Gold Hydrogen (ASX: GHY)

Developing Naturally Occurring Australian Hydrogen Resources

Morgan's Business Breakfast | March 15, 2023

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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 Technical Officer, Mr. Luke Titus. Mr. Titus' qualifications include a Bachelor of Science from Fort Lewis College, Durango, Colorado, USA, and he is an active member of AAPG and SPE. Mr. Titus' has 25 years of relevant international exploration and development experience in industrial rocks and minerals, precious metals, conventional and unconventional hydrocarbons, and associated gases, including hydrogen and helium. Mr. Titus 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. Titus consented to the inclusion in this report of the matters based on his information in the form and context in which it appears.

Executive Summary - Low cost, low carbon Hydrogen

Title over reported natural hydrogen prospective resource occurrences	Historic wells flowed hydrogen in gas samples. Independent expert unrisked Best Estimate Prospective Resource of 1.3 billion kilograms of hydrogen (Refer Slide 11)
Flagship project, exploration permit granted and application	Ramsay Project (green on map) is 100% owned by Gold Hydrogen. Other locations under application, also 100% Gold Hydrogen. Total area 75,000km^2
Near term value inflection point	Stage One exploration drilling and testing programme is expected to commence as early as Q3 CY2023 on the Yorke Peninsula. Hydrogen is anticipated but we will test for all gases including helium.
Enabling arrangements with leading global hydrogen experts	Strategic supplier arrangements with Schlumberger, Total Seismic, Xcalibur Aviation and a leading Commonwealth scientific organisation
Significant commercial and environmental competitive advantage	As a replacement for carbon based fuels, naturally occurring hydrogen offers significant cost and emissions advantages relative to other sources of hydrogen production

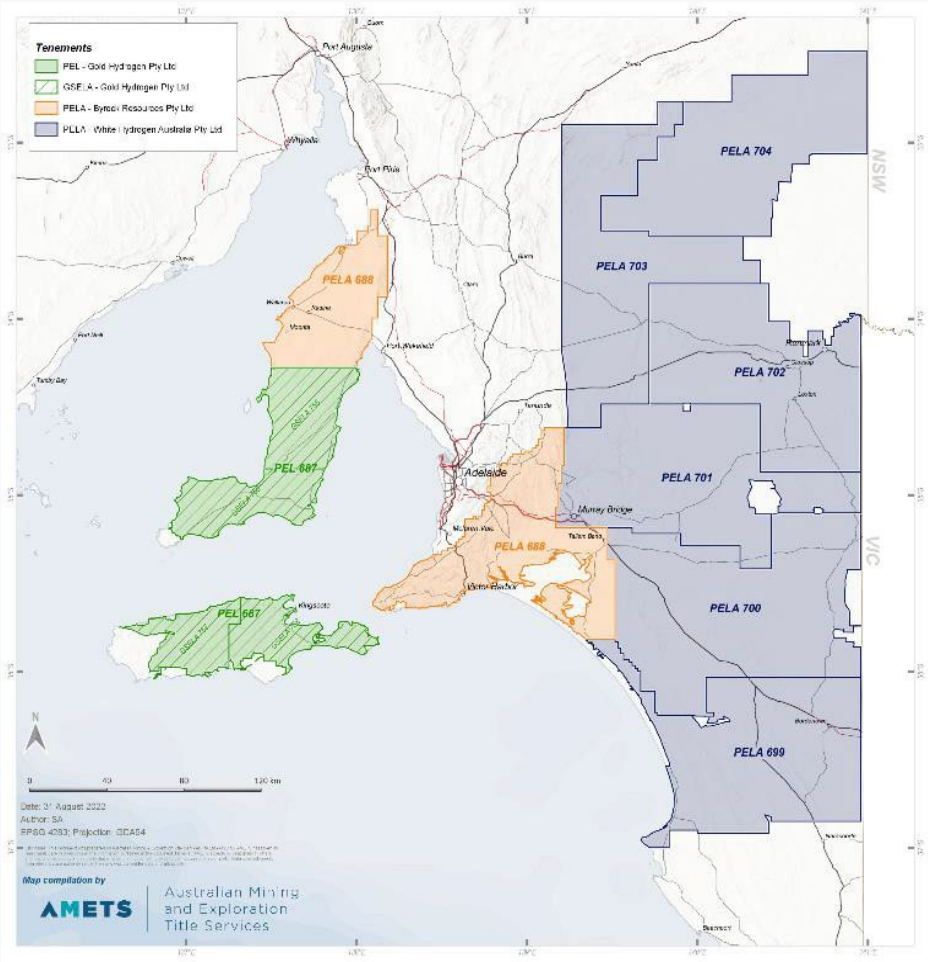


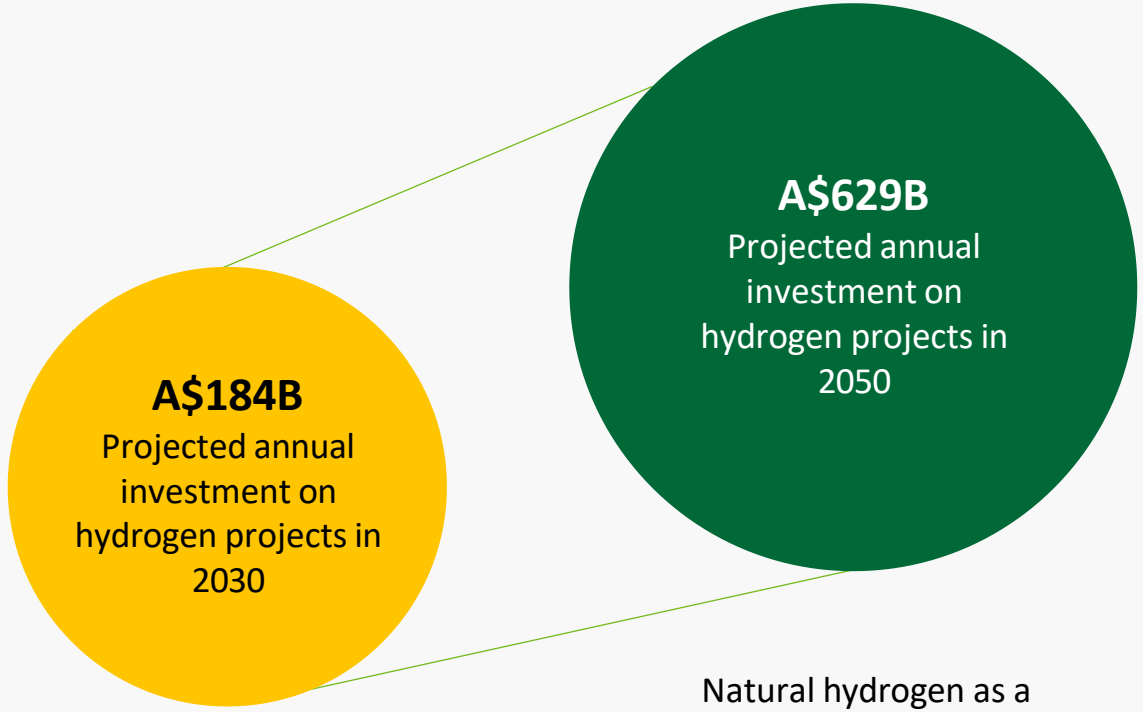
Figure: Overview of Gold Hydrogen tenements

Industry Overview

Gold Hydrogen

Global Hydrogen Forecast

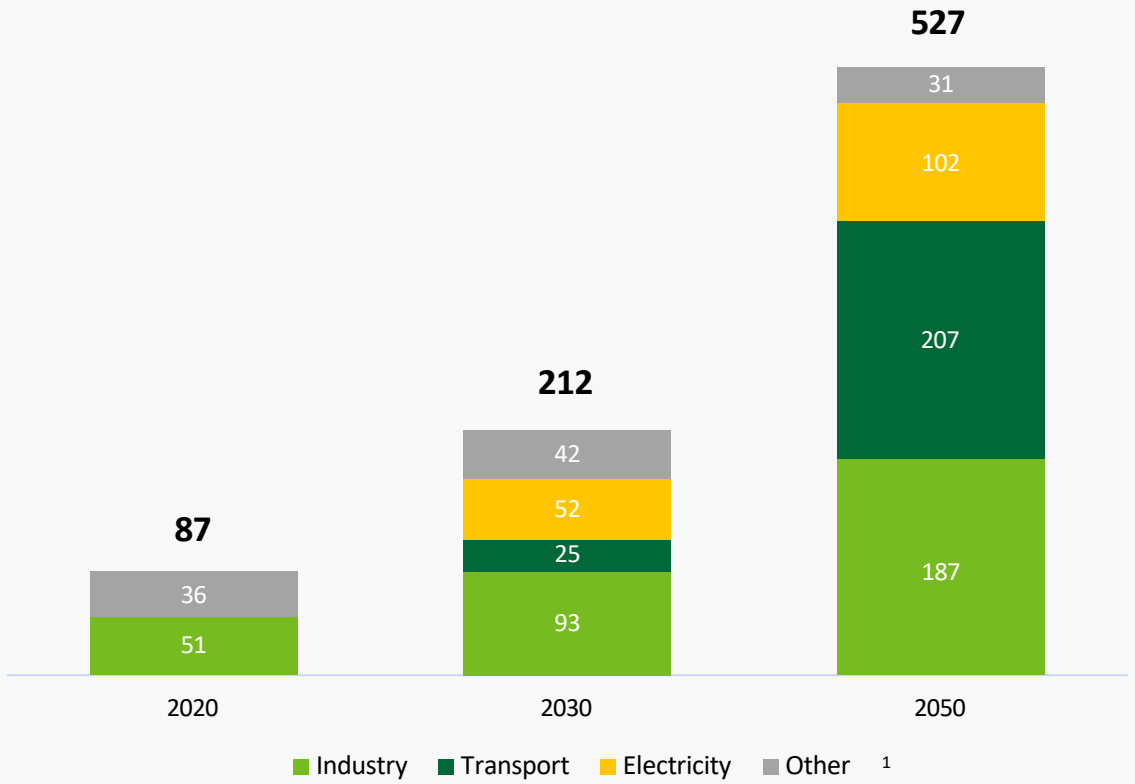
Substantial investment laying the foundation for hydrogen use



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

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

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



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

Types of Hydrogen Production

Naturally occurring Hydrogen offers a significant cost and carbon neutral advantage relative to other hydrogen production (manufacturing) processes.

	Natural	Grey	Black/Brown	Blue	Green
Energy source	Natural hydrogen	Natural gas	Coal	Natural gas / coal	Renewables / biomass
Environmental impact	Carbon-neutral	High	Very High	Low	Carbon-neutral
No thermal process	✓	✗	✗	✗	✗
Production cost (A$/kg)[1,2]	**$1.00[3]**	$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

1. *P = Polymer electrolyte membrane electrolysis. A = Alkaline Electrolysis.*
2. *For industrial buyers, a hydrogen offtake price of €3 ($4.50) per kg would be required to incentivise hydrogen production over power generation*
3. *Source: Christophe Rigollet[1], 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."*

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

Project Overview

Gold Hydrogen

Gold Hydrogen's Ramsay Project

Granted natural hydrogen exploration permit	Gold Hydrogen has a 100% ownership of the flagship Ramsay Project covering 7,820km^2 on the Yorke Peninsula and Kangaroo Island in South Australia
Australia's only proven naturally occurring hydrogen accumulation	Certified unrisked Prospective Resource of 1.3 billion kg hydrogen and drill ready prospects (Refer Slide 11)
Significant upside potential	Historic wells resulted in the discovery of >80% natural hydrogen gas at depths of ~500m. Potential exists for deeper hydrogen sources and reservoirs in the untested depths from >500m to 4,500m
Pathway to commercial extraction	With a 'natural hydrogen system', gas can be extracted using modern drilling techniques
Eligible Research & Development (R&D) activities	Gold Hydrogen has been successful to date in achieving a Research and Development tax incentive for its activities and expect this to continue. Gold Hydrogen currently receives approx. 43.5% of its total R&D expenditure back.

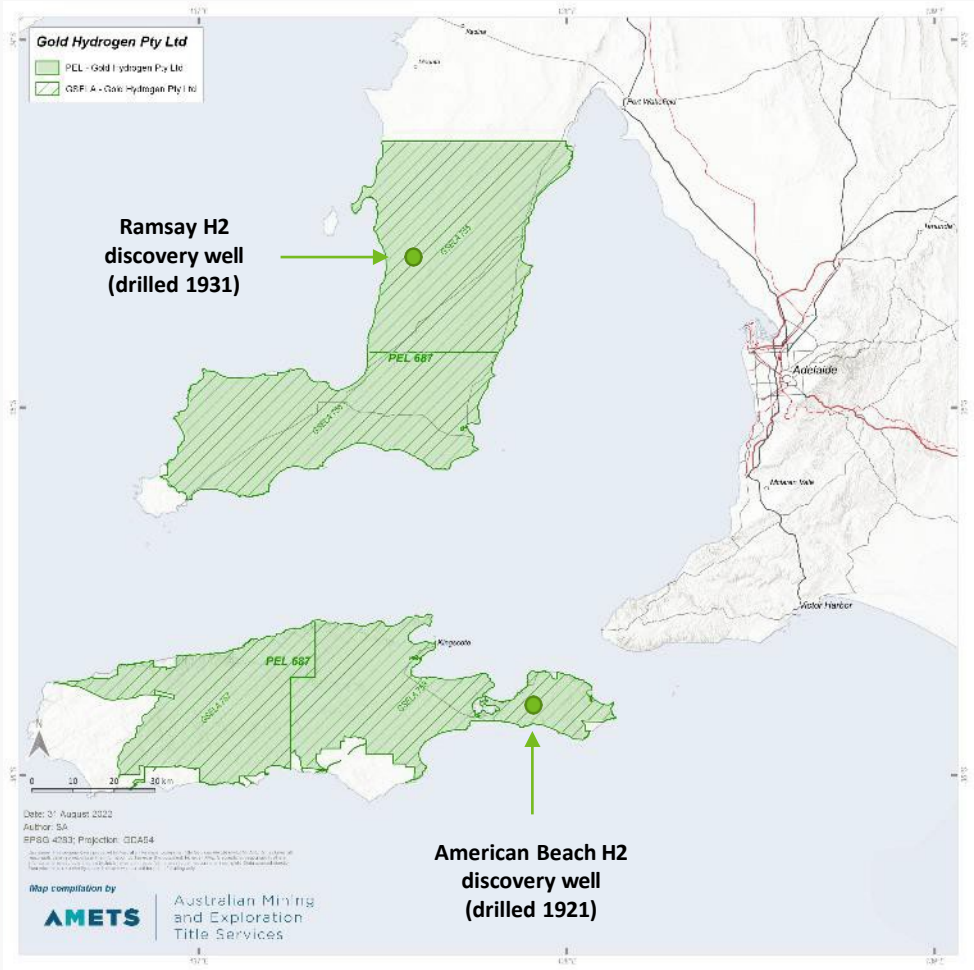


Figure: Gold Hydrogen's Ramsay Project tenements

Historical Drilling Encounters Hydrogen

- Notable increase in natural hydrogen richness with depth, 90% H2 composition (air corrected) circa 500m
- Other known natural hydrogen occurrences in Australia average < 5% of the total gas composition
- Existing discovered hydrogen composition is comparable to commercial play in Mali (>90% hydrogen)

Historical drilling

	American Beach discovery well		Ramsay discovery well		
Depth (m)	187.4	**289.5**	240.8	262.1	**507.8**
H2 (%) – sample composition	51.3	**68.6**	76.0	64.4	**84.0**
H2 (%) – air corrected values	65.6	**83.3**	76.0	73.1	**89.3**

Independent analysis estimates a prospective Hydrogen resource of circa 1.3bn kilograms

- Best Estimate Prospective Resource calculated only to 750m
- Deeper source, reservoirs, and hydrogen accumulation yet to be tested >500 to 4,500m
- High Estimate of 8.82 billion kilograms, may only represent 5% of the accumulation that extends to untested depths of >3,000m

NOTE – the estimated quantities of Natural Hydrogen that may potentially be recovered by the application of a future development project(s) relate to undiscovered accumulations. These estimates have both a risk of discovery and a risk of development. Further exploration, appraisal and evaluation is required to determine the existence of a significant quantity of potentially recoverable Natural Hydrogen.

Unrisked prospective hydrogen resources, PEL 687 ('000 tonnes)

	Low estimate	Best estimate	High estimate
Prospect	165	1,135	8,050
Lead	42	178	770
Total	**207**	**1,313**	**8,820**

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	The optimal geological conditions for the natural formation of hydrogen gas revolve primarily around the hydrolysis and radiolysis reactions in old rocks	Ramsay Project is ideally 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	The entrapment of the naturally formed hydrogen is essential to find commercially viable accumulations	Ramsay Project contains seals in the Cambrian stratigraphy including tight limestones that overlie the basement source rocks. These seals were penetrated by the historic wells that discovered hydrogen	✓
Structure	Ideally the host rocks for formation of hydrogen gas are located along major structural boundaries in an extensional geological regime where natural fractures exist	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	The commerciality of a resource is a function of its reservoir type, volume (size), depth (accessibility), extraction rate and quality of the natural hydrogen content	Ramsay Project extends >5km in depth with discovered flows of up to 84% natural hydrogen, with additional discovered flows of up to 89% natural hydrogen which overlie the basement source rocks	✓

Key Objectives

Gold Hydrogen's core business objectives over the next two years are:

To initially validate the natural hydrogen occurrences of the 1920s and 1930s, and prove that natural hydrogen is present in PEL 687

To demonstrate that natural hydrogen is present in sufficient volumes to be extracted for commercial use

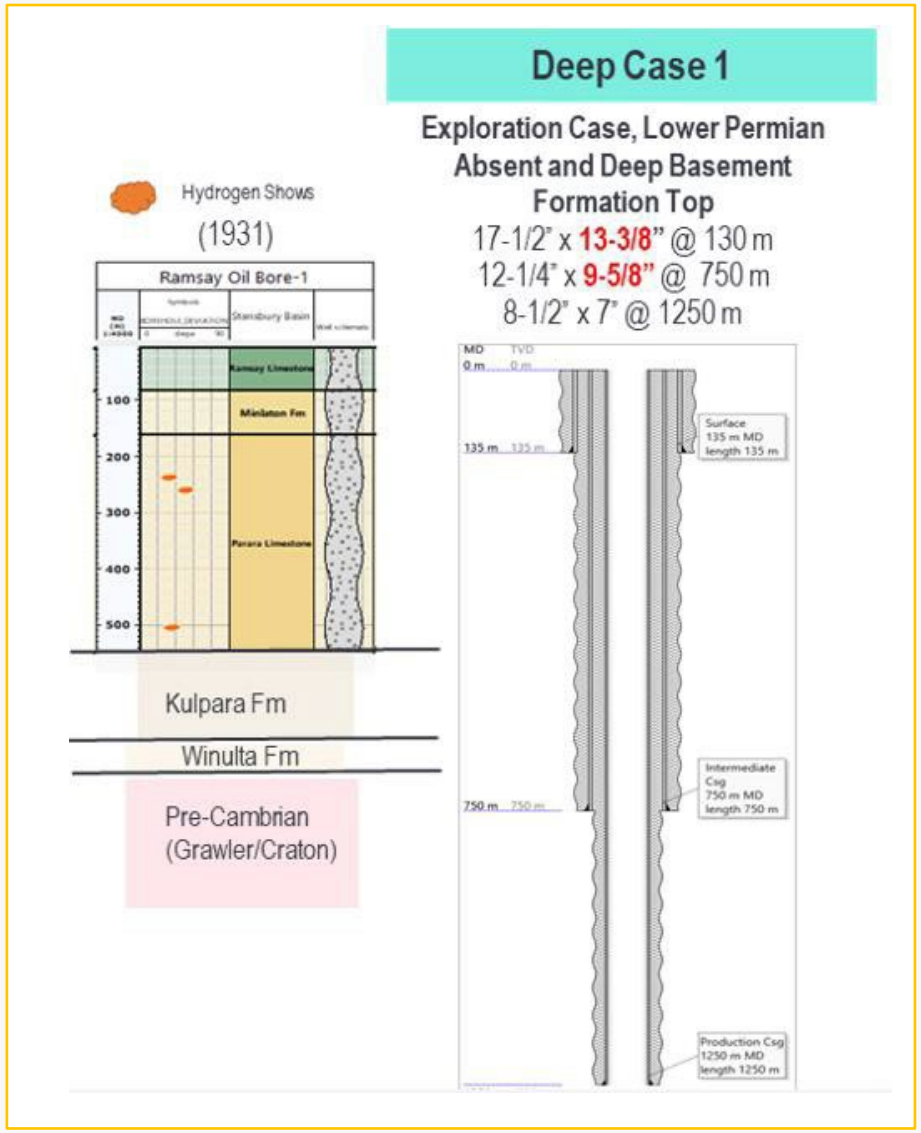
Enabling Engagements in Place

Commonwealth Scientific Organisation	Schlumberger	TOTAL SEISMIC	Xcalibur AIRBORNE GEOPHYSICS
Develop new techniques and processes to accurately identify and effectively extract natural hydrogen gas	Assist with and commence workflows including subsurface characterisation; wellbore design; and development of a downstream production model	Vertical-seismic-profile (VSP) to support the future pilot	High-definition airborne survey over 18,203 line-kms at 500-metre line spacing over the Yorke Peninsula and Kangaroo Island blocks
Agreement in Aug-2022	Master Service Agreement in Jun-2022	Contract in Jul-2022	Contract in Aug-2022
Work program to Mar-2024	Drill and test from Q3 2023	Ongoing to Sep-2023	Program commencing Mar-2023 and report in Jun-2023

Planned Work Programs

Key Milestones for drilling the first well in the Ramsay Project include but not limited to:

- Complete basis-of-design for Exploration Well-1: **Q1-CY23**
- Complete procurement for Exploration Well-1: **Q2-CY23**
- Exploration Well-1 drill and test: **Q3-CY23 to Q1-24**
- Resource Update: **Q4-23**
- Commence workflows for Exploration Wells 2 & 3: **Q1-CY24**



Key activities and milestones

Activity	Timeline	Objectives / Opportunities

Reprocessed seismic data	Completed	• Results to date confirm:
		  ○ the existing Ramsay discovery is in a good geological setting, i.e. potentially good reservoir
		  ○ existing iron rich source rocks and identification of further natural hydrogen targets
		• Now integrating data with static and dynamic models to identify additional prospects

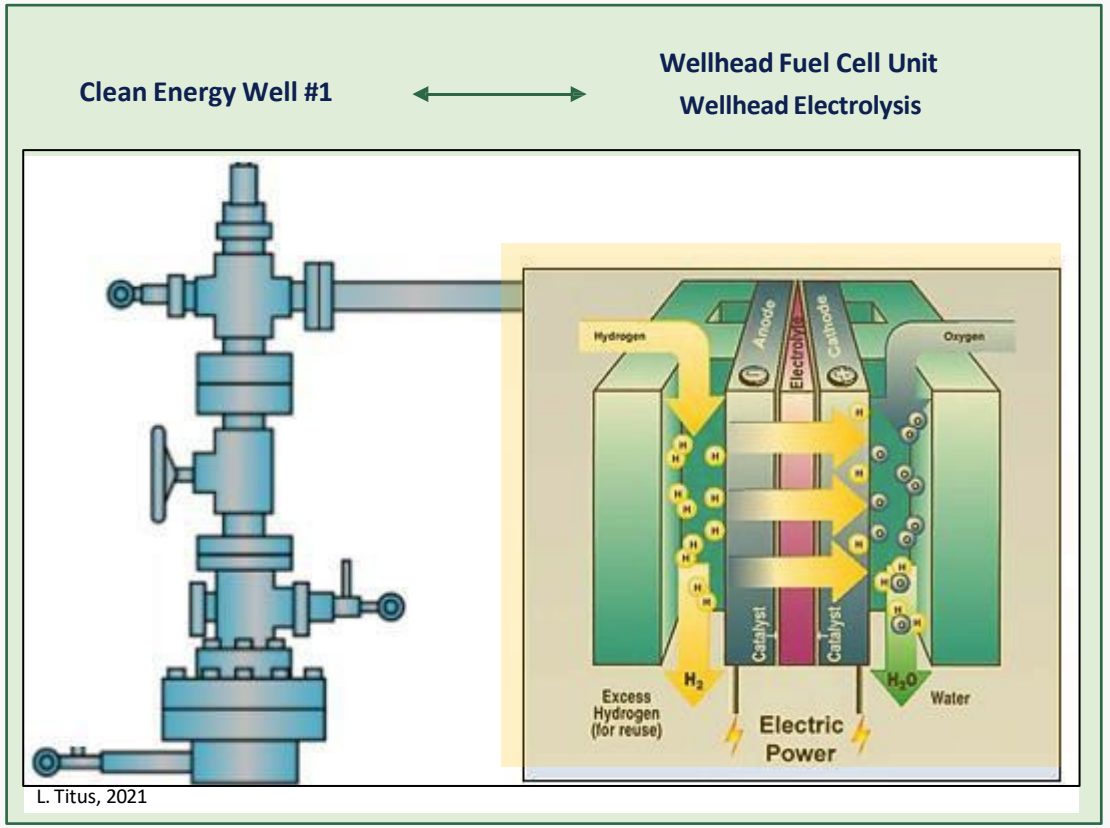
Airborne Survey & Soil-gas Survey	March-April 2023	• Assist in identifying, prioritising, and refining natural hydrogen targets by highlighting areas of higher prospectivity. • Supports and guides ongoing work program activities.
Drilling	Spud Sep 2023	• 'Twinning' the historic Ramsay Well to confirm hydrogen is present as identified in 1920's-30's • Hydrogen is anticipated but we will test for all gases including helium.
Application tenements, PEL(A) 688 and six other tenements	Progressing to grant over the next 12 months	• PEL(A) 688 adjoins PEL 687 • Independent expert assessment indicates possible future prospective resources can be booked once it is granted.
Storage licences	Applications pending	• Provides opportunity to store gas (hydrogen or other) in natural underground reservoirs should they be identified.

Commercial relationships	In discussion	• Looking to implement MoU's with:
		  ○ Manufacturers (H2 as energy for heating)
		  ○ Electricity producers (H2 fuel cells)
		  ○ Infrastructure companies (pipelines etc)
		• Interest received from world major oil and gas companies

Stage 1: Commercialisation: Initial Wellhead

Using existing technology and infrastructure to convert hydrogen Resources to Reserves

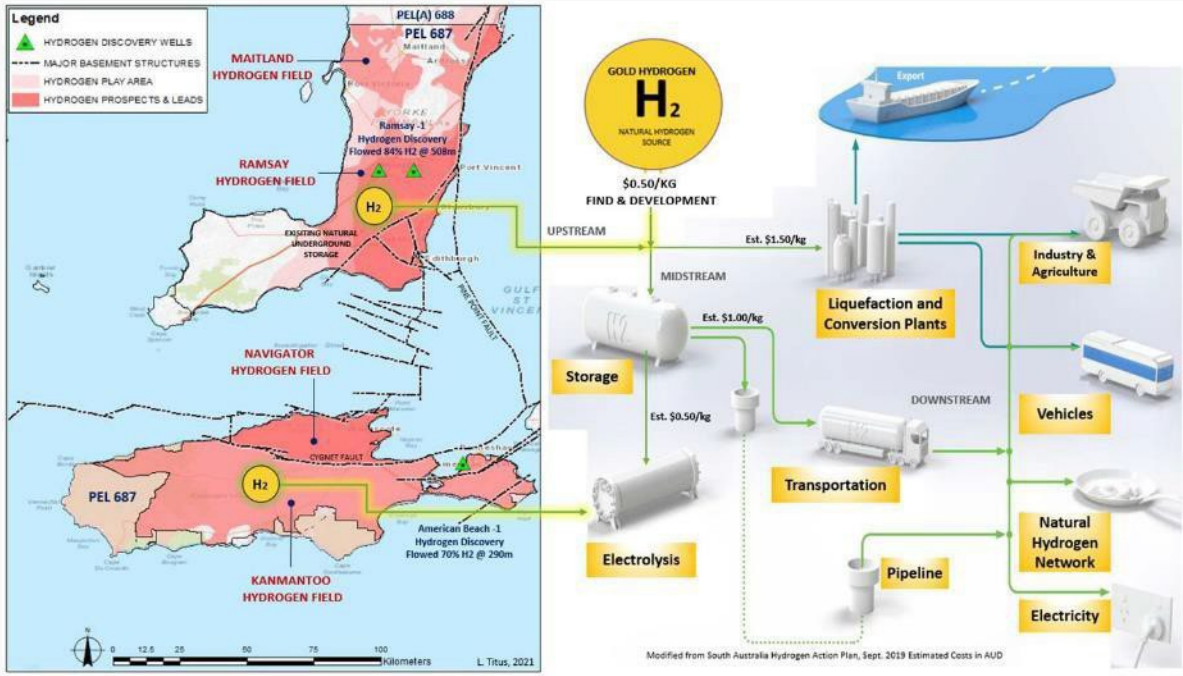
- Exploration drilling in Q3 CY23 on Ramsay prospect
- Install wellhead fuel cell unit (proof of concept)
- Scalable to meet peaks in demand and provide reliable and stable power supply with option for onsite battery storage
- Pure water as by-product of hydrogen as a fuel



L. Titus, 2021

Stage 2: Large Scale Commercialisation

- Early opportunities to support local transition from carbon-based energy sources to natural hydrogen sources
- Aligned to South Australia and National Hydrogen Action Plan
- Ideally located supply for domestic and international market off-takers



Key Board and Management

Neil McDonald

Founder &
Managing Director

Luke Titus

Founder &
Chief Operating Officer

Alexander Downer

Independent
Non-Executive Chair

- One of the country's best known politicians and diplomats incl. as leader of the Liberal Party, Minister for Foreign Affairs and High Commissioner to the UK
- Chair of the International School of Government (Kings College, London), Chair of Policy Exchange, and Trustee of International Crisis Group
- Advisor or board member to Hakluyt & Company, Cappello Capital Corp, the Adelaide Symphony Orchestra, Huawei in Australia, Ironbark Zinc (ASX:IBC), and Yellowcake plc (LSE:YCA)

Katherine Barnet

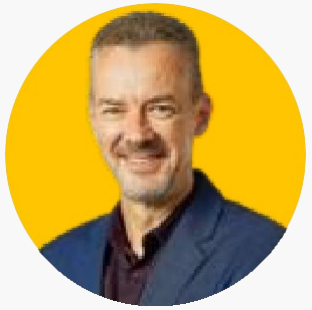
Independent
Non-Executive Director

- A financial professional and Chartered Accountant (Fellow, MCom FCA) with a 25+ year career in professional services
- Partner at Olvera Advisors, a boutique Sydney-based consultancy having worked on some of Australia's largest corporate matters in particular for renewable energy, resources, retail, property and construction

Roger Cressy

Executive Director,
Commercial & Operations

- Over 35 years of experience in resource industries, predominantly in gas exploration and production, and also in minerals processing and materials handling
- Held CEO, COO and other executive roles on upstream and downstream operations across Australia, as well as in PNG, Indonesia and Uganda



Karl Schlobohm

Company Secretary &
Chief Financial Officer

- A Chartered Accountant with 30 years experience across a wide range of industries
- Held positions as CFO, Company Secretary and / or Non-Executive Director of DGR Global Ltd (ASX), Sol Gold Plc (LSE / TSX), IronRidge Resources (LSE:AIM), Agenix Limited (ASX), Discovery Metals Limited (ASX), and a range of other ASX listed companies

Summary

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Flagship project, exploration permit granted	Ramsay Project (green on map) is 100% owned by Gold Hydrogen. Other locations under application
Near term value inflection point	Stage One exploration drilling programme is expected to commence as early as Q3 CY2023 on the Yorke Peninsula
Enabling engagements with leading global hydrogen experts	Strategic supplier arrangements with Schlumberger, Total Seismic, Xcalibur Aviation and a leading Commonwealth scientific organisation
Significant commercial and environmental competitive advantage	As a replacement for carbon based fuels, naturally occurring hydrogen offers significant cost and emission free advantages relative to other sources of hydrogen production

Neil McDonald
Director
neil@goldhydrogen.com.au
+61 0 421 331 933

Luke Titus
Technical Director
luke@goldhydrogen.com.au
+61 0 488 012 122

goldhydrogen.com.au