



PROVARIS ENERGY LTD.

Compressed Hydrogen

connecting the world to a clean energy future.

16 May 2022

www.provaris.energy

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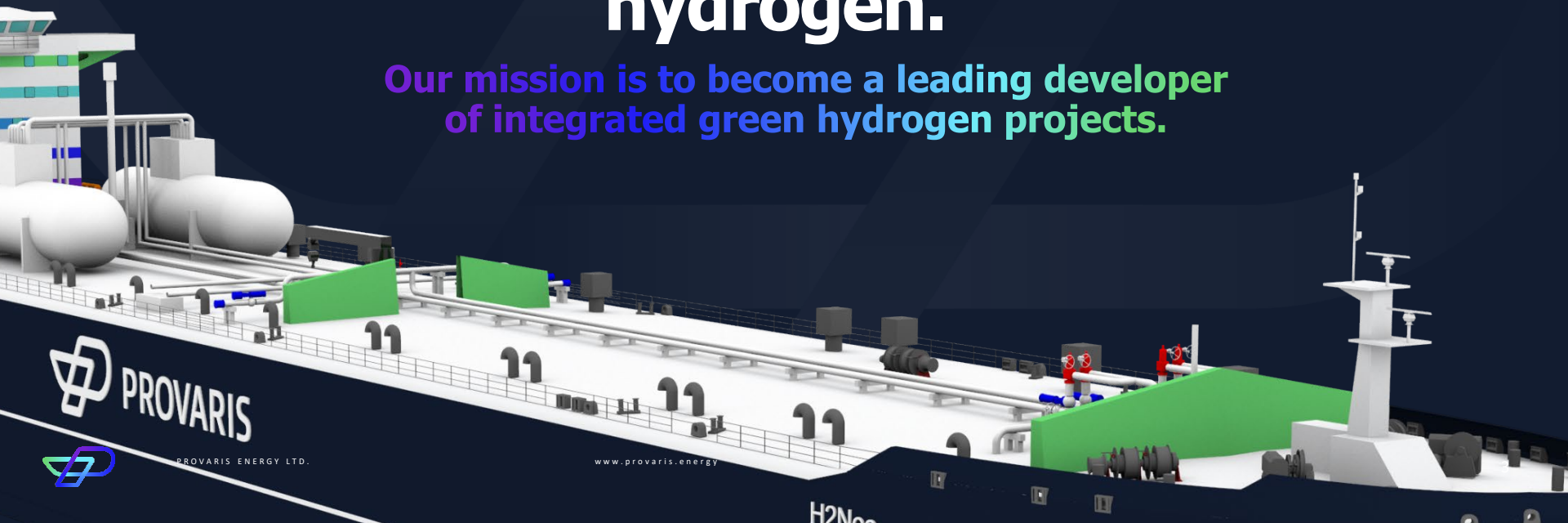
\$ refers to Australian Dollars unless otherwise indicated.

This presentation was authorised by the CEO for release on 16 May 2022



Provaris is making the future of green hydrogen accessible through the simplicity and efficiency of compressed hydrogen.

Our mission is to become a leading developer of integrated green hydrogen projects.



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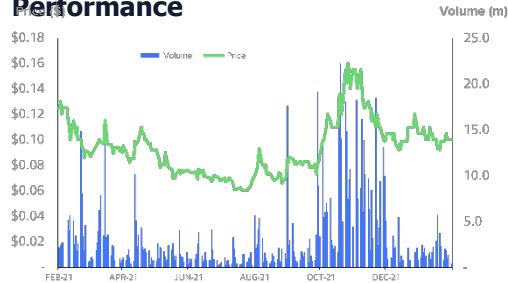
H₂N₂

Corporate Overview

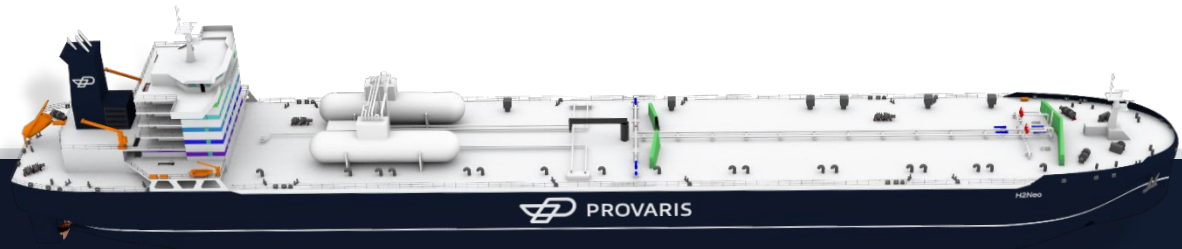
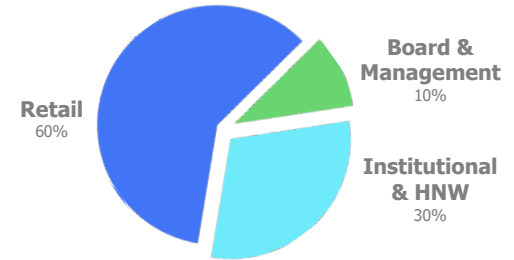
Ordinary Shares on Issue (PV1.ASX)	555m
Other Listed Exchanges	Frankfurt, FRA:WS9
Market Capitalisation (at 7c)	\$39m
Cash (at 31 March 2021)	\$13.6m
Listed Options on Issue (PV10A.ASX) ¹	96.7m
Performance Rights & Shares ^{2 3}	43.0m
Unlisted Options ⁴	9.0m

1. Listed Options PV10A, expiry 26 May 2023, exercise \$0.12
2. Performance Rights & Shares issued to Board, Management and Consultants
3. Refer to the 30 June 2021 Annual Report for full details of all Milestone Conditions
4. Broker options exercisable at 18.75c, Expiry November 2024

12mth Share Price Performance



Shareholding (Undiluted)



Board & Management

Australian company with global experience across energy infrastructure, utilities, ship newbuilds, operations, and capital markets



Martin Carolan

Managing Director &
Chief Executive Officer
Commercial & Capital Markets

SYDNEY



Garry Triglavcanin

Executive Director & Chief
Development Officer
Engineer, LNG, Project Development

PERTH



Greg Martin

Non-Executive Chairman
*Business Leader, Energy, Infrastructure,
Governance*

SYDNEY



Andrew Pickering

Non-executive Director
Shipping, Newbuilds, Tankers, LNG

SYDNEY



David Palmer

Non-executive Director
Shipping, Commercial, Financing

SINGAPORE



Norman Marshall

Commercial Manager
Legal, Commercial, Project Finance

PERTH



Per Roed

Chief Technical Officer
*Newbuilds, Tankers, LNG, Ports,
Operations*

ROTTERDAM



Mats Fagerberg

Business Development - Europe
*Commercial, LNG, Infrastructure,
Shipbroking*

LISBON



Luke Velterop

Project Manager
Project Development

PERTH



Dave Stenning

GH2 Carrier Development
*Ship Design, Class Approvals,
Commercial*

CALGARY



John Fitzpatrick

Naval Architect & Inventor
Ship Design, Class Approvals

CALGARY



Emma Connor

Chief Financial Officer
Accounting, Finance

PERTH



Developing a portfolio of integrated **green hydrogen** projects, leveraging innovative compressed shipping IP to be first to market

Value creation through innovative IP and projects with a focus on 'simplicity and efficiency'. Focus on project origination, development, construction and operations.

Upstream Hydrogen Production

- Origination of integrated hydrogen export projects for regional export markets using compression
- Project development leverages benefits of compression
- **2.8 GW Tiwi H2 Project announced in October 2021 (Tiwi Islands, NT)**
 - Closest export port location to Asian markets
 - Brownfield development opportunity with low environmental impact
 - Traditional owner and NT Government support
 - Phased development to benefit from ongoing capex/opex cost reductions & growth in offtake markets
- **Commercial, technical and financial partners will be introduced at the right time to maximise value to Provaris shareholders.**

Midstream Hydrogen Transport

- Collaboration with bankable green hydrogen project developers seeking a regional export solution
- 
HYPOXIA 1500 - HYDROGEN
- **HyEnergy MOU announced in August 2021**
 - Large-scale 8 GW Project
 - Located on the Gascoyne Coastline, WA
 - Partner includes global energy major with access to customers
 - Provaris supported by WA Government funding for its feasibility
 - Feasibility for transport of up to 275,000 tpa using compression
 - **Screening continues on a global portfolio of opportunities that are suitable for compressed hydrogen transport**

Ship Engineering & Approvals

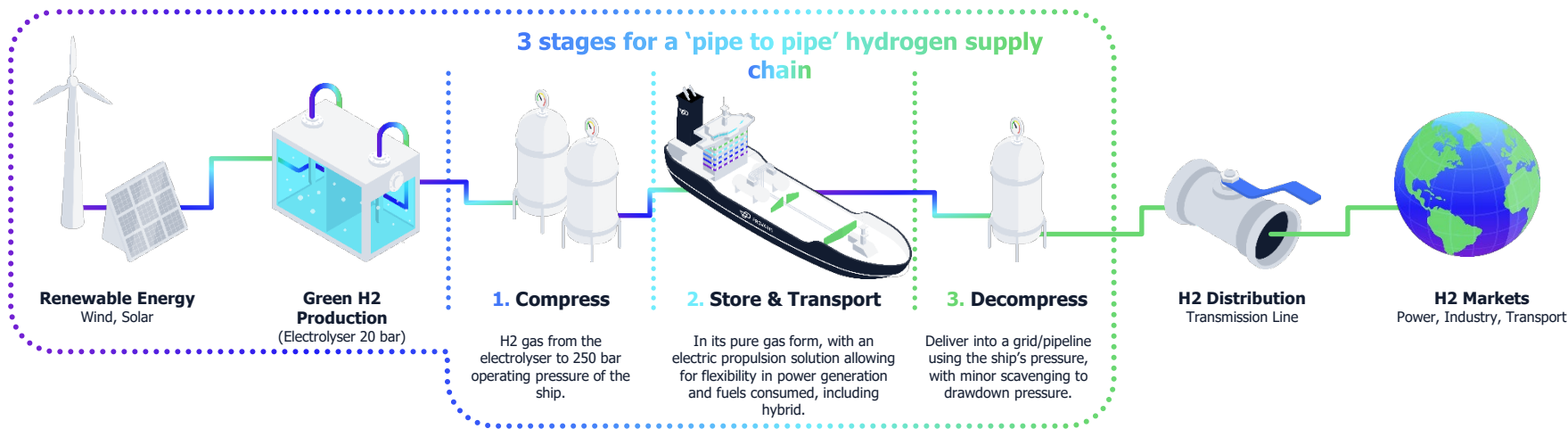
- In-house team with +20yrs with experience in innovative design for bulk-scale gas carrier solutions
- **Proprietary GH2 Carrier** under development with Class AIP for two capacity carriers.
- **Targeting Class Approvals for ship construction in 2023**
- **Technical partners include: Wartsila, Ballard Power Systems, APL/NOV**
- Patent IP portfolio
- Integration with onshore and offshore loading, unloading and mooring systems



Fundamentals for Compressed Hydrogen



Compression provides a simple and energy efficient supply chain for **green hydrogen**



Advantages of Compression:

- **Proven application of compression** to deliver green hydrogen at a competitive cost
- **Commercial at low volumes** – does not require economy of scale
- **Small footprint** compared to hydrogen liquefaction and/or ammonia liquefaction enables 'plug and play' deployment model for new markets
- **Load follow power generation** to minimise storage and ESS requirements
- **Flexibility in loading** via onshore berth facilities or offshore buoy systems
- **Modular development** aligns with market growth



Compression provides first mover advantage for bulk marine hydrogen export

- **Compression is a proven, safe and reliable method of storing hydrogen** – currently used for onshore applications at pressures up to 700 bar
- **Roadmap to zero carbon shipping solution** through an electric propulsion system that allows for full flexibility in fuels for power generation, including hybrid (battery) integration
- **Simple, energy efficient and competitive** (LCOH) to regional markets up to 3,000 nautical miles
- **Stores, transports & delivers hydrogen in high purity gaseous form**
 - **Minimal technical barriers, no boil off**
 - **Avoids the energy and capital-intensive processes** to convert hydrogen to a liquid or chemical state
- **AIP Class Approval** demonstrates there are no risks that would prevent the ultimate classification of the vessel
- **First commercial scale hydrogen exports by 2026**

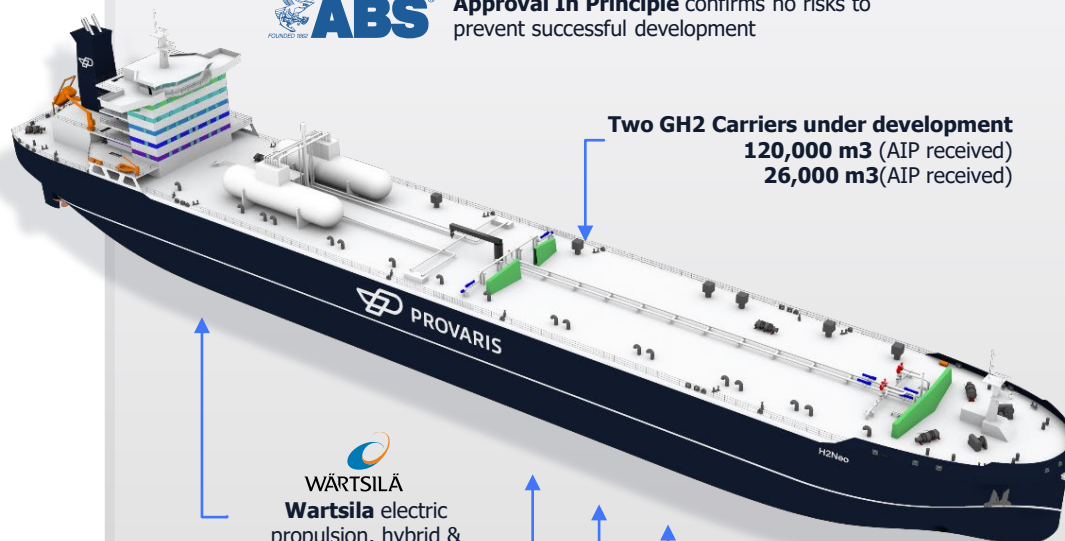


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Approval In Principle confirms no risks to prevent successful development



Two GH2 Carriers under development
120,000 m3 (AIP received)
26,000 m3 (AIP received)


Wärtsilä electric propulsion, hybrid & **Ballard** Fuel Cell systems
BALLARD

Bulk hydrogen storage at **250 bar operating pressure**

Proprietary IP with **US Patent filed** on tank design

Maneuvering capability tailored to operating requirements, including **offshore loading**



Clarksons Platou
Ship Broker

Supply chain efficiency has significant impact on delivered cost

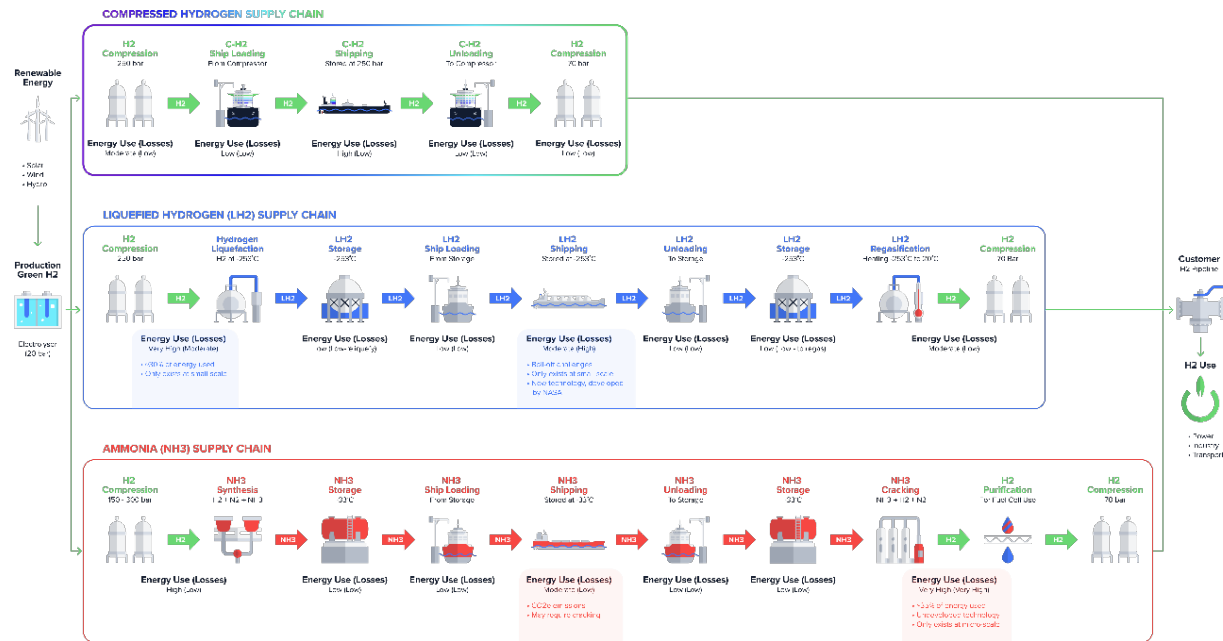
Key findings – Provaris Scoping Study, March 2021

- **Compression is integral to all three supply chains** to increase the volumetric energy density of H₂
- **Compression has minimal technical barriers**, with ship classification approvals being key
- LH₂ supply chain is significantly more **complex with additional energy intensive processes** as well as onshore storage requirements
- NH₃ involves mature and well-developed technologies. However, if the end user requires high purity hydrogen, then **technical barriers and energy penalty to crack and purify (reconversion)**

Compression is the most energy efficient solution for delivery of green hydrogen over regional distances given it removes cost and energy penalties of conversion and reconversion

Energy Rating for C-H₂, LH₂ and NH₃

	Use (kWh / kg H ₂)	Losses (% day)
Very High	10.0 +	2.0 + %
High	5.0 –10.0	0.5 –2 %
Moderate	1.0 –5.0	0.2 –0.5 %
Low	Less than 1.0	Less than 0.2 %



Future Project Development



Global opportunity to develop a portfolio of green hydrogen projects

Strategy is to develop a portfolio of projects to position compression as a preferred solution for regional marine transport

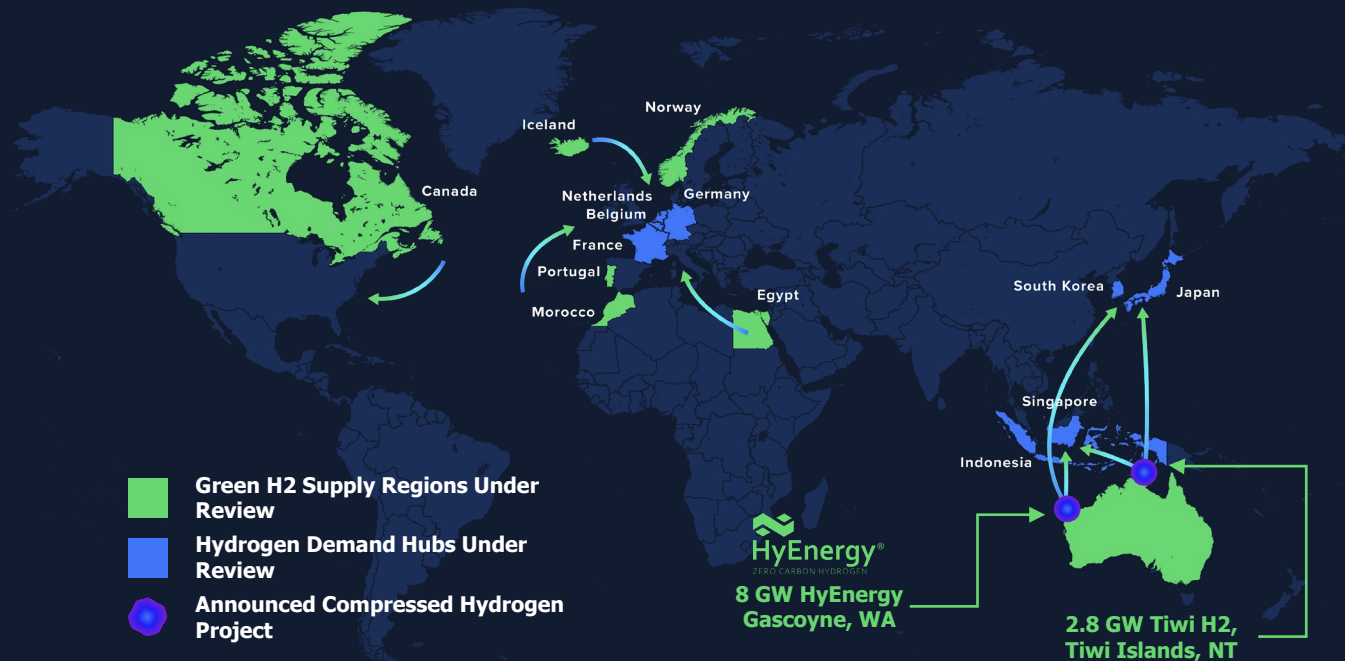
Two projects export projects undergoing feasibility studies

Tiwi Green Hydrogen Export Project (Northern Territory) for export markets into Asia.

100% Provaris project includes upstream renewable generation and compressed hydrogen shipping.

HyEnergy Project (Western Australia) for export markets into Asia. Partners include Total Eren & Province Resources. *Provaris engaged for compressed shipping only.*

Screening continues for hydrogen projects in the regional markets of Asia and Europe.



Tiwi H2 Project

strategically located to key export markets

- Positions Provaris as a developer/owner of green hydrogen molecules and fully integrated hydrogen supply chain for export
- First-mover advantage for export of gaseous green hydrogen from Northern Australia to key markets in Asia
- World-first development of an integrated compressed hydrogen export project

2.8 GW
Solar Generation **~100ktpa**
Green Hydrogen

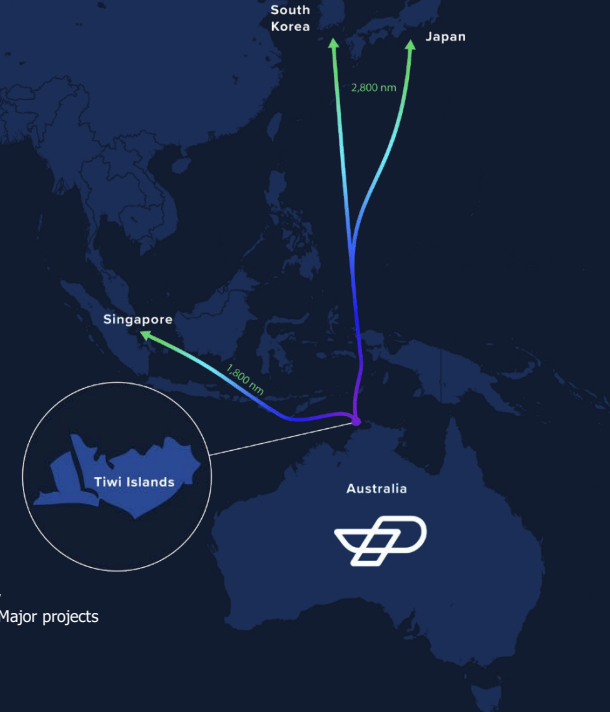
2026
Target first **~1,400ktpa**
export **CO2 Emissions**
Avoided



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Provaris acknowledges that its proposed Tiwi Islands Green Hydrogen Export Project is located on the traditional lands of the Munupi people. It is a privilege to have the support and such a close working relationship with the Tiwi Land Council and Munupi Landowners.



Support from the Northern Territory
Commissioners for Investment and Major projects



Site infrastructure enables first-mover export project from Northern Australia

- **Milestones:** EIA referral submission 2Q2022, Feasibility completion and FID decision 2H2023, target first export late-2026
- Staged development aligned with customer demand
- Integrated with CH2transport supports efficient and modular approach for export
- Northern Territory Government and landowner support
- Commercial, technical and financial partners will be introduced at the right time to maximise value to Provaris shareholders.
- Strong ESG credentials for project financing

STRATEGIC LOCATION

Tiwi Islands located along the northern most part of Australia providing shorter regional shipping distance to Asian export markets

TRADITIONAL LAND OWNERSHIP

Ownership has always remained with the Munupi people – a clear process to a commercial lease (Section 19) for operations

LOW ENVIRONMENTAL IMPACT

Existing plantation land for commercial use. Small scale desalination for water use and options for local water catchment

HIGH SOLAR INTENSITY

2,540 hectare solar site has been assessed to have the potential for 2.8 GW of solar generation, in a region of high solar intensity

EXISTING PORT INFRASTRUCTURE

Availability of existing port capable of berthing pilot-ship and industrial precinct for installation of electrolysis and compression

LANDOWNER SUPPORT

Support of the Tiwi community given new sustainable industry and long-term economic opportunities for jobs and social benefits



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MOU to evaluate export of green hydrogen from 8GW HyEnergy Project to Asia-Pacific using GH2 Carriers

- Objective is to demonstrate the technical & commercial advantages of compression for export to Asia-Pacific -Singapore and Taiwan are being evaluated
- Scope includes export solution for Phase 1 of the HyEnergy project (4GW of renewable energy producing ~ 275,000 tpa of H2)
- Compression is ideally suited for the HyEnergy Project
 - Scaled production with Phase 1 operations and exports in late 2020's
 - Proximity to Asia-Pacific markets (i.e. 1,800nm to Singapore)
 - Option to load offshore vs approve/build new traditional port berthing
- Received \$300,000 funding grant from the WA Government
- **Delivery of Provaris feasibility study in June 2022**

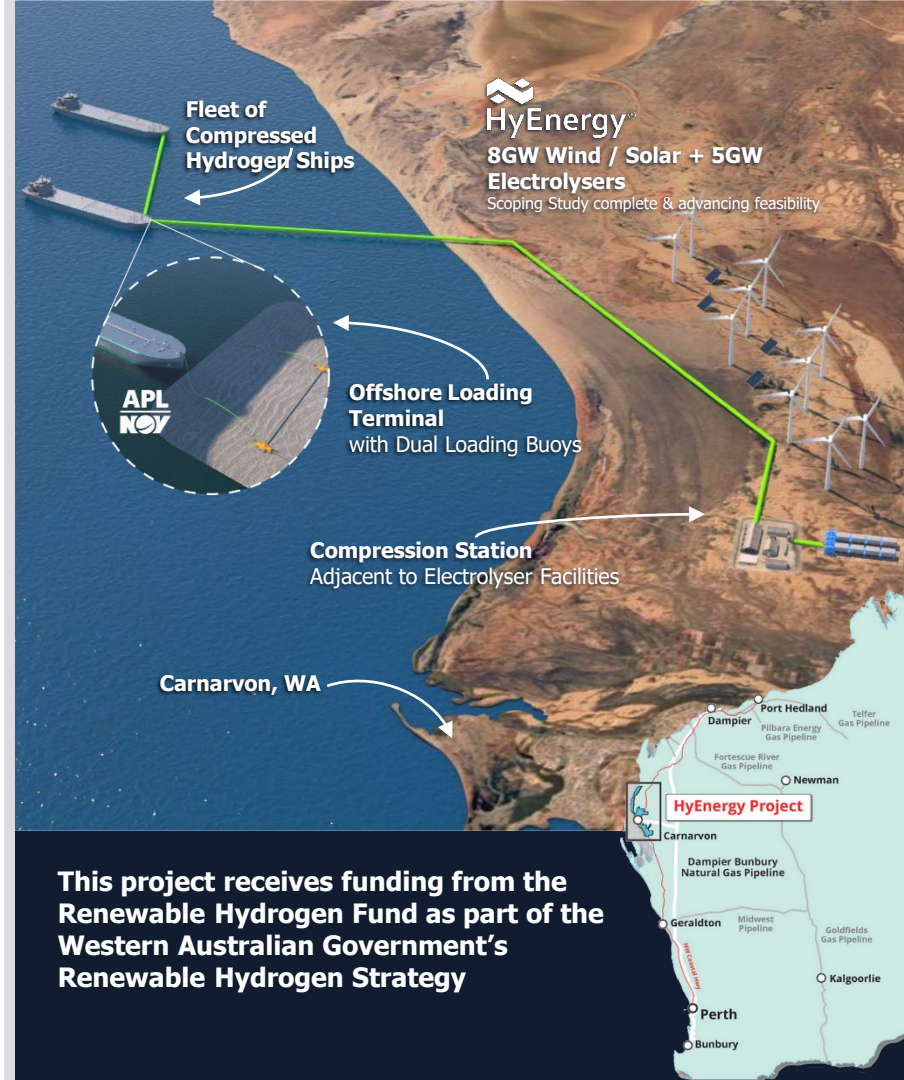
HyEnergy[®] SCOPING STUDY OUTCOMES (March 2022)

- Province Resources and Total Eren developing mega-scale renewables project (8 GW renewables and 5GW electrolyzers) to produce 500,000 tpa green hydrogen
- Total Eren is a global renewable energy IPP with more than 3.5 GW of solar and wind assets in operation or under construction. Total Eren is ~30% owned by energy major TotalEnergies.
- Scoping Study confirms the technical feasibility of an integrated green energy production project, using renewable power generated from the Gascoyne.
- Definitive feasibility completion 2024
- Phase 1 production phased from 2027



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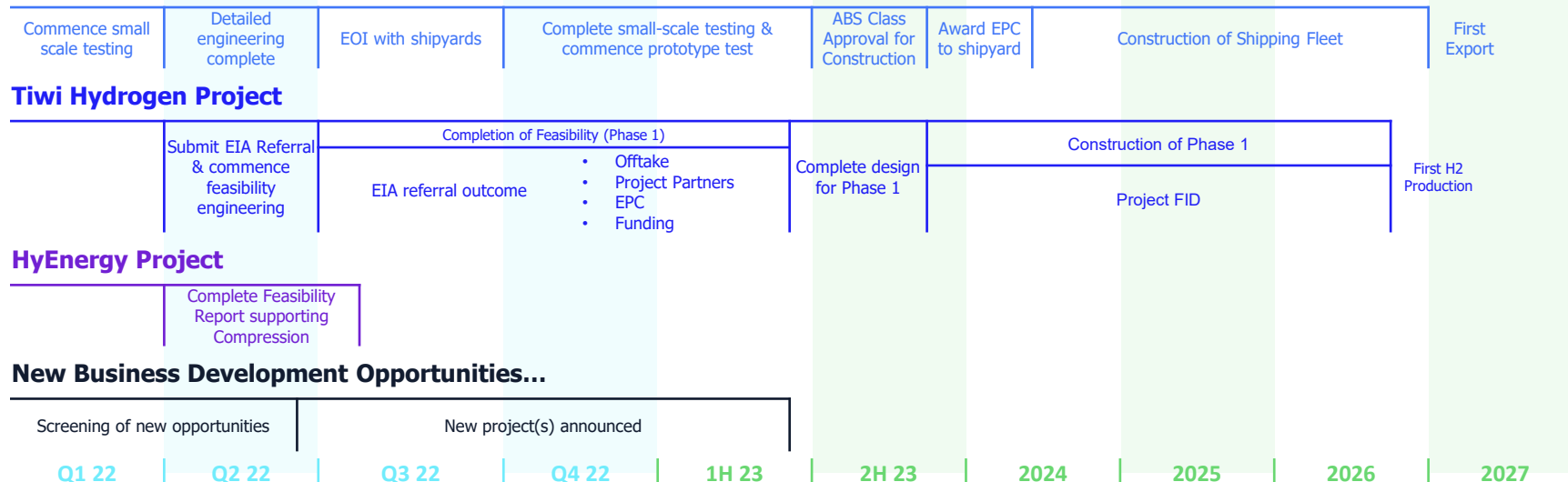


This project receives funding from the Renewable Hydrogen Fund as part of the Western Australian Government's Renewable Hydrogen Strategy

Forward Program for Shipping Class Approvals aligned with the Tiwi H2 Project

Timeline of approvals through to first export and operations in 2026

Shipping Class Approvals



Hydrogen Sector With Significant Tailwinds



Hydrogen market set for remarkable growth through to 2050

Role of hydrogen in the energy transition: The key tool for harder-to-decarbonize sectors: Iron & Steel, Refining, Power Generation, Heavy Transport, Heat, & Shipping

+30 Countries
Established Hydrogen
Strategies

USD 70 Billion
Public Funding
Commitments

USD 5 Trillion
Investment in H2
Supply Chains

150M Tonnes
Seaborne Trade by
2050

Safe and cost-efficient transport, storage and distribution of hydrogen will be critical in setting the pace of its large-scale deployment

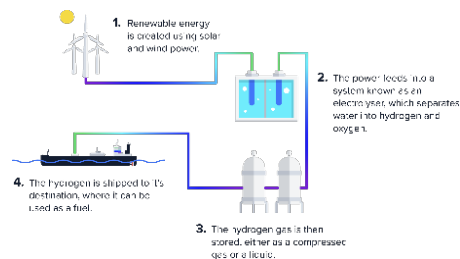
^ International Renewable Energy Agency (IRENA); Wood Mackenzie Company Research



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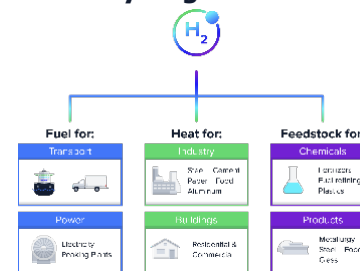
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Green H2 production



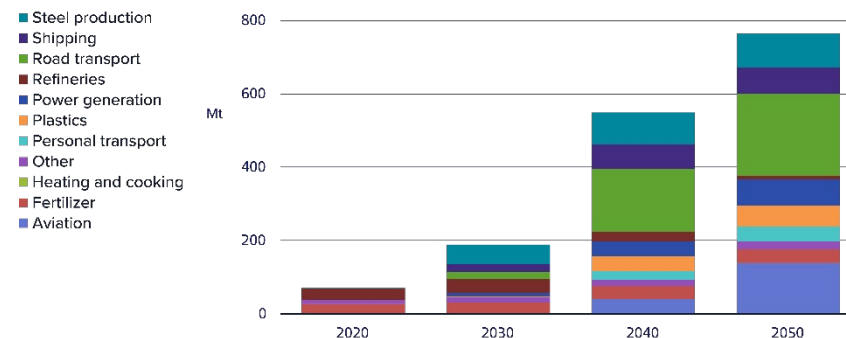
Falling costs of renewables and hydrogen technologies to make green hydrogen cost competitive by 2030

Hydrogen uses



Commitment to 2030 net-zero targets brings forward investment case for a 'green premium'

Addressable market for hydrogen increases substantially to 2050, with 30% forecast for seaborne trade*



Source: RystadEnergy HydrogenCube-high case scenario; * Wood MacKenzie

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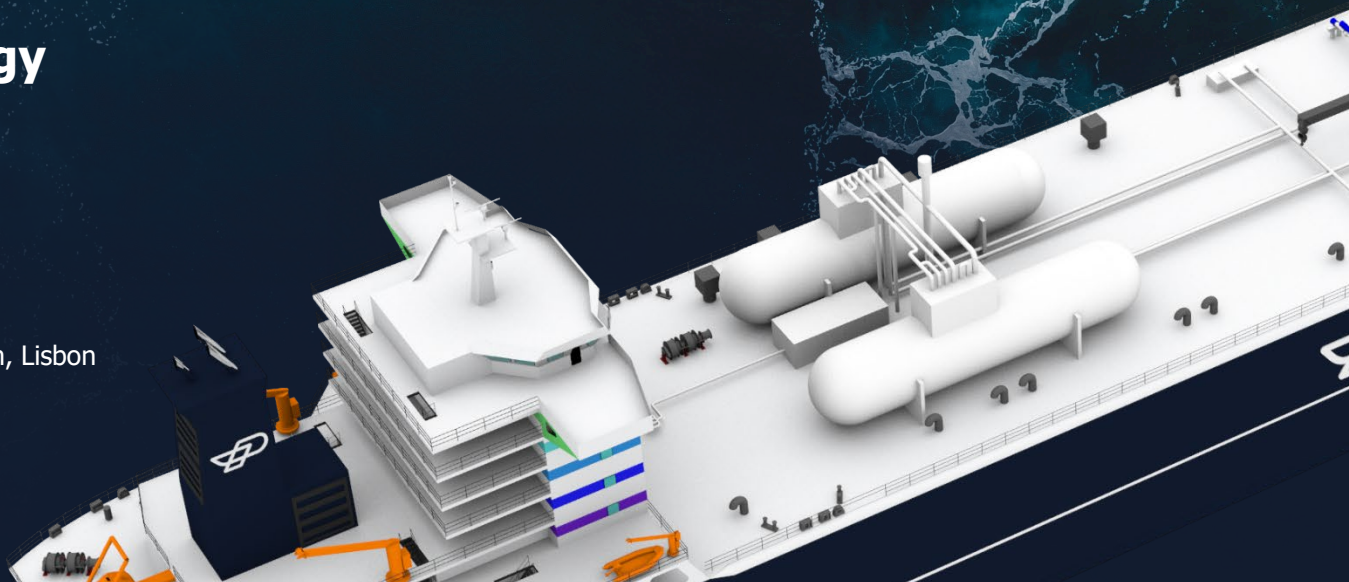
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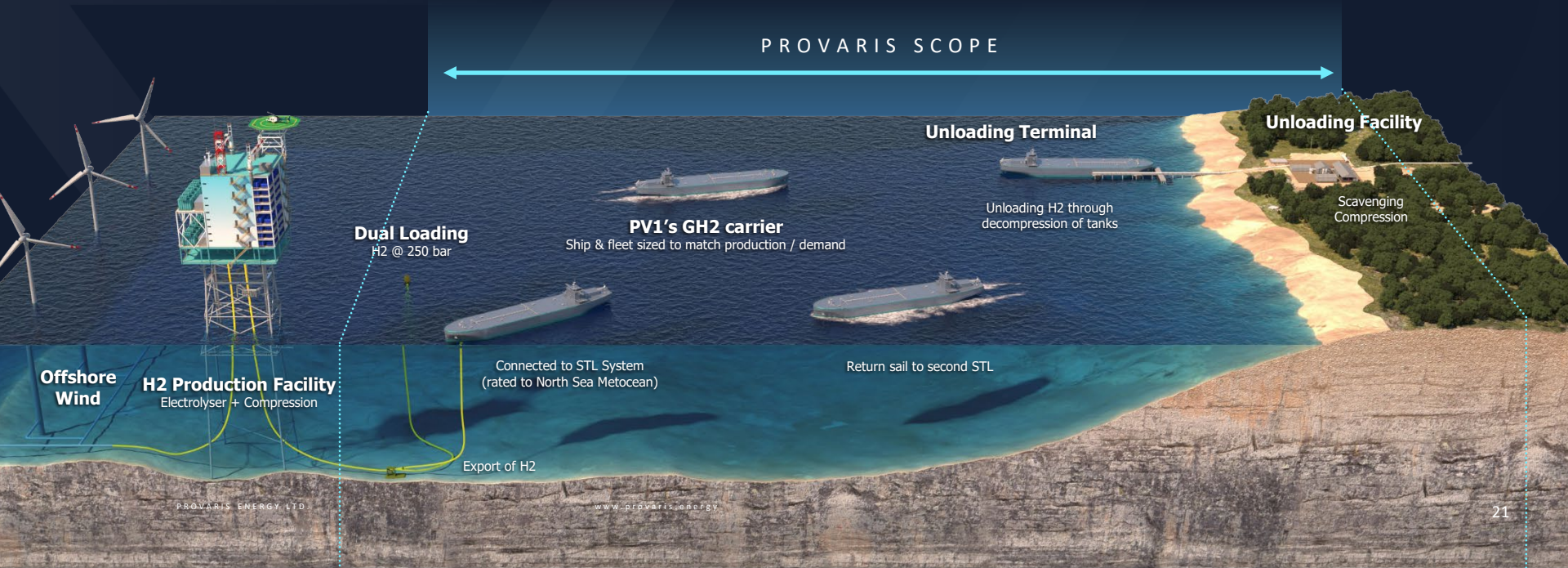


Appendices



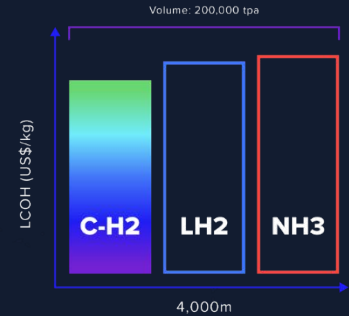
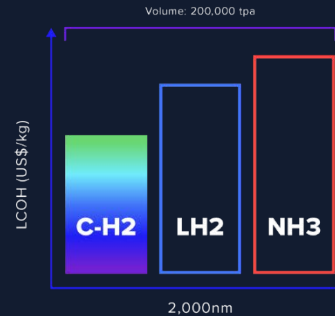
Compression provides for efficient offshore hydrogen production using installed wind generation

An energy efficient offshore transport solution for the development of a hydrogen production facility using "off-grid" wind power



Scoping Study confirmed compression delivers a competitive delivered cost with **zero emissions**

- 100% green supply chain analysis for hydrogen
- Export volumes of 50,000 to 400,00 tpa
- Market distances of 2,000 to 4,000 n.m.



Opportunity for **PROVARIS** to be a market leader in hydrogen transport

"Hydrogen seaborne trade could hit 150M tonnes by 2050."

2050."—Wood Mackenzie, October 2021

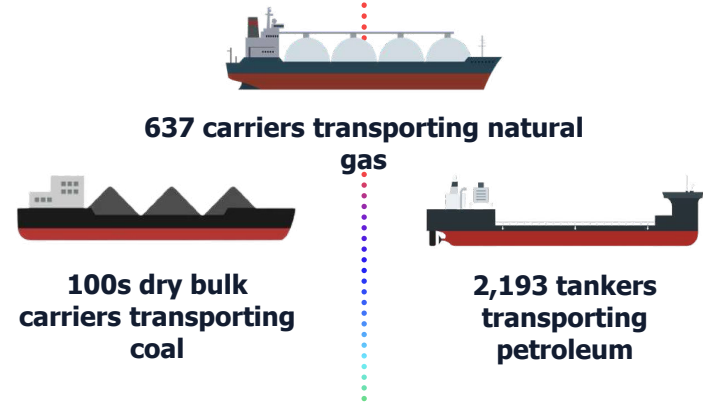
- Marine industry will need significant investment in supply chains to transport equivalent energy as hydrogen
- Only one demonstration ship (pending sea-trials) designed for liquefied hydrogen, built by Kawasaki Heavy Industries (80-ton capacity)
- Two shipyards with Approval in Principle for liquefaction storage design at scale
- Transportation and distribution costs for hydrogen are a function of the volume transported, the distance and the type of hydrogen carrier
- PROVARIS targeting first operations 2026 commercial scale operations



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2030 HYDROGEN
PROVARIS targeting first operations 2026



^ Clarksons Platou Research;
Provaris estimates