PROVARIS
(PV1 AU)

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8 August 2023

Current Price (A$)	**0.07**
Shares in issue (m)	549
Mkt Cap (A$m)	37
Net debt (A$m)	-5
EV (A$m)	33
BVPS (c)	32.2

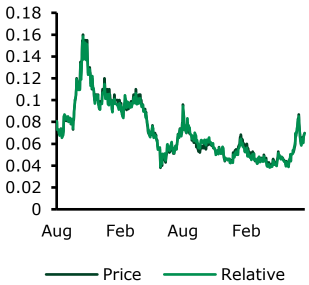
Share price performance	
1m	25.9%
3m	47.8%
12m	3.0%
12 m high/low	0.1/0
Ave daily vol (30D)	1,200,015

Shareholders	
National Nominees	24.6%
HSBC Custody Noms	7.3%
Citicorp Noms	5.9%
Bnp Paribas Noms	5.8%
Spo Equities Pty	5.2%
Marjack Holdings	4.3%
Sasigas Nominees	3.1%
Bnp Paribas Noms	2.8%
Bnp Paribas Noms	2.0%
Prospect Custodian	2.0%
Total for top 10	63.0%
Free float	71.8%

Next news Results Q3

Business description

Hydrogen shipping and project developer



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UNLOCKING NEAR-TERM HYDROGEN

Provaris offers a cost-effective solution to hydrogen delivery that beats competing technologies at ranges where considerable opportunity exists. It also allows Provaris to develop hydrogen projects where it can take advantage of cheap renewable energy and deliver more hydrogen per unit of electricity generated. It offers investors exposure to an integrated hydrogen project developer and exporter as near-term downstream demand starts to pick up. We initiate coverage with a central case valuation of A$0.15 based on the initial project pipeline only. Further project demand could take this to A$0.28.

The cheapest solution for regional hydrogen delivery

Provaris has designed a hydrogen delivery solution which uses established compression technology rather than liquefication or conversion to a derivative fuel. While the solution needs more vessels than alternatives, when the alternative solutions properly factor in processing and reprocessing costs the outcome shows a clear advantage for compression in ranges up to 2,000 nautical miles (nm) and potentially up to 3,000 nm. And because the overall process is more efficient it reduces the total amount of renewable energy capacity required for every tonne delivered. This allows Provaris to develop efficient projects linking near-term demand centres with sites of low-cost renewable energy.

Developing strong projects

Provaris has forged key partnerships and is developing a number of projects targeting end uses in key markets. The early focus is primarily on regional demand in Europe with supply from projects in Norway. The Asian demand centres of Singapore, Japan and South Korea present a secondary target region for supply from the company's project in Australia. Projects are located where compression has a competitive advantage, based on a reliable low-cost renewable electricity to deliver the lowest cost of gaseous hydrogen. Provaris gives exposure to early mover production where green hydrogen economics can already be commercial.

Central case valuation of A$0.15 per share

Our central case valuation has been derived using a DCF valuation for two Norwegian projects based on FjordH2, which we consider to be closest to reaching FID. We have a central case valuation of A$015. Our high case model adds the first planned Asian project and gives a valuation of A$0.28. Our low case valuation uses a delayed Norway project.

A$,000 Dec	2022a	2023e	2024e	2025e	2026e	2027e
Sales	367	0	0	0	0	107,268
EBITDA	-13	-9	0	0	-1	0
PBT	-6,758	-4,437	-4,548	-4,662	-28,621	-19,489
EPS	-13.2	-8.7	0.0	-0.4	-0.7	-0.3
CFPS	0.0	0.0	0.0	0.0	0.0	0.0
DPS	0.0	0.0	0.0	0.0	0.0	0.0
Net Debt (Cash)	-11,617	-4,699	-10,170	178,534	524,298	974,663
Debt/EBITDA	881	543	3,727,796	-4,664,67	-7,514,10	-3,611637
P/E	0.0	0.0	-24.9	-0.2	-0.1	-0.3
EV/EBITDA	n/a	n/a	n/a	n/a	n/a	n/a
EV/sales	- n/a	n/a	n/a	n/a	n/a	-0.1
FCF yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Div yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

INVESTMENT SUMMARY

Provaris has created an efficient solution for hydrogen delivery at a regional level beating rival solutions. It is using this to create competitive advantage, developing hydrogen production where renewable electricity is cheap but also allowing it to access early strong sources of demand. It is developing hydrogen export projects based on cheap renewable energy and delivering competitively priced hydrogen to locations where demand exists today. It has the potential to become a key provider of near-term solutions to the growing hydrogen industry, and provides investors with exposure to early stage production projects where it is developing integrated supply and export projects with partners.

Cheapest hydrogen regional shipping solution

Using a compressed hydrogen solution means more ships are needed than liquefaction solutions or processing the hydrogen into fuels such as methanol or ammonia, but the costs of that processing, including liquefaction, ammonia or methanol synthesis and reconversion, outweigh the additional shipping costs. With Provaris' proprietary vessel design offering a low cost solution, the overall cost of delivering hydrogen becomes competitive. The cost position has been confirmed by the EU Joint Research Council.

Less energy too

Part of the gain from the Provaris compression approach is that less energy overall is used to deliver useable hydrogen to where it is needed. This means the green hydrogen solution requires less renewable energy than other solutions which in turn means more is available for other decarbonisation solutions. It allows Provaris to develop the most efficient green hydrogen production and link it to near-term demand sources.

Immediate opportunity in Norway

Provaris is working to develop projects producing green hydrogen in Norway and shipping it to the EU where real demand for hydrogen is growing. The market in Europe is growing following the adoption of the Additionality Delegated Act which makes green hydrogen eligible for support as a renewable fuel.

Growth potential in Australia

The company is also working on projects in Australia where renewable energy is available at scale with hydrogen export potential to Singapore, Japan and South Korea. Singapore is the world's largest bunkering port and could be a major source of demand for green hydrogen.

Vessel design creates a barrier to entry

By using a standard medium to long range tanker design, Provaris has kept vessel costs low while providing an efficient means to transport hydrogen in its proprietary compressed cargo containment system. A Front End Engineering Design (FEED) level approval has already been secured from ABS and is sufficient for shipyards to submit firm quotes. Additionally, the company has developed a compressed floating storage (barge) solution using the same design principles which results in a lower cost and locationally flexible hydrogen storage solution. The storage solution has a broader market application beyond shipping, as it applies across all hydrogen carriers (where large-scale storage is required) as well as for future bunkering applications.

BULL POINTS

- Cheapest solution for storing and shipping hydrogen on a regional basis
- Key projects in markets with demand today
- Proprietary vessel design

BEAR POINTS

- Capital intense projects will require partnerships
- Project complexity relative to standard renewable energy projects
- Small company with limited liquidity

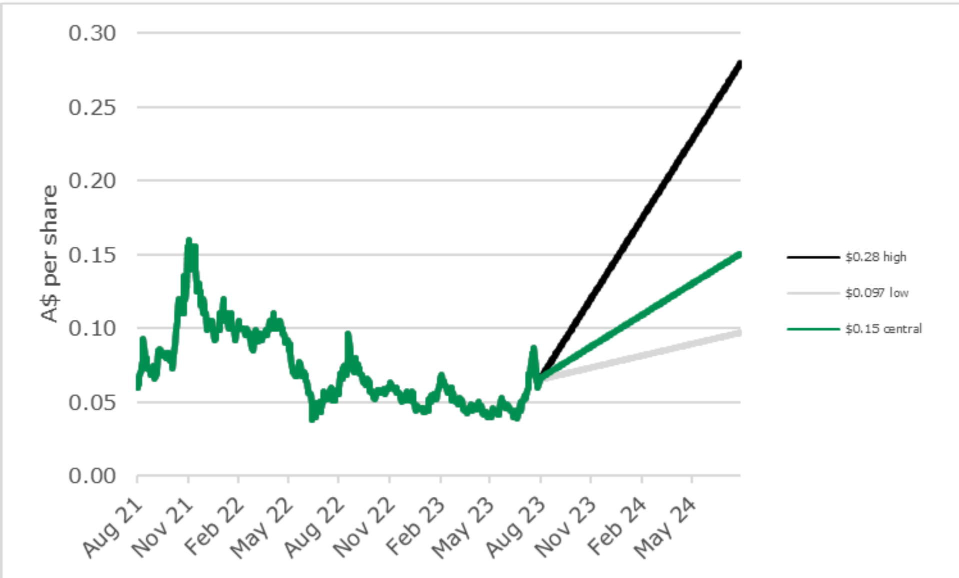
CATALYSTS

- Project milestones
- Vessel class approvals
- Partnerships and new projects

VALUATION

We have valued the company using a DCF approach with a discount rate of 10% using the median beta of comparator companies. Based on the development of the Norwegian FjordH2 project and a second similar project we get a central case valuation of A$0.15 per share. For our low case valuation, we have delayed the development of FjordH2 and assumed the second does not come online, giving a low case valuation of A$0.97. Development of a second, larger project in Europe using the same input assumptions as the FjordH2 project could give valuation as high as A$0.28.

Share price performance and valuation outlook



Source: Longspur Research, Bloomberg

RISKS

We see the main risks to our valuation as failure to reach project financial close, project delays, failure to obtain Final Class Approval for the H2Neo vessel and the broader hydrogen demand and timing. Mitigation includes strong partnerships, project diversification, strong design and targeted market opportunities.

PROVARIS – COMPANY INTRODUCTION

ADDRESSING THE HYDROGEN DELIVERY PROBLEM

Company background

Provaris (previously Global Energy Ventures Ltd) was established in 2016, by way of a Reverse Takeover (RTO) of an oil and gas explorer, to develop a compressed natural gas (CNG) shipping business, including the successful Class Approval of a new CNG carrier In 2019, after identifying the burgeoning hydrogen market as lacking the midstream infrastructure to match supply and demand centres, attention turned in 2019 to developing a new compressed hydrogen carrier design, based on its extensive experience in the design and approvals of compressed gas carriers and compression technology. Provaris pivoted fully into developing a hydrogen vessel in 2021 with the receipt of Approval in Principle (AiP) for the H2Max and H2Neo carrier designs, and began the process of identifying partners and potential projects to achieve this.

Projects identified to date include the FjordH2 project in Norway and the Tiwi H2 project in Australia, both of which Provaris will be a project developer and exporter in addition to the HyEnergy project in Australia where Provaris was involved in the pre-feasibility study to determine the applicability of using compression as midstream exporter.

Company History Timeline

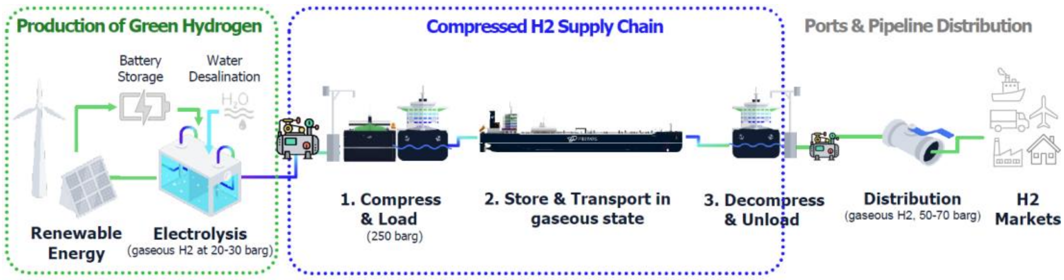
Year	Event
2014	Listed on ASX as Titan Energy
2017	Change of name to Global Energy Ventures and transition into CNG projects
2021	Raised $6.3m
	Hydrogen ship programme launched with AIP for H2Max carrier design
	Announced development of 2.8GW Tiwi H2 Project on the Tiwi Islands
	MOU for HyEnergy Project
	AIP received for the H2Neo carrier design
	Raised $10.6m
2022	Change of name to Provaris Energy
	Tiwi H2 Project Given Major Project Status by Northern Territory Government
	HyEnergy Export Feasibility Study Announced
2023	Design Approval for H2Neo vessel based on extensive FEED package Release of Western Australian Government Compressed Hydrogen Feasibility Study
	Completion of Pre-feasibility and Collaboration agreement with Norwegian Hydrogen for the joint development of a 270MW FjordH2 Project in Norway Collaboration agreement with Gen2Energy to complete a Pre-feasibility for the large-scale export supply chain for the Afjord project in Norway Technical Collaboration with Prodtex AS to develop and test a prototype compressed hydrogen tank in Norway, concurrent with a development plan for tank production facilities in Norway. DNV appointed as a second ship classification society for Final Class Approval

Source: Longspur Research

THE HYDROGEN SUPPLY CHAIN

The listed market is dominated by electrolyser and fuel cell companies with really only Everfuel (EFUEL NO) and Hydrogen Refuelling Solutions (ALHRS FP) representing other important parts of the hydrogen supply chain. This misses the fact that there is a lot of value in delivering and processing hydrogen and in addressing the key requirements of efficient and low cost ways to store and transport hydrogen at scale. We see this as a key area of opportunity for investors as the hydrogen market grows.

Hydrogen Suplpy Chain



Source: Provaris

The supply chain starts with hydrogen creation with green hydrogen being produced from renewable energy using electrolysis. But there is more to hydrogen than electrolysis. To move hydrogen, it must be converted to a form that can be easily transported. This may be as simple as compression but liquefaction using cryogenics and conversion to hydrogen rich fuels such as ammonia are also possible. Liquefied hydrogen or converted alternatives when used in shipping also require a subsequent conversion back into useable hydrogen or hydrogen derived products at the point of use, something that Provaris' compressed technology does not require. There is a perception that shipping itself can be both expensive and inefficient in distributing hydrogen, however this is largely dependent on the hydrogen carrier used.

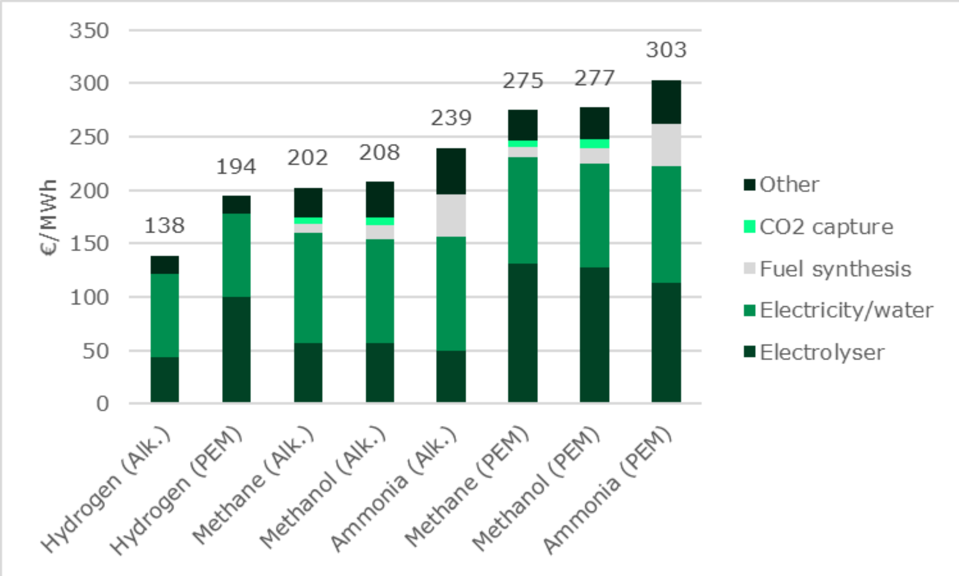
Distribution pathways for hydrogen

Conversion process	Hydrogen carrier	Transport method	Re-conversion process
Liquefaction	Liquid hydrogen	Shipping	Re-gasification
Ammonia synthesis	Ammonia	Shipping	Ammonia cracking
LOHC hydrogenation	LOHC	Shipping	LOHC De-hydrogenation
Compression	Gaseous hydrogen	Pipeline	De-compression
Compression	Gaseous hydrogen	Shipping	Scavenging

Source: Longspur Research, IRENA

As a result, while hydrogen can be the lowest low carbon fuel source for a number of applications when considered at the point of creation it is not always the cheapest solution at the point of use.

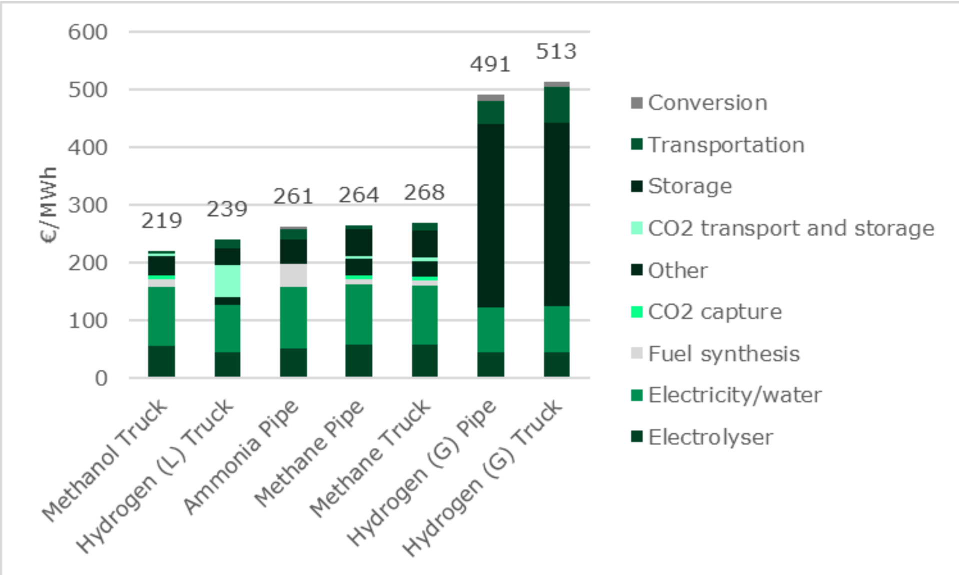
Production costs for low carbon fuels suggest hydrogen lowest cost



Source: Longspur Research, Dias et al

Our analysis of low carbon solutions for hydrogen logistics found that it was more efficient to convert hydrogen into methanol or ammonia to deliver the most cost effective fuel at the point of use.

Full delivered costs show methanol as lowest cost option



Source: Longspur Research, Dias et al

But this assumes that the end market requires methanol or ammonia. Where hydrogen is required the costs of reconversion can make these fuels less efficient.

Critical to any analysis is the overall efficiency of the energy used on a well to wheel basis. We can show that the main options of liquefaction and ammonia have lower efficiencies than another option – the more straightforward solution of compression.

Hydrogen delivery efficiencies

Liquefied H2 (2,000 nm)	Renewable energy	Electrolysis	Liquefaction	Storage / Shipping	Regasification
Efficiency	85%	72%	83%	84%	95%
Cumulative	85%	61%	51%	43%	**41%**
Ammonia NH3 (2,000 nm)	Renewable energy	Electrolysis	Haber-Bosch Process	Storage / Shipping	Cracking
Efficiency	90%	72%	86%	95%	76%
Cumulative	90%	64%	55%	52%	**40%**
Compressed H2 (H2Max, 2,000 nm)	Renewable energy	Electrolysis	Compression	Storage / Shipping	Scav. Compression
Efficiency	96%	72%	98%	90%	98%
Cumulative	96%	69%	67%	61%	**59%**
Compressed H2 (H2Neo, 620 nm)	Renewable energy	Electrolysis	Compression	Storage / Shipping	Scav. Compression
Efficiency	99%	72%	98%	93%	98%
Cumulative	99%	69%	67%	63%	**61%**

Source: Provaris, Longspur Research

What these tables show is that all means of energy transport result in loss of energy resulting in low energy efficiency. Liquefaction is poor with energy lost in the liquefaction process itself and in boil off en-route. Ammonia also sees energy lost in cracking and compression is the best outcome in terms of overall lowest energy lost.

COMPRESSION

Provaris has created a midstream solution for hydrogen based on compression rather than liquefication or conversion to another carrier. Basic hydrogen compression technology is well proven with over 50 years of operational track record. The Provaris solution compresses hydrogen to 250 bar before storing and transporting the gas in a proprietary cargo containment system at ambient temperature, and a closed system to prevent boil-off. Decompression and scavenging pressure are required at the destination with hydrogen distribution generally at a lower pressure of 50 to 70 bar.

Compression has tended to be discounted because of the poor volumetric density of hydrogen and no precedent of a commercial CNG carrier. Hydrogen has a lot of energy per unit of weight which require greater volumetric capacity. This can explain the industry's focus on cryogenic or chemical carriers.

Main hydrogen delivery options

Properties	Unit	Compressed hydrogen	Liquid hydrogen	Methanol	Liquid ammonia
Storage method	-	Compression	Liquefaction	Ambient	Liquefaction
Temperature	oC	25 (room)	-252.9	25 (room)	25 (room)
Storage pressure	MPa	69	0.1	0.1	0.99
Density	kg/m3	39	70.8	792	600
Explosive limit in air	%vol	4–75	4–75	6.7–36	15–28
Gravimetric energy density (LHV)	MJ/kg	120	120	20.1	18.6
Volumetric energy density (LHV)	MJ/L	4.5	8.49	15.8	12.7
Gravimetric hydrogen content	wt%	100	100	12.5	17.8
Volumetric hydrogen content	kg-H2/m3	42.2	70.8	99	121
Hydrogen release	-	Pressure release	Evaporation	Catalytic decomposition T>200oC	Catalytic decomposition T>400oC
Energy to extract hydrogen	kJ/mol-H2	-	0.907	16.3	30.6

Source: Aziz, M., Wijayanta, A.T., Nandiyanto, A.B.D., Ammonia as Effective Hydrogen Storage: A Review on Production, Storage and Utilization, Energies 2020, 13, 3062; doi:10.3390/en13123062

The lower volumetric density means that shipping compressed hydrogen will require greater shipping capacity where seaborne delivery is being considered thus it will require greater vessels compared with cryogenic or chemical solutions.

However, on an integrated basis, the reduction in energy loss for conversion and reconversion can off-set the increase in shipping fleet costs over the lifetime of a project, resulting in a lower delivered cost of hydrogen.

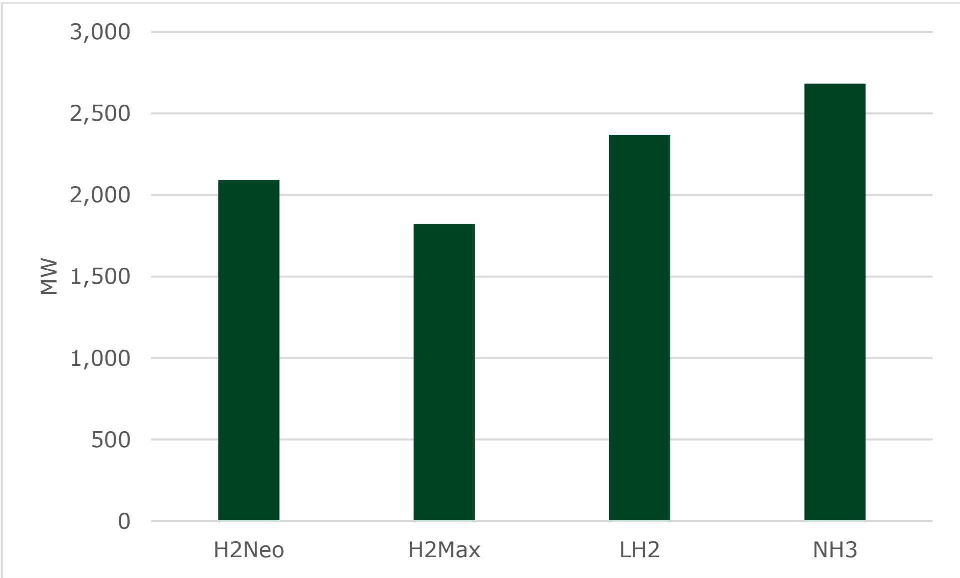
RENEWABLE ENERGY UTILISATION

One of the reasons for concentrating on energy efficiency is that it impacts the overall amount of renewable energy required to generate green hydrogen at the point of production. This is important because if we are to reach net zero we will need considerable quantities of renewables together with associated infrastructure including grid and storage. We estimate (Simple Not Easy, Longspur Research 18 February 2021) that a net zero outcome will require 22,486GW of renewable energy capacity. Currently there is 107GW deployed globally so this is a 210x increase.

This represents a major challenge and if we are required to add additional capacity to cover less efficient hydrogen transport solutions it makes the task of getting to net zero more challenging.

One key advantage of a developing compressed hydrogen supply chains is the lower renewable energy capacity required to deliver green hydrogen to the point of demand.

Renewable Energy Generation Capacity Required



Source: Provaris' Comparison Report 2023 (based on a solar/wind renewable generation profile, 2,000 nautical miles and 100,000 tpa of delivered hydrogen)

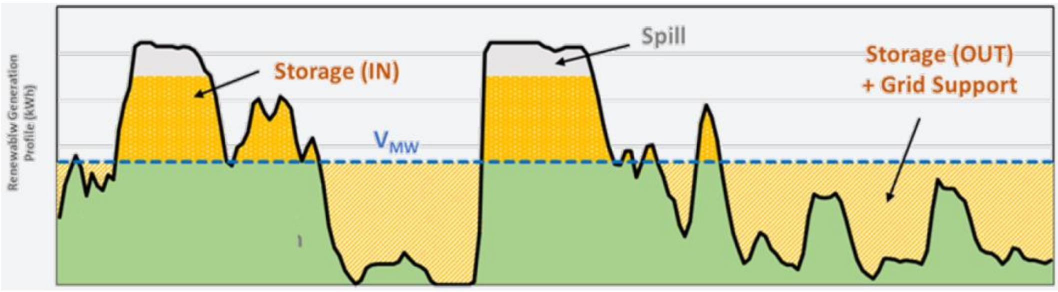
THE BENEFITS OF FLEXIBILITY

Another issue surrounding the upstream source of green power for green hydrogen is the fact that renewable energy's intermittency creates problems for upstream storage and shipping. The process of liquefaction requires a constant feed of hydrogen into the liquefaction process so electrolysers must be run in a baseload operation. That either requires a baseload power source or battery storage to flatten out the intermittent power supply. Both solutions have a cost implication.

The alternative solution of using ammonia is not quite so fussy about constant operation but cannot be fully exposed to intermittent generation. The Haber Bosch process will normally viewed as requiring at least 40% of its power to be consistent otherwise it needs to shut down and restart when power crosses back over the threshold (this remains an area of research and development). The end result is that the liquefaction and ammonia processes required significant capital spend and associated losses related to the hydrogen and battery storage required to link intermittent renewable generation to base load characteristics of liquefaction or ammonia production.

By contrast compression can run on and off and "load follow" the availability of renewable generation storing hydrogen when it is produced and standing by for more when there is no generation. This allows projects with captive generation to be created without any need to connect to wider power grids.

Conversion of a variable wind/solar profile to flat profile



Source: Provaris

The flexibility that compression offers also extends to grid connected renewable resources such as hydro power in Norway. Hydrogen production and subsequent compression is able to back off during periods of high electricity demand and price (a benefit to the grid provider), and then also ramp up with excess capacity when demand and prices are low.

Provaris has engaged Thema Consulting to assess the benefit of compression for grid connected projects in future, more volatile power markets. Important to note that Thema expects increasing levels of volatility long term. In such a market, the compressed, flexible solution will be able to achieve lower power pricing compared to base power alternatives such as liquefaction (LH2) and Ammonia (NH3). The inherent flexibility with compression, and when utilizing Provaris' effective hydrogen storage solutions, can also balance the power market.

FUEL CONSUMPTION

Industry commentary has also suggested in a number of early studies that a long-haul compressed hydrogen solution to power any large-scale ship would severely deplete the cargo. However, these were based on analyses of vessels not specifically designed for the transport of hydrogen.

We have modelled shipping using compressed hydrogen in both a first of a kind small vessel and a larger more optimal vessel and show these against a reference fossil fuelled tanker.

Shipping Fuel Consumption

Project Parameters				
Ship Type		**H2Neo**		**H2Max**
Production (tpa)		40,000		100,000
Distance (n.mile)		620		2,000
Ship Parameters				
Gross Cargo (t)		430		2,000
Net Cargo (t)		415		1,930
Speed (knots)		11		11
Hydrogen Consumption	LNG tpd	H2 tpd	LNG tpd	H2 tpd
Loading (at Berth)	3.0	1.2	5.3	2.0
Port In/Out (~5 knots)	6.9	2.7	10.0	3.9
Sailing (~11 knots)	14.7	5.7	31.0	12.0
Round Trip Voyage (hrs)				
Port In/out (Loading)		9		12
Loading (from barge storage)		18		48
Sailing to Customer		56		182
Port In/out (Unloading)		9		12
Unloading		18		48
Sailing to Back		56		182
Total Round Trip Time (hrs)		**167**		**484**
Round Trip Consumption (t of H2)		30.4		193.4
% of Cargo		**7.1%**		**9.7%**

Source: Longspur Research

This shows that neither vessel uses more than 10% of its hydrogen cargo for propulsion.

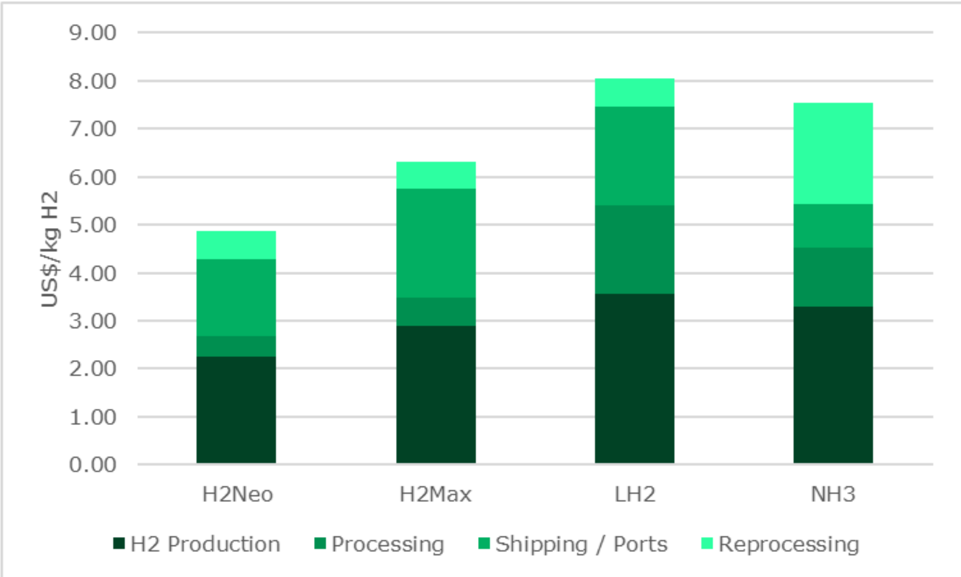
BUT ISN'T COMPRESSION EXPENSIVE?

It is not disputed that compression requires additional vessels when compared to alternatives, but this is outweighed by the benefits.

(a) significantly less capex at the production end (no liquefaction/ammonia facilities)
(b) the Provaris vessel design minimises the costs of vessels so that the cost burden of more vessels is not as great as some expect
(c) a more efficient process means less upstream renewable energy capacity is required per tonne of hydrogen produced

The capital required for compressed shipping also needs to be compared against the higher costs of processing hydrogen, either liquefying it or converting it to ammonia, and reprocessing it back to hydrogen at the destination. A full comparative analysis of these costs shows that the Provaris compression solution is the cheapest overall at voyage lengths of up to 2,000 nm using their H2 Max vessel and even better at shorter voyage lengths using the H2Neo vessel.

Hydrogen Value Chain Cost Breakdown



Source: Provaris' Comparison Report 2023 Based on a solar/wind renewable generation profile, 2,000 nm and 100,000 tpa of delivered hydrogen. H2Neo at 620 nm.

The graph uses data provided by Provaris from modelling undertaken by the company. We have reviewed this as well as undertaking our own modelling which broadly confirms the picture. We have used a slightly lower figure for losses on ammonia reprocessing (cracking) although note that these are still high at 24%, which is the best case scenario identified in work published by the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

LCoH Key Assumptions on Hydrogen Volume

Hydrogen Volume Balance		**H2Neo**	**H2Max**	**LH2**	**NH3**
Delivered Hydrogen	tpa	**40,000**	**100,000**	**100,000**	**100,000**
Distance	n.m	**650**	**2,000**	**2,000**	**2,000**
Renewable Source		Hydro	Solar/Wind	Solar/Wind	Solar/Wind
Reprocessing	%	2.5%	2.5%	5.0%	24.0%
CIF (Unloaded)	tpa	41,026	102,564	105,263	131,579
Ship Fuel Use	%	7.1%	9.7%	16.3%	4.7%
FOB (Loaded)	tpa	44,146	113,542	125,762	138,068
Conversion Efficiency	kWh/kg	55.0	55.0	55.0	55.0
Processing Use/Losses	%	2.3%	2.3%	16.7%	14.1%
Gross Curtailment	%	1.0%	4.3%	20.0%	10.5%
Energy Cost	GWh	**2,510**	**6,679**	**10,380**	**9,877**
Net Curtailment	%	1.0%	4.3%	15.0%	10.5%

Source: Provaris, Longspur Research

Importantly here is the modelling of power sources used to electrolyse water into green hydrogen. Liquefaction requires a constant power supply or enough battery storage to deliver a constant supply and this increases losses, either from curtailed power or bought in power to supplement the project's own generation.

LCoH Key Assumptions on Processing Stages

		H2Neo	H2Max	LH2	NH3
Power Supply					
Installed Capacity (Solar/Wind)	MW	730	1,910	2,790	3,000
Cost of Supply (Renewables)	$/MWh	30	30	30	30
Cost of Supply (Grid External)	$/MWh	30	30	30	30
Electrolyser					
Installed Capacity	MW	270	1,400	1,320	1,750
Capex	$ / kW	780	780	780	780
Opex	% of Capex	3.0%	3.0%	3.0%	3.0%
Process Facility					
Type	Type	Comp	Comp	LH2	NH3
Installed Capacity	MW Comp / tpd H2	50	100	346	378
Capex (Port/Storage)	$/kW; $m/tpd	3,450	3,450	2.3	2.1
Opex (Port/Storage)	% of Capex	2.1%	2.1%	4.0%	2.5%
Battery (BESS) per 500MW / 1,000MWh					
Installed Capacity	MWh	0	800	2,200	1,100
Capex	US$m / kWh	350	350	350	350
Opex	% of Capex	2.0%	2.0%	2.0%	2.0%
Hydrogen Pre-Process Storage (per 2,000 t barge)					
Capacity / Barge	tonnes	0	0	3,300	2,800
Capex	US$m/2,000 t	0	0	300	300
Opex	% of Capex	1.0%	1.0%	1.0%	1.0%
Port Infrastructure (Loading)					
Capex (Port/Storage)	US$m	120	350	215	240
Opex (Port/Storage)	US$m pa	5.0	13.3	13.3	13.1
Shipping					
# of Ships	#	2	3	4	2
Capex per ship	US$m	135	370	120	125
Opex	% of Capex	3.5%	1.6%	2.7%	4.0%
Port Infrastructure (Unloading)					
Capex (Port/Storage)	US$m	50	350	145	170
Opex (Port/Storage)	% of Capex	5.0	10.9	11.0	10.6
Reprocessing Facility					
Type	Type	Scav. Compression	Scav. Compression	Regassification	Cracking
Installed Capacity	MW / tpd	50	100	288	360
Capex	$/kW,$m/tpd	3,450	3,450	0.52	0.8
Opex	% of Capex	2.1%	2.1%	2.5%	4.0%

Source: Provaris, Longspur Research

LCoH Summary Outputs

		H2Neo	H2Max	LH2	NH3
Operating Costs					
Electricity Costs	US$m pa	75.3	200.4	327.0	296.3
Electrolyser	US$m pa	6.3	32.8	30.9	41.0
Process Facility	US$m pa	3.6	7.2	31.8	19.8
Battery (BESS)	US$m pa	0.0	5.6	15.4	7.7
Hydrogen Pre-Process Storage	US$m pa	0.0	0.0	5.0	4.2
Port Infrastructure (Loading)	US$m pa	5.0	13.3	13.3	13.1
Shipping	US$m pa	9.5	17.8	12.7	10.0
Port Infrastructure (Unloading)	US$m pa	5.0	10.9	11.0	10.6
Reprocessing Facility	US$m pa	3.6	7.2	3.7	11.8
Total Opex		***108.3***	***295.1***	***450.7***	***414.4***
Capital Costs					
Electrolyser	US$m	211	1,092	1,030	1,365
Process Facility	US$m	173	345	794	790
Battery (BESS)	US$m	0	280	770	385
Hydrogen Pre-Process Storage	US$m	0	0	495	420
Port Infrastructure (Loading)	US$m	120	350	215	240
Shipping	US$m	270	1,110	480	250
Port Infrastructure (Unloading)	US$m	50	350	145	170
Reprocessing Facility	US$m	173	345	150	296
Total Capex	**US$m**	***996***	***3,872***	***4,079***	***3,916***
Recovery Factor	US$m pa	*86*	*336*	*354*	*340*
LCOH		**4.87**	**6.31**	**8.05**	**7.54**

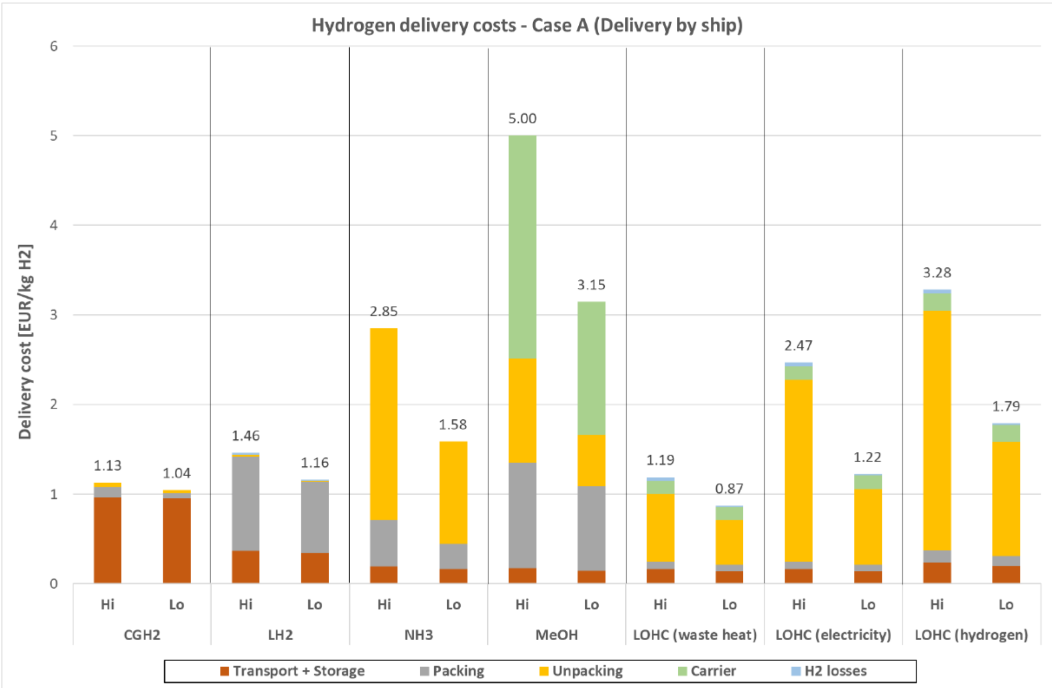
Source: Provaris, Longspur Research

ECONOMICS INDEPENDENTLY CONFIRMED BY EU

The EU Joint Research Council (JRC) has also reached similar conclusions for the benefits of compressed hydrogen shipping. Their 2022 report [Ortiz Cebolla, R., Dolci, F. and Weidner Ronnefeld, E., Assessment of hydrogen delivery options, EUR 31199 EN] is clear that this is the most attractive option for distances up to 2,500 km (1,300 nm). Note this analysis is for 1 million tonnes per annum.

"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"

Hydrogen Delivery Costs by Ship



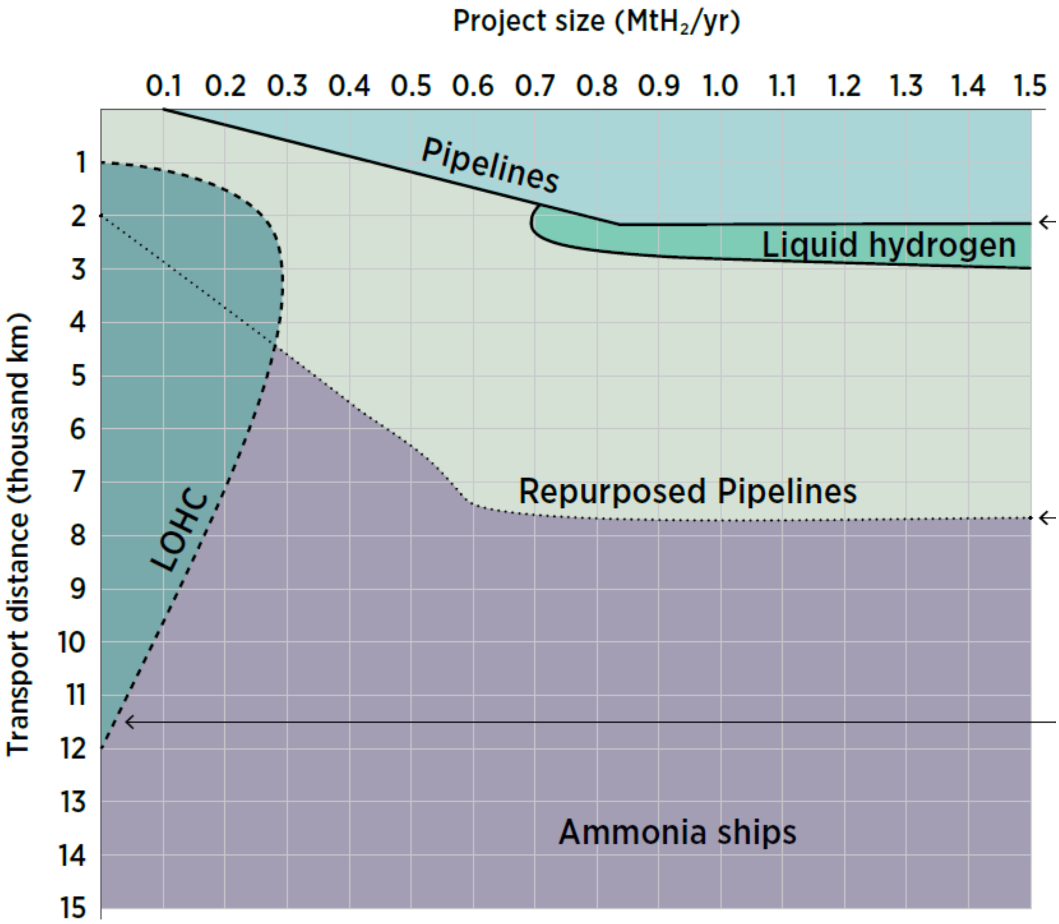
Source: JRC

All these studies show a benefit to using compressed hydrogen based on immediately deployable technology. If this solution is fully adopted it is likely that know-how and volume savings will lead to lower costs improving the economic benefits of the solution.

OTHER DELIVERY SOLUTIONS

The International Renewable Energy Agency (IRENA) has analysed methods of transporting hydrogen and produced a graphic. This suggests that for regional distances either pipelines or liquid hydrogen are the main options although liquid organic hydrogen carriers may have a role.

Most cost-effective hydrogen transport pathway in 2050



Source: IRENA

PIPELINES

Pipelines are really suitable for high volumes. The economics are related to the volume transported. Because the area of the pipeline, and thus the volume of gas moved, increases with the square of the radius (A=πr2) but the wall material is related to the circumference which increases linearly with the radius (C=2πr) then the capital cost of the pipeline per unit of volume reduces the higher the volume. As a result, we think pipelines are a good solution for major trade routes but will still need feeder and subsidiary transport options around them.

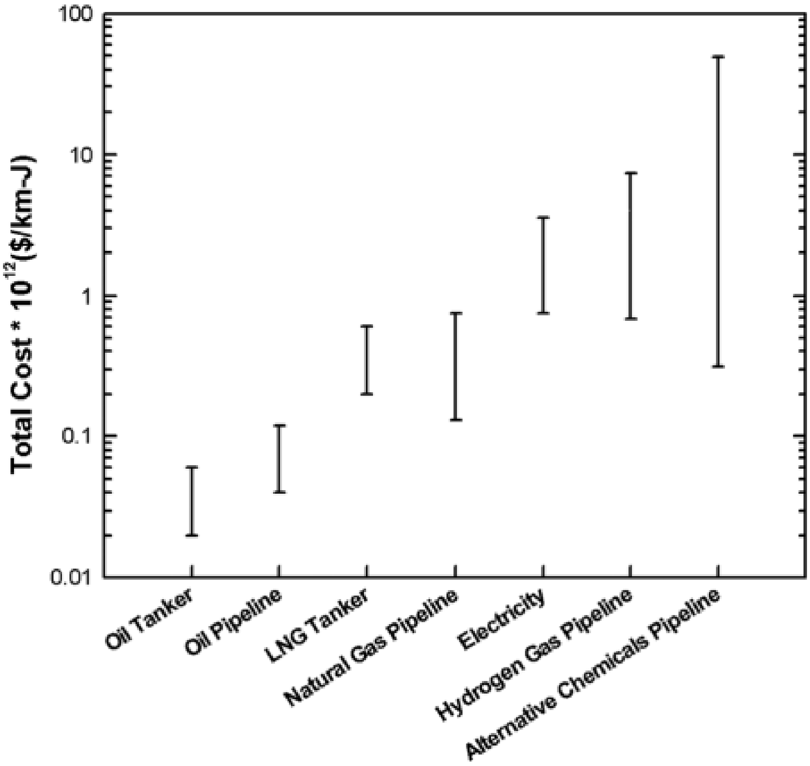
There is also the possibility of repurposing existing natural gas pipelines. Existing subsea pipelines are likely to remain in use for natural gas for some time as existing fields deplete. The need for hydrogen to come into the market is likely to happen before full depletion so we don't see these becoming available when required. However onshore pipelines may be repurposed and this has already happened in the Netherlands.

Pipelines are planned in the North Sea and include a MoU for joint project between Equinor and RWE for a pipeline from Equinor blue hydrogen production facilities in Norway to Germany. While the project also plans to facilitate the movement of green hydrogen the output will have a high proportion of blue hydrogen which we think will not appeal to every off-taker.

CO-LOCATING ELECTROLYSERS WITH DEMAND CENTRES

The mooted alternative to distributing hydrogen over distance is to locate electrolysers alongside demand or in the very near vicinity in order to eliminate the midstream infrastructure as far as possible. Theoretically this makes a great deal of sense as there will likely be both water and electricity availability in high industrial demand centres. There are several issues with this in practice however. From a purely locational perspective, demand centres are typically not near significant renewable energy generation, meaning that electricity will either need to be taken from the grid or renewable energy distributed directly on a private wire potentially to the electrolyser. If taken from the grid, then without suitable safeguards in place this could result in increased fossil fuel consumption in grids that are not already significantly decarbonised. If transmitting via private wire, then the cost of installing cabling combined with transmission losses puts electricity delivered on a per unit basis comparable to that of hydrogen pipeline as evidenced in the graphic below.

Unit Costs for Transporting Energy



Source: Energy Environ. Sci., 2018, 11, 469

KEY OPPORTUNITIES – PROGRESS IN NORWAY

In early January 2023, Provaris announced a partnership with Norwegian Hydrogen AS to assess the use of compressed hydrogen to develop export hydrogen supply chains in the Nordics. In March 2023, Provaris announced the completion of a pre-feasibility study for a 50ktpa hydrogen export facility from Norway to the EU targeting shipping costs of EU 1.00 to 1.50/kg.

In June, Provaris announced a collaboration agreement with Norwegian Hydrogen to jointly develop 270MW project at Alesund in Western Norway, which includes an export capacity of 40ktpa. The initial development of 20MW for local hydrogen supply and the remaining 250MW driving the export facility operating in 2027.

It is planned that a binding Joint Development Agreement will be completed before the year end with a 50/50 JV structure with shared costs to develop the project. Land has already been secured, with power reservation expected in the 3rd quarter 2023 and a grid offtake contract based on 100% renewable hydro power to be progressed. Likely offtake will be located at the port of Eemshaven or Hamburg for the German industrial market.

We have estimated an IRR of 14% on the project based on the following metrics.

This is very much a proof of concept project using the smaller H2Neo vessel. There is clear scope to do far more in accessing low cost renewables in Norway for the Northern European hydrogen market. This is highlighted by the announcement of a second collaboration with Gen2 Energy AS to develop a large-scale supply chain for hydrogen from Norway to Europe.

Illustration of Norway Project IRR

Selected Inputs	
Project Life	30 Years
Max H2 Per Annum (tpa)	40,000
Delivery Distance (nautical miles)	620
Project Capacity (MW)	270
Vessel Type	H2Neo
Number of Vessels	2
Vessel capacity (tons H2)	430
Voyages pa	94
Average Speed (knots)	9
Shipping Opex (US$m per vessel)	5.1
Shipping Capex (US$m per vessel)	135
Compression Capex ($M each port)	60
Port facilities ($M each port)	40
Storage Barge loading port only ($M)	80
Electrolyser Capex ($k/MW)	844
Total Capex (US$’000)	1,053
Revenue	
H2 Price (US$/kg)	8
Total Revenue (US$'000)	8,928,978
Cost of Sales	
Total electricity cost (US$m)	3,109,872
Total water cost (US$m)	27,624
O&M (US$m)	1,093,636
Shipping opex	295,800
Port Fees and O&M Costs (US$m)	290,041
Electrolyser depreciation	133,119
Compressor depreciation	78,862
Vessel depreciation	79,350
Facilities and other depreciation	108,739
Total depreciation	400,070
Total Cost of Sales (US$’000)	5,617,112
EBITDA	4,112,005
IRR	14%

Source: Longspur Research

THE EUROPEAN OFFTAKE MARKET

The European hydrogen backbone (HB) initiative is being developed as an open access hydrogen network. The initiative is backed by a group of 32 energy infrastructure operators. Initial projects such as the HyPerLink project will result in a network of up to 7.2GW of hydrogen demand connected in a 610km pipeline system covering the Netherlands and Germany with access to major industrial centres and connecting key ports in the North Sea. For Provaris it represents a perfect termination point for hydrogen trains coming from low cost renewable energy projects in Norway and possibly elsewhere around the North Sea, with the backbone and hyperlink being developed through 2024 to 2027, aligning with Provaris timeliness for vessels to be on the water.

If you take the Norway model and apply within the country, there are several sites located in bidding zones that can supply reliable low-cost renewable grid power. The maximum shipping distance for an export project from Norway to European ports would be 1,000 nautical miles.

If you then look at markets like Scotland which has ambitions to develop material offshore wind resources, the Provaris model for compressed hydrogen would be an elegant application to manage curtailed (or excess) future supply to convert to hydrogen and compress and transport for the markets of Europe.

Project HyPerLink

Source: Gasunie

Provaris is already in discussion with ports, pipeline operators, utilities and industrial off-takers. These latter are seeing the benefits of growing regulatory support for their use of green hydrogen.

DELEGATED ACT BRINGS GREEN HYDROGEN INTO PLAY

On 20 June 2023 the European Commission formally published the Additionality Delegated Act which set conditions for hydrogen and other synthetic fuels to be eligible for support as renewable fuels of non-biological origin (RFNBOs). The conditions mean that hydrogen created from the electrolysis of water using renewable energy will be included and be acceptable to meet the quotas required under the Renewable Energy Directive II (RED II), notably the overall requirement the 32% of energy consumed in the EU is renewable by 2030.

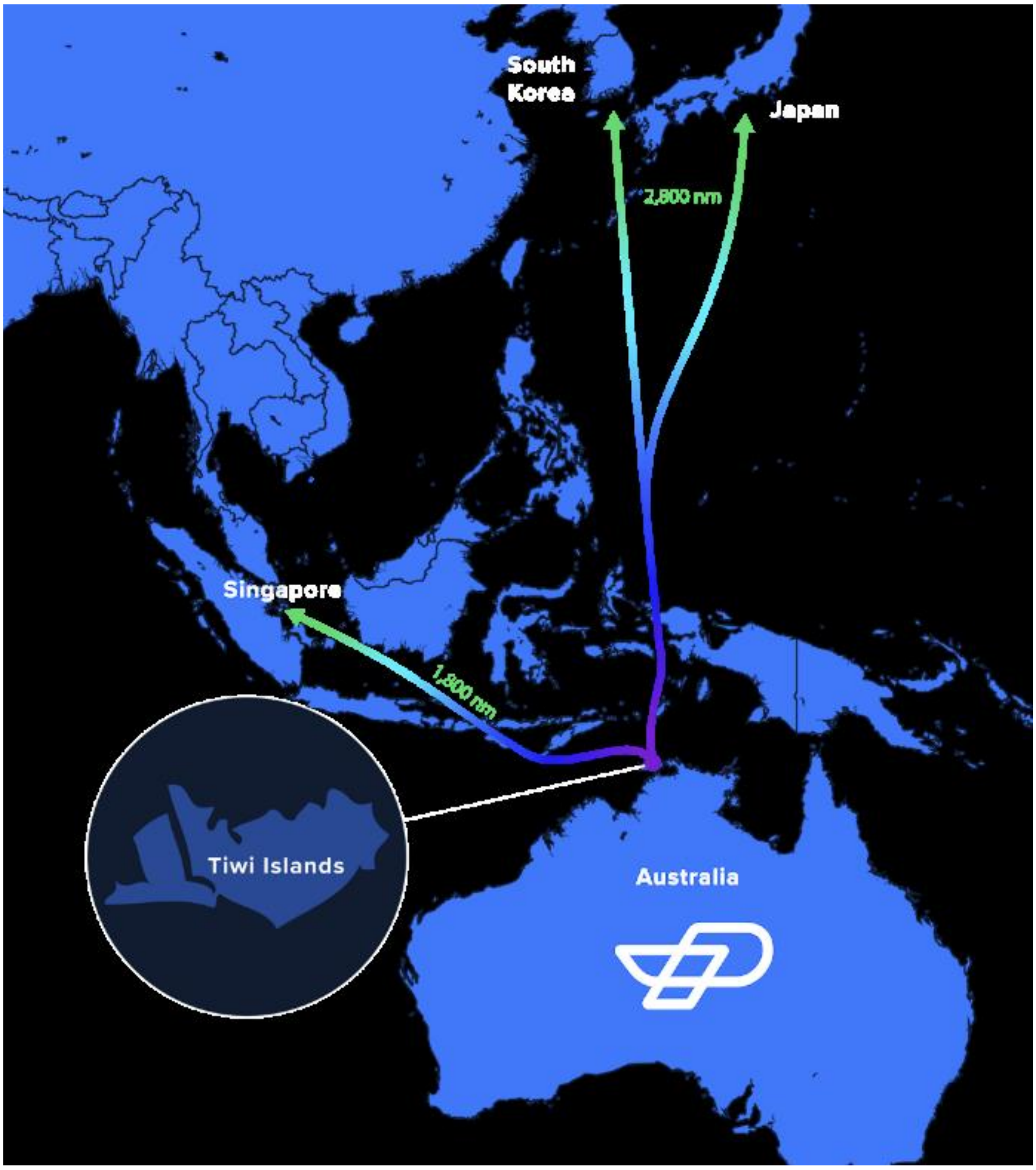
RED III now looks set to require that 42% of hydrogen used in industry be renewable by 2030. Additionally, for transport a 1% share of energy is set to be provided by RFNBOs including hydrogen.

AUSTRALIA TO SINGAPORE AND BEYOND

Provaris is also involved in two projects in Australia. It is the 100% developer of an up to 100,000 tpa project in the Tiwi Islands in the Northern Territories with potential offtake targets in Singapore, Japan and South Korea. It is also working with HyEnergy on a feasibility study for a 200,000tpa project in Western Australia serving Singapore.

The Tiwi H2 project incorporates over 2GW of solar PV generation to produce up to 100,000 tpa of green hydrogen from the Tiwi Islands in the Northern Territory. The project will export this hydrogen to Singapore 1,800nm distant or Japan or South Korea at 2,800nm.

Tiwi H2 Project Map



Source: Provaris

A concept design study was completed in August 2022 confirming the feasibility of the project and permitting is being advanced with an environmental impact study due to be submitted in early 2024. An owner's engineer has been appointed and pre-Front End Engineering and Design work for the solar farm is underway. The target for first exports is early 2028.

Provaris has provided guidance to the market it plans to bring in development partner(s) to finalise the FEED study and achieve FID. Provaris has not provided guidance on the target equity holding of the project at FID, however it plans to retain the midstream shipping required for the project. Initial marketing for offtake has focussed on Singapore given its proximity to market and compression providing Singapore with a capital-lite solution for the delivery of pipeline ready hydrogen for industrial locations use on Jurong Island.

VESSEL DESIGN IS A BARRIER TO ENTRY

DESIGN OUTLINE

Provaris has taken a standard medium range/long range (MR/LR) tanker design with two integrated tanks to store bulk-scale hydrogen at 250 bar. This is a simple low cost solution but the tank design is critical and proprietary to Provaris. The company has filed a US patent to protect this IP.

Critical to the tank design is safety, and the company has undertaken considerable critical safety studies with process and risk analyses carried out. The company has worked with Northern Marine as their technical and ship management partner. Northern Marine is part of the Stena Group and one of the shipping industry's leading service providers.

Working with Northern Marine, Provaris has secured Design Approval from ABS for the H2Neo carrier design. This is based on a front end engineering and design (FEED) package and is sufficient for shipyards to submit firm quotes. Final Class Approvals is subject to production and testing of a prototype tank, which is programmed for completion with Q1 2024.

Provaris has initially developed two classes of ship designs. The first, the H2Neo, has a hydrogen cargo capacity of 430t which would support an annual project export capacity up to 200,000 tpa. It already has Approval in Principle (2012) and Design Approval (FEED, 2022) from ABS for this carrier. A shipbuilding contract is expected in 2024, signed in parallel with taking FID on first H2 production project, and first commercial operations are planned for 2027.

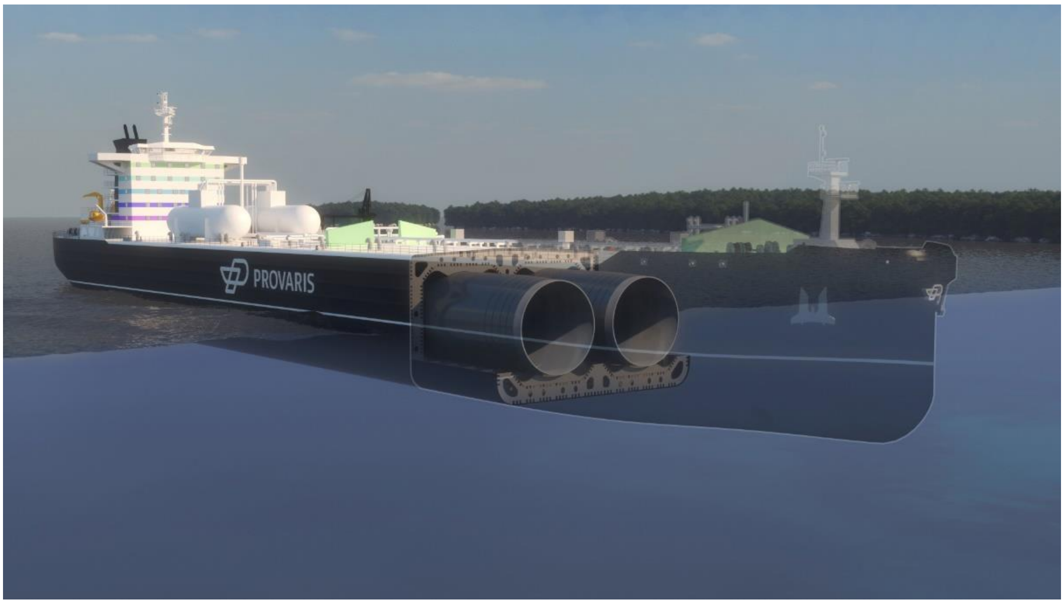
The second vessel (H2Max) is a larger carrier with 2,000t of cargo capacity that allows for servicing a 900,000 tpa project. Target FEED approval is for 2024 with construction starting in 2026 for first operations in 2030.

Two Carriers Under Development

		H2Neo	H2Max
Cargo carrying capacity	m3	26,000	120,000
Cargo carrying capacity	t	430	2,000
Project export capacity	tpa	200,000	900,000
Shipping range	Nm	2,000	3,000
AiP Received		2021	2021
FEED Approval		2022	Late 2023
Shipbuilding Contract		2023	c.2026
First operations		2027	c.2030

Source: Provaris

Vessel Twin Tank Concept



Source: Provaris

FUEL CELL PROPULSION

The vessels will have hybrid-electric propulsion systems. This means that the ships propeller(s) will be driven by electric motors, and that the power management system onboard includes a base battery power installation.

The inclusion of batteries gives two major benefits: (a) peak shaving and spinning reserve, allowing the generator sets to run at optimum load and thus improved specific fuel consumption values; and (b) load response (immediate power to consumers) that allows installation of all type generator sets (from internal combustion engines to fuel cells), noting some of these options have slower start-up / acceleration etc.

The base design for both H2Neo and H2 Max has been for dual fuel LNG for the power generation onboard. However, the designs are also prepared for biodiesel and/or methanol engines, and the engine room is designed for future H2 fuel cell propulsion.

Provaris does not intend to build the first series of ships with 100% reliance on fuel fells for propulsion. Whilst Provaris has ongoing dialogue and collaboration with key fuel cell manufacturers, Provaris deems the risk too high to proceed with 100% hydrogen and fuel cell propulsion until the fuel cell technology has been duly proven onboard ships in marine environments.

In initial configurations, vessels may rely on traditional fuels with blended options to bring them within EU emission limits but with no need to go to full hydrogen propulsion units the limits are tightened further.

STORAGE AS WELL AS SHIPPING

Every shipping solution requires some degree of storage and part of the Provaris solution is a barge based compressed hydrogen solution named H2Leo. The company has taken its vessel design and adapted this to a storage barge with Approval in Principle (AiP) obtained from ABS for a 300t to 600t of hydrogen storage capacity. The capacity can be expanded up to 2,000t. The model is the same compression model as the shipping solution.

The main cost effective alternative for hydrogen storage is the use of salt caverns. The principal of cavern storage is nearly identical to that offered by Provaris with hydrogen compressed. However, this solution requires salt caverns to be available and while there is significant capacity worldwide it is not universally distributed. Unlike a barge, caverns cannot be located precisely where it is needed and as a result is likely to require additional shipping to be moved to where it is needed.

Provaris estimates that H2Leo can deliver a storage cost of just US$0.3m/t compared with other high pressure storage solutions which range up to US$2.0m/t. The barge design received approval in principle from ABS in April 2023.

H2Leo Storage Barge Concept

Source: Provaris

FINANCIALS

EARNINGS OUTLOOK

In our base case we have modelled Provaris' announced Norwegian FjordH2 project using a 50% share of the project and a 70:30 debt to equity ratio in the project financing and the same inputs for the second project outlined with Gen2. Capex commences in 2025 and first revenues at the end of 2027 on the first project, with the second following a year later. Revenues have been derived from an US$8/kg of hydrogen produced stored and exported. Our model is highly sensitive to changes in hydrogen pricing however we have used a conservative increase on our calculated LCoH to establish the sales price on the basis that we do not believe management would reach FID on a project where the economics from electrolysis to consumption would not work. Our forecast has revenues of A$106m in 2027 from c.10,000 tonnes of hydrogen being produced and exported, increasing to c.40,000 tonnes per annum in 2028. The company moves into a net profit position in 2030 once interest payments from the debt component of the financing of the export vessels begin to reduce. We have not included any grant income or subsidies in our forecasts but consider it likely that the company will be a strong candidate for these at both a national and international level.

Prior to first revenues we expect administration costs to remain the major item on the income statement, increasing with additional technical work prior to FID on the first Norwegian project. The details from the Norwegian are yet to be confirmed and there is a significant risk within this forecast that the project comes online later than forecast, impacting on the valuation. We have considered this as part of our sensitivity testing below.

BALANCE SHEET

Provaris is currently intending on acting as both a hydrogen project developer and transporter, using its compressed hydrogen shipping solution. In doing so, the company will require a significant amount of capital. We see this as largely being done at a project finance level and have modelled accordingly; however, we have included a significant proportion of this as being raised through and equity issue to cover both project development, interest payments and corporate overheads prior to significant revenue generation. With a fully permitted and developed project plan, we expect to see a number of different debt and equity solutions for the company as we get closer to the EU mandated hydrogen targets. Securing a long term offtake for the hydrogen would further enhance the prospects of gaining financing at the project level.

As this is the first project the company is undertaking, we have limited the project gearing to 70%. We have not included any available subsidies or grants nor sales from the use of carbon credits and see any developments in this area as being potentially accretive to project economics. For the remaining financing we expect that Provaris will have to issue further equity and have modelled that based on the current share price of A$0.06 noting that any equity raise would likely be done at a discount, somewhat offsetting the likely share price rises as the first project comes closer to fruition and is accordingly de-risked. We see this as being done at moments of significant progress in order to meet the requirements of certain liquidity events such as the purchase of the vessels and electrolysers as the Norway project develops.

VALUATION

Green hydrogen companies are still in their relative infancy in equity markets and a number of the relevant peer group are still pre-revenue or not directly comparable. As such a number of valuation metrics are unsuitable for the purposes of valuation. Accordingly, we have performed our valuation using a well-constructed DCF model for the currently announced project and potential future projects.

We have used a weighted average cost of capital of 10.0%. This is based on the high end of the most recent UK's Competition and Markets Authority assessment on cost of capital. We see this as one of the best contemporary estimates based on thorough work that if required must be able to stand the scrutiny of a judicial review. This gives a real risk-free rate of -1.0% which with a 2.5% inflation assumption gives 1.5% nominal. The market premium is 8.5% based on historical ex-post market returns going back to 1900. We have used a beta of 1.0 based on the average beta from the comparator group. With assumed debt this gives us a WACC of 10.0%.

Weighted Average Cost of Capital

Risk free rate	1.5%
Market premium	8.5%
Loan margin	5.0%
Marginal tax rate	22.0%
After tax cost of debt	5.1%
Debt/total capital	-70.3%
Beta	1.0
Cost of equity	10.0%
Weighted cost of capital	10.0%

Source: Longspur Research, CMA

We have forecast cashflows to 2040 based the long project life and the significant upfront capex to be incurred. We then calculate a terminal value in 2040 based on Gordon's growth model and assuming that long-term cashflows are flat in real terms. The terminal EV/EBITDA on this basis is 9.7x which we do not see as onerous. Modelling has been done in USD and we have used the long term historic average for the US/AU dollar rate for conversion.

DCF Valuation – Central Case

AS$'000	**2023e**	**2024e**	**2025e**	**2026e**	**2027e**	**2028e**	**2029e**
Operating cashflow	-4,418	-4,529	-4,642	-4,758	32,956	120,690	271,976
Associates	0	0	0	0	0	0	0
Tax paid	0	0	0	0	0	0	0
Interest tax shield	0	0	0	0	0	0	0
Capex	0	0	-298,660	-470,121	-635,231	0	0
Free cashflow	-4,418	-4,529	-303,302	-474,879	-602,240	130,979	-4,418
Terminal growth	1.0%						
Terminal valuation	3,762,184						
Terminal EV/EBITDA	9.7						
Implied EV	443,063						
Implied market cap.	978,581						
Implied share price	**0.15**						

Source: Longspur Research, forecasts go out to 2040

This gives a base case valuation of A$0.15 per share.

SCENARIOS

One of the key identified risks to for Provaris is the delays to projects and we have modelled this in our low case scenario. We have pushed the Norway project timeline 2 years rightwards and only included one of the identified projects in this case which gives an implied share price of A$0.097. This is a moderate increase on the current price and shows that there is still upside in this scenario which given the complexity of the project and the capital requirements is possible.

In our high case model, we have included an Asian delivery from the Tiwi Islands project using the newer and larger H2Max vessel and travelling a distance of 2000 nautical miles, delivering 100tpa of H2, with Provaris again having a 50% partner in the project. We see the project delivering significant returns for Provaris if the company can secure the funding required on attractive terms. In our upside case we see A$0.28 per share.

DCF Scenarios (A$/share)

Case	**Scenario**	**Valuation (A$/share)**
Low	Delayed Norway Project	0.097
Central	2 Norway Projects	0.15
High	Norway Projects and Tiwi	0.28

Source: Longspur Research

Comparative multiples are fairly meaningless as the green hydrogen industry continues to develop and due to the niche offering Provaris offers within the hydrogen ecosystem. We have included multiples from hydrogen project developers, downstream operators and LNG shipping companies below all of which could have reasonable parallels drawn with parts of the Provaris business.

Comparative Multiples

	Market Cap (AU$)	EV/EBITDA current	EV/EBITDA prospective	EV/Sales current	EV/Sales prospective
Provaris Energy	37,351,078	-	-	-	-
Grenergy Renovables	388,506,416	26.26	9.25	-	3.62
Hydrogene de France	415,178,819	-	27.99	44.14	3.76
Linde Plc	283,315,913,573	19.98	15.63	5.91	5.44
Hydrogen Refuelling Systems	525,295,453	-	63.25	13.55	6.51
Atome	68,857,385	-	-	-	50.22
Everfuel	189,838,884	-	-	33.43	2.20
Gaztransport	6,653,599,409	20.87	10.11	11.03	6.17
Golar LNG	3,825,300,344	10.72	7.76	11.88	6.30
	37,351,078				
Mean	36,922,811,285	19.46	22.33	19.99	10.53
Median	470,237,136	20.43	12.87	12.72	5.81
Max	283,315,913,573	26.26	63.25	44.14	50.22
Min	68,857,385	10.72	7.76	5.91	2.20

Source: Bloomberg

RISK

We see the main risks to our valuation as failure to reach project financial close, project delays, failure to achieve vessel type rating and broad hydrogen demand. Mitigation includes strong partnerships, project diversification, strong design and targeted market opportunities.

Failure to reach project financial close

Provaris will need to engage with development and funding partners. While those have been identified and some agreements are now in place, financial close is not guaranteed.

Timing uncertain and delays possible

Related to this is a more general timing risk with project delays always possible. On the whole we think this is entirely a timing issue rather than one of whole project viability.

Failure to achieve vessel type rating

Provaris has achieved design approval from ABS which will allow shipyards to submit vessel quotes. However, vessels will still be required to gain type rating and this is not guaranteed. We cannot see any particular issues in this but until gained it remains a risk factor.

Hydrogen market demand

There have been a lot of questions asked about how much real demand there is for hydrogen and some previously assumed use cases have been seen to be inefficient. However, there are still very sizeable markets in areas where there is no doubt that green hydrogen will be a solution. These include the decarbonisation of grey hydrogen production from fossil fuels and increasing demand for hydrogen derived fuels. As a result, we think demand risk is overstated.

MANAGEMENT

BOARD & KEY MANAGEMENT

Greg Martin: Independent Non-Executive Chairman

Greg has over 40 years of experience in the mining, utilities, financial services, energy, and energy-related infrastructure sectors. He has held several high-level positions, including Managing Director and CEO of The Australian Gas Light Company (AGL) and Chief Executive at Challenger Financial Services Group. He currently serves as Chairman of multiple organizations, including Mawson Infrastructure Group Inc., Sierra Rutile Holdings Limited, and Hunter Water Corporation.

Martin Carolan: Managing Director and CEO

Martin joined the company in 2019 as an Executive Director and Chief Financial Officer before assuming his current role in June 2021. Martin has been involved with Provaris since its inception in 2017 as a major shareholder and advisor to the previous Board, bringing extensive capital markets and corporate strategy experience from his 15 years in the Australian capital markets. He holds a Bachelor of Business in Banking and Finance and a Graduate Diploma in Applied Finance.

Garry Triglavcanin: Executive Director and Chief Development Officer

Garry has over 25 years of experience in the international energy industry, with expertise in project development, negotiation, and delivery. Garry has held senior roles at Liquefied Natural Gas Limited and Woodside Petroleum, where he worked on various projects. He holds a Bachelor of Engineering in Mechanical and a Master of Business Administration.

Andrew Pickering: Non-Executive Director

Andrew has 40 years of experience in shipping and logistics. Andrew had a distinguished career with Stolt-Nielsen Limited and was the founding CEO of Avenir LNG Limited. He has extensive experience in providing transportation, storage, and distribution solutions for chemicals and bulk-liquid products. Andrew holds various directorships and brings significant expertise in global energy supply businesses and LNG solutions.

David Palmer: Non-Executive Director

David is an Independent, Non-Executive Director of Provaris Energy Ltd. He holds a Masters Degree in Economics from the University of Cambridge and an Executive MBA from Harvard Business School. With 45 years of experience in the shipping industry, David has held senior positions at John Swire and Sons, Stolt-Nielsen Inc., and other prominent organizations. He brings expertise in shipping, capital markets, corporate strategy, M&A, and management to the company.

Per Roed: Chief Technical Officer

Per has more than 20 years' experience in the global shipping and maritime infrastructure industries, including senior roles in AP Moller Maersk (Head of Newbuildings), BMT Asia Pacific (Managing Director) and Stolt Nielsen (Global Manager, Newbuilding & Technical). Prior to joining Provaris in 2022, he was a key contributor in the establishment of Avenir LNG (a joint venture between Stolt, Golar, and Hoegh) where he held the role of Chief Technical Officer. He has extensive newbuild experience, having been in change of newbuild projects totalling billions of USD with AP Moller and Stolt, including complex tanker and gas projects. Similarly, he has managed large scale maritime infrastructure / port projects (including liquid bulk and LNG) through this tenure with BMT.

FINANCIAL MODEL

Profit and Loss Account

AU$,000, Dec	2022a	2023e	2024e	2025e	2026e	2027e
Turnover						
Project income	367	0	0	0	0	107,268
Central costs and fees	0	0	0	0	0	0
Other	0	0	0	0	0	0
Other	0	0	0	0	0	0
Total	367	0	0	0	0	107,268
Operating profit						
Project income	367	0	0	0	0	29,950
Central costs and fees	-7,125	-4,437	-4,548	-4,662	-4,779	-2,000
Other	0	0	0	0	0	0
Other	0	0	0	0	0	0
Operating profit	-6,758	-4,437	-4,548	-4,662	-4,779	-2,000
P&L Account	**2022a**	**2023e**	**2024e**	**2025e**	**2026e**	**2027e**
Turnover	367	0	0	0	0	107,268
Operating Profit	-6,758	-4,437	-4,548	-4,662	-4,779	27,950
Investment income	0	0	0	0	0	0
Net Interest	0	0	0	0	-23,843	-47,440
Pre Tax Profit (UKSIP)	-6,758	-4,437	-4,548	-4,662	-28,621	-19,489
Goodwill amortisation	0	0	0	0	0	0
Exceptional Items	0	0	0	0	0	0
Pre Tax Profit (IFRS)	-6,758	-4,437	-4,548	-4,662	-28,621	-19,489
Tax	0	0	0	0	0	0
Post tax exceptionals	0	0	0	0	0	0
Minorities	0	0	0	0	11,921	8,745
Net Profit	-6,758	-4,437	-4,548	-4,662	-16,700	-10,745
Dividend	0	0	0	0	0	0
Retained	-6,758	-4,437	-4,548	-4,662	-16,700	-10,745
EBITDA	-6,342	-4,437	-4,548	-4,662	-4,779	32,992
EPS (p) (UKSIP)	-13	-9	0	-1	-1	0
EPS (p) (IFRS)	-13	-9	0	-1	-1	0
FCFPS (p)	-9	-9	0	-38	-24	-17
Dividend (p)	0	0	0	0	0	0

Source: Company data, Longspur Research estimates

KEY POINTS

- Grant income drops off in 2022 and then first revenues from the first Norwegian project in 2027
- This then builds beyond the forecast period presented above
- Administration expenses normalise after high share based payments in the FY22

Balance Sheet

AU$,000, Dec	2022a	2023e	2024e	2025e	2026e	2027e
Fixed Asset Cost	1	2,501	2,501	301,161	771,282	1,406,514
Fixed Asset Depreciation	0	0	0	0	0	-5,041
Net Fixed Assets	1	2,501	2,501	301,161	771,282	1,401,472
Goodwill	0	0	0	0	0	0
Other intangibles	5,386	5,386	5,386	5,386	5,386	5,386
Investments	0	0	0	0	0	0
Stock	0	0	0	0	0	0
Trade Debtors	0	0	0	0	0	26,450
Other Debtors	343	343	343	343	343	343
Trade Creditors	-771	-791	-811	-831	-852	-27,301
Other Creditors <1yr	0	0	0	0	0	0
Creditors >1yr	0	0	0	0	0	0
Provisions	-62	-62	-62	-62	-62	-62
Pension	0	0	0	0	0	0
Capital Employed	4,897	7,378	7,358	305,998	776,098	1,406,288
Cash etc	11,617	4,699	10,170	5,528	-24,740	-64,540
Borrowing <1yr	0	0	0	0	0	0
Borrowing >1yr	0	0	0	209,062	524,558	935,123
Net Borrowing	-11,617	-4,699	-10,170	203,534	549,298	999,663
Share Capital	85,812	85,812	252,479	999,129	2,174,431	3,762,510
Share Premium	0	0	-156,667	-858,518	-1,963,302	-3,456,096
Retained Earnings	-73,019	-77,456	-82,005	-86,667	-91,445	-93,445
Other	3,721	3,721	3,721	3,721	3,721	3,721
Minority interest	0	0	0	44,799	103,396	189,936
Capital Employed	4,897	7,378	7,358	305,998	776,098	1,406,288
Net Assets	16,514	12,076	17,528	102,464	226,800	406,625
Total Equity	16,514	12,076	17,528	102,464	226,800	406,625

Source: Company data, Longspur Research estimates

KEY POINTS

- We have assumed capex commences in FY25 with spend on electrolysers and part payments on vessels however this can be brought leftwards into 2024 to arrange long lead items
- This has a corresponding rise in net debt and equity with the associated funding required for the capex

Cashflow

AU$,000, Dec	2022a	2023e	2024e	2025e	2026e	2027e
Operating profit	-6,758	-4,437	-4,548	-4,662	-4,779	27,950
Depreciation	416	0	0	0	0	5,041
Provisions	0	0	0	0	0	0
Other	1,159	0	0	0	0	0
Working capital	376	19	20	20	21	0
Operating cash flow	-4,807	-4,418	-4,529	-4,642	-4,758	32,992
Tax paid	0	0	0	0	0	0
Capex (less disposals)	0	0	0	-298,660	-470,121	-635,231
Investments	0	0	0	0	0	0
Net interest	0	0	0	0	-11,921	-38,695
Net dividends	0	0	0	0	0	0
Residual cash flow	-4,807	-4,418	-4,529	-303,302	-486,800	-640,935
Equity issued	9,823	0	10,000	44,799	70,518	95,285
Change in net borrowing	0	6,918	-5,471	213,704	345,764	450,365
Adjustments	38	0	0	0	0	0
Total financing	9,861	6,918	4,529	258,503	416,282	545,650

Source: Company data, Longspur Research estimates

KEY POINTS

- Cash outflows for project and administration costs until FY26 when capex commences
- Assumed raises in FY25, FY26 and FY27 assuming there is no farmout of projects and a portion of these are equity funded

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