energy Technology Perspectives 2023. Costs of shipping ammonia expected at \$1.9-2.2/kgH₂ (average \$2.05/kg), LH₂ \$2.0-3.7/kgH₂ (average \$2.85/kg): <https://www.hydrogeninsight.com/innovation/iea-ammonia-and-lohc-will-be-cheaper-options-for-shipping-hydrogen-than-liquefied-h2-even-with-reconversion-costs/2-1-1387346>
5. Ammonia re-crack to H₂ - The cost of re-cracking ammonia to hydrogen is estimated to be € 1/kg / US\$1.08/kg: <https://pubs.rsc.org/en/content/articlehtml/2021/se/d1se00345c>
6. Green hydrogen production cost - Source: IEA Global Hydrogen Review 2022, p.92. 2021 Wind Onshore and Solar PV average price of US\$6/kg.
7. Green Hydrogen liquefaction - Unit costs of liquefaction system for hydrogen 1.44 \$/kg LH₂: <https://www.sciencedirect.com/science/article/abs/pii/S0360319919311127>
8. Green Hydrogen Load-out & Receiving Facilities - ~US\$3/kg. Australian Hydrogen Market Study Sector Analysis Summary, May 2021, CEFC, p.84.

