PROVARIS

Compressed Hydrogen

The missing link for economic regional supply

20-24 February 2023 | OSLO ROADSHOW

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This presentation was authorised by the CEO for release on 23 February 2023

Provaris | The pursuit of the original and universal energy

REPowerEU ambition of producing 10mtpa and importing 10mtpa by 2030

Renewable Energy Directive: The Delegated Act **1)** the definition of what 'renewable hydrogen' is and clarifies the principle of "additionality" securing transition without pressure on the grid and **2)** a methodology for calculating life-cycle greenhouse gas emissions for RFNBOs.

Integrated value chain understanding unlocks a world of untapped potential

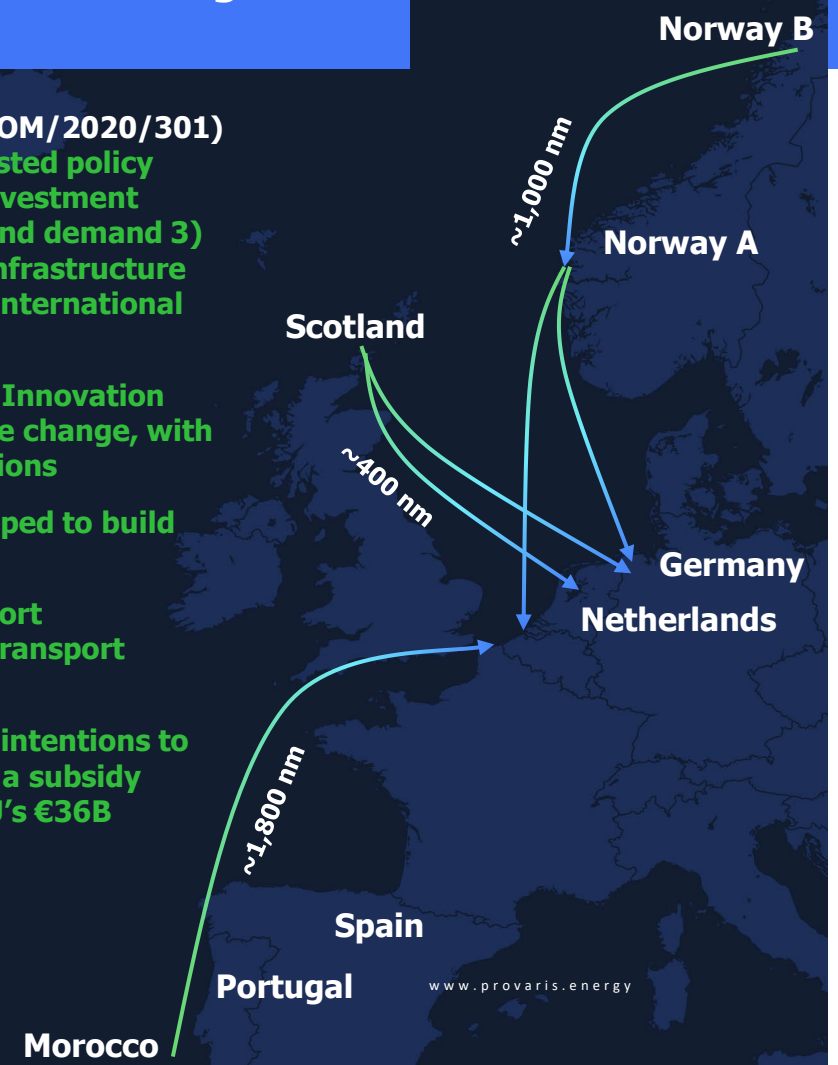
US Inflation Reduction Act sets the precedent for the EU to follow <$ 3/kg Production Tax Credit (<0.45 g-CO2/g-H2)

Demonstrating compression can deliver lowest-cost regional supply for hydrogen

“Hydrogn is a key pillar of the REPowerEU Plan to get rid of Russian fossil fuel” - ‘early mover’ with compressed H2

EU continues to accelerate funding for H2 supply

- **The EU strategy on hydrogen (COM/2020/301)** was adopted in 2020 and suggested policy actions points in five areas 1) investment support 2) support production and demand 3) create a hydrogen market and infrastructure 4) research and cooperation 5) international cooperation.
- **€95 billion** Horizon Europe R&D Innovation Fund until 2027 to tackle climate change, with €12B allocated to 2023 applications
- **€3 billion** hydrogen bank developed to build out H2 markets
- **€3 billion** IPCEI Hy2Use to support construction of electrolysers & transport infrastructure
- **Green Deal Industrial plan** with intentions to offer green hydrogen producers a subsidy programme, funded from the EU’s €36B Innovation Fund



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

- Europe has a clear roadmap for climate change and energy security which has established a 10Mtpa import market by 2030
- Provaris establishing EU market access to industrial users accessing the H2 backbone within a 2,000 nautical mile shipping distance
- **Provaris Norway AS established in August 2022 to service European opportunities**
- Norway provides up to 25% of EU’s current gas supply makes it a relevant energy partner
- Norway’s H2 production costs to be very competitive given reliable grid hydro power and high utilization of electrolysers, with close to 50% of the EU hydropower reservoir capacity is in Norway
- Supportive Norwegian government for domestic and export
- **Norway to benefit from the Delegated Act (Additionality Rules)**
  - **Exception will apply as long as a country’s electricity production emits less than 65g of CO2e/kWh (Norway is 30gCO2e/kWh)**
  - **10yr exception for projects exporting before 2027**

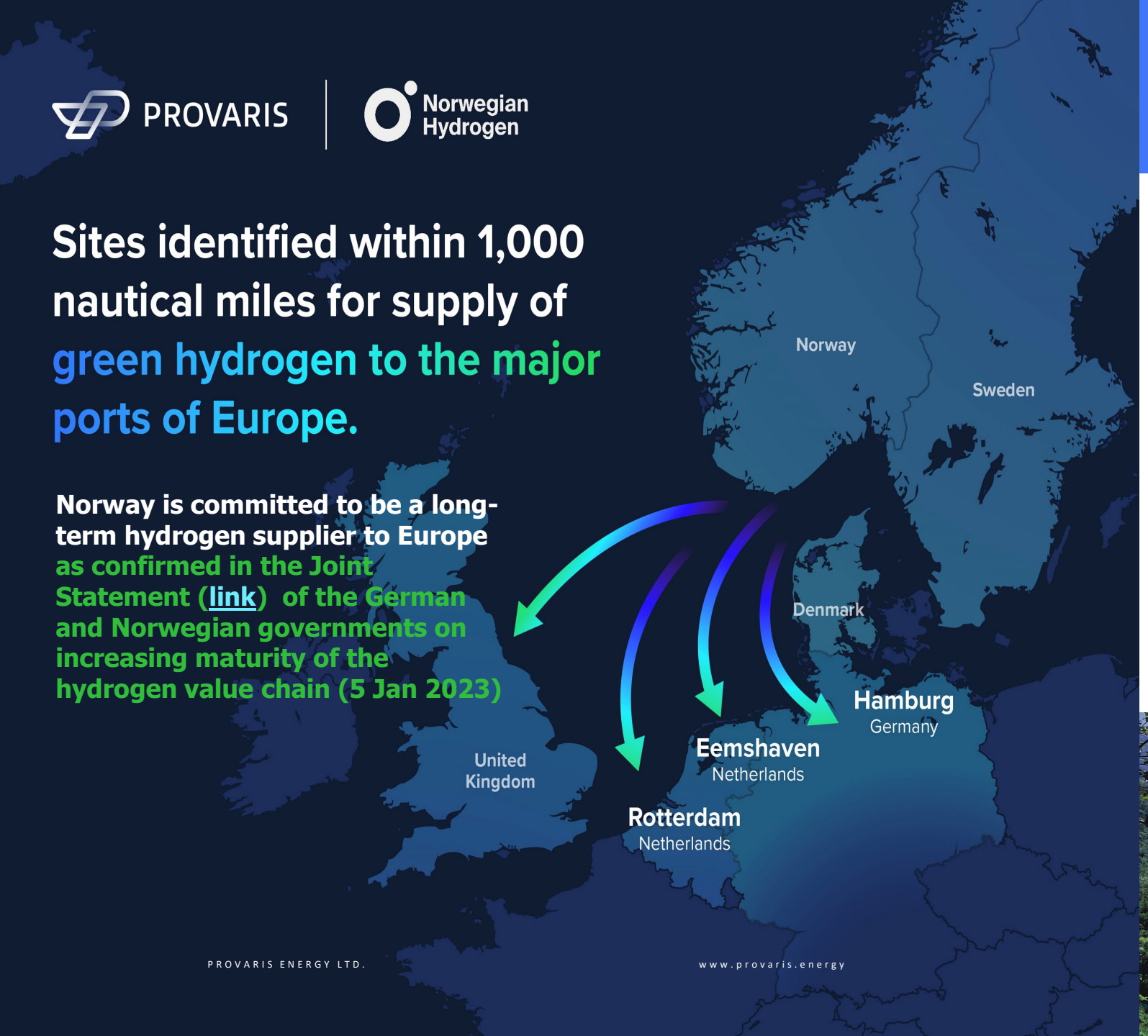
Norwegian Energy Partners

Norwegian Hydrogen

PROVARIS | Norwegian Hydrogen

Sites identified within 1,000 nautical miles for supply of green hydrogen to the major ports of Europe.

Norway is committed to be a long-term hydrogen supplier to Europe as confirmed in the Joint Statement (link) of the German and Norwegian governments on increasing maturity of the hydrogen value chain (5 Jan 2023)



Collaboration announced with Norwegian Hydrogen to jointly develop green hydrogen value chains in the Nordic region

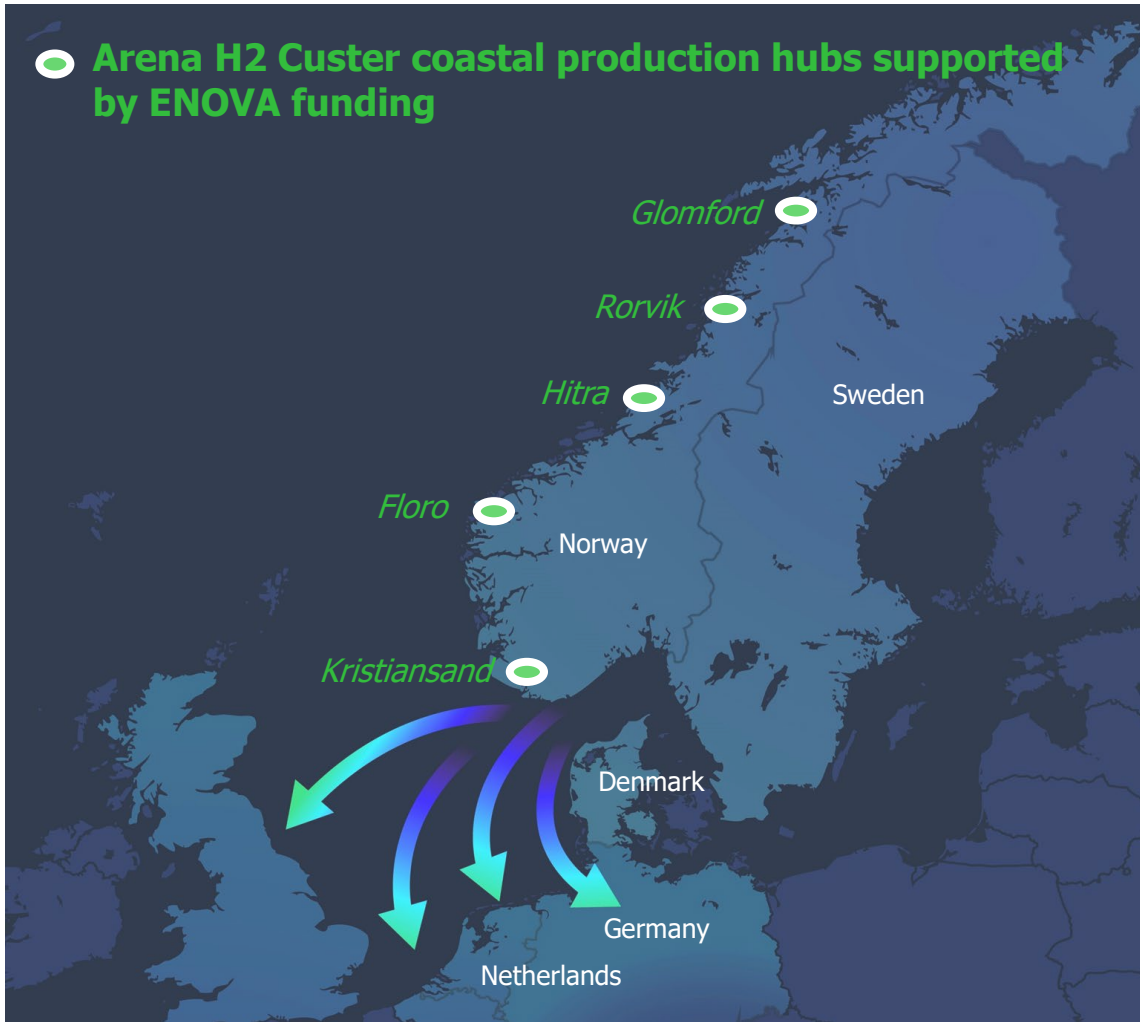
- Accelerate the development of export scale projects utilizing Provaris' compressed H2 carriers and development expertise
- **Norwegian Hydrogen developing Norway's largest H2 production facility**
- Pilot-E project Hellesylt Hydrogen Hub will complete and demonstrate hydrogen delivery chain in the North West region of Norway
- When production opens in 4Q23 Hellesylt will be the largest producer of green hydrogen in Norway
- Supported by industrial shareholders, including Flakk Group, Mitsui & Co, Tafjord, Hofseth & Hexagon Purus.
- Multiple sites identified for export volume from the Nordic region
- Funding schemes available through the European Union and Norway
- **Concept Design Study for preferred site completed in March 2022 quarter**
- **Collaboration will target delivery of hydrogen by 2027**

Provaris identified as the "missing link" to create the MilkHy Round

Funding for hydrogen hubs providing infrastructure to decarbonize Norway's maritime sector and a platform for future export capacity

Five (5) coastal H2 production hubs have received 669M NOK (~100M USD) from ENOVA to develop supply for the maritime sector

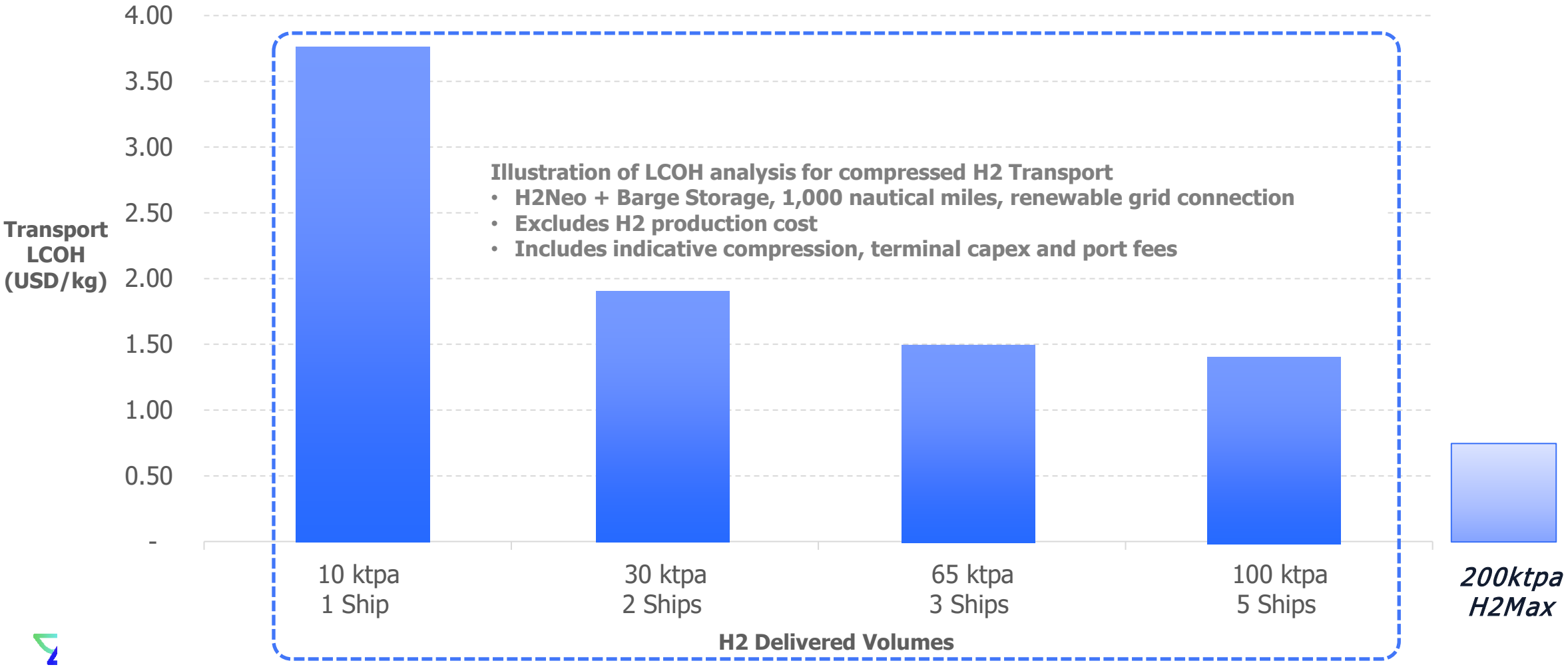
- Mature projects with established end-use demand from hydrogen fueled maritime vessels
- Geographic spread and developed maritime infrastructure provides export potential for the west coast of Norway
- **All projects are based on compressed H2 technology** for distribution with Phase 1 production scale of 5 to 25 tpd starting 2025
- **Provaris identified as the "the missing link" to enable scale-up of daily production (tpd) and aggregate for coastal transport and potential export volumes to Europe**
- Goal is to increase production, utilize production capacities and delivery low-cost hydrogen
- Compression allows clusters to optimise for regional/seasonal variations in hydrogen demand



Norwegian Energy Partners ENOVA Arena H2Cluster The Norwegian Hydrogen Cluster

Export volume ambitions rewarded through reduction unit economics for compressed H2 marine transport

Scale benefits on utilization across the compressed H2 supply chain can achieve sub-USD 1.00/kg transport costs from Norway



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

Increasing awareness of Compressed H2 continues to grow the pipeline of regional opportunities in Europe & Asia

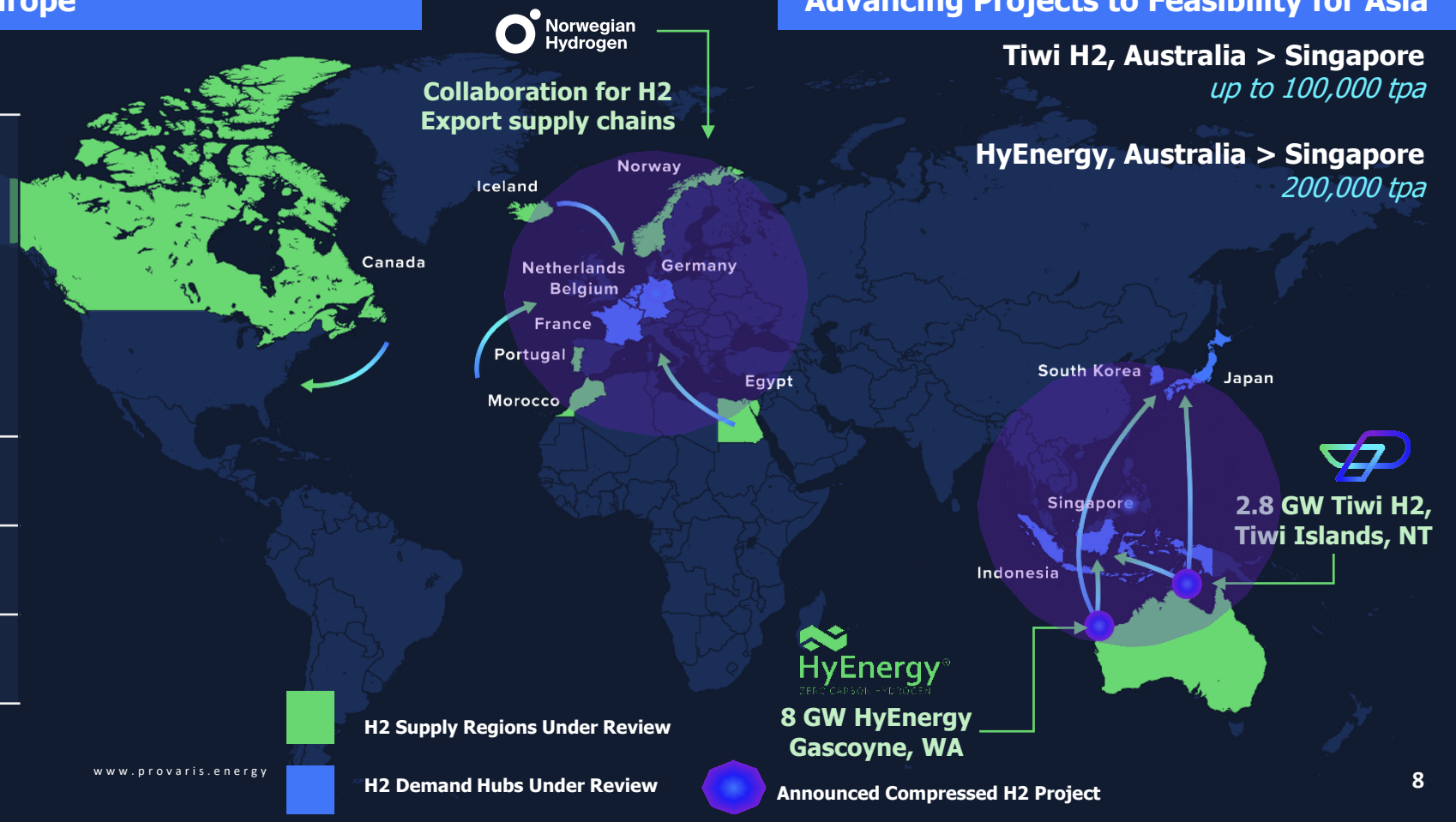
Techno-economic studies advanced for Europe

Europe	Green hydrogen imports essential for reaching targets set under the EU's "Fit for 55" legislative package and REPowerEU by 2030 ○ *20 Mtpa per year total demand* ○ *10 Mtpa required through imports*
Singapore	2-3 Mtpa by 2050; focus now on H2 blend for power generation
Japan	2-3 Mtpa by 2030, growing to 20 Mtpa by 2050
Korea	2-3 Mtpa by 2030, growing to 30 Mtpa by 2050

Advancing Projects to Feasibility for Asia

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

HyEnergy, Australia > Singapore
200,000 tpa



Development pathway in position to be first supplier of green hydrogen to rePowerEU with potential to scale to full

Transition from H2Neo to H2Max by 2030 supports 1Mpta scale ambitions and materially impact delivered cost

	H2Neo	H2Max
		
Cargo Carrying Capacity	**26,000 m³ @ 250 barg**	**120,000 m³ @ 250 barg**
Development Timeline	✓ **AiP Received - 2021** ✓ **FEED Design Approval - 2022** • Effective Shipbuilding Contracts – 2023 (scheduled) • **First operations - 2026 (possible)**	✓ **AiP Received - 2021** • FEED Approval – 2023 (scheduled) • Effective Shipbuilding Contracts (target for 2026) • **First operations - 2030 (possible)**
Project Export Volume Capacity *	**200,000 tpa**	**950,000 tpa**
Shipping Range	**Up to 2,000 nautical miles**	**Up to 3,000 nautical miles**

* Assumptions:
- Unloading in 18 hours
- Fleet Ships (see overleaf) is based on project production rates and distance to market
- Actual importation volumes can be multiples of the above "fleet" production facility capacities.

Accelerating innovation in the hydrogen industry

Bridging the gap with IP for Integrated Solutions

Leveraging Project Experience, Core Insights, IP, and Development Expertise with global attention for our solution providing unique insight in global H2 value chain developments

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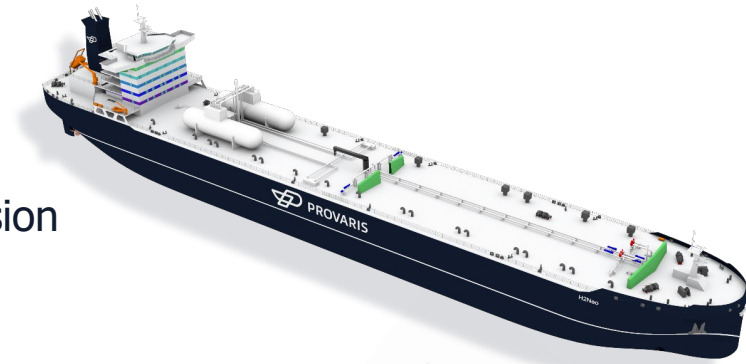
1 Proprietary IP

Hydrogen **marine carriers and storage** using compression (Engineering, Class Approvals, Newbuilds, Patents)



2 Green Hydrogen Production

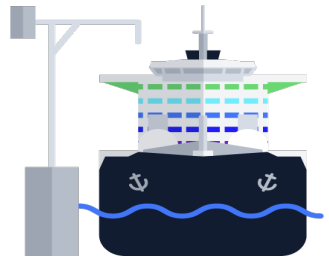
Developer of the **full hydrogen value chain** from electrons to delivered molecules

Pipeline of +3 GW of production capacity across Asia and Europe

3 Shipping & Storage Solutions

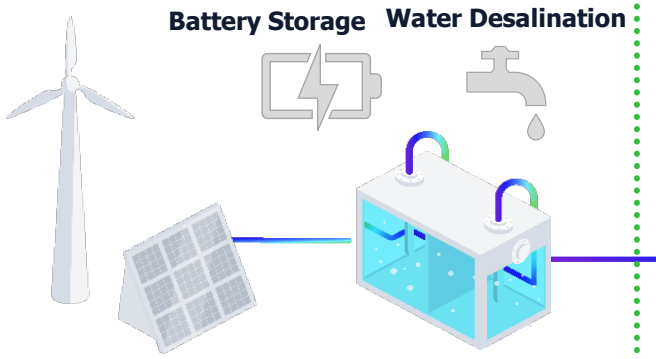
Collaborating with producers and markets to integrate **terminals, storage and shipping,** long-term charter and offtake contracts with infrastructure returns

Global H2 project supply provide further return potential



Compression provides the missing link for a low-capex, simple and energy efficient regional supply chain

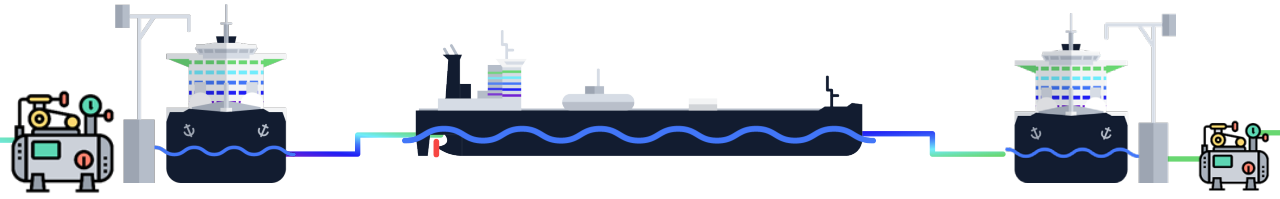
Green Hydrogen Production



Renewable Energy
Wind, Solar, Hydro

Green H2 Production
(Electrolyser 20 bar)

Compressed H2 Supply Chain



1. Compress & Load

- H2 gas direct from the electrolyser compressed to 250 bar operating pressure
- Size of compression based on peak loading rate
- **Load follow the production profile**
- Option for barge storage if required or optimization of fleet

2. Store & Transport

- Closed system, ambient temp, no boil-off losses
- Fleet size determined by volume/distance (round-trip optimisation)

3. Decompress & Unload

- Unload into a grid/pipeline using the ship's pressure, with minor scavenging to drawdown pressure
- Option for barge storage if required or optimisation of fleet

H2 Distribution
Transmission Line

H2 Markets
Power
Industry
Transport

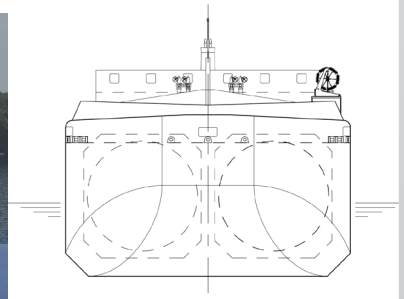
Advantages of a compressed H2 supply chain:

- **Safe, proven & bankable technology**
- **Commercial at low volumes**
- **Small footprint minimises environmental impact**
- **First to market for gaseous H2 exports in 2026/27**
- **Flexibility in loading systems**
- **Modular development aligns with growth**
- **Load follow generation profile minimises storage and BESS**
- **Capable of supporting giga-scale export projects**

World first Design Approval for bulk hydrogen carrier

Low emission shipping through green fuels for power generation, including Fuel Cell and Hybrid integration

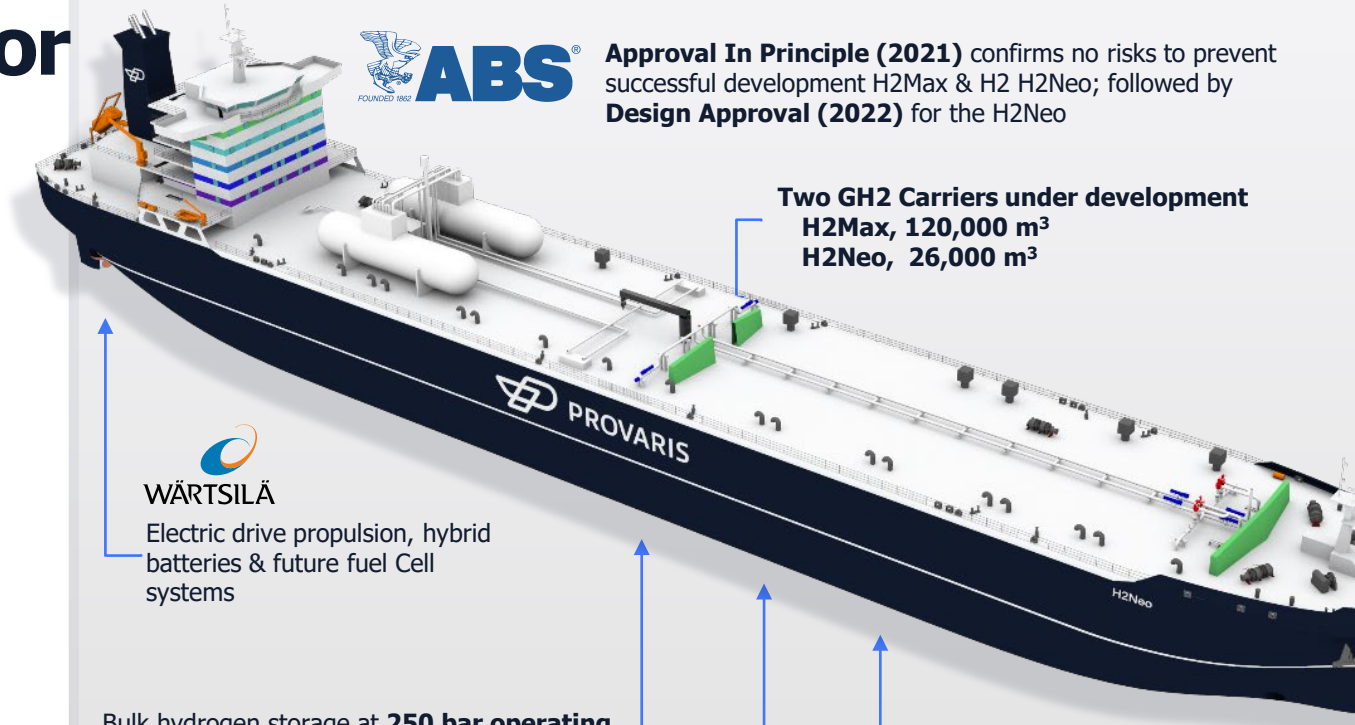
- Standard MR/LR tanker hull form with a proprietary design for integrated tanks to store hydrogen at 250 bar pressure
- **World first Class 'Design Approval' from ABS which verified:**
  - > Cargo tank integration can transport compressed hydrogen at bulk scale at 250 bar pressure
  - > Sufficient for shipbuilders to quote (price and schedule) with confidence
  - > Critical safety studies, process and risk analyses have been carried out, which allowed ABS to verify relevant safety aspects of the ship's design and operation
  - > Class Level design package for H2Neo to finalise FEED-level capex and schedule
- **Engagement with Clarksons on shipyard identification and selection process in early 2023**
- **Targeting first operations in 2026 for H2Neo & 2030 for H2Max**



ABS

Approval In Principle (2021) confirms no risks to prevent successful development H2Max & H2 H2Neo; followed by **Design Approval (2022)** for the H2Neo

Two GH2 Carriers under development
H2Max, 120,000 m³
H2Neo, 26,000 m³



WÄRTSILÄ

Electric drive propulsion, hybrid batteries & future fuel Cell systems

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**

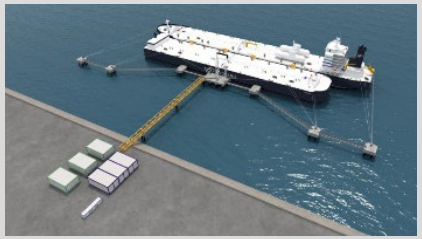
Northern Marine

Technical Partner

CLARKSONS

Ship Broker

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

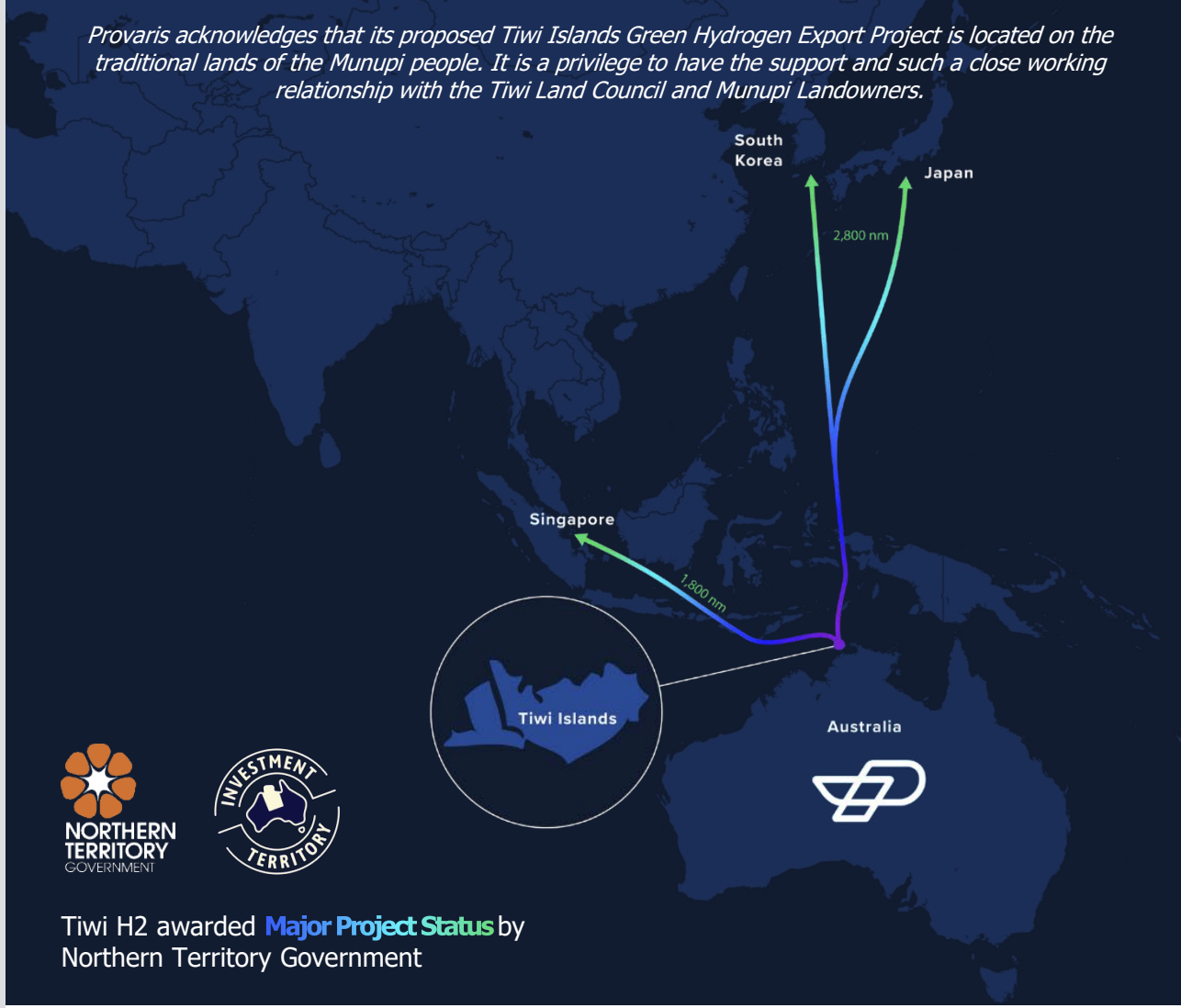
- **Concept Design Study (August 2022) confirmed feasibility for an integrated compressed hydrogen production for 100,000 tpa export project**
- **USD 4.5-5.2B project capex** including fleet of GH2 Carriers to support efficient and modular approach across two stage development
- **Major Project Status** awarded by Northern Territory government
- **Strong ESG credentials** for project financing and government funding (examples include. CEFC, ARENA, NAIF)
- **Permitting advancing** Federal and Territory EIS submission in Q4 2023
- **Early Works Program** for Solar Farm pre-FEED and Owners Engineer appointed

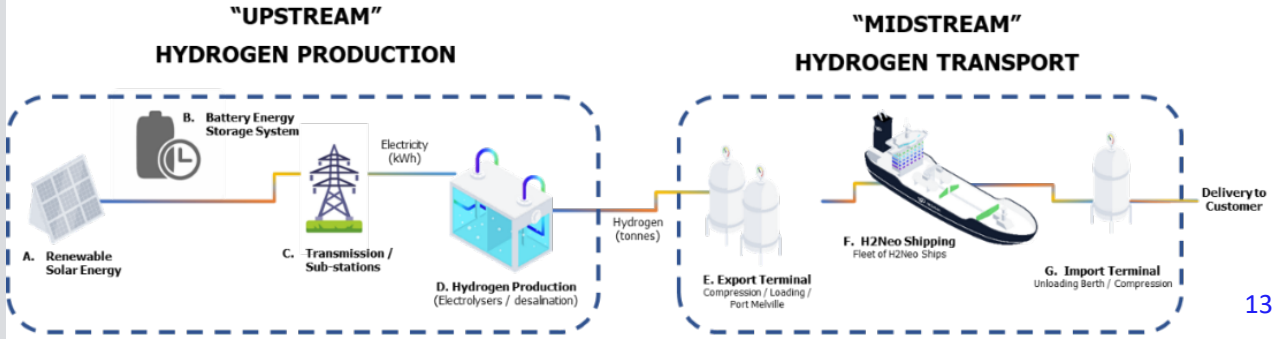
2.8 GW
Solar Generation

~100,000 tpa
Green Hydrogen

2027
Target first export

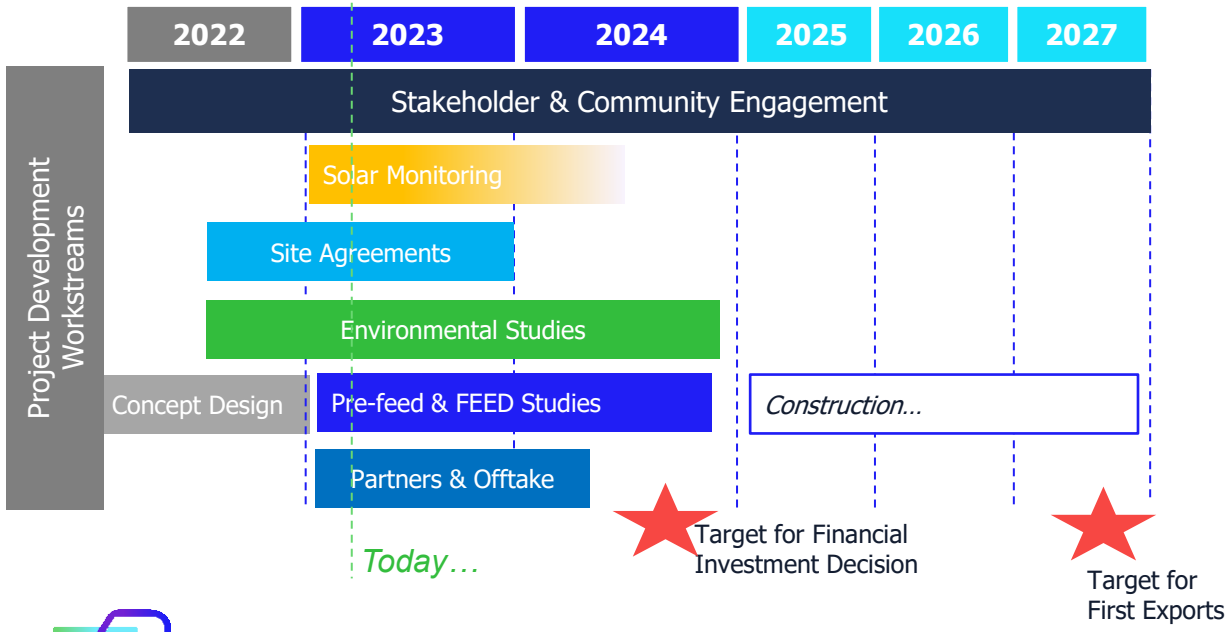
~900,000 tpa
CO2 Emissions Avoided

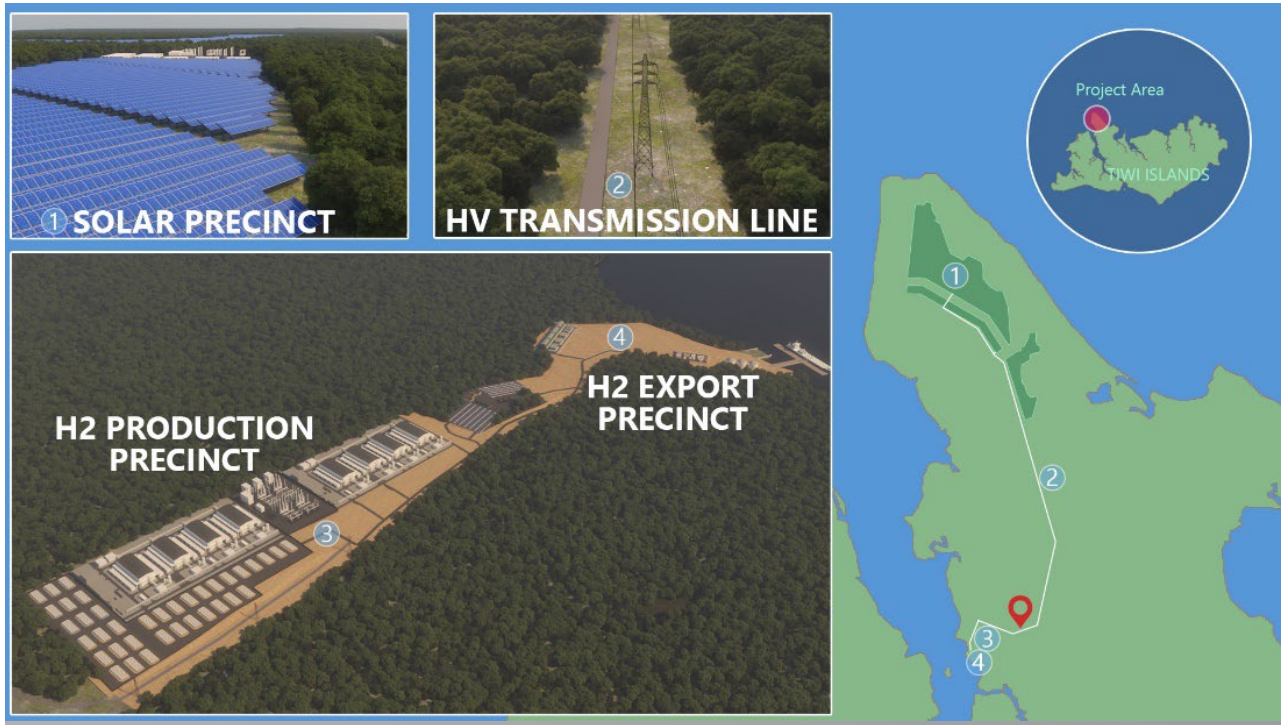


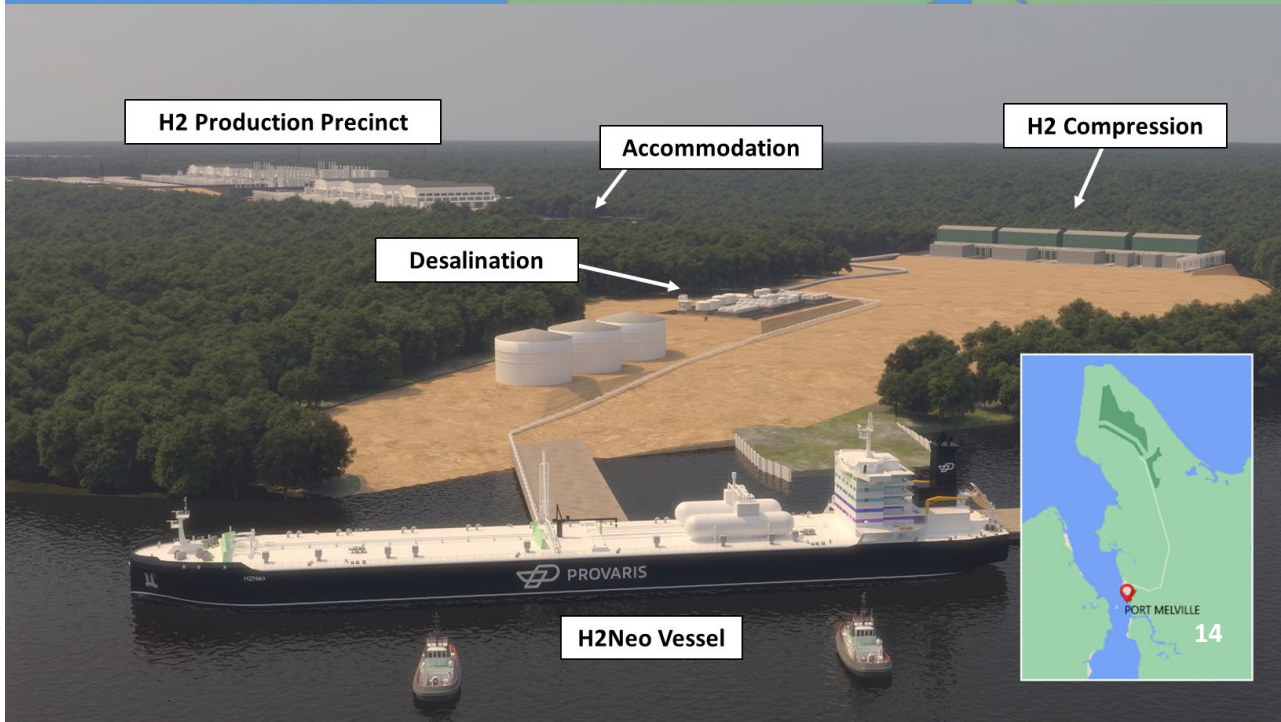


Site selection to enable first-mover export project from Northern Australia

- **Strategic Location to Markets**
- **Traditional Land Ownership**
- **Low Environmental Impact**
- **Solar Intensity & Water Access**
- **Existing Port Infrastructure**
- **Landowner & Government Support**

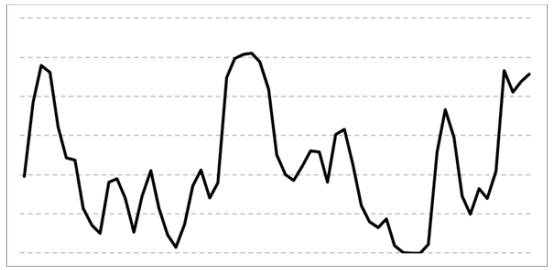




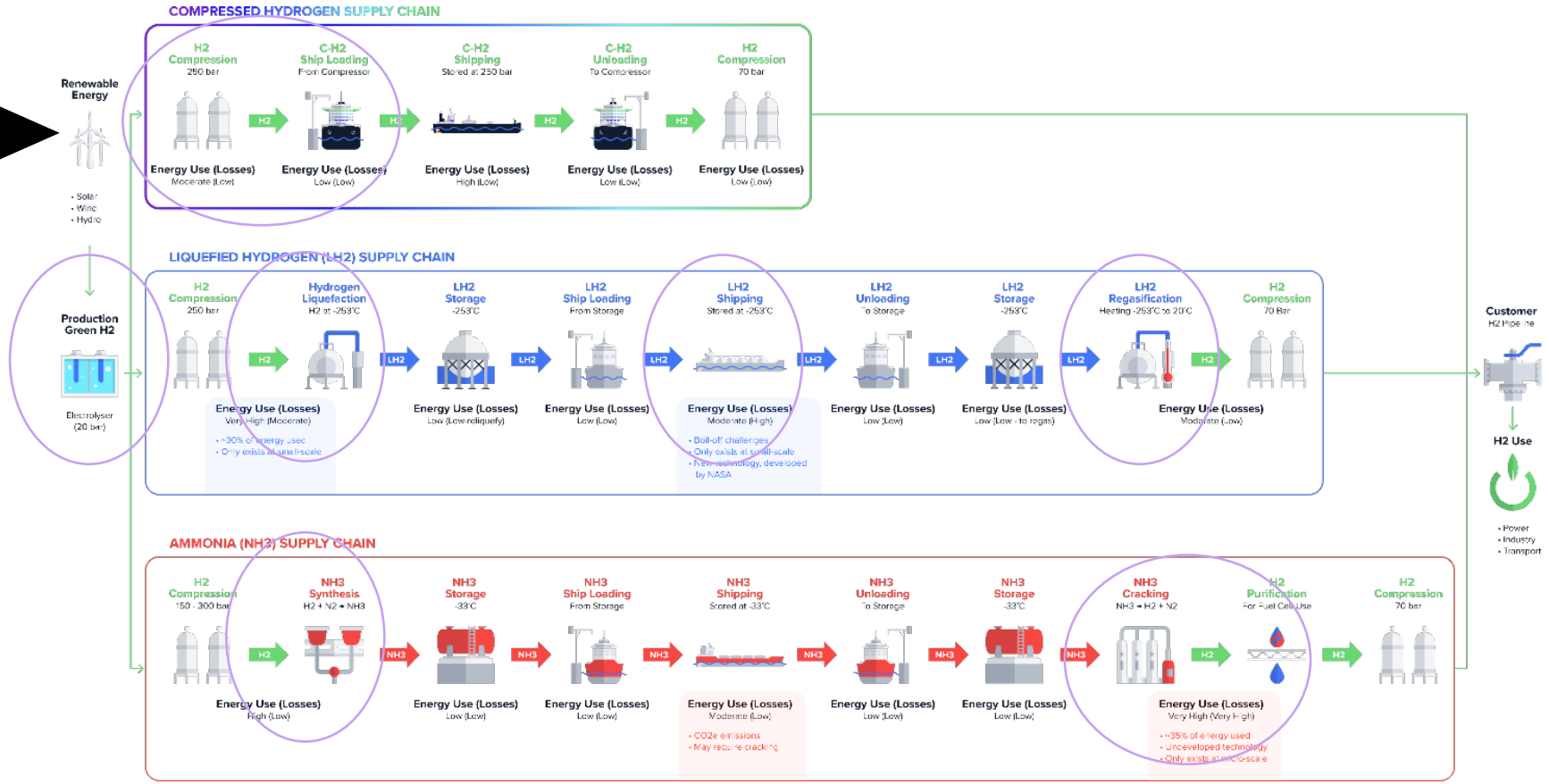


Efficiency and delivered levelised cost needs to be evaluated across the full supply chain

Compression can "100% load-follow" renewable generation, enabling efficient and cost-competitive delivery



Power Generation = H2 Production = Compression

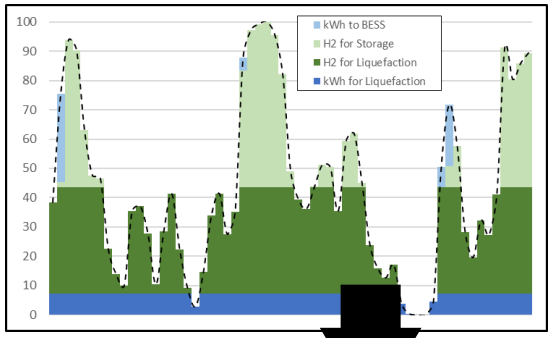


- Renewable generation profile does not match the baseload/stable process required for liquid or chemical conversion
- Location, renewable resource and chosen transport vector has an impact on the cost of hydrogen produced (ie. Batteries, Storage, Losses)
- Complexity, capital and energy required to convert and reconvert hydrogen in order transport

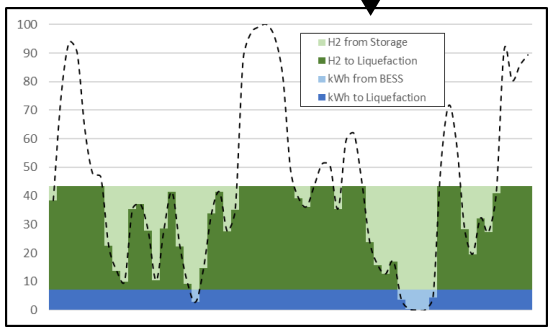
1. Provaris Compressed H2 Scoping Study, March 2021

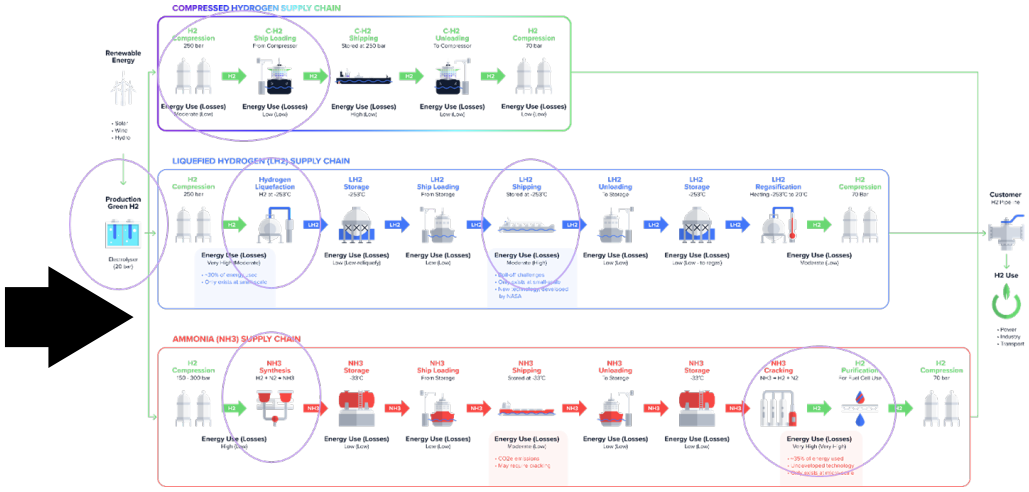
Efficiency and delivered levelised cost needs to be evaluated across the full supply chain

Alternative carriers require a "stable/flat" hydrogen production for efficient conversion and delivery profile – at what impact on the delivered LCOH?



Illustrative Renewable Profile





Provaris assumptions on factors that impact on LCOH of supply chain

	GCH2	LH2	NH3
Load Follow	0-100%	0%	40-100%
Hourly Change	100%	0%	5%
Conversion Efficiency	1 kWh/kg H2	11 kWh/kg H2 (15-20% energy use)	9 kWh/kg H2 (10-15% energy use)
Boil-off per day	0%	Up to 1%	0%
Reconversion Losses	>0.5% (Scavenging)	5% (Regasification)	30-40% (Cracking)

Source: Company research

> Solutions required for steady or flat profile requires capex for Batteries, H2 Storage, and/or 'fossil fuel' grid back-up

> Compression enables 100% load follow to match the renewable profile and minimize the cost impact of batteries and storage

Momentum is building…

- **REPowerEU establishes a 10Mpta import market** with Norway to benefit from 'additionality' rules being introduced
- Demonstrating the simplicity and efficiency of **compression can provide lowest-cost for H2 delivery** to EU
- Firming up a **pipeline of projects in Norway** and other regional supply locations to compete with fossil fuel
- **Global opportunity for compression** extends beyond Europe
- Nordic projects to create **significant value for shareholders** by being a first mover with a cost advantage
- **Illustration:** USD $1/kg margin on 45ktpa H2 per year translates into USD $45m pa (for a single project)

2023 Focus…

Q1: Confirm scope and location of first Norway project

Q2: Mature a portfolio of export projects from the Nordic region to confirm multi-project potential

Q3: Validation event targeted with an energy major

Q4: Target FID on first Norway project

H2Neo Prototype testing complete and shipyard contract finalised

Tiwi H2 project EIS Submission & RFP for EPC

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Appendices

Experienced Board & Management

Australian listed company (PV1.ASX) with offices in Sydney, Perth, Oslo and global experience across energy infrastructure, utilities, ship newbuilds and operations, and capital markets

Martin Carolan

Managing Director & CEO

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 - Europe

Capital Markets, Commercial, Energy Transition

OSLO

Mats Fagerberg

Business Development - Europe

Commercial, LNG, Infrastructure, Shipbroking

LISBON

Dave Stenning

GH2 Carrier Development

Class Approvals, Commercial

CALGARY

John Fitzpatrick

Naval Architect & Inventor

Ship Design, Class Approvals

CALGARY

Emma Connor

Chief Financial Officer

Accounting, Finance

PERTH

Corporate Overview

Capital Structure

Ordinary Shares on Issue (PV1.ASX)	548 Million
Market Capitalisation (at 6.5c)	**A$ 36 Million**
Cash (at 31 December 2022)	A$ 8.1 Million
Listed Options on Issue (PV1OA.ASX) [1]	96.7 Million
Performance Rights [2]	24.0 Million
Unlisted Options [3]	9.0 Million

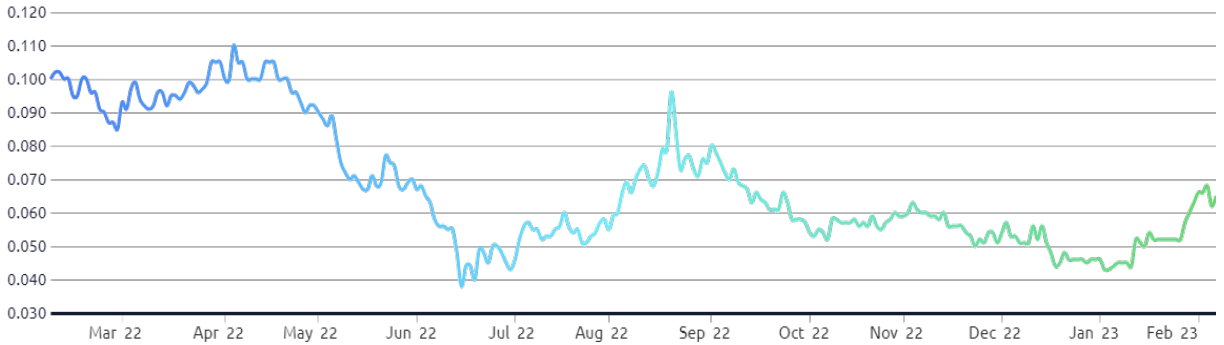
Shareholding (Undiluted)

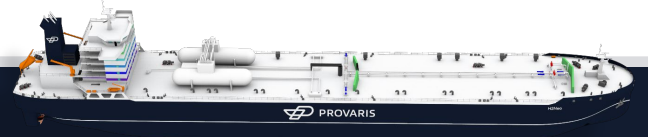
Institutional & HNW	18%
Management	5%
Total top 20	33%

1. Listed Options PV1OA, expiry 26 May 2023, exercise $0.12
2. Performance Rights issued to Management
3. Broker options exercisable at 18.75c, Expiry November 2024

Regional Locations

12mth Share Price Performance





The journey to establishing a regional marine supply chain for green hydrogen

2016-20

- Full Class Approvals for CNG carrier with commercialization limited to midstream service to majors.
- 2018/19: New bulk carrier concepts for unprocessed gas taken from offshore platforms.
- 2019: Energy price crash
- 2019/20: Impact of Energy Transition, Net Zero Roadmaps, Hydrogen Strategies
- **Design for new bulk-carrier established for hydrogen**

Technical Success…

2021

- **Launch of Hydrogen Strategy** with AIP from Class for 2 carriers: H2Max & H2Neo

2022

- **'Design Approval' from Class** for H2Neo based FEED level design and safety/hazard studies

2023

- *Prototype Testing for cargo tank*
- *Launch floating storage solution*
- *Shipyard selection*
- *Final Class Approval H2Neo*
- *Award ship contract*

2026/7

- *First operations*

Advancing commercial pipeline…

2021

- Completed Scoping Study and Launch Tiwi H2, 2.8 GW solar to H2 export project

2022

- Completed Tiwi H2 Concept Design Study
- MOU with Total Eren
- HyEnergy MOU: Compressed H2 export Feasibility Study
- Provaris Norway AS established for Oslo office to service EU

2023

- Tiwi H2 pre-FEED, EIS permitting, land agreements
- MOU with NH2 for export supply chains to EU (*first project March 23)*
- *EU port operator - import terminal*
- *Pipeline of compressed H2 value chain developments in Asia & EU*

2026/7

- *First production and export ….*

Hydrogen market set for remarkable growth through to 2050

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

+30 Countries
Established Hydrogen Strategies

USD '000s Billions
Public Funding Commitments

USD + 5 Trillion
Investment in H2 Supply Chains

150M Tonnes*
Seaborne Trade by 2050

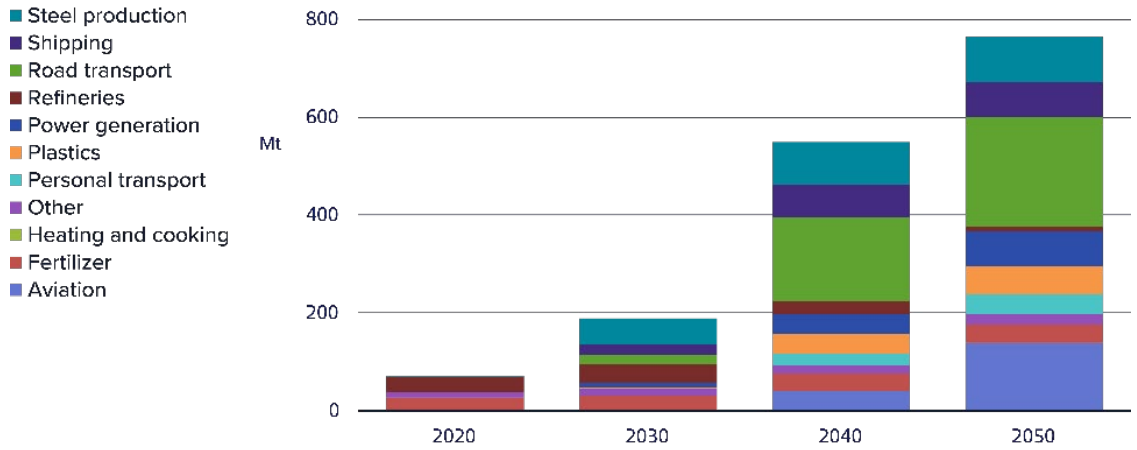
Safe and cost-efficient transport, storage and distribution of hydrogen remains critical to deliver global supply chains

PROVARIS ENERGY LTD.

www.provaris.energy

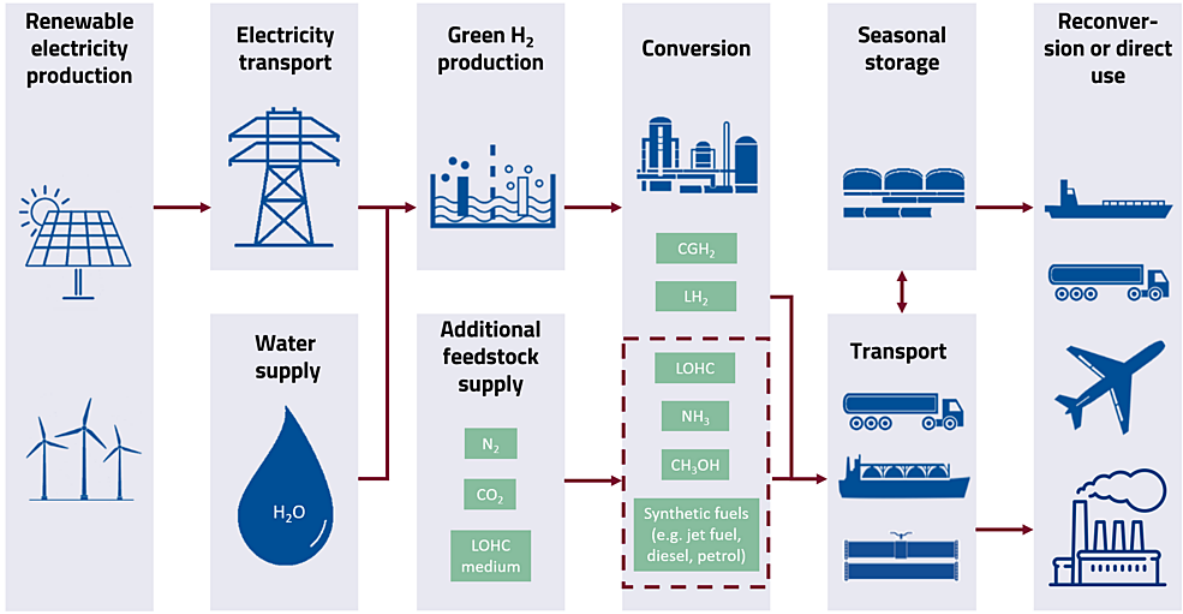
^ International Renewable Energy Agency (IRENA); Wood Mackenzie Company Research

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



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

Overview of Hydrogen Supply Chain



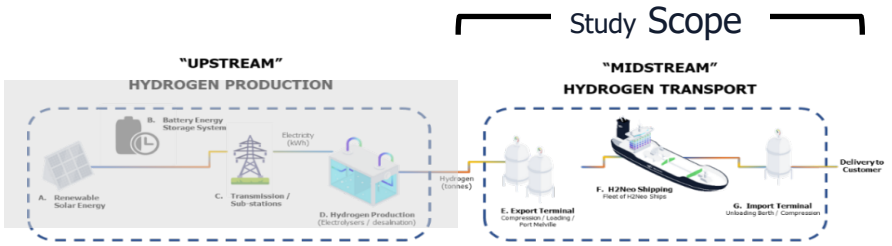
WA study for offshore export terminal demonstrated technical and commercial feasibility for 200ktpa

CASE STUDY: HyEnergy Project targeting 550,000 tpa of green hydrogen from Gascoyne Region for export, with a Pre-feasibility Study underway

Export Feasibility Study Completed January 2023:

- Demonstrated technical and commercial feasibility of using offshore loading solution for export to Asia-Pacific
- Focused on proposed 200,000 tpa from a Phase 1 development scenario (Compression, shore crossing, subsea pipeline, offshore loading) delivered to Singapore
- Compressed H2 solution is highly suitable given it supports scaled production, flexibility in loading, the project's proximity to markets
- Publication by the WA Government of Knowledge Share Report

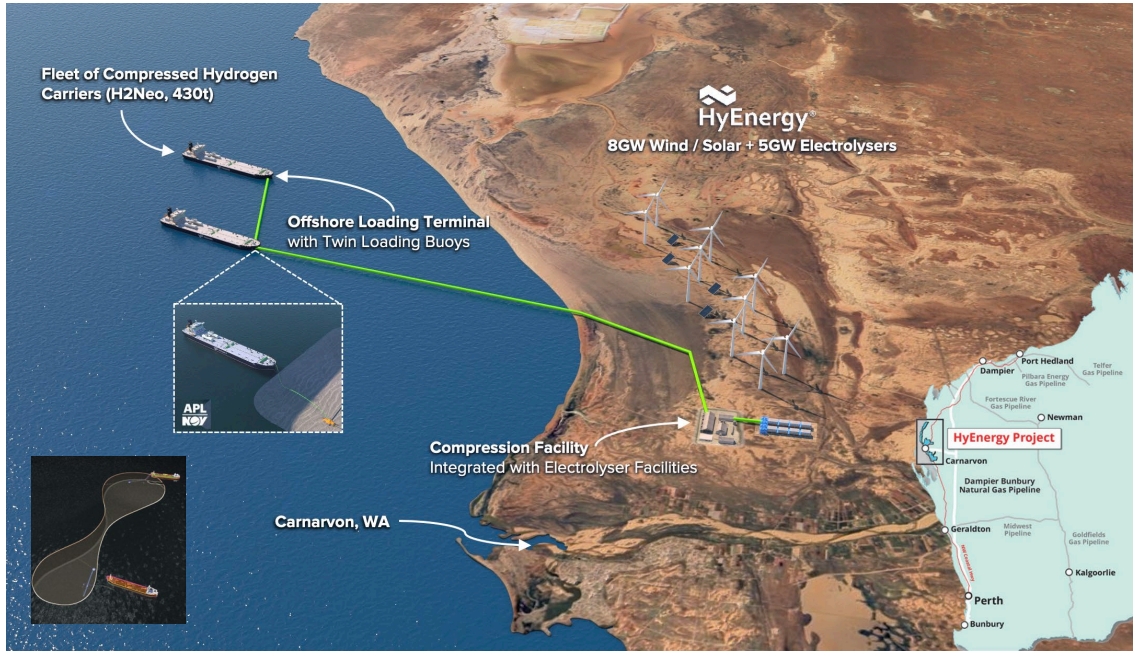
  https://www.wa.gov.au/government/publications/provaris-compressed-hydrogen-export-feasibility-study-public-knowledge-sharing-report



Next steps:

- HyEnergy to commence Pre-Feasibility Study for the full project value chain in 2023

Study confirmed flexible floating single anchor loading (SAL) solution can ensure continuous operations

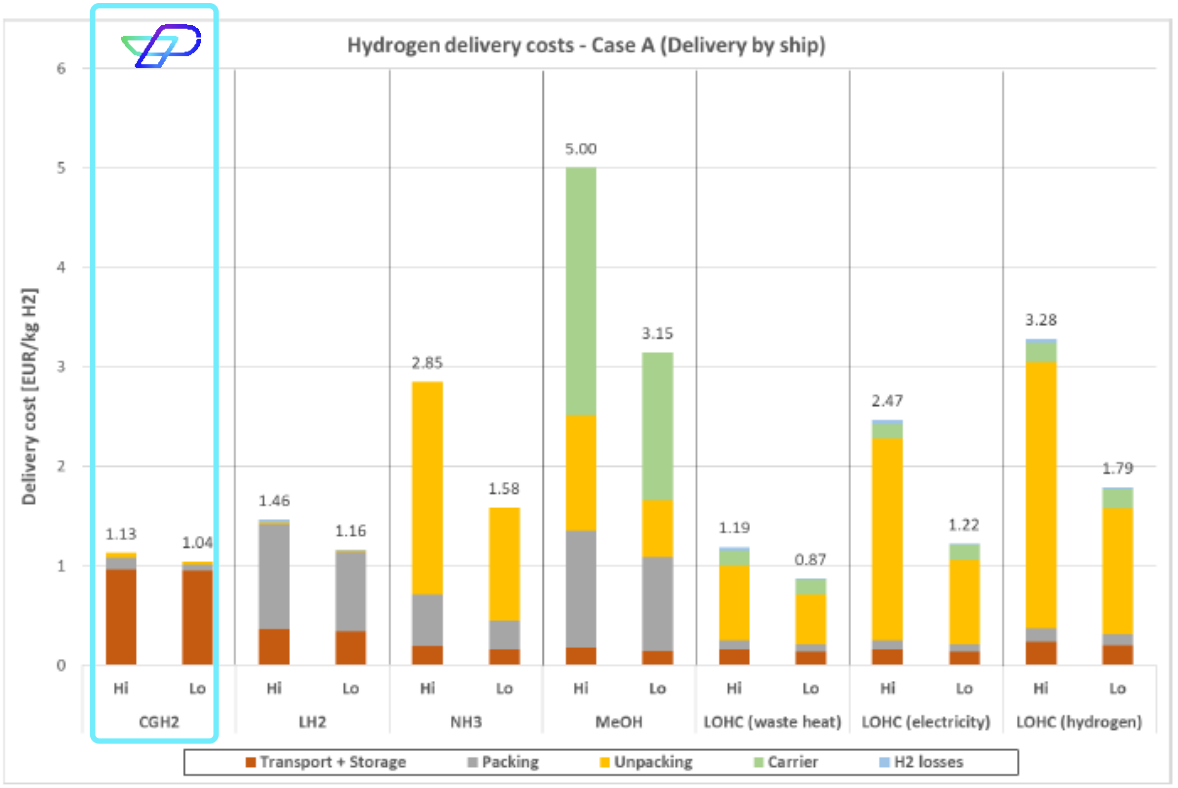


NOTE: All illustrations are conceptual with final locations of all facilities to be determined by the HyEnergy Project in future Feasibility Studies.

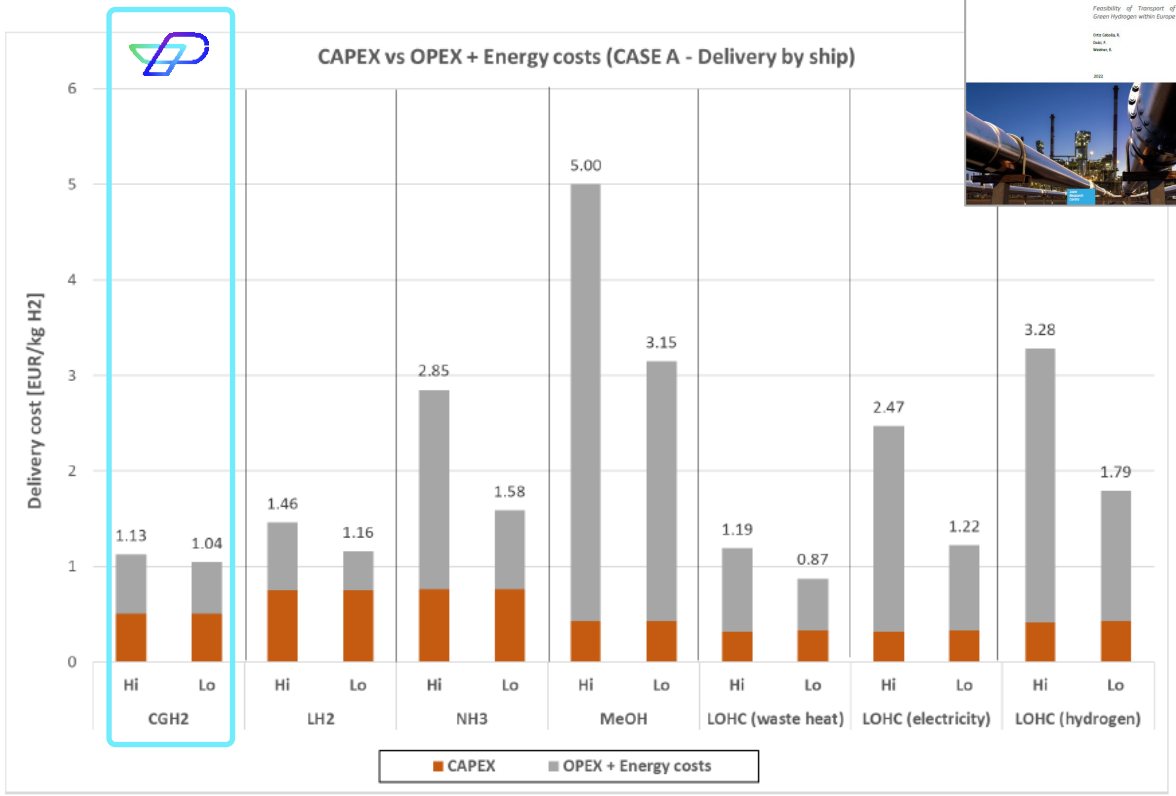
This study received funding from the Renewable Hydrogen Fund as part of the Western Australian Government's Renewable Hydrogen Strategy

Independent research supports the cost advantage and efficiency of Compressed H2 over regional distances

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**

https://joint-research-centre.ec.europa.eu