



# Gold Hydrogen

**Aiming to Develop Naturally  
Occurring Australian Hydrogen  
and Helium**

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Statements in this presentation as to gas and mineral resources has been compiled from data provided by Gold Hydrogen's Chief Engineer, Mr. Billy Hadi Subrata. Mr. Hadi Subrata's qualifications include a Bachelor and Master of Engineering Science from University of New South Wales, Sydney, Australia, and he is an active member of Engineers Australia and SPE. Mr. Hadi Subrata's has 18 years of relevant exploration, development and production experience in petroleum, conventional and unconventional hydrocarbons, and hydrogen. Mr. Hadi Subrata has sufficient experience that is relevant to Gold Hydrogen's resources to qualify as a Reserves and Resources Evaluator as defined in the ASX Listing Rules 5.11. Mr. Hadi Subrata consented to the inclusion in this report of the matters based on his information in the form and context in which it appears.

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# Executive Summary - Low Cost, Natural Hydrogen

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**Title over natural hydrogen occurrences and a certified prospective resource**

Certified Prospective Resource for natural hydrogen with an unrisks Best Estimate of 1.3 billion kilograms (**Refer Slide 13 for details**)



**Flagship 'Ramsay Project', exploration permit granted, plus application permits**

Ramsay Project 7,820 km<sup>2</sup> (green on map) is 100% owned by Gold Hydrogen. Other locations under exclusive application to Gold Hydrogen are a further 67,512 km<sup>2</sup>



**Ramsay 1 & 2 exploration well results indicate Hydrogen and Helium**

Preliminary gas sample analyses have yielded high purity levels of up to **86% hydrogen plus helium in high purity levels at up to 6.8%**



**Enabling engagements with leading global experts and contractors**

Strategic engagements to date with CSIRO, Schlumberger, Total Seismic, Xcalibur, Savanna Energy Services



**Significant commercial and environmental competitive advantage**

As a replacement for carbon-based fuels, naturally occurring hydrogen offers significant cost and emission advantages relative to other sources of hydrogen production. Global helium projects may be commercial from 1% purity or less

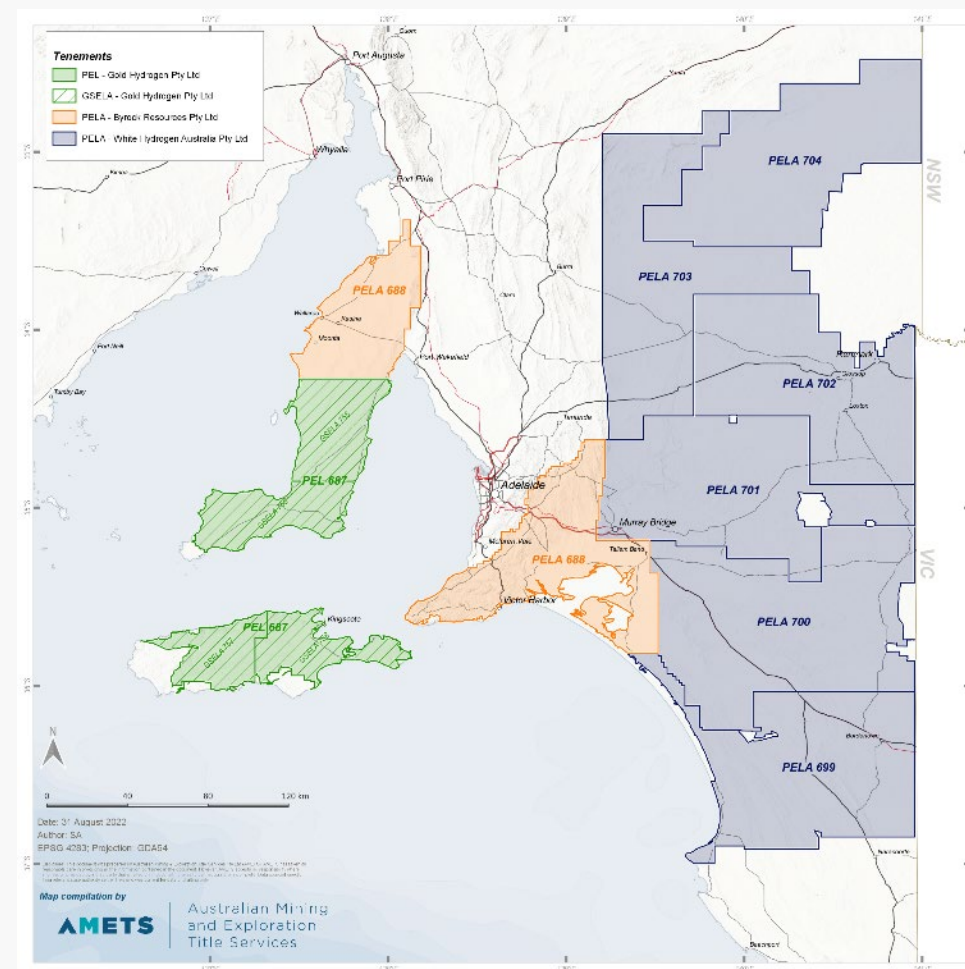


Figure: Overview of Gold Hydrogen tenements

# Investor Snapshot

## Capital Structure

Total shares on issue	159.7m
Shares escrowed (to Jan 25)	83.0m
<i>Free-float</i>	<i>76.7m</i>
Options on issue (75c / \$1.00 / \$1.75)	5.1m
Fully-diluted capital	164.8m
<b>Market cap at 70 cents</b>	<b>\$112m</b>
Cash on hand	\$21m

## Share Price Performance Since IPO (Jan 2023)



*In December 2023, the Australian Financial Review ranked Gold Hydrogen as one of the best performing IPOs of 2023*

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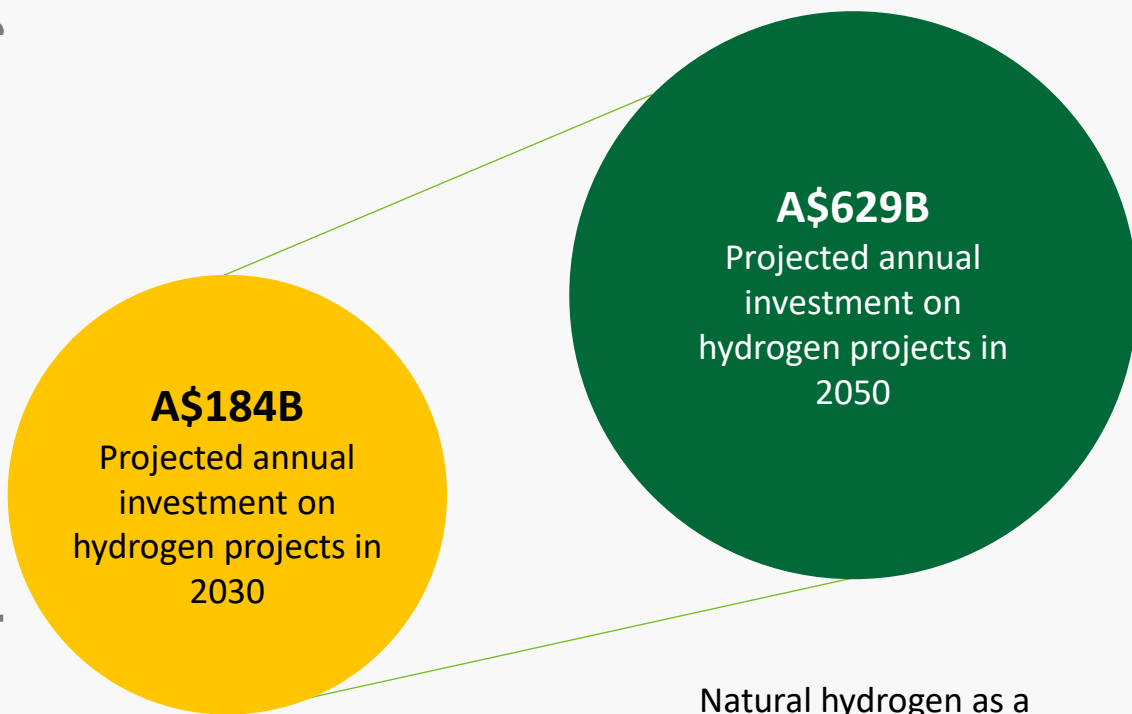
# Industry Overview



# Global Hydrogen Forecast

Substantial investment laying the foundation for Hydrogen use

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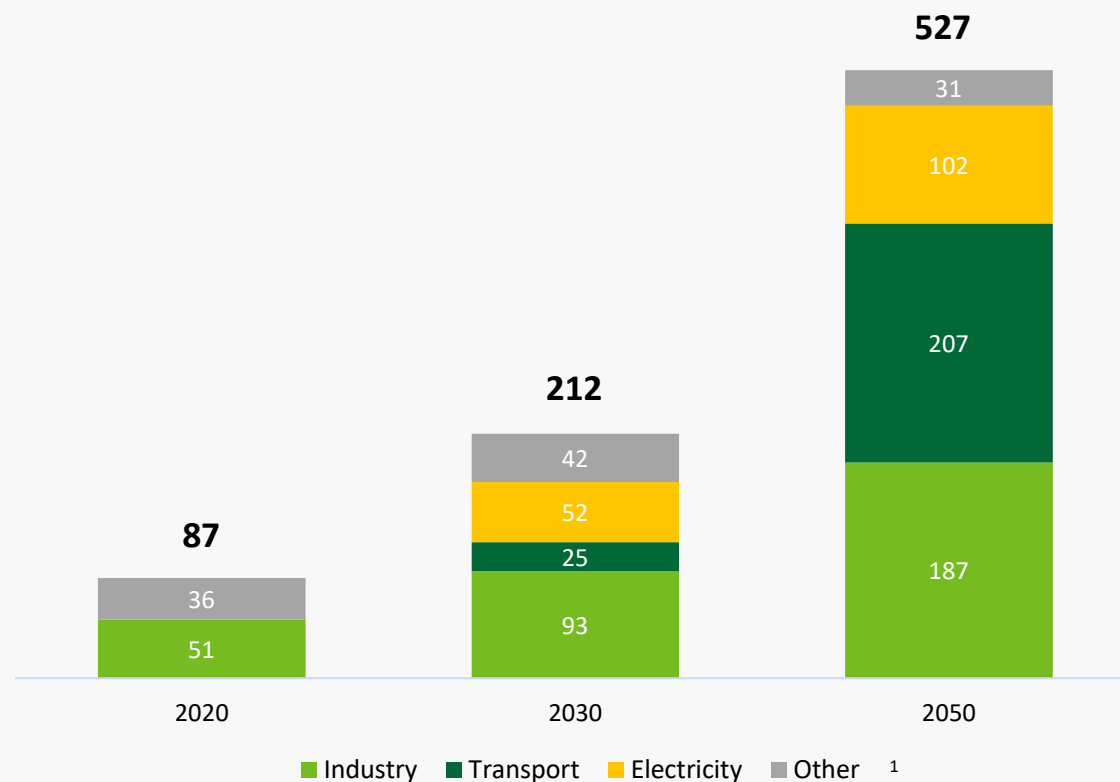


ESG push to decarbonise industries and economies is underpinning demand for hydrogen

Natural hydrogen as a carbon-neutral, low-cost source presents a very attractive opportunity to facilitate decarbonisation

Source: Frost & Sullivan Report - Page 29 of Gold Hydrogen Prospectus

Global Hydrogen Demand by Sector, Net Zero Emissions Target Scenario (Mt)



Source: International Energy Agency, Oct-2021  
1. Other includes buildings, agriculture and refineries

# Key Trends Driving Hydrogen Adoption

Most hydrogen used today is in the production of ammonia and steel, or by oil refineries

**Future growth projections are based on a number of key trends that are driving adoption**



**ESG investment and country policies** push to decarbonise



**Technological advances** across the hydrogen value chain



**Hydrogen enhances flexibility** of grids and industrial applications



**Use of hydrogen as transport fuel** or heat source alternative



# Types of Hydrogen Production

Naturally occurring Hydrogen offers significant cost and / or carbon advantages relative to other Hydrogen production (manufacturing) processes

Gold Hydrogen is exploring for 'gold' or 'white' (natural) Hydrogen

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	Gold / White (natural)	Grey	Black/Brown	Blue	Green
Energy source	Natural hydrogen	Natural gas	Coal	Natural gas / coal	Renewables / biomass
Environmental impact	Low	High	Very High	Low	Low
No thermal process	✓	✗	✗	✗	✗
Production cost (A\$/kg) <sup>1,2</sup>	\$1.00	\$5.60	\$6.20-\$6.40	\$10.20-\$10.30	P: \$6.40-\$25.50 A: \$4.70-\$23.20
Cost comparable to existing power generation <sup>3</sup>	✓	✗	✗	✗	✗

Today, ~95% of all hydrogen produced is from natural gas

Source: Frost and Sullivan, Sep-2022 (Refer Gold Hydrogen Replacement Prospectus dated 29 November 2022)

1. Source: Christophe Rigollet<sup>1</sup>, Alain Prinzhofer<sup>2,3</sup>, Natural Hydrogen: A New Source of Carbon-Free and Renewable Energy That Can Compete With Hydrocarbons, First Break, Volume 40, Issue 10, Oct 2022, p. 78 – 84

DOI: <https://doi.org/10.3997/1365-2397.fb2022087>; "The Bourakébougou field, in Mali, represents the first natural hydrogen deposit studied both scientifically and industrially.

It gives us information on its renewability, on the natural flows involved and therefore on its sustainable exploitation. It is possible to estimate that the cost of operating hydrogen would be less than \$1/kg, which is significantly cheaper than any

manufactured hydrogen, whether green, grey, or blue. Equivalent work is in progress in other continents, in order to be able to compare our knowledge of this Malian field with other fields in the world, which will make it possible to better ensure the industrial and societal interest of R&D for this new field."

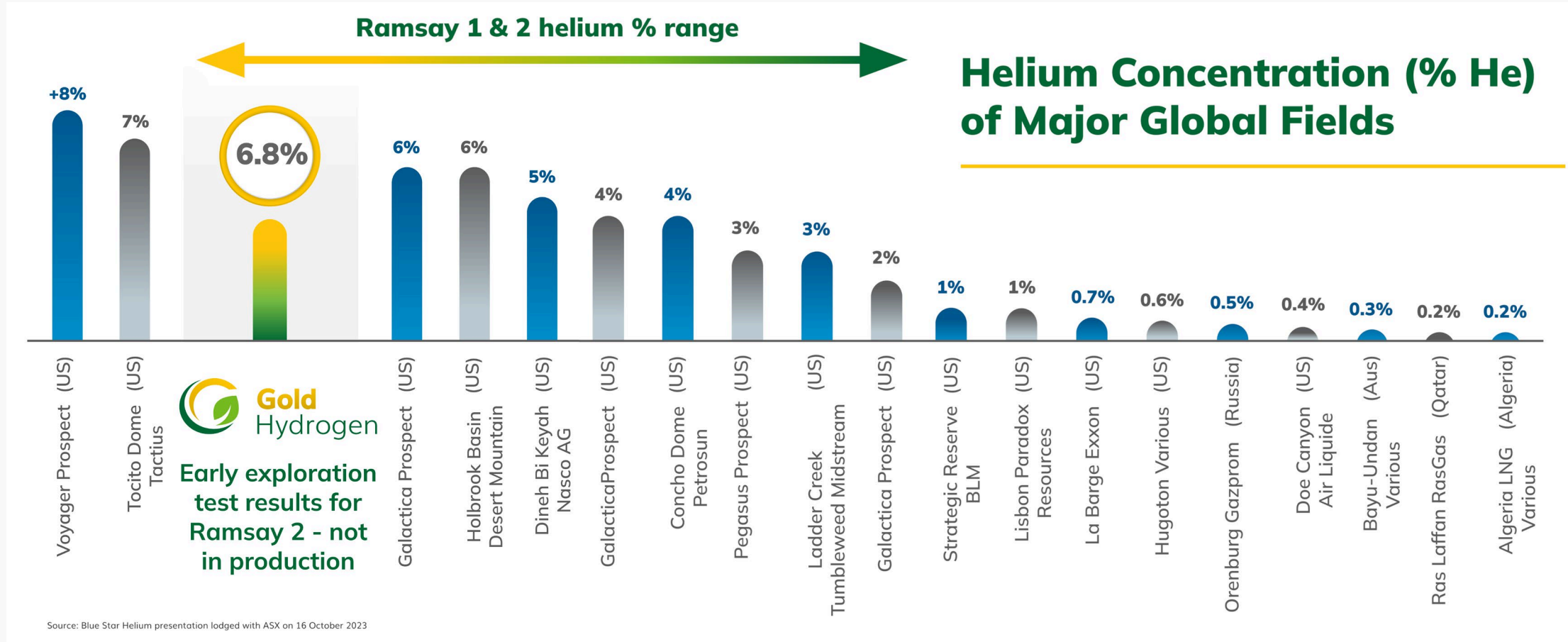
2. P = Polymer electrolyte membrane electrolysis. A = Alkaline Electrolysis. Gold Hydrogen cost is an estimate

3. For industrial buyers, a hydrogen offtake price of €3 (\$4.50) per kg would be required to incentivise hydrogen production over power generation

# Global Helium Projects

Gold Hydrogen's Ramsay 1 & 2 exploration wells found Helium at up to 6.8% (in addition to the 86% Hydrogen identified)

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Gold Hydrogen currently has insufficient data to publish of a prospective resource for Helium, but is aiming to establish a maiden prospective resource report in the first quarter of 2024.



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# Company Overview



# Historical Drilling Found Hydrogen: Ramsay 1 Confirmed it

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In the 1920s and 1930s, Natural Hydrogen occurrences in PEL 687 were reported during unsuccessful ventures looking to discover oil

Gases from the Ramsay Oil Bore were sampled by the State of South Australia at the rig site and after lab analysis was found to have a very high Natural Hydrogen content between 66% and 89% (air corrected)

Gold Hydrogen successfully twinned the Ramsay Oil Bore in October 2023 (Ramsay 1) and also drilled Ramsay 2 and found up to **86% Hydrogen and 6.8% Helium** (refer ASX releases from 31 October 2023 to 19 December 2023)





	<i>Historical drilling</i>		<i>2023 Program</i>	
	American Beach	Ramsay Oil Bore 1	Ramsay 1	Ramsay 2
Depth (m)	289.5	240	220 - 1005	220 – 1064
H2 (%) air corrected values	83.3	76	73.3% H2	86% H2 (6.8% He raw gas)

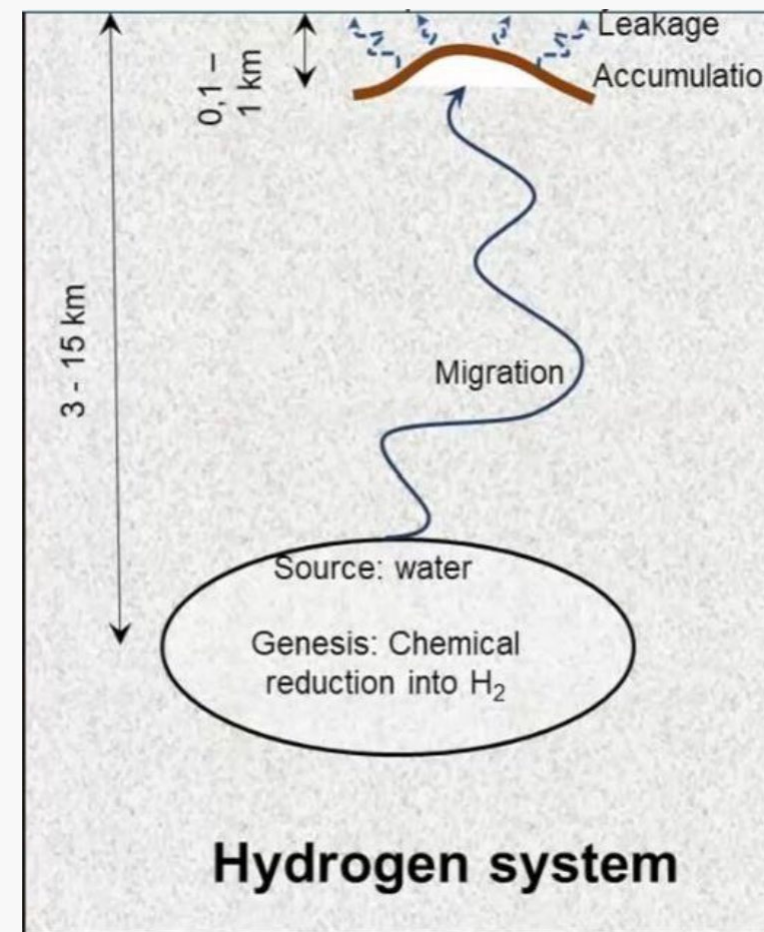


# Key Success Factors

Ramsay Project ticks the boxes in respect of the key attributes for the formation and accumulation of Natural Hydrogen

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Key Success Factor	Ramsay Project	
<b>Source &amp; Generation</b> <i>Via hydrolysis and radiolysis reactions in old rocks</i>	Located at the Gawler craton of South Australia, where radiolysis and hydrolysis reactions of iron-rich rocks are ongoing creating naturally occurring hydrogen	
<b>Seals &amp; Traps</b> <i>Required to enable accumulations of naturally formed hydrogen</i>	The Cambrian stratigraphy including tight limestones that overlie the basement source rocks provides likely seals that were penetrated by the historic wells that found hydrogen	
<b>Structure</b> <i>Major structural boundaries in an extensional geological regime where natural fractures exist</i>	Ramsay Project located on major lithospheric boundary and bend in the Tasman line of the Delamerian orogeny. Additionally, it is within the setting of the tectonically active horst-graben Adelaide extensional rift	
<b>Reservoir</b> <i>To be commercial, a reservoir of adequate volume, accessibility, flow rate and quality is required</i>	Ramsay Project Reservoir may extend to 5km depth (with only 50-150m thickness assumed in the Technical Expert Report) with historical occurrences of up to 84% Natural Hydrogen (up to 89% air-corrected) from rocks which overlie the Basement Source rocks	



Source: SPE Hydrogen Section, online. November 2, 2023  
(Ref: Prinzhofer, 2021)



# Gold Hydrogen 2024 Activities

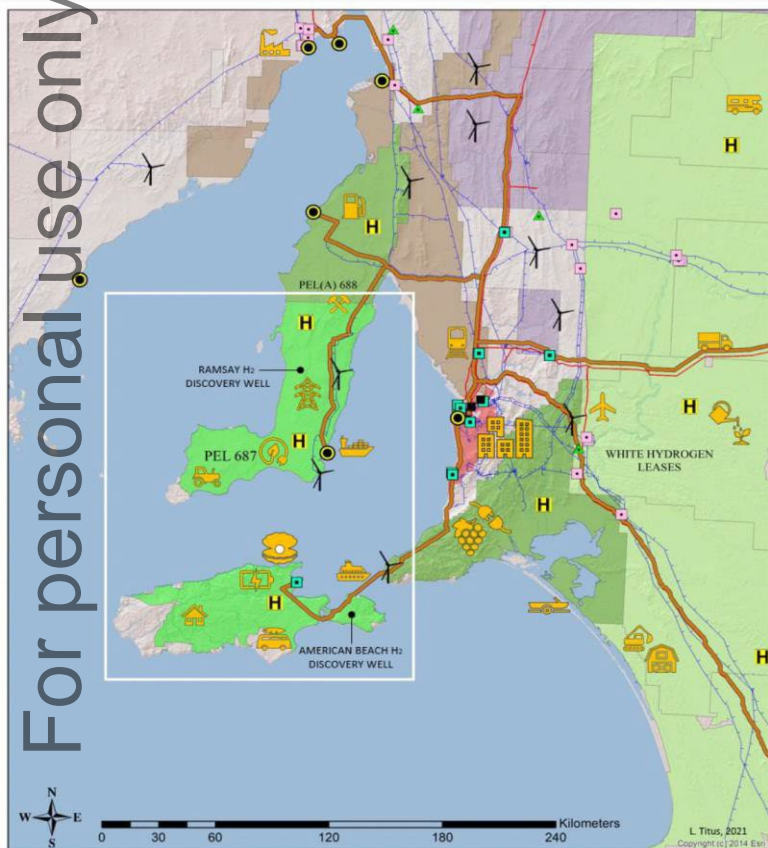
- March 2024 – Maiden Prospective Resource Report for Helium
- March 2024 – Commence flow testing technical program Ramsay 1 & 2
- May 2024 – Update to Prospective Resource Report for H2 and He
- May 2024 – Begin Ramsay pilot feasibility study
- June 2024 – 2D seismic program
- August 2024– Proposed drilling of Ramsay 3 & 4
- October 2024 – Well test Ramsay 3 & 4
- November 2024 – Decision on Ramsay pilot

*Ramsay 1 drill site and Savanna Energy drill rig*

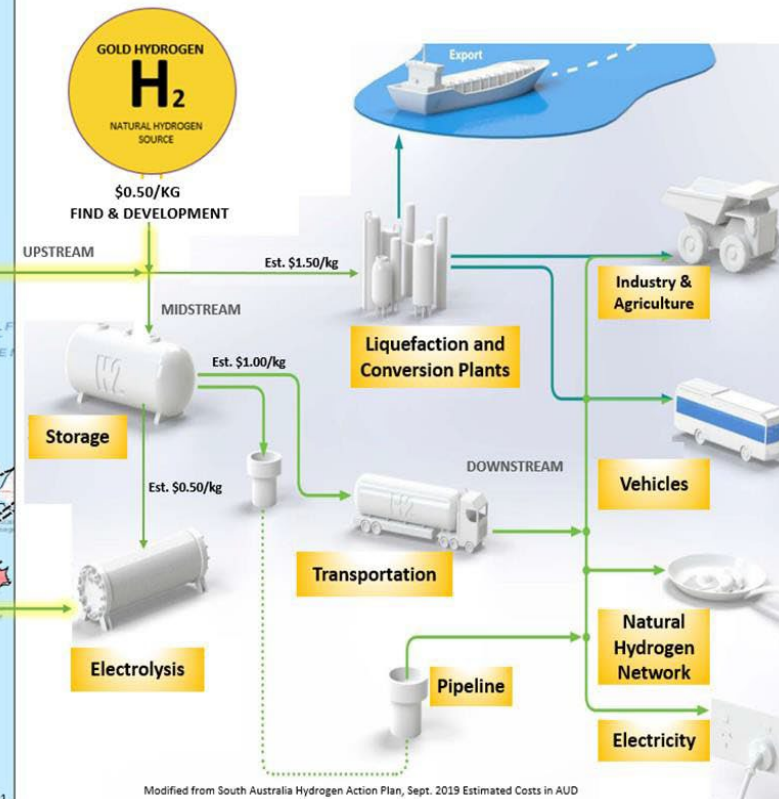
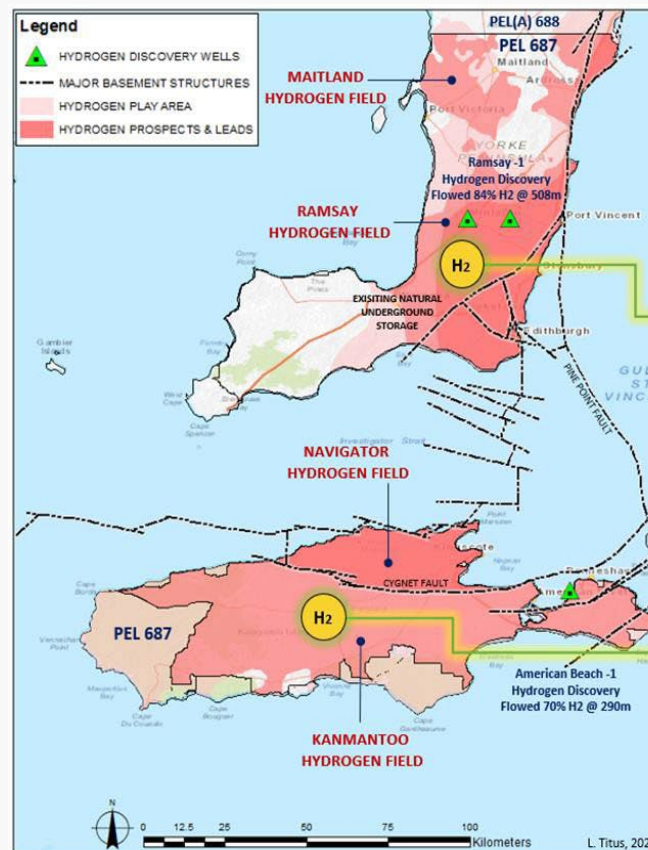


# Large Scale Potential Commercialisation Opportunities

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- Legend**
- Existing Power Generation FUEL SOURCE**
- H** NATURAL HYDROGEN
  - F** FOSSIL
  - ▲** HYBRID
  - ☀** SOLAR
  - 🌪** WIND
  - BIOMASS
- Infrastructure**
- Proposed Hydrogen Pipeline
  - Existing Pipelines
  - Existing Transmission Lines
  - ⊙** GA Proposed Hydrogen Ports
- Leases**
- Gold Hydrogen PEL687
  - Byrock Resources PEL(A)688
  - Energy Exploration PEL126
  - White Hydrogen Leases
  - H2Ex Leases
  - 2H Resources Leases
  - Adelaide
- GOLD HYDROGEN CLEAN ENERGY ECONOMY**





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# Key Team





# Key Management



**Neil McDonald**  
**Founder & Managing Director**

Neil McDonald has more than 20 years of extensive commercial experience across the energy and minerals sectors in multiple Australian states. He has been involved from greenfield exploration to early development in projects across Queensland, Northern Territory and South Australia. He has worked on and helped commercialise some of Australia's largest exploration projects for private and public companies.

As a commercial lawyer, Neil has a strong legal grounding in commercial and regulatory compliance in the resources industry. Areas of focus in his career have been: acquiring new assets for business growth, monetisation of existing assets, engaging domestic and international investors, new partnerships to maximise commercialisation of assets, developing non-partisan relationships at the highest political levels, both Federal and State.

Neil is a graduate of the Australian Institute of Company Directors.



**Roger Cressey**  
**Executive Director, Commercial & Operations**

Roger Cressey has more than 35 years of experience in the resource industry, predominantly in gas exploration and production.

Roger has held CEO, COO and other executive roles within upstream and downstream operations across Australia, most recently in Queensland, NT and before that PNG. He has also held senior roles with companies active in Indonesia and Uganda.

Roger's strengths lie in managing multi-discipline teams, strategy development and delivery.

He has a strong focus on engagement with both external and internal key stakeholders.



**Karl Schlobohm**  
**Company Secretary & Chief Financial Officer**

Karl Schlobohm is a Chartered Accountant and Fellow of the Governance Institute of Australia, with over 30 years experience across a range of businesses and industries.

Karl has extensive listed company experience spanning the ASX, LSE, AIM and TSX exchanges, and has acted as CFO and / or Company Secretary for a number of publicly-listed companies in the resources industry including SolGold plc, Atlantic Lithium Ltd, DGR Global Ltd, and Meridian Minerals Ltd.



**Josh Whitcombe**  
**Chief Operating Officer**

Dr Josh Whitcombe is a Chartered Chemical Engineer and RPEQ with over 20 years of experience in the Oil and Gas industry, both offshore and onshore.

Josh has held a number of Senior Management roles with small to mid-sized gas producers in Australia. After completing a PhD in oil refining he worked offshore with Shell International before returning to Australia 15 years ago.

Prior to joining Gold Hydrogen he has had extensive experience in both green field exploration and brown field conventional gas operations. He has demonstrated an ability to manage diverse technical challenges, while focusing on HSE and community outcomes.

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# Board of Directors

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**Neil McDonald**  
 Founder &  
 Managing Director

- Neil McDonald has more than 20 years of extensive commercial experience across the energy and minerals sectors in multiple Australian states. He has been involved from greenfield exploration to early development in projects across Queensland, Northern Territory and South Australia. He has worked on and helped commercialise some of Australia's largest exploration projects for private and public companies.
- Neil is a graduate of the Australian Institute of Company Directors.



**Alexander Downer**  
 Independent  
 Non-Executive Chair

- Alexander Downer is one of the country's best-known politicians and diplomats. Leader of the Liberal Party, Minister for Foreign Affairs and High Commissioner to the UK. Before entering politics he was an executive director of the Australian Chamber of Commerce.
- Since departing Canberra and the diplomatic service, he holds or has previously held board appointments including the Advisory Board of British strategic intelligence and advisory firm Hakluyt & Company, merchant bankers Cappello Capital Corp. the Adelaide Symphony Orchestra, Huawei in Australia, as well as ASX-listed Lakes Oil NL and Ironbark Zinc Ltd.
- Alexander is currently a Non-Executive Director of Yellow Cake Plc, is a columnist for the AFR and is Companion of the Order of Australia.



**Katherine Barnet**  
 Independent  
 Non-Executive Director

- Katherine Barnet is a Chartered Accountant with over 25 years' experience in the provision of professional services. Katherine is currently a partner at Olvera Advisors, a boutique Sydney-based consultancy, and has worked on some of Australia's largest corporate matters and achieved success in developing, evaluating and understanding complex financial transactions, optimising sustainable growth and increasing value to corporate entities. Her recent corporate expertise has been focused on the renewable energy / mining, retail, property and construction industries.
- Katherine is a Fellow of CAANZ and ARITA and a member of the Australian Institute of Company Directors.



**Roger Cressey**  
 Executive Director,  
 Commercial & Operations

- Roger Cressey has more than 35 years of experience in the resource industry, predominantly in gas exploration and production.
- Roger has held CEO, COO and other executive roles within upstream and downstream operations across Australia, most recently in Queensland, NT and before that PNG. He has also held senior roles with companies active in Indonesia and Uganda.
- Roger's strengths lie in managing multi-discipline teams, strategy development and delivery.
- He has a strong focus on engagement with both external and internal key stakeholders.

# Gold Hydrogen Summary

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	<p><b>Title over reported natural hydrogen occurrences and a prospective resource</b></p>	<p>Certified Prospective Resource for natural hydrogen with an unrisks Best Estimate of 1.3 billion kilograms <b>(Refer Slide 13 for details)</b></p>
	<p><b>Flagship project, exploration permit granted</b></p>	<p>Ramsay Project 7,820 km<sup>2</sup> (green on map) is 100% owned by Gold Hydrogen. Other locations under exclusive application to Gold Hydrogen are a further 67,512 km<sup>2</sup></p>
	<p><b>Exploration results</b></p>	<p>Stage One exploration drilling program of Ramsay 1 and Ramsay 2 on the Yorke Peninsula. Preliminary gas sample analyses have yielded high purity levels of up to 86% hydrogen plus helium in high purity levels up to 6.8%</p>
	<p><b>Enabling engagements with leading global experts</b></p>	<p>Strategic engagements to date with SLB (Schlumberger), CSIRO, Total Seismic, and Xcalibur Multiphysics, Savanna Energy Services</p>
	<p><b>Significant commercial and environmental competitive advantage</b></p>	<p>As a replacement for carbon-based fuels, naturally occurring hydrogen offers significant cost and emission advantages relative to other sources of Hydrogen production</p>

*... and we have a potential Helium play as well*





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Hydrogen

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