



PROVARIS ENERGY

AGM Presentation

24 November 2022

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\$ refers to Australian Dollars unless otherwise indicated.

This presentation was authorized for release by the CEO on 24 November 2022



Board & Management

Australian listed company (ASX.PV1) with staff in Sydney, Perth, Oslo and Calgary providing global expertise 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

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

LONDON



Norman Marshall

Commercial Manager
Legal, Commercial, Project Finance

PERTH



Per Roed

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

OSLO



Herman Hildan

Strategic Advisor – Provaris Norway AS
*Investment Banking, Shipping, Capital
Markets, Advisory Services*

OSLO



Mats Fagerberg

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

LISBON



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



Lindsay Whiting

Tiwi H2 Facilitation Manager
Major Projects, Port Operations,

DARWIN



Successful transition into an **integrated hydrogen company**

Australian public company, Provaris Energy (ASX.PV1) – Perth, Sydney, Oslo, Calgary

2016 to 2020

2016-2019: Developed FEED level design to commercialize Compressed Natural Gas (CNG) marine supply chain

2019: Strategy and value chain position redefined to address transition to green hydrogen

2020: Launch of Compressed Hydrogen shipping concepts, patent lodgment, and Class engineering and approvals program with ABS

2021

Engineering and commercialization programs established...

- **AiP on two GH2 Carriers** and Scoping Study to define economic case for compression
- **MOU for our first midstream project** in Australia – 8GW HyEnergy Project
- **Announced Tiwi H2 export project:** 2.8GW solar farm, electrolysis, desalination, compression and export of 100ktpa (ownership of molecules)

2022

Scaling up commercialization opportunities...

- **Established Provaris Norway AS** to service European opportunities
- **Delivered Tiwi H2 Design Concept Study** and running a partner process
- **MOU with Total Eren** for co-operation on commercialisation of compressed H2 solutions
- **Approval for Construction** for the H2Neo carrier > December 2022
- **Establishing access to European market** for mid-stream opportunities
- **Maintain a healthy cash balance, with \$9.3M** (31 October 2022)



2022 milestones de-risking the path to commercialisation

2016 to 2020	2021	2022
<p>2016-2019 Developed FEED level design to support Class Construction National Gas (CNGL) marine trade chain</p> <p>2019 Strategic and value chain position established to address transition to green hydrogen</p> <p>2020 Launch of Compressed Hydrogen export network, vessel design and Class engineering and approval progress with ABS</p>	<p>Engineering and commercialisation programs established.</p> <ul style="list-style-type: none"> • AP on new GN2 Contract and Supply Chain under construction case for construction. • Approved Class H2 Design Concept Study and HAZID for preliminary process. • MOU for our first milestones project in Australia, with HyEnergy project. • Approved Class H2 Design Concept Study and HAZID for preliminary process. 	<p>Initiating of commercialisation opportunities.</p> <ul style="list-style-type: none"> • Established Provaris Norway AS to service European opportunities. • Delivered Class H2 Design Concept Study and HAZID for preliminary process. • MOU with Total Eren for co-operation on commercialization of compressed H2 supply chain. • Approved for Construction for the HyEnergy project - December 2022. • Establishing access to European market for first-class opportunities.

Q1 2022

- Received WA Govt. funding for HyEnergy Export study (200tkpa)
- Commenced Design Concept Study for Tiwi H2 (2.8 GW, 100ktpa)
- Commenced FEED level design package for Class & Shipyard

Q2 2022

- Study initiated for EU supply chain with H2 developer & port and pipeline operator for market access
- Technical partnership with Northern Marine to support Class & Newbuild

Q3 2022

- Established Provaris Norway AS to service European opportunities
- Completed Concept Design for Tiwi H2 (2.8 GW, 100ktpa)
- Completion of H2Neo FEED design & HAZID for Class review
- Commenced discussion with shipyard on constructability, schedule and cost
- MOU with Total Eren to co-operate on commercialization of a compressed H2 supply chain
 - > In-depth technical verification
 - > Opportunities underway for Asia and Europe
 - > Assistance with shipyard & financing

Q4 2022

- Developing a pipeline of EU opportunities – Norway as supply hub
- Asia marketing road-show identifies interest in a compressed H2 supply chain – Australia as supply hub, with other regional supply hubs emerging.
- Tiwi H2 commenced Early Works & Detailed Design and commencement of EIS submission
- H2Neo 'Class Approval for Construction' – expected shortly in December 2022
- Completion HyEnergy Export Study – soon to be published by the WA Govt.



Business model creating value for shareholders across the hydrogen value chain with multiple revenue streams

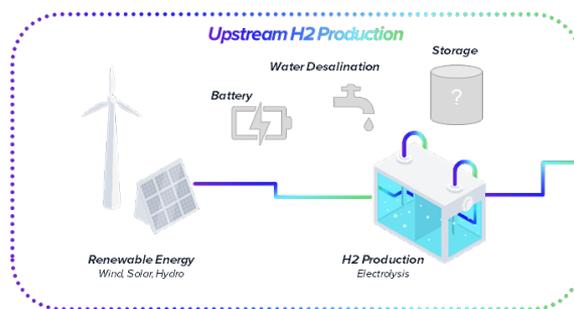
Core insights, knowhow and hydrogen development skills gained through project development activity

1 H2 Shipping IP & Knowhow



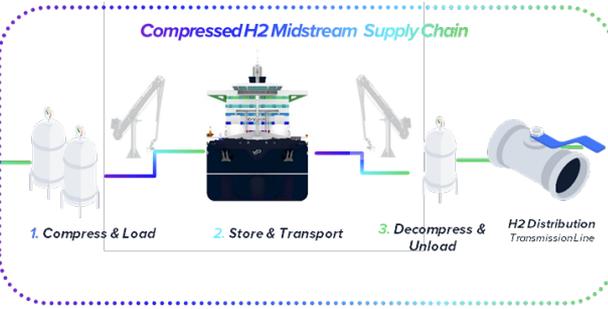
- Significant experience in gas / compression, and bulk scale shipping solutions for oils, chemicals, and natural gas
- Proprietary GH2 Carrier & Storage with IP patents
- **Class approvals in 2022 and first operations 2026**
- Integrated techno-economic models developed for compression, terminal and shipping
- Developing floating storage solutions increases optionality for commercialization pathways
- **Only developer of compressed H2 shipping at scale**

2 H2 Production for Export



- **Origination of integrated h2 export projects** for regional export markets using compression
- **2.8 GW Tiwi H2 export project** (Tiwi Islands, Northern Territory, 100% Provaris)
- **Upside from exposure to the commodity and asset creation**
- **Partners introduced at the right time to maximise equity value to Provaris**

3 H2 Marine Transport Services



- **Collaboration with advanced H2 development projects** suitable for compression
- **Stable long-term fixed-cash flow contracts**
- **MOU with 8GW HyEnergy Project**, Western Australia
- **MOU partnership with Total Eren**, developer of H2 export across Asia and EU markets
- **Advancing multiple opportunities in Europe**

Technical & Commercial partnerships established...



Accelerating pace and scale of the global transition to hydrogen has never been more evident

Increasing awareness of Compressed H2 has grown the pipeline of regional opportunities in Europe & Asia

Qualification & Scoping Studies for Compressed H2 into Europe

- Morocco > Netherlands (70 - 200,000 tpa)
- Norway > Germany & Netherlands (20 - 100,000 tpa)
- Spain > Netherlands (50,000 tpa)
- Scotland > Netherlands (50 - 100,000 tpa)
- Europe/North Africa > Israel (70,000 - 400,000 tpa)

Valuable support provided by the Australian Government, including through DFAT and Austrade, for international engagement and outreach with policy makers, potential commercial partners and investors

Advancing Projects to Feasibility for Asia

Tiwi H2, Australia > Singapore
up to 100,000 tpa

HyEnergy, Australia > Singapore
200,000 tpa

2.8 GW Tiwi H2,
Tiwi Islands, NT

HyEnergy[®]
HYDROGEN ENERGY
8 GW HyEnergy
Gascoyne, WA

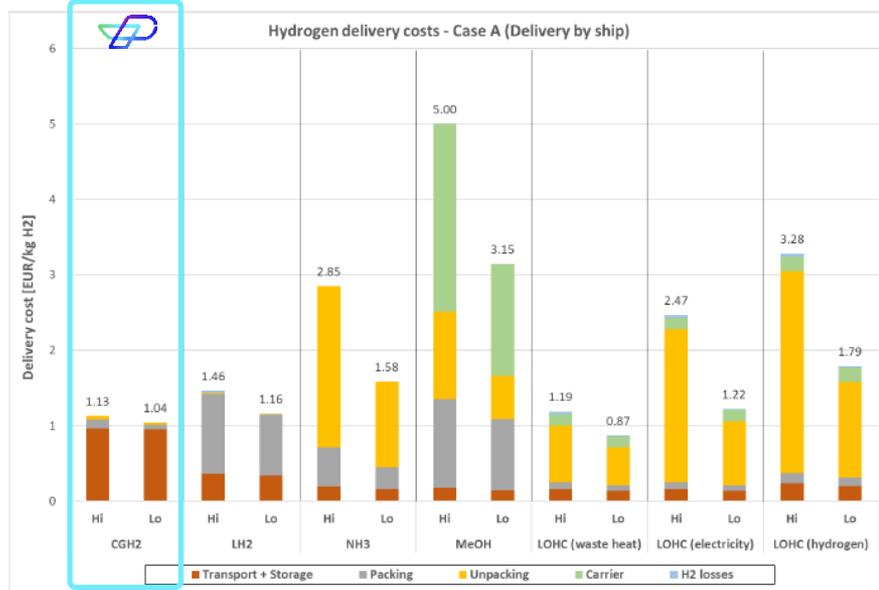
-  H2 Supply Regions Under Review
-  H2 Demand Hubs Under Review

 Announced Compressed Hydrogen Project

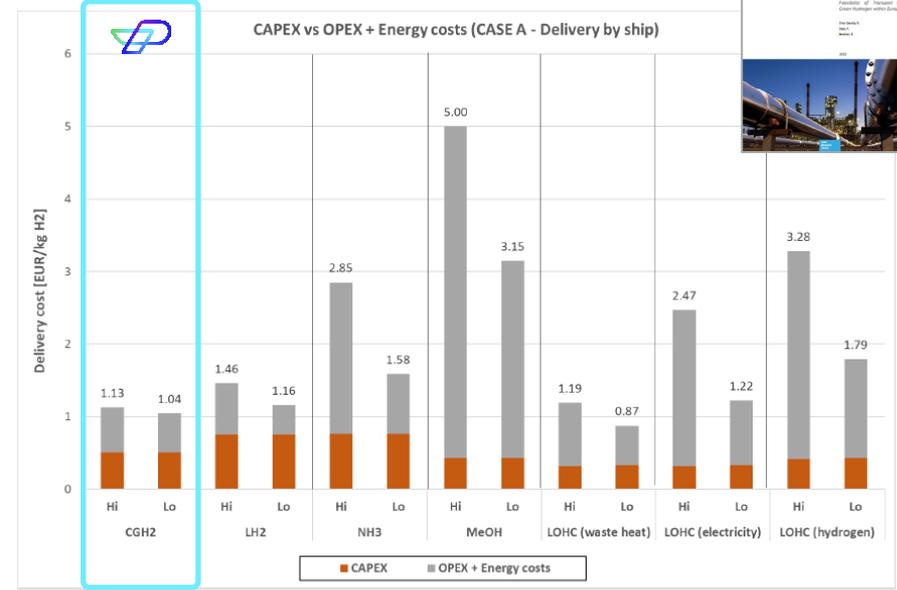


Independent research in Europe supports the cost advantage and efficiency of Compressed H2 over regional distance

(1Mtpa continuous delivery over a 2,500km shipping)



Source: JRC analysis



Source: JRC analysis

"In the case of compressed hydrogen delivered by ship, it can be seen that the final cost is dominated by the transport costs. Due to its lower density, transport of compressed hydrogen requires a bigger and more expensive fleet than any other packaging mode. However, the packing and unpacking costs (i.e. compression costs) are low enough to compensate for the higher transport costs. **This makes compressed hydrogen by ship an attractive option, for Case A, with a delivery distance of 2,500 km**" Source: JRC, 2022



Compressed H2 delivers Europe an 'early mover' carrier to meet H2 import demand

REPowerEU ambition of 10mtpa H2 production and 10mtpa H2 import by 2030

- > Delivery of H2 in liquid or chemical form being recognized as more costly and challenging to deliver in the timescale required.
- > Significant regional supply within 2,000 nautical miles of a 10mtpa market.
- > Provaris is seeking to establish EU market access to industrial users accessing the H2 backbone
 - Joint-study nearing completion to develop 'end to end' supply chain using compressed H2.
 - Outreach continues with multiple port, pipeline and end-user markets to increase awareness of compressed H2 to be considered mainstream alternative for import
- > Establishment of Provaris Norway AS and local team to service European opportunities:
 - Close to 50 per cent of the EU hydropower reservoir capacity is in Norway
 - Norway demonstrating an increasing interest in both a coastal trade export to major EU markets for energy
 - Norway's H2 production costs to be very competitive given costs of grid hydro power and high utilization of electrolyzers
 - Supportive Norwegian government for hydrogen production, local consumption, and export of clean energy

EU continue to accelerate funding for H2 supply

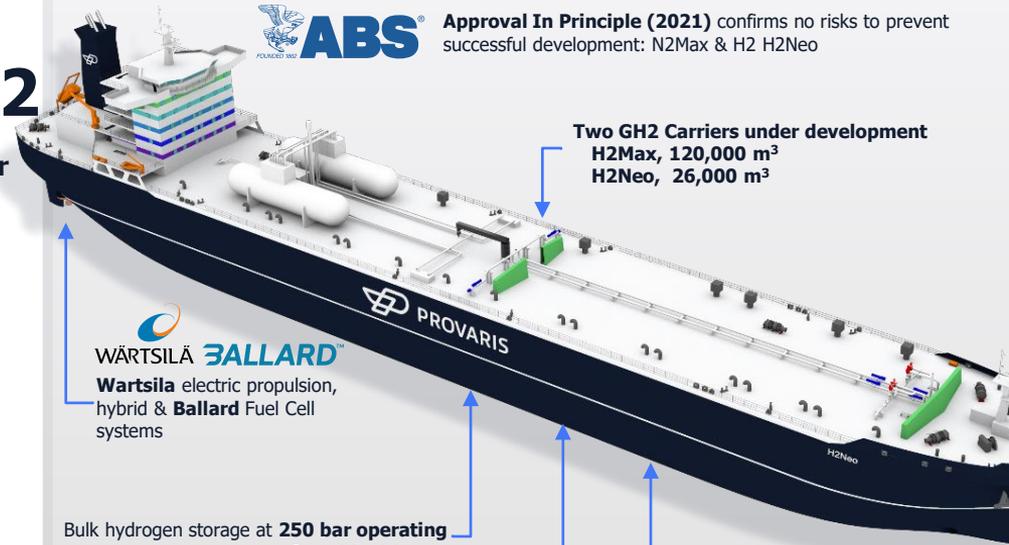
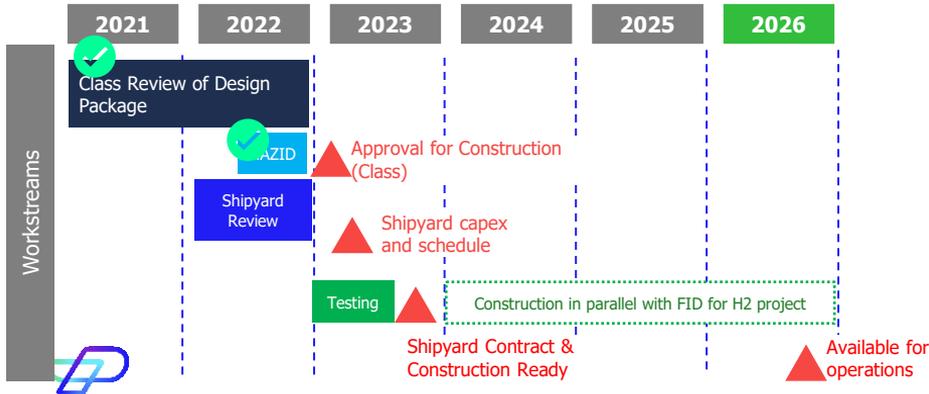
- > €95 billion Horizon Europe R&D Innovation Fund until 2027 to tackle climate change, with €12 billion allocated to 2023 applications
- > €3 billion hydrogen bank developed to build out H2 markets
- > €3 billion IPCEI Hy2Use to support construction of electrolyzers & transport infrastructure



Class Approvals on track for de-risking milestones in 2022

Roadmap to low emission shipping through green fuels for power generation, including Fuel Cell and Hybrid integration

- Standard MR tanker hull form with a proprietary design for integrated tanks to store hydrogen at 250 bar pressure
- **Advanced development program in 2022**
 - > H2Neo Engineering design package, including risk and safety studies
 - > Material testing of welds for structural steel and liner materials in a hydrogen environment.
- Technical Partnership with Northern Marine to assist with construction, safety management systems and operational requirements for fleets.
- **Approval for Construction (Class) – confirmation imminent to support out timeline for operations in 2026.**



Bulk hydrogen storage at **250 bar operating pressure & ambient temp.**

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

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



Integration with fixed jetty solutions for both near and off-shore applications, accounting for storage, water depths, metocean, and geotechnical conditions (Illustrations are for Jurong Island, Singapore)



Tiwi H2 strategically located to export markets in SE-Asia

- > Project announced October 2021 and completion of Scoping Study.
- > 100% Provaris Energy as developer
- > Concept Design Study (August 2022) confirms feasibility for an integrated compressed hydrogen production for 100,000 tpa export project
- > USD 4.5-5.2B project capex including fleet of H2Neo Carriers to support efficient and modular approach across two stage development
- > **Major Project Status awarded by Northern Territory** government and support from Australian Federal Agencies (Austrade)
- > Strong ESG credentials for project financing and government funding (examples include. CEFC, ARENA, NAIF)

2.8 GW
Solar Generation

up to 100,000 tpa
Green Hydrogen

2027
Target first export

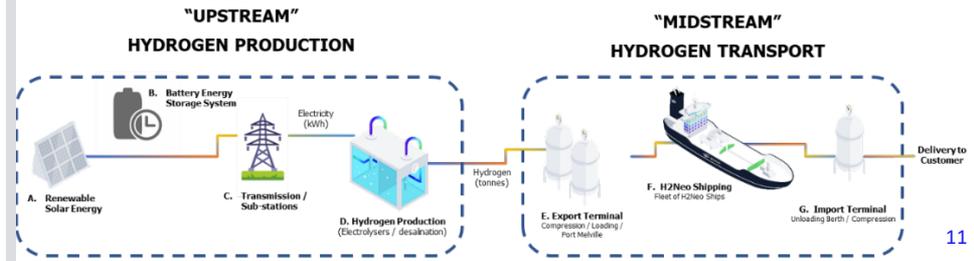
~900,000 tpa
CO2 Emissions Avoided



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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.

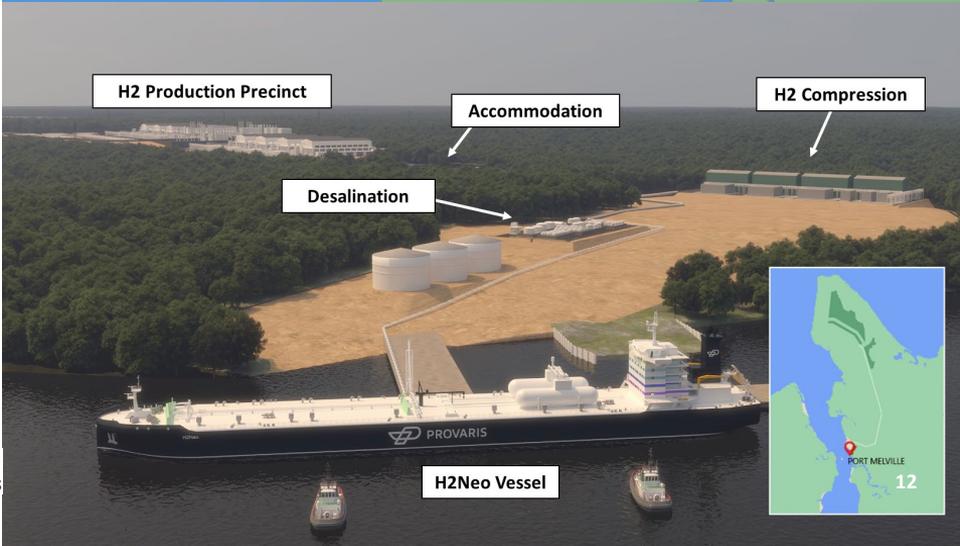
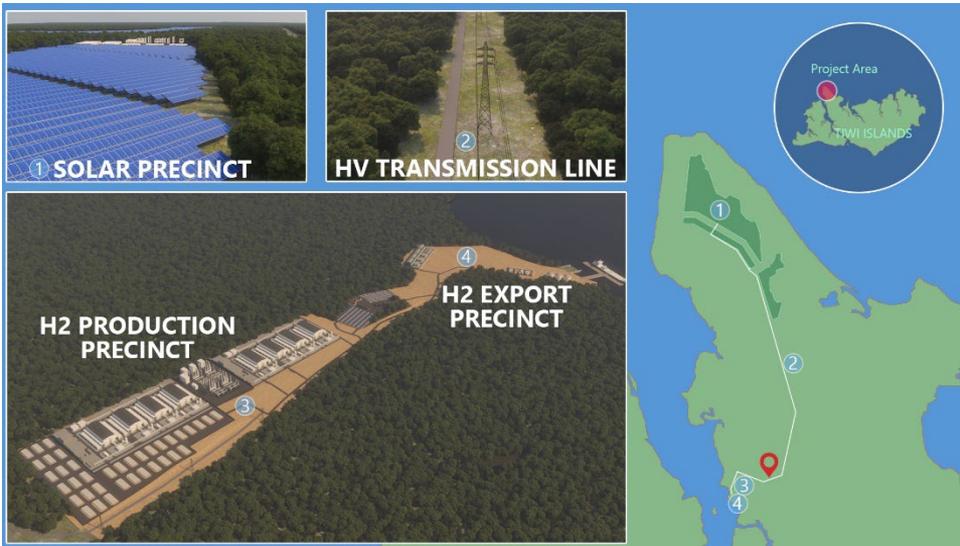
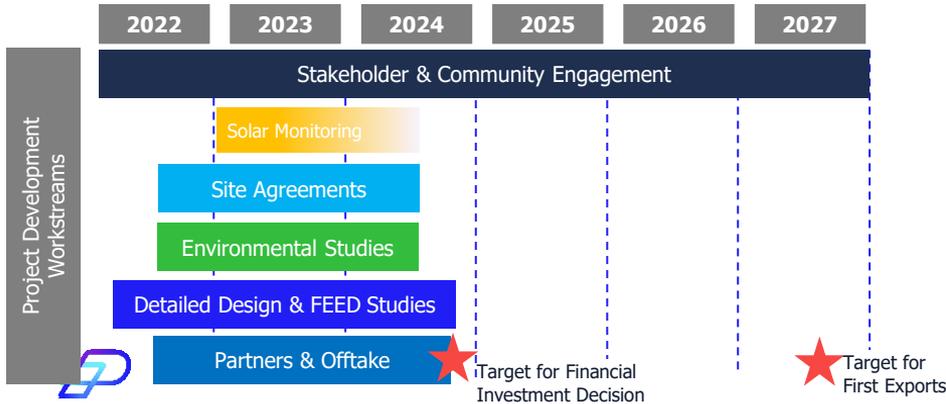


Tiwi H2 export project

advancing into Detailed Design

early works for EIS submission

- **Early works program underway to fast-track workstreams required for the EIS submission in 2023**
- Owner's engineering team appointed to advance detailed design of the Solar Precinct to a 30% design basis in 2023. Enables tender for EPC construction proposals.
- Advancing land and site agreements through Darwin-based team with strong Tiwi community relations.
- Commenced a process to introduce project equity and development partner.
- Valuable support provided from Austrade and DFAT for outreach programs to attract and engagement international partners.



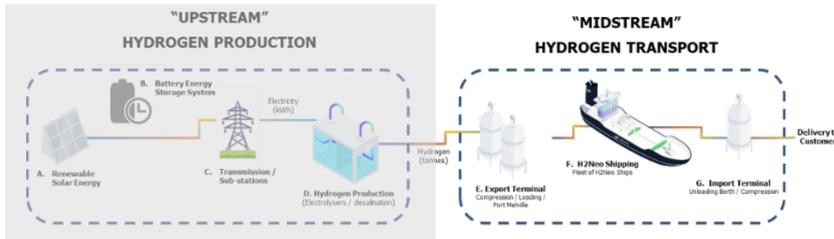
Successful study for export of green hydrogen HyEnergy Project to Asia-Pacific



- HyEnergy Project targeting 550,000 tpa of green H2 for export
- Feasibility study to demonstrate the technical & commercial feasibility of compression using offshore loading solution for export to Asia-Pacific
- Scope for Provaris includes the export of 200,000 tpa from a Phase 1 with a focus on Singapore (Compression, shore crossing, subsea pipeline, offshore loading)
- Compression H2 solution is highly suitable given it supports scaled production, flexibility in loading, the project's proximity to markets, and

OUTLOOK

- **Completion of final Knowledge Sharing awaiting acceptance and publication by the WA Government.**
- **HyEnergy has requested Compressed H2 be included into a Pre-Feasibility Study for the full project value chain in 2023**



NOTE: all illustrations are conceptual with final locations of all facilities to be determined by HyEnergy in future Feasibility Studies.



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

2023 milestones & outlook...

1 H2 Shipping IP & Knowhow

- > **'Final' Class Approvals for Construction** final the H2Neo carrier
- > **Partnership with a Shipyard** for any future prototype design, testing and commissioning required
- > **Partnership with Shipowner(s)** and Financial Advisors on future contract, financing and construction

NEW DEVELOPMENTS

- > **Launch of Compressed H2 Floating Storage** based on existing IP of GH2 carrier design
- > **Launch of next stage of development and Class Approvals for H2Max carrier** based on successful H2Neo approvals
- > **Assess & apply for suitable R&D funding schemes**



2 H2 Production for Export

TIWI H2

- > **Secure investment and/or Joint Development Partner(s)**
- > **Secure Offtake HOAs to progress to agreements**
- > **Completion of Detailed Design for Tiwi H2** in order to issue proposals to EPC for construction.
- > **Submission of EIS** for Territory and Federal approvals
- > **Assess & apply for suitable government funding schemes**

NEW PROJECTS...

- > **Identification of Joint Development Projects** suitable for export projects suitable for Compressed H2

3 H2 Marine Transport Services

HYENERGY PROJECT

- > **Conclusions of WA funded Export Feasibility Report**
- > **Selection in the next stages** for integrated project feasibility studies

EUROPE

- > **Secure Agreements for Provaris as mid-stream provider for a European based project(s)**
- > **Assess & apply for suitable R&D funding schemes**
- > **Development of strategic partner(s)** to accelerate deployment of midstream opportunities

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Thank you

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