

Compressed Hydrogen

**Establishing low-cost
hydrogen supply
chains to Europe**

May 2024

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This presentation was authorised by the CEO for release on 21 May 2024



\$ refers to Australian Dollars unless otherwise indicated.

Provaris is developing innovative and unique IP using the simplicity and efficiency of compression to deliver hydrogen supply chains for Europe

- > **Company Overview:** Australian-listed company focusing on the production, storage and shipping of hydrogen, with a European office in Oslo, Norway.
- > **Collaborations:** Established collaborations with technical and commercial partners to implement innovative approach for the production, storage, and transportation of bulk-scale hydrogen in Europe.
- > **Strategic Importance:** Safe, efficient and low-cost hydrogen storage and transport are crucial for Europe to achieve its 2030 energy transition goals.
- > **Market Position:** Increasing attention from European utilities, highlighted by three Memorandums of Understanding (MOUs). Supporting our status as the lead importer of gaseous hydrogen in Europe before 2030.
- > **Pending Approvals:** Final approvals for storage and shipping IP, expected to lead to binding agreements and early revenue opportunities starting in 2024.

Compression: proven technology eliminating the capital and energy intensity to ship H2 and addresses the scarcity of gaseous H2 supply

Production of Hydrogen

Proprietary Storage & Shipping Solutions

Provaris' unique business model operates across the supply chain...



Compression the lowest cost carrier for regional hydrogen, ready to deliver at scale late



Safe

and proven method for storage and transport of hydrogen



Efficient

for regional production and delivery reducing capital and energy intensive processes



Flexible

to 'load follow' the variability and volatility in renewable energy generation



Simple

process enables low capex design, build and repeat



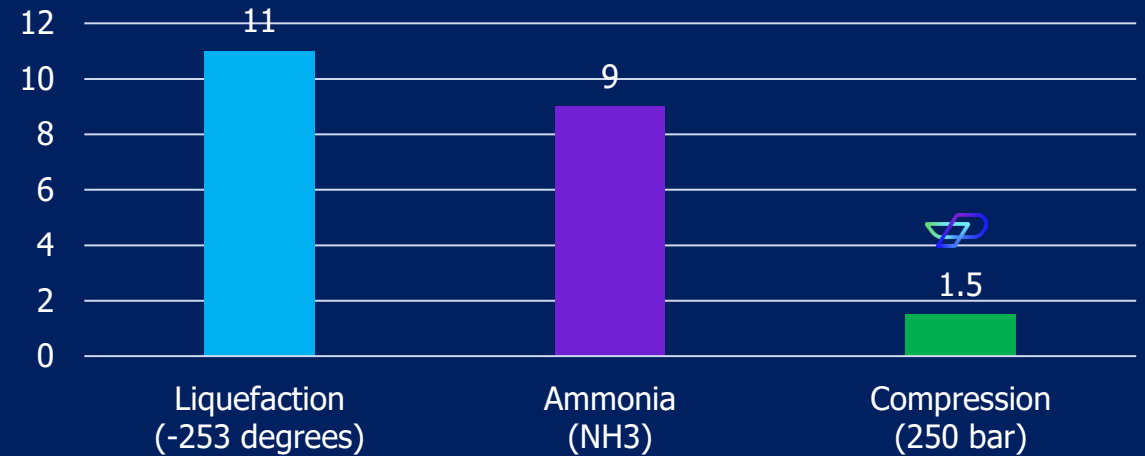
Delivers gaseous H2

required for decarbonisation of industries

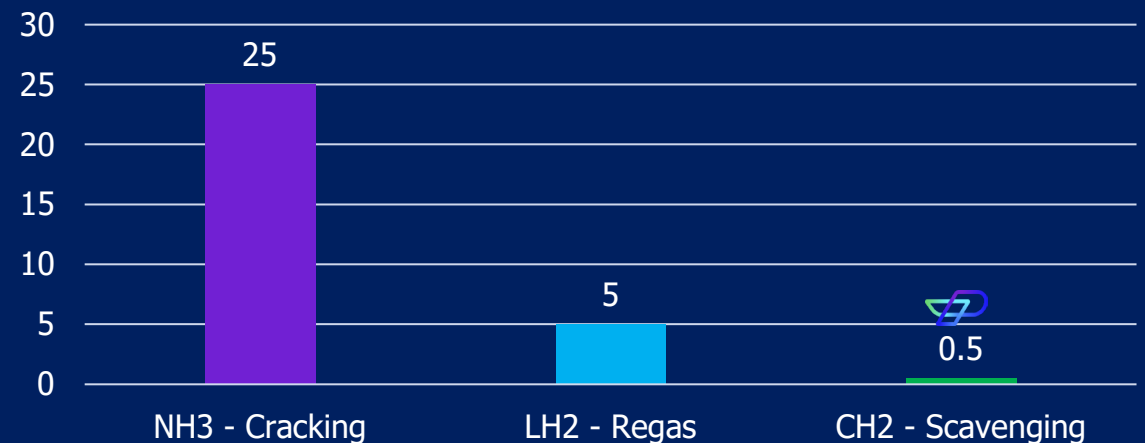
Simplicity and conversion efficiency of compression demonstrates a lower delivered cost of hydrogen

- > It's not all about the energy density!
- > Maintains gaseous H2 cargo; No cargo loss (boil-off); Ambient temperature
- > Priority industrial applications (refineries, steel, power, HDV) all need H2 gas
- > Eliminates refrigerated storage at loading and discharge ports
- > Combination of lower capex & 50% less energy use = lower delivered cost
- > **Simplicity, efficiency and cost advantage now recognised by European utilities**

Conversion of H2 into a carrier for export (KWh/Kg H2 – energy used)



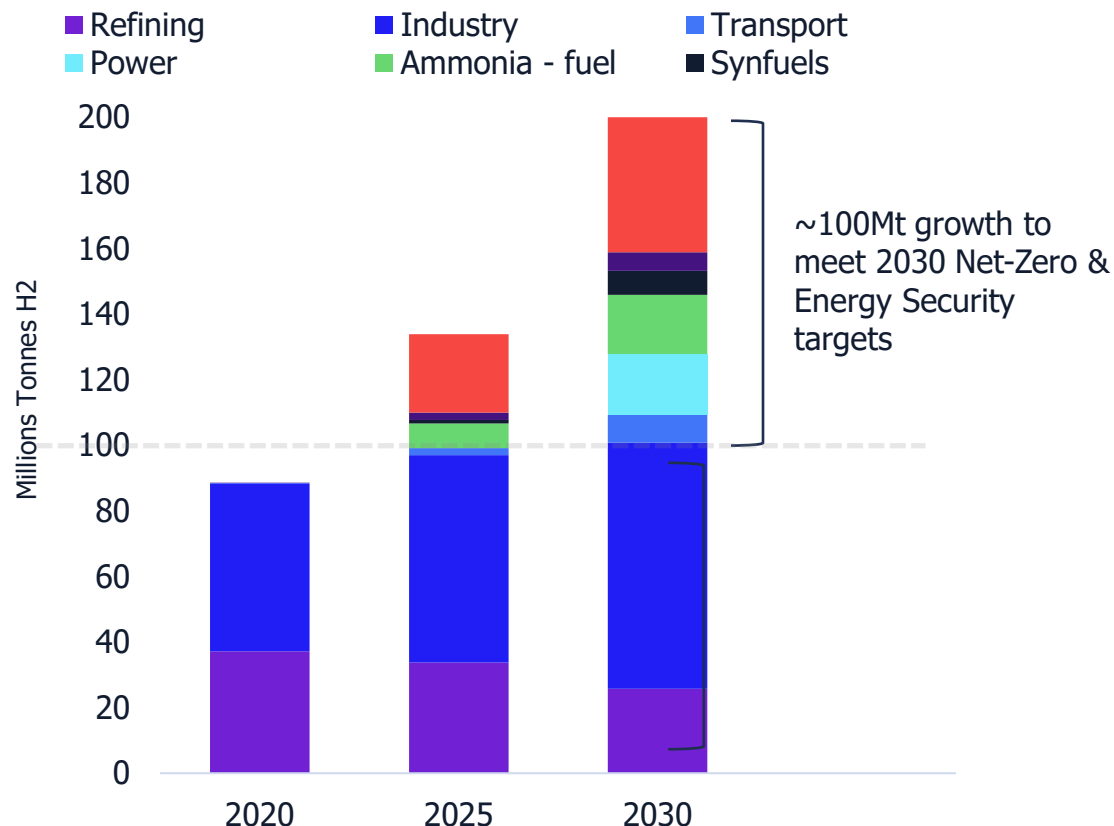
Reconversion to gaseous H2 ready pipeline gas (% energy lost)



Increasing number of countries committed to a net-zero policy positions hydrogen as essential pillar to reach the targets

Unprecedented support through policy and funding to scale infrastructure for production, storage and transport

Global hydrogen demand in the Net Zero Scenario, 2020-2030*



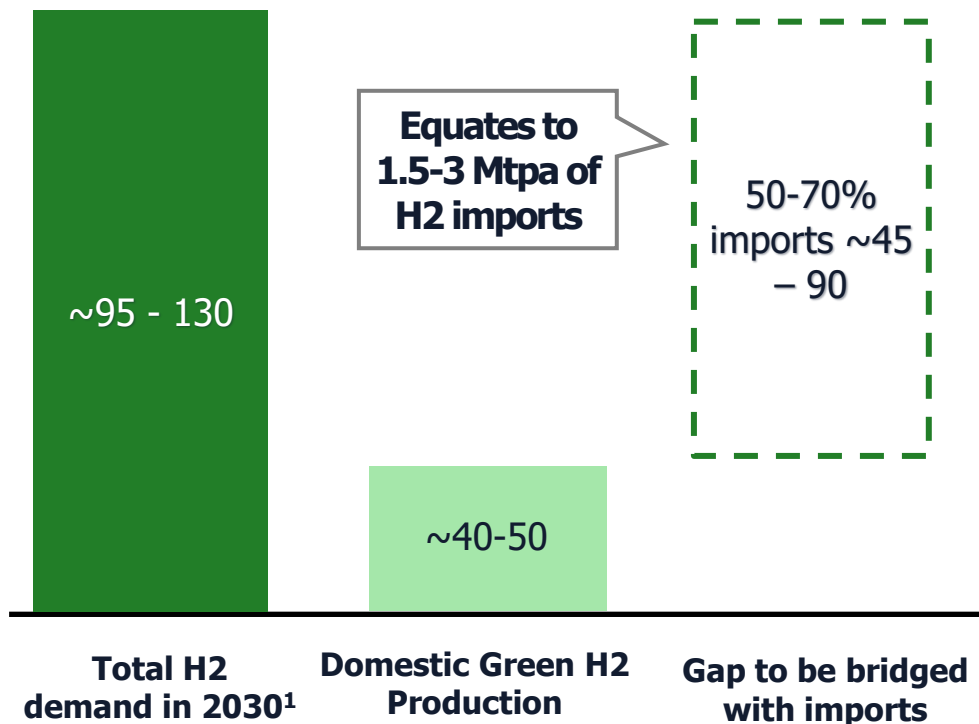
- > 98% of all hydrogen today is produced with fossil fuels and no carbon capture (CCS), creating 1-2kg CO2 emissions per kg
- > Development 'low-emission' (blue) hydrogen also requires scale up of CCS technology, storage and transport infrastructure
- > Hydrogen produced from electrolysis (green) seen as the holy grail; costs driven by scale/maturity of technology and renewable energy source
- > Conversion to another molecule for transport comes at a cost through additional energy, scale and capex
- > Regardless of color or emissions - there is a need to establish global efficient supply chains for hydrogen
- > **Global opportunity available for developers who can provide a low-cost supply of green hydrogen before 2030**

Germany's requirement for energy security with a transition to green fuels requires dependency on imported hydrogen

EU's largest power market (625TWh or 200GW) committed to phase out coal; banned uranium: and reliant on LNG

Germany's 2030 hydrogen ambition (in TWh)

"Meeting German demand solely through domestic supply would neither be technically nor economically viable". NHS 2023



Provaris focused on Europe for commercialisation

- > **EU Green deal committed €100 billion** to support industries (Innovation Fund; Horizon Europe; EU Hydrogen Bank; H2Global)



- > **Major power utilities announced investments +€100B** in energy transition projects by 2030, including hydrogen
- > **Development of import infrastructure includes ship transport** and pipelines via 'core-network'
- > **Germany tendering for 10 GW of 'H2-ready'** gas-fired generation capacity for 2030
- > **Provaris now recognized as being the lowest cost** of gaseous H2 regional supply to Germany
- > **Three MOUs signed with German Utilities** (including **Uniper Global Commodities**)

Europe has established policy framework with increasing funding to support large-scale deployment of hydrogen to meet 2030 targets

2024 continues to see the introduction of both EU and country specific incentive schemes for both supply and offtake

- > 2019: EU Green Deal launched – package of policy objectives to reach net-zero by 2050.
- > 2021: EU turned climate goals into legislation with “Fit for 55” with member states committed to cutting net greenhouse gas emissions in the EU by at least 55% by 2030, compared to 1990 levels. **Estimated investment of €70 billion up to 2050**, funded through ETS schemes (C-BAM).
- > 2023-4: Increasing funding schemes announced for hydrogen activities across technology innovation, production of renewable and low-carbon hydrogen and distribution, and implementation in downstream industries.

EU Funding initiatives continue to flow in 2024...

NEWS ARTICLE | 15 December 2023 | Directorate-General for Climate Action | 2 min read

Innovation Fund: 37 large-scale clean tech projects sign grant agreements worth €3.45 billion supporting the EU’s clean energy transition

Fifteen hydrogen projects to receive €1.25bn of EU innovation funding after signing grant agreements

Recipients include Fortescue, H2 Green Steel, Bosch, Iberdrola, Repsol and Topsoe

EU to fast-track 65 hydrogen projects after signing energy infrastructure list into law

The sixth PCI/PMI list includes 65 H2 developments, including electrolyzers, pipelines and import terminals – although at least one has already been scrapped

NEWS ARTICLE | 7 May 2024 | European Climate, Infrastructure and Environment Executive Agency | 2 min read

Horizon Europe: €163.5 million available to fund green, smart and resilient transport and mobility research projects

The European Commission has launched two new calls for projects under [Horizon Europe's Work Programme for 2023-2024 Cluster 5](#) – which groups together topics on Climate Action, Energy and Mobility.

Massive boost for green hydrogen exporters as Germany allocates €3.5bn to H2Global auction subsidies

Total public funding for H2 import subsidy programme now approaches the €5bn capitalisation promised by Berlin

PRESS RELEASE | 30 April 2024 | Brussels | 3 min read

European Hydrogen Bank auction provides €720 million for renewable hydrogen production in Europe

EXCLUSIVE | Second EU hydrogen auction worth €2.2bn set to be delayed to autumn 2024

Emergence of industrial scale offtake...

Decarbonizing Refining: TotalEnergies Launches a Call for Tenders for the Supply of 500,000 tons per year of Green Hydrogen

Germany's SHS launches green hydrogen tender for Saarland steel plants

thyssenkrupp issues tender for 143,000 tonnes of hydrogen to decarbonise steel production

Düsseldorf, 23 April 2024

Salzgitter AG and Uniper SE sign pre-contract for the supply and purchase of green hydrogen

Germany outlines \$17 bln plan to subsidise gas-to-hydrogen shift

By Riham Alkousaa

February 5, 2024 4:19 PM GMT+1 · Upd.

NEWS

CIP, Uniper Ink Deal for Export of Hydrogen from Denmark to Germany

by Paul Anderson | Rigzone Staff | Wednesday, May 08, 2024 | 2:30 AM EST

Establishing a platform of technical innovation and commercial activities across hydrogen production, shipping and storage

Integrated development model provides multiple pathways to commercialise our IP and diversity of revenue

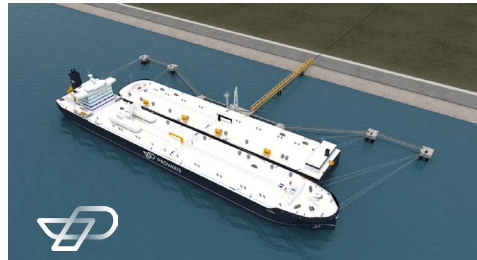


Leveraging unique IP and approach across the supply chain...

- Collaboration for H2 Supply projects in Norway
- Infrastructure funds seeking FID ready supply projects



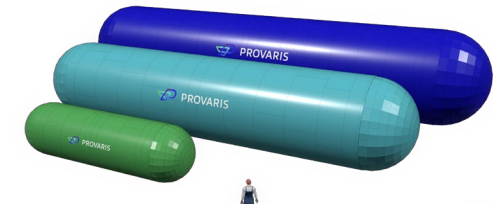
- Advanced design & approvals for hydrogen carriers
- Shipowners to fund and operate fleet under LT charter



- 3 MOUs for H2 supply with German utilities
- Collaboration for Rotterdam import terminal



JV for production of tanks in Norway for distribution to Europe, providing **early revenue opportunity in 2024**



Target first revenue 2024...

1 Equity share in hydrogen production assets

2 License fees for ship design

3 Share of cash flow from long-term charter agreements

4 Long-term supply agreements underwrite investment in the supply chain assets

5 JV partnership for hydrogen tank production and sales

Making substantial progress on H2 supply chains for Europe across supply, shipping, ports and offtake

Provaris' focus in Europe being validated through Collaborations and MOUs for commercialisation

SUPPLY



- > Joint development with Norwegian Hydrogen for H2 supply from Nordic sites (FjordH2 PFS demonstrated competitive delivered cost; benefits of grid connected sites)
- > Additional sites under review for supply using Provaris carriers – Norway, Iberia, UK

SHIPPING



- > Final Class Approval (DNV) pending successful prototype testing in Norway
- > Clarksons acting as Advisor (shipyards, owners, financing)

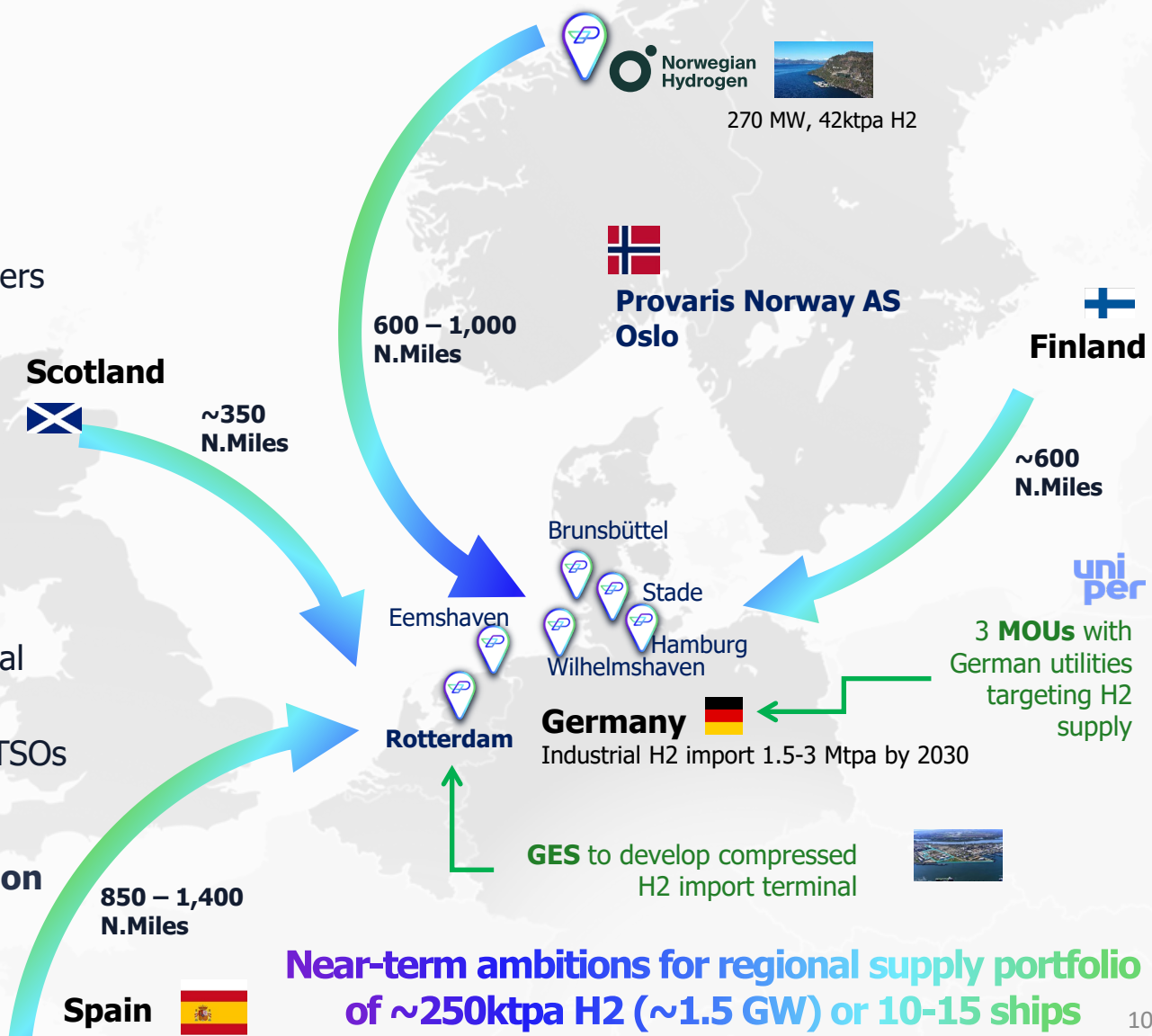
IMPORT & DISTRIBUTION



- > Collaboration with GES for Port of Rotterdam import terminal provides market access to Europe
- > Due diligence with Dutche and German pipeline ports and TSOs

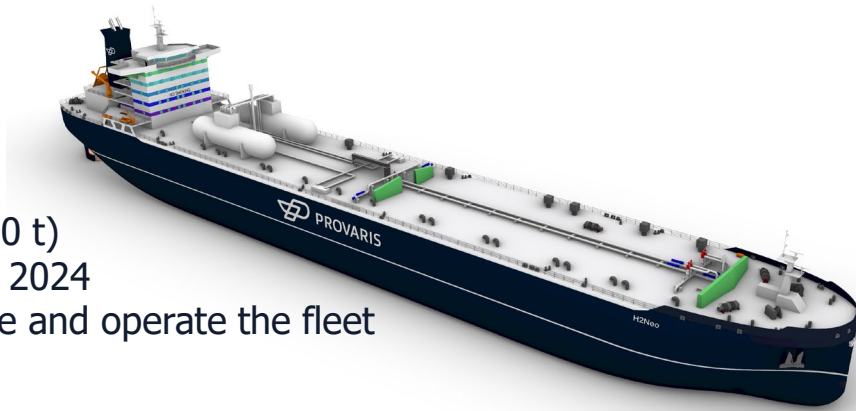
OFFTAKE

- > 3 MOUs signed with German utilities (collective ~€60 billion budget spend on Energy Transition by 2030)
- > Includes **Uniper Global Commodities**

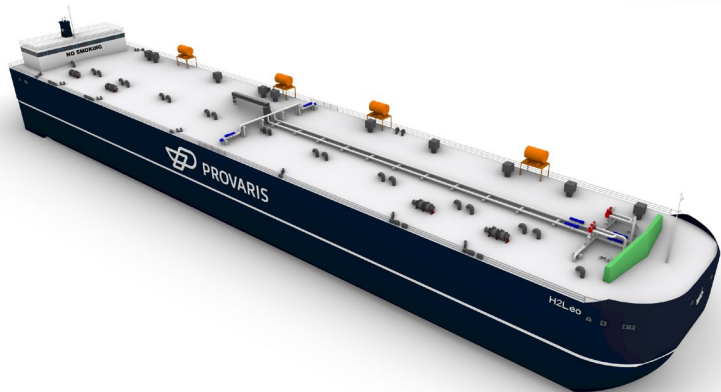


Proprietary ship design and IP for world first bulk-scale gaseous hydrogen carrier

H2Neo
Hydrogen Carrier (450 t)
Final Class Approvals 2024
Shipowners to finance and operate the fleet



H2Leo
Hydrogen Storage
(300-600 t H₂)



Supported by:



Application of existing technology provides flexible and low capex jetty solutions



Extension of tank IP for industrial storage applications creates a 2024 revenue opportunity



Industrial Buffer Storage



Refueling Stations



Maritime Fuel/Bunkering



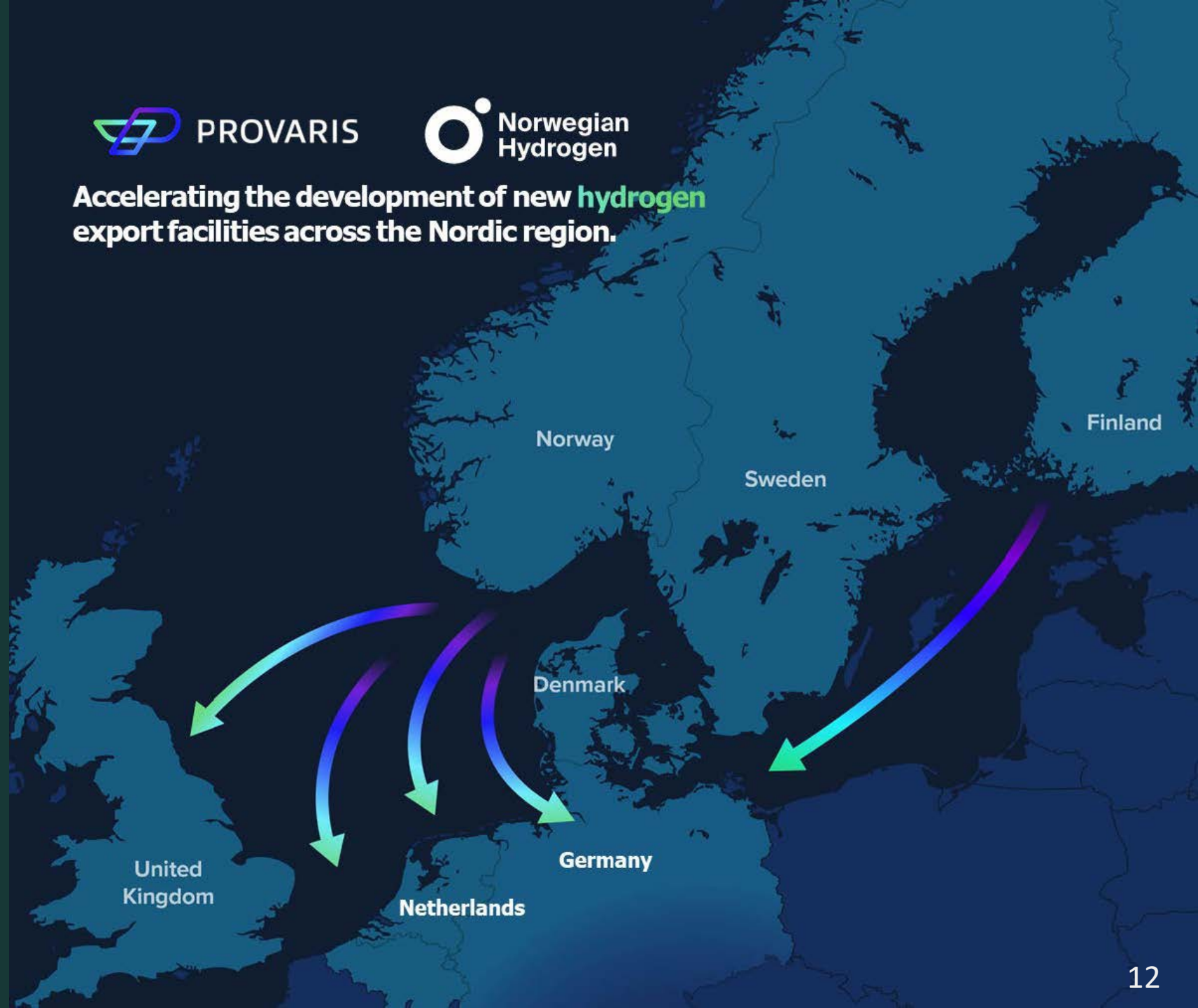
Gaseous H₂ storage
1 – 10 tonne capacity
250 barg

Collaboration for large-scale export of green hydrogen from the Nordics to the EU

Track of developing hydrogen facilities across the Nordics (incl. Norway and Denmark)

Collaboration projects include equity in supply projects

Accelerating the development of new **hydrogen** export facilities across the Nordic region.





GES GLOBAL
ENERGY
STORAGE

Collaborating with Global Energy Storage for a compressed hydrogen import facility at Port of Rotterdam

- > Largest energy terminal in the world
- > Site adjacent to HyNetwork H2 pipeline under construction along with road, rail and barge for distribution within port
- > GES own and operate the terminal
- > Feasibility study and co-marketing 2024
- > **Provides access to European markets by 2028**
- > GES operator of 3 terminals, backed by private equity energy infrastructure funds



World first bulk-scale hydrogen carrier pending final approvals mid-2024

Unique Proprietary tank design 'unlocks' significant market opportunity for low-cost storage and bulk-scale shipping

2021

AiP received
(Approval in Principle)



H2Neo carrier

Conventional MR tanker

Cargo capacity: 27,000m³ (450t)

Project export capacity scale ¹: 200,000 tpa (<2,000 Nm)

Hybrid propulsion system including Battery & H2 Fuel Cell

Extensive FEED and safety studies completed

2022

FEED Design Approval
(Construction ready subject to Prototype Test)

2024

Final Class Approvals Target - Mid 2024

- Prototype Tank Testing
- LOI Shipbuild Contract
- First orders for industrial tanks

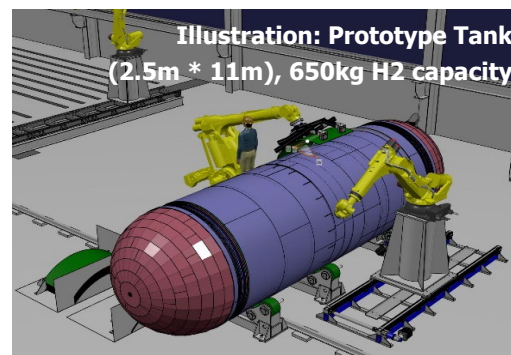


Illustration: Prototype Tank (2.5m * 11m), 650kg H2 capacity

2025

- Scale-up production of tanks
- FID H2 Project
- Charter contract +10yrs
- Shipbuild contract

2027/28

- Hydrogen export projects based on Provaris hydrogen carriers
- Shipping operations aligned to H2 Export project
- Revenue share of production and shipping contracts

Note 1 Assumptions:

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

Marine Classification



Technical Partner



Large addressable market for industrial hydrogen storage solutions seeking alternatives to high-cost composite solutions

Demonstrated approvals and efficient production cell facility in Norway to accelerate revenue business in 2024

Large addressable market focused compression

- > Buffer storage for intermittency or maintenance creates flexibility and lowers the cost of hydrogen
- > Long-term storage is focused on caverns which takes time and capital
- > Existing market applications focus on small-scale (sub-1-tonne) high-cost composite tanks, short duration, localized storage or conversion to hydrogen alternatives.



1-tonne capacity tank vs 40t container solution

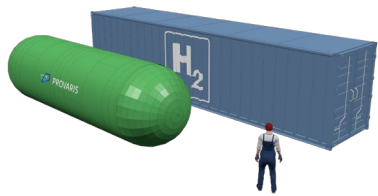
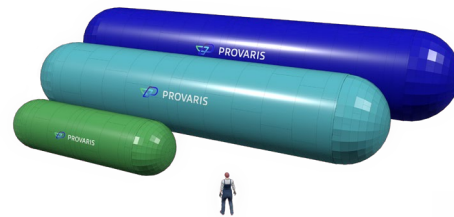


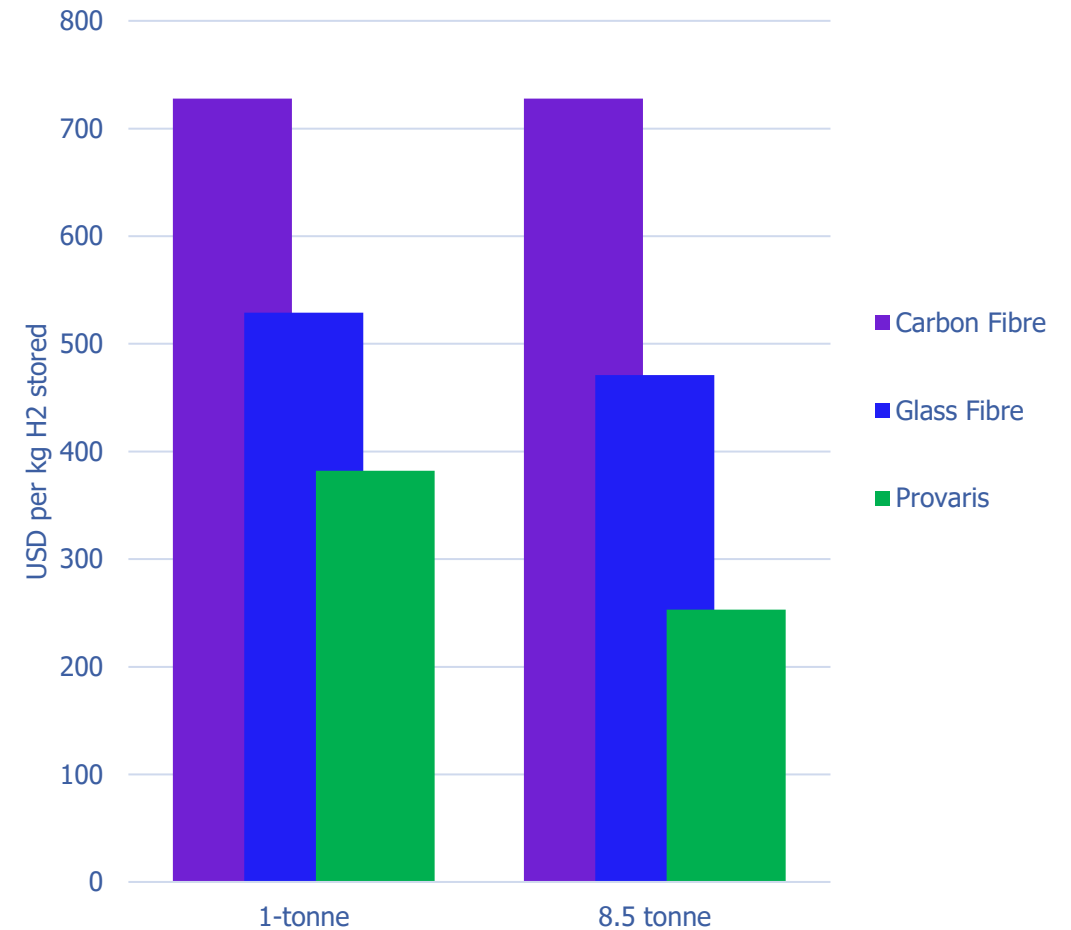
Illustration 1,5,10 tonne tanks



Example of Europe refueling market opportunity:

- > AFIR legislation passed by the EU in Sept. 2023
- > Stipulates **minimum 1-tonne H2 storage capacity for 657 HRS sites** to be deployed across 27 member states by 2027.
- > Deployment must start in 2025.

Maximise the volume of hydrogen stored at lowest capital cost ¹



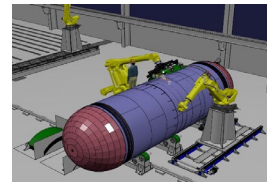
¹ Longspur Research, 2024

Advanced development program positions Provaris as a 2024 investment story

Multiple catalysts providing long-term value creation from H2 supply projects and early-stage revenue from industrial tanks production and sales

Key milestones for 2024...

Mid-2024: Prototype Tank testing & Final Class Approvals for H2Neo carriers



2H-2024: First orders for small scale tanks for delivery and revenue late 2024



2H-2024: Target for binding agreement with German Utilities for H2 supply and shipping



2024: Additional hydrogen supply projects moving through feasibility with Provaris H2Neo carriers



Creating shareholder value...



Shipyard contract, owners and financing terms



Early revenue from tank sales 2024

- Production facility established
- First orders and revenue 2024



First Export Project FID in 2025, export 2027



Equity share in H2 supply projects using Provaris carriers

Investment Highlights



- 1 Leveraged to European policy actions mandating the use of hydrogen** supported by funding incentives for technology, producers, importers and industrial users
- 2 Unique IP and innovation using compression** creates first mover advantage and most economical regional hydrogen supply before 2030
- 3 Pending shipping approvals** paving the way for binding hydrogen supply chain agreements and the launch of industrial storage tanks for early revenue opportunity in 2024
- 4 Increasing attention from major German utilities seeking gaseous hydrogen** supply alternatives, evidenced with 3 MOUs (Uniper) and import terminal (GES) collaboration for Rotterdam
- 5 Advancing hydrogen supply projects in collaboration with local partners**, utilizing Provaris storage and transport solutions
- 6 Multiple discussions underway for funding alternatives** in the development and infrastructure asset development



Corporate Overview

Capital Structure

Ordinary Shares on Issue (PV1.ASX; WS90.BE)	597 M
Market Capitalisation (at 4.5c)	A\$ 27 M
Cash (31 March 2024)	A\$ 1.7 M
Convertible Bonds (Macquarie Bank) ¹	A\$500,000
Performance Rights ²	24.0 M
Unlisted Options ³	41.7 M

1. A\$3 million Two-year standby facility with Macquarie Bank, announced 3 May 2024.

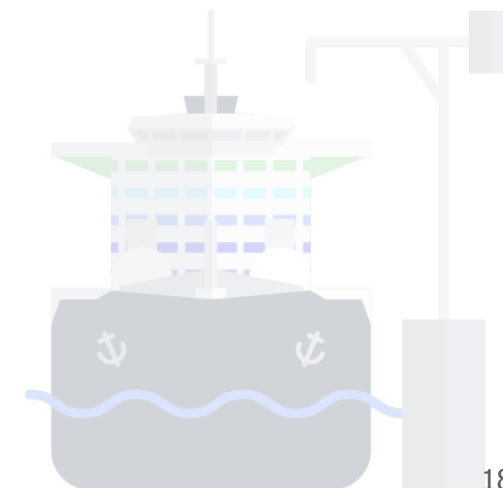
2. Performance Rights issued to Management Expiry 2025.

3. 9M at 18.75c, Expiry November 2024; 23.75 at 7.5c, Expiry March 2026; 4M at 6.6c, Expiry May 2027

Shareholding (Undiluted)

OC Funds Management	4.9%
HNW/Family Office	15.0%
Board & Management	7.0%
Total top 20	38%

12mth Share Price Performance



Board & Management

Global experience in energy infrastructure, utilities, ship newbuilds, operations, and capital markets



Martin Carolan
Managing Director
& CEO

Commercial
& Capital Markets

SYDNEY



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



Per Roed
Chief Technical Officer

Newbuilds, Tankers, LNG, Ports,
Operations

OSLO



Mats Fagerberg
Business Development -
Europe

Commercial, LNG, Infrastructure,
Shipbroking

LISBON



Garry Triglavcanin
Product Development
Director

Engineer, LNG, Project Development

PERTH



Norman Marshall
Group Commercial Manager

Legal, Commercial,
Project Finance

PERTH



John Stevenson
Group Financial Controller

Accounting,
Finance

SYDNEY



Jessica Roed
Operations Manager,
Norway

Shipping, Logistics

OSLO



Contacts



Martin Carolan
Managing Director & CEO
mcarolan@provaris.energy



Norm Marshall
Company Secretary
nmarshall@provaris.energy

Media & PR Enquiries

Melanie Singh
NWR Communications
+61 439 748 819
melanie@nwrcommunications.com.au

www.provaris.energy



ASX.PV1



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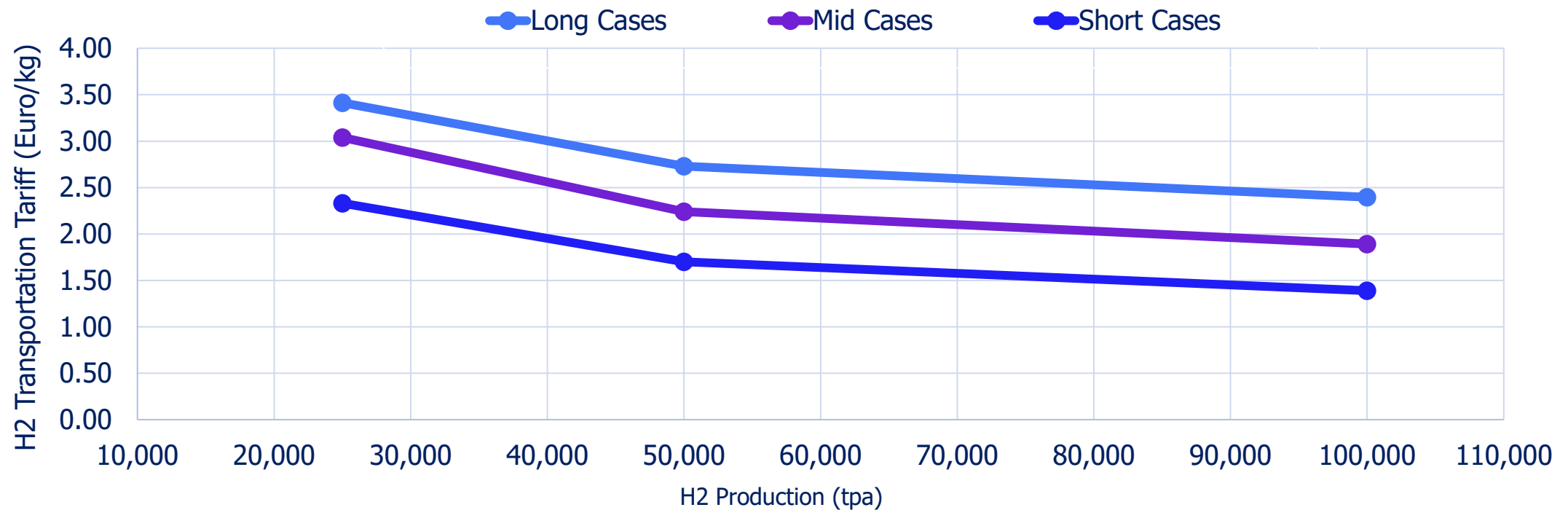
Sydney, Perth, Oslo



info@provaris.energy

Cost of delivered hydrogen is driven by production volume and distance as opposed to a fixed transport cost

Illustrative Compressed H2 Marine Transportation Tariff (Compression, Loading, Shipping, Scavenging)





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