



Gold Hydrogen

Ramsay 1 & 2: Australia's First Natural Hydrogen & Helium Exploration Wells

Resource Rising Stars - April 2024

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This presentation contains "forward looking statements" concerning the financial condition, results of operations and business of Gold Hydrogen. All statements other than statements of fact or aspirational statements, are or may be deemed to be "forward looking statements". Often, but not always, forward looking statements can generally be identified by the use of forward looking words such as "may", "will", "expect", "intend", "plan", "estimate", "anticipate", "continue", "outlook", and "guidance", or other similar words and may include, without limitation, statements regarding plans, strategies and objectives of management, future or anticipated production or construction commencement dates and expected costs, resources or reserves, exploration results or production outputs. Forward looking statements are statements of future expectations that are based on management's current expectations and assumptions and known and unknown risks and uncertainties that could cause the actual results, performance, or events to differ materially from those expressed or implied in these statements. These risks include, but are not limited to price fluctuations, actual demand, currency fluctuations, drilling and production results, commercialization, reserve estimates, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal, and regulatory developments, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals, and cost estimates. More detail on the risks relevant to Gold Hydrogen's business and operations is set out in Risks section of this presentation.

Prospective Resource Statements

The Prospective Resource Statements for Natural Hydrogen and for Helium have been included in presentation under the approval of Mr Billy Hadi Subrata, Chief Engineer for Gold Hydrogen, who is a Qualified Petroleum Reserves and Resources Evaluator. Mr Hadi Subrata confirms that, as at the date of this announcement, there is no change to information or additional information, since the effective dates, that would materially change the estimates of prospective resources quoted.

QPRRE Statement – Natural Hydrogen

The Prospective Resource Statement for Natural Hydrogen in this presentation is based on, and fairly represents, information and supporting documentation prepared by independent consultants "Teof Rodrigues & Associates" with an effective date of 30 September 2021, and which forms part of the Company's Replacement Prospectus dated 29 November 2022. The Prospective Resource Statement, together with all relevant notes, also appears in the Company's ASX release of [13 January 2023](#).

QPRRE Statement - Helium

The Prospective Resource Statement for Helium in this announcement is based on, and fairly represents, information and supporting documentation prepared by independent consultants "Teof Rodrigues & Associates" with an effective date of 21 February 2024, and which was announced by the Company on that date together with the accompanying assumptions and notes.

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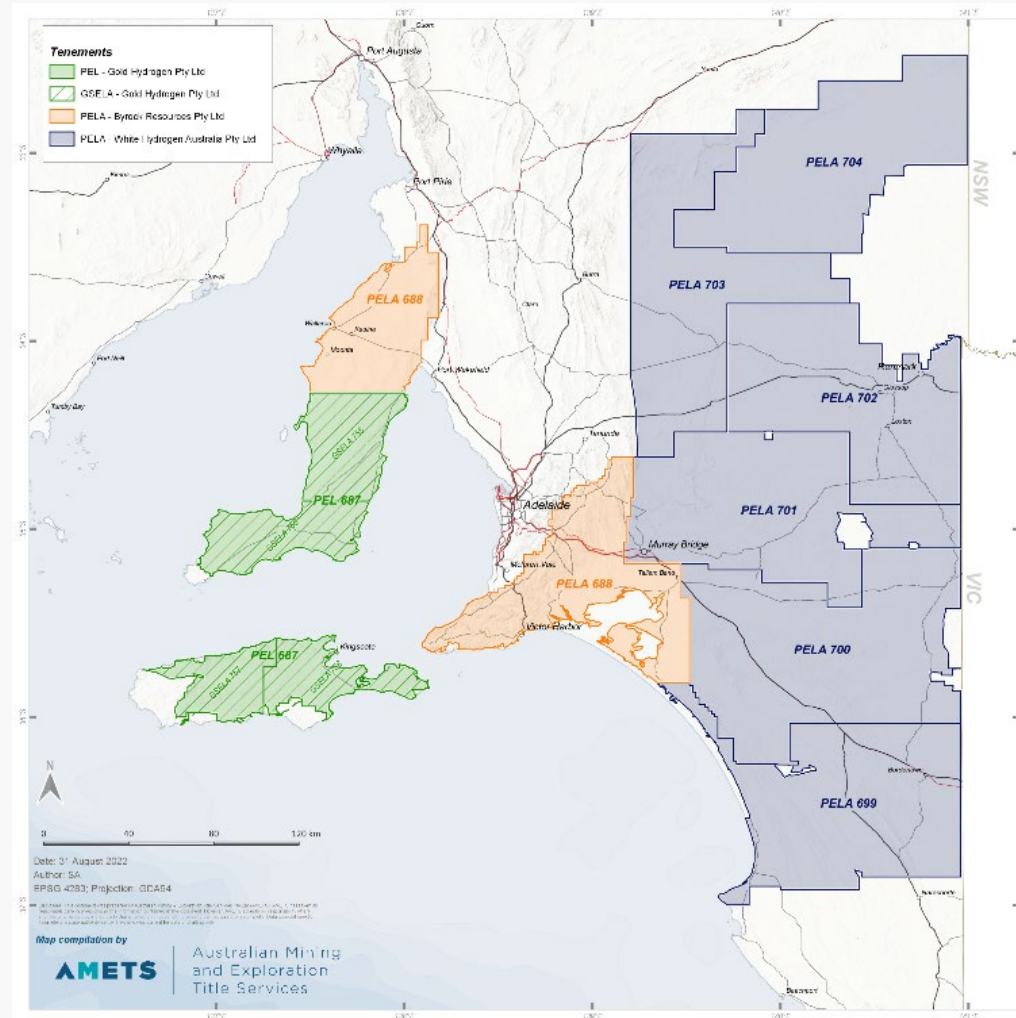
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Executive Summary – Natural Hydrogen plus Helium

	<p>Title over natural hydrogen & helium occurrences and certified prospective resources, with extensive exploration upside</p>	<p>Certified Prospective Resource for natural hydrogen with an unrisks Best Estimate of 1.3 billion kilograms, and an unrisks Best Estimate of 41Bcf of helium with a mean average of 96 Bcf (Refer Slides 14 and 15 for full details)</p>
	<p>Flagship ‘Ramsay Project’, exploration permit granted, plus application permits</p>	<p>Ramsay Project 7,820 km² (green on map) is 100% owned by Gold Hydrogen. Other locations under exclusive application to Gold Hydrogen are a further 67,512 km²</p>
	<p>Ramsay 1 and Ramsay 2 exploration well results indicate Hydrogen and Helium</p>	<p>Preliminary gas sample analyses have yielded high purity levels of up to 86% hydrogen, plus helium in high purity levels at up to 17.5% air-corrected</p>
	<p>Enabling engagements with leading global hydrogen experts and contractors</p>	<p>Strategic engagements to date with CSIRO, Schlumberger, Total Seismic, Xcalibur, Savanna Energy Services</p>
	<p>Significant commercial and environmental competitive advantage</p>	<p>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, as helium is considered both rare and valuable</p>



Overview of Gold Hydrogen tenements

Investor Snapshot

Capital Structure – 31 March 2024

Total shares on issue	159.7m
Shares escrowed (to Jan 25)	83.0m
Free-float	76.7m
Options on issue (75c / \$1.00 / \$1.75)	5.1m
Fully-diluted capital	164.8m
Market cap at \$1.48 / share	\$236m
Cash on hand	\$20m

Share Price Performance Since IPO



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

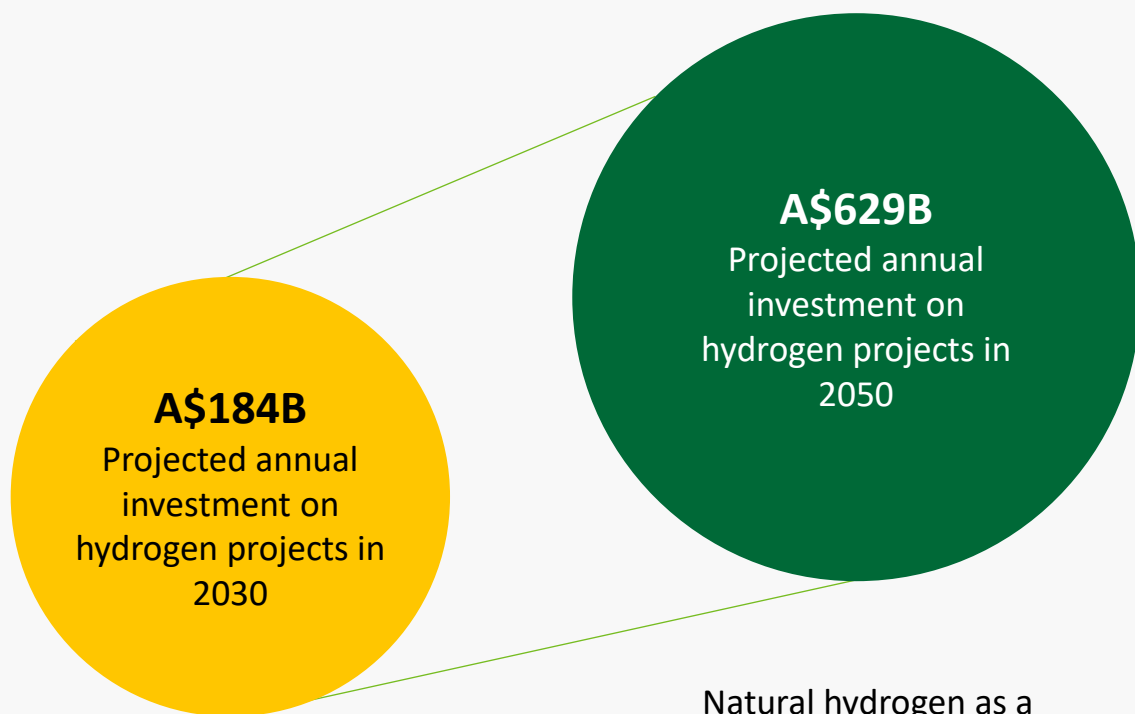


Industry Overview



Global Hydrogen Forecast

Substantial investment laying the foundation for Hydrogen use

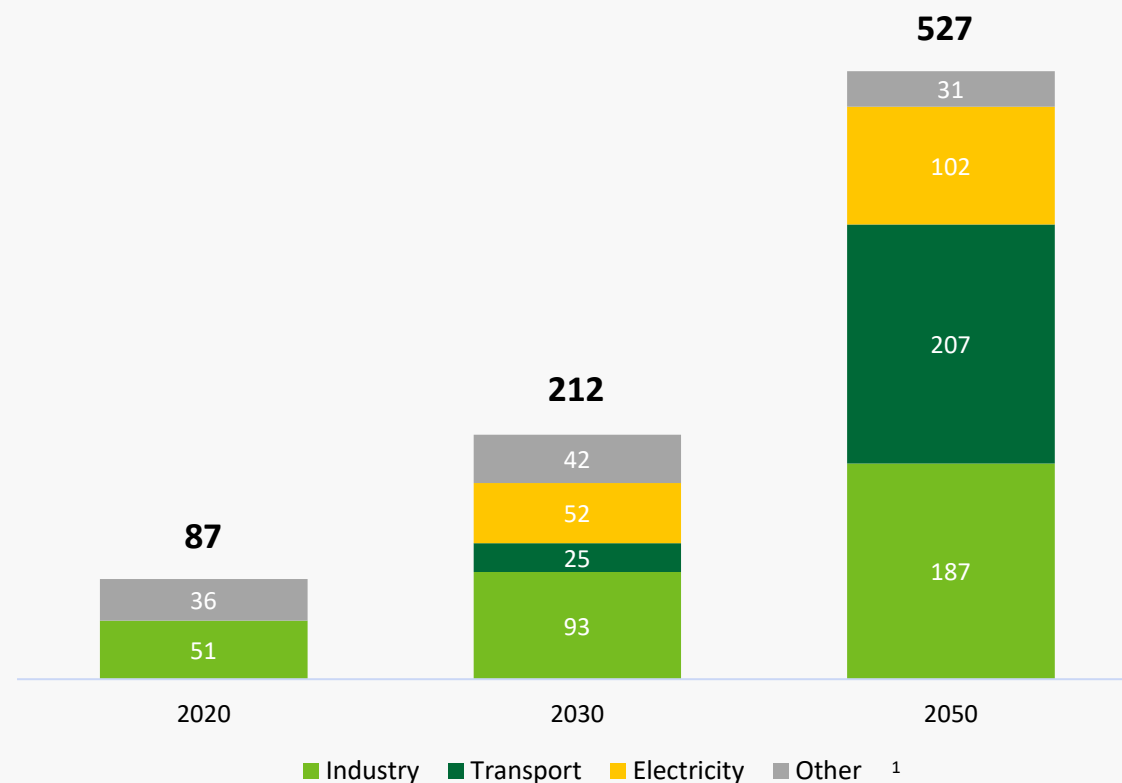


ESG push to decarbonise industries and economies is underpinning demand for hydrogen

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

Key Trends Driving Helium Requirements

Most helium used today is in the health industry, electronics and space industries

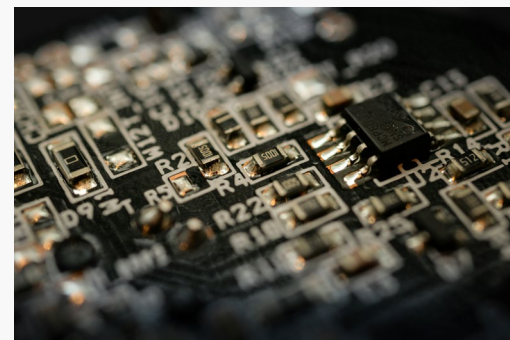
Future growth projections are based on a number of key technologies



Health Care



Space Industry



Electronics



Industrial uses

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



	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) ^{1,2}	\$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 ³	✓	✗	✗	✗	✗



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 Rigollet¹, Alain Prinzhofer^{2,3}, 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

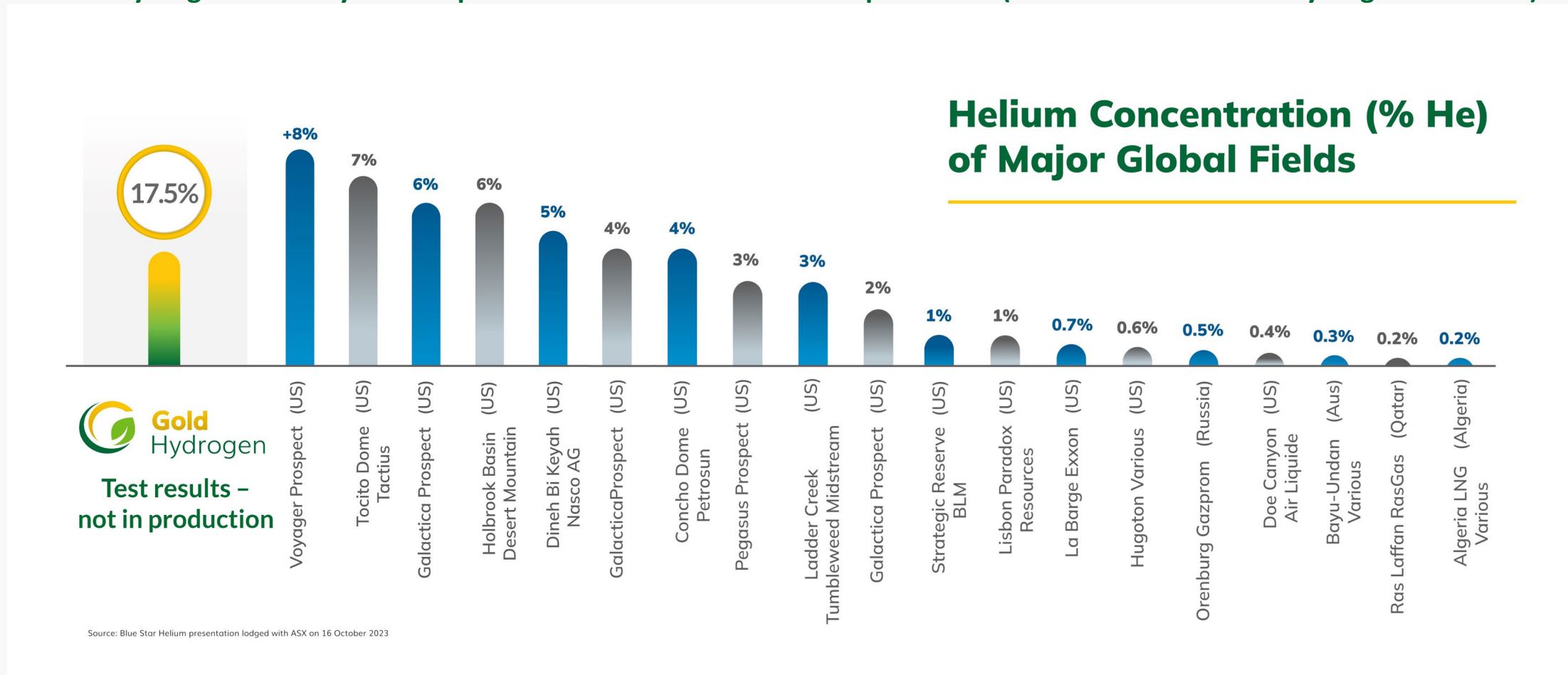
manufactured hydrogen, whether green, grey, or blue. Equivalent work is in progress in other continents, in order to be able to compare our knowledge of this Malian field with other fields in the world, which will make it possible to better ensure the industrial and societal interest of R&D for this 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 17.5% (in addition to the 86% Hydrogen identified)



Indicatively, longer-term bulk pricing is expected to be approximate USD450 per Mcf (thousand cubic feet).^[1]





^[1] February 2024 www.noblehelium.com.au, quoting Kornbluth Consulting.

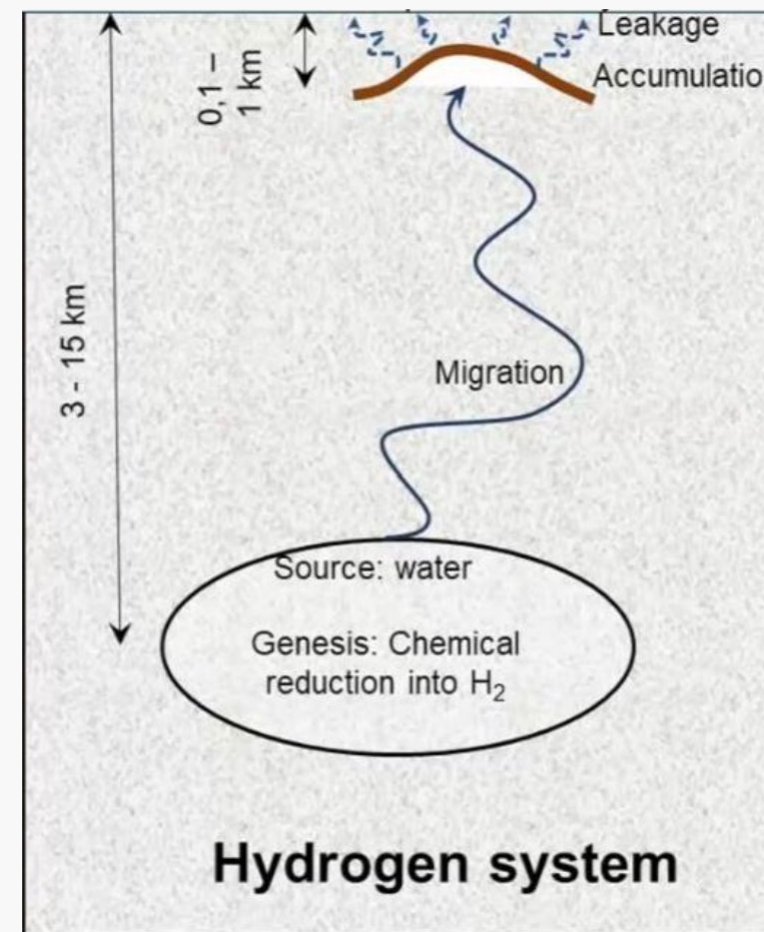


Company Overview

Key Success Factors

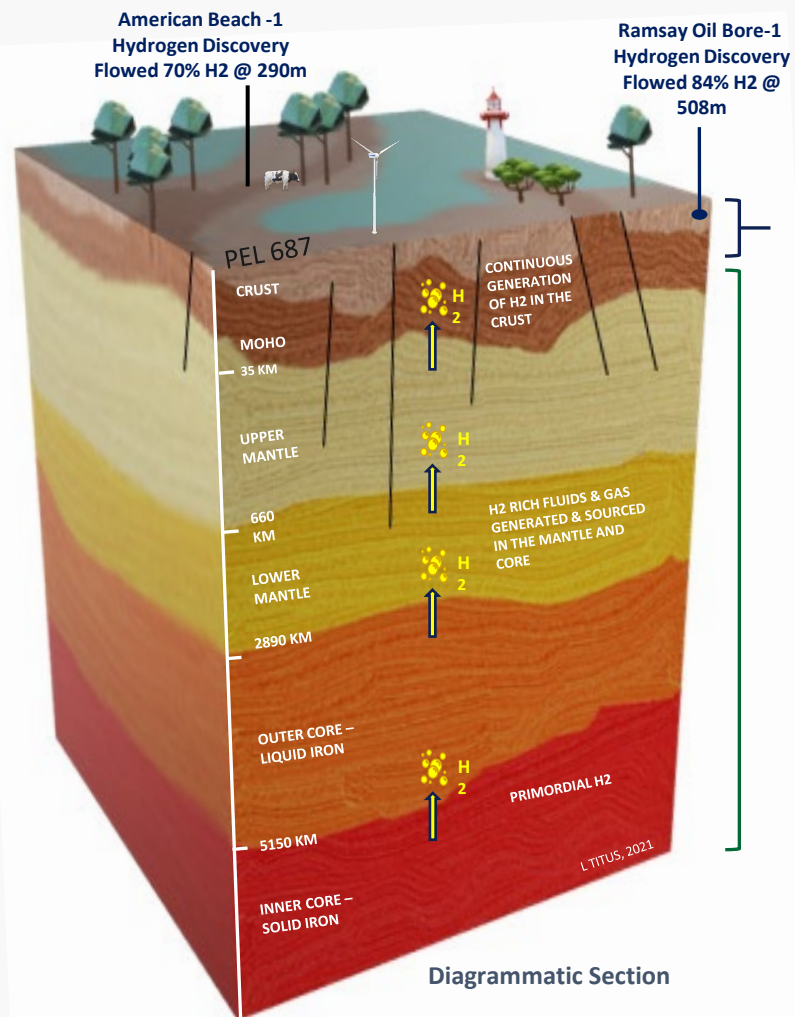
Ramsay Project ticks the boxes in respect of the key attributes for the formation and accumulation of Natural Hydrogen

Key Success Factor	Ramsay Project	
Source & Generation	<i>Via hydrolysis and / or 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	
Seals & Traps	<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	
Structure	<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	
Reservoir	<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 Prospective Resources (Using PRMS guidelines)

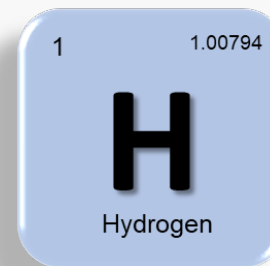


Certified Prospective Hydrogen Resources, existing discoveries and drill ready hydrogen prospects (calculated volume not determined)

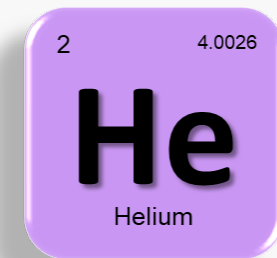
 Unrisked Prospective Hydrogen Resources, PEL 687			
SPE-PRMS Sub-Class Category	Low Estimate (kTonnes)	Best Estimate (kTonnes)	High Estimate (kTonnes)
Prospect	165	1135	8050
Lead	42	178	770
Total	207	1313	8820

NOTE - All estimates are unrisked and aggregated arithmetically by category, hence caution that the aggregate low estimate maybe a conservative estimate and the aggregate high estimate maybe very optimistic estimate due to the portfolio effects of arithmetic summation. The estimated quantities of hydrogen that may potentially be recovered by the application of future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery (Pg), risk of development (Pd) and risk of commercialization (Pc). Further exploration, appraisal and evaluation is required to determine the existence of a significant quantity of potentially recoverable Natural Hydrogen.

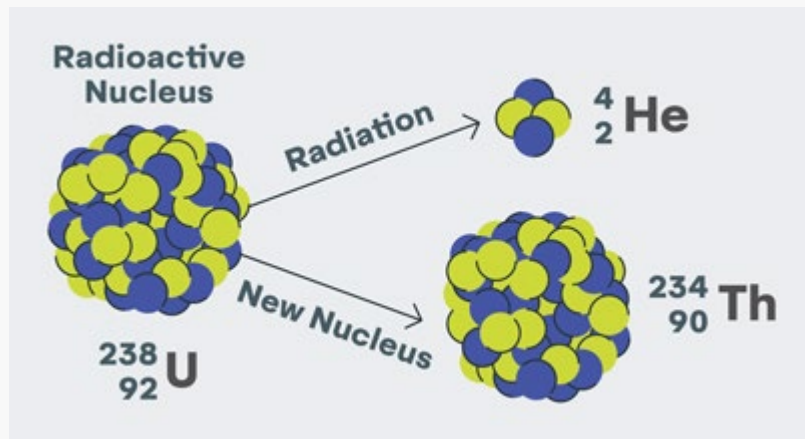
See ASX release of 13 January 2023 for full details and notes



Gold Hydrogen Prospective Resources (Using PRMS guidelines)



Certified Prospective Helium Resources, Ramsay Field (PEL 687 Yorke Peninsula)



Gold Hydrogen Unrisked Prospective Helium Resources, PEL 687			
SPE-PRMS Sub-Class Category	Low Estimate (Bscf)	Best Estimate (Bscf)	High Estimate (Bscf)
Prospect Ramsay Fault Block	2	8	38
Prospect South of Ramsay Fault Block	5	33	205
Total	7	41	243

NOTE - All estimates are unrisked and aggregated arithmetically by category, hence caution that the aggregate low estimate maybe a conservative estimate and the aggregate high estimate maybe very optimistic estimate due to the portfolio effects of arithmetic summation. The estimated quantities of helium that may potentially be recovered by the application of future development project(s) relate to undiscovered accumulations. These estimates have both an associated risk of discovery (Pg), risk of development (Pd) and risk of commercialization (Pc). Further exploration, appraisal and evaluation is required to determine the existence of a significant quantity of potentially recoverable helium.

See ASX release of 21 February 2024 for full details and notes



Yorke Peninsula has granites widely distributed in the subsurface

Well Testing Objectives and Other Key Points

- Commenced 5 March 2024 at the Ramsay 1 well site, then moved to Ramsay 2
- March / April on-site well testing program plus post testing compositional and technical results period for Stage 1. Stage 2 in planning phase.
- Primary objectives - to extract gases to the surface in sufficient quantities, and to obtain more gas samples for international analysis
- Identify the helium properties and its potential value
- Pilot Project planning:
 - Hydrogen to energy
 - Helium bottling plant

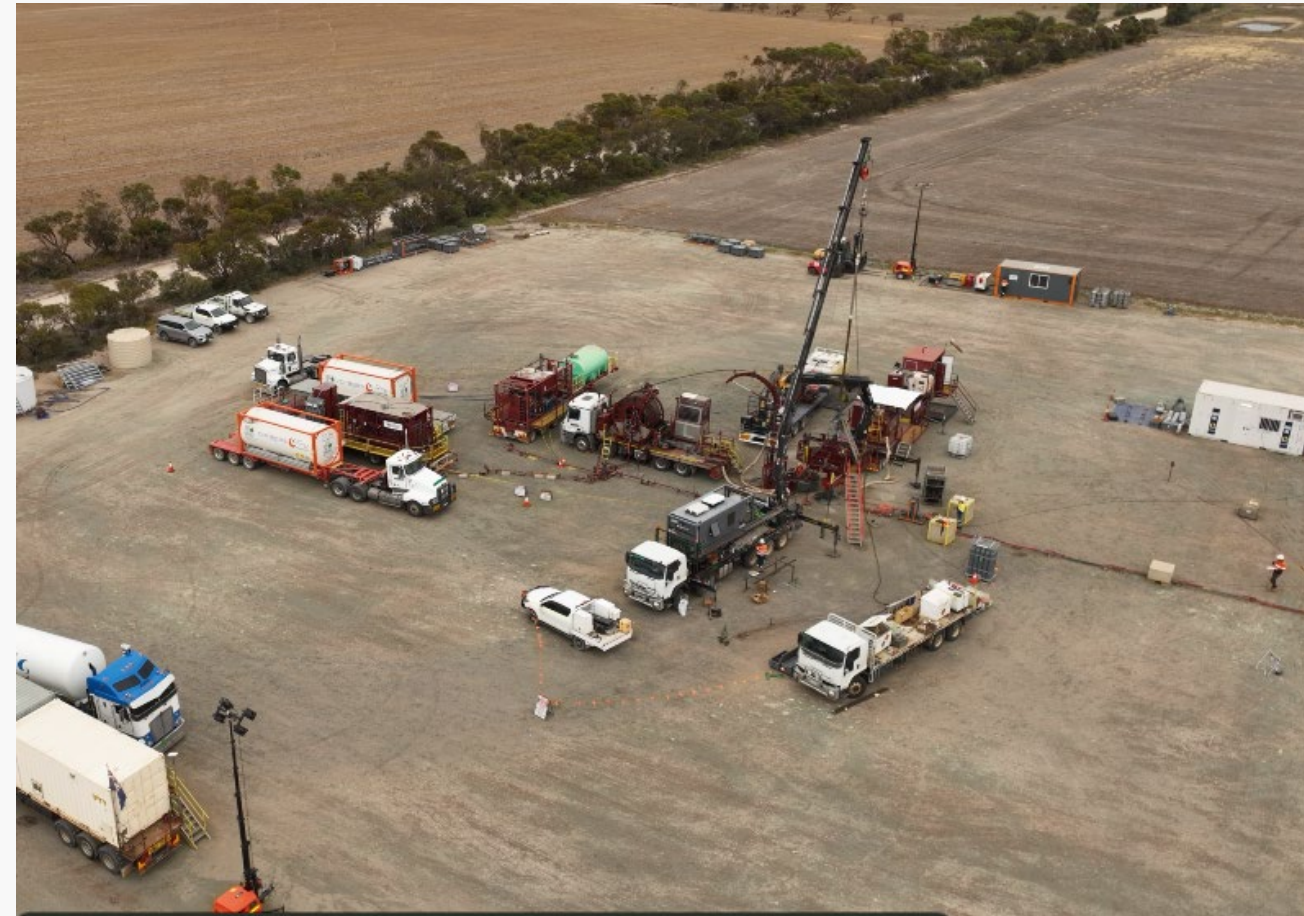
Well testing equipment on site at Ramsay 1



Well Testing – Stage 1 Interim Results

- Air-corrected helium result of 17.5% confirmed for Ramsay 2 well at a depth of 778m
- Both hydrogen and helium produced to surface
- Samples from various zones tested sent to independent international and domestic labs for compositional and isotopic testing and analysis
- Key learnings designed to assist with future well design, drilling and production techniques, and will ultimately assist with pilot plant concept design
- Planning underway for an extended Stage 2 well testing program

Well testing equipment on site at Ramsay 2



Gold Hydrogen – Planned 2024 Activities*

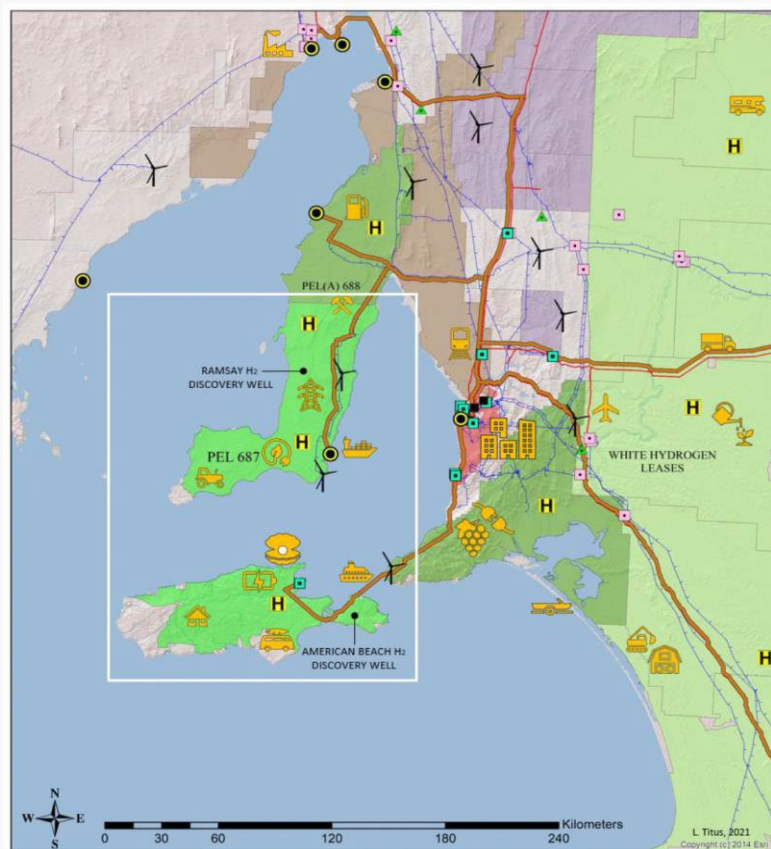
- ✓ February 2024 – Maiden Prospective Resource Report for Helium
- ✓ March 2024 – Commence flow testing technical program Ramsay 1 & 2
- April / May 2024 – Stage 1 and Stage 2 exploration well testing program
- May 2024 – Update to Prospective Resource Report for H2 and He
- May 2024 – Begin Ramsay pilot feasibility study
- Mid 2024 – 2D seismic program
- Q4 2024 – Proposed drilling of Ramsay 3 & 4
- Q4 2024 – Well test Ramsay 3 & 4
- Late 2024 – Decision on Ramsay pilot

*** Note: the timing and extent of some activities may be determined by earlier results**

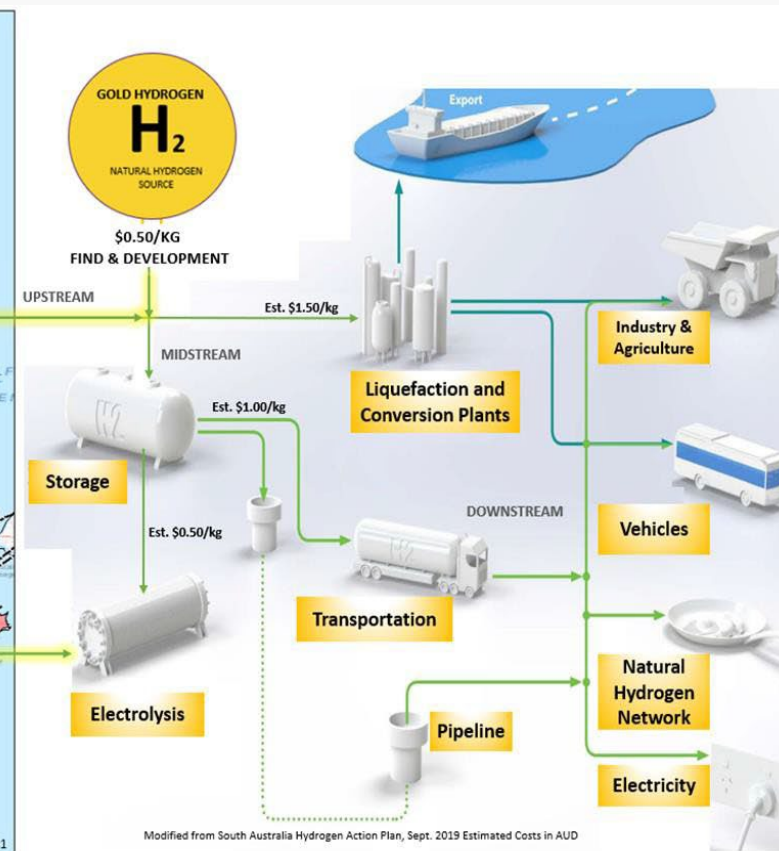
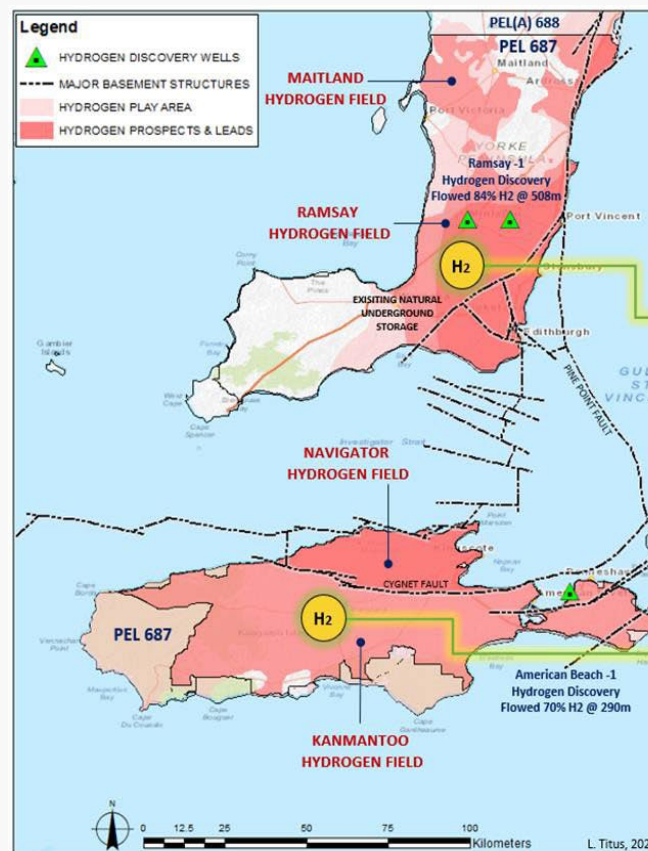
Ramsay 1 drill site and Savanna Energy drill rig



Large Scale Potential Commercialisation Opportunities - Hydrogen



- Legend**
- Existing Power Generation**
- H NATURAL HYDROGEN
 - Fossil
 - HYBRID
 - SOLAR
 - WIND
 - BIOMASS
- FUEL SOURCE**
- Proposed Hydrogen Pipeline
 - Existing Pipelines
 - Existing Transmission Lines
 - GA Proposed Hydrogen Ports
 - 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**





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.

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



Roger Cressey
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 & CFO

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 is currently a Non-Executive Director of the Australian Shareholders Association, and has extensive listed company experience in multiple executive roles spanning the ASX, LSE, AIM and TSX exchanges with numerous companies in the natural resources sector.



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.



Frank Glass
Chief Exploration Adviser

Frank Glass is a well-respected geologist and geoscientist with experience in both traditional oil & gas and natural hydrogen exploration plays.

Frank has well over 30 years industry experience, including a decade spent with Shell.

Frank has a Masters Degree in Structural Geology from the University of Amsterdam, and holds numerous professional memberships including the Petroleum Exploration Society of Australia and the European Association of Geoscientists and Engineers.

Board of Directors



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



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