

# Provaris Energy

Quarterly update

## Q3 activity update highlights key milestones

The Q322 update from Provaris neatly summaries not only the significant progress made in the period, but highlights further progress already made in the early weeks of Q4 and other key announcements that are likely to be forthcoming before year-end, including the potential Approval for Construction of the novel H2Neo compressed hydrogen carrier that would make Provaris Energy the genuine first mover in the space. Agreements leading to first offtake for Tiwi H2 or contracts for long-term shipping services could come as early as next year and would be a real game-changer, affirming management's confidence in the credibility of its compressed hydrogen solution.

Year end	Revenue (£m)	PBT* (£m)	EPS* (p)	DPS (p)	P/E (x)	Yield (%)
06/21	0.2	(3.1)	(0.7)	0.0	N/A	N/A
06/22	0.4	(6.8)	(1.3)	0.0	N/A	N/A
06/23e	0.3	(9.7)	(1.7)	0.0	N/A	N/A
06/24e	0.3	(10.2)	(1.6)	0.0	N/A	N/A

Note: \*PBT and EPS are normalised, excluding amortisation of acquired intangibles, exceptional items and share-based payments.

## Several key steps achieved in last quarter

In Q322, Provaris Energy completed its Tiwi H2 Concept Design Study, which is important because it establishes a clear pathway for the project to proceed to technical, commercial and economic studies. It also entered a memorandum of understanding (MOU) with Total Eren to co-operate on the commercialisation of a compressed H2 supply chain, with projects already identified from Total Eren's portfolio of development projects targeting import demand from Europe and Asia.

## Expect significant steps in Q4 and beyond

Already in the current quarter Provaris has carried out a joint marketing exercise with Total Eren and has already announced key appointments for an early works programme at Tiwi H2 to advance detailed design and environmental approvals. We anticipate the key de-risking shipping milestone of Class Approval for Construction shortly. Looking out further, the next key milestone would be the signing of agreements to show progress towards offtake and/or shipping contracts, which is likely to be achieved in 2023.

## Valuation: Achievements to date confirm confidence

The key achievements in Q3 and the next key milestones expected in Q4 and into 2023 (the potential signing of an offtake agreement) give us confidence in the commercial viability of Provaris's ambitious projects. Our modelling, which produced internal rates of return (IRR) of 9.7–18.7% from a range of scenarios and vessel sizes, remains robust. Our assumptions remain relevant and are unchanged. Successful offtake discussions would be an opportunity to revisit our IRR assumptions and are likely, in our opinion, given the exponential growth in demand for green hydrogen forecast by the International Energy Agency.

## Industrial support services

28 November 2022

**Price** **A\$0.06**

**Market cap** **A\$32m**

A\$1.5/US\$

Net cash (A\$m) at 30 June 2022 11.6

Shares in issue 548.3m

Free float 100%

Code PV1

Primary exchange ASX

Secondary exchange FRA

## Share price performance



% 1m 3m 12m

Abs (7.3) (33.8) (55.7)

Rel (local) (12.9) (35.2) (53.9)

52-week high/low A\$0.12 A\$0.04

## Business description

Provaris Energy is becoming a vertically integrated green hydrogen producer and supplier, combining production and compressed hydrogen shipping solutions for transporting energy from Australia to regional markets in South-East Asia and Europe.

## Next events

Interim results February 2023

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## Quarterly update on activities

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Provaris Energy made significant progress during the September quarter, including reaching several key milestones at its Tiwi H2 project in the Northern Territory, its HyEnergy export study in Western Australia, and the MOU signed with Total Eren. Already in the December quarter it has completed a marketing initiative in South-East Asia. It has also received advice that an Environmental Impact Statement (EIS) process is required for submission in 2023 for project approvals mid-2024, with planning and early works now underway. Furthermore, it is hoping to receive Class Approval for Construction on its novel H2Neo compressed H<sub>2</sub> vessel. Looking out further, the next key milestone would be the signing of agreements to show progress towards offtake and/or shipping contracts which is likely to be achieved in 2023.

### Tiwi H2 project milestones reached in September quarter

In the July to September 2022 quarter, Provaris Energy completed its Tiwi H2 concept design study. This is important because the study established a clear pathway for the project to proceed to pre-FEED (front-end engineering and design) and FEED level technical, commercial and economic studies, which then allow for the consideration of potential project funding options. The study also confirmed several observations and outcomes first published in Provaris Energy's 2021 [compressed hydrogen chain scoping study](#).

The highlights of the study are important and include:

- Confirmation that the Tiwi H2 project is **technically feasible** for an integrated compressed hydrogen production and export project.
- First hydrogen production, compression and export loads **targeted for 2027**, and with an assumed 30-year life.
- **Total capital costs** are estimated to be in the range of US\$4.5bn to US\$5.2bn, with c 70% of the total cost being non-compression related, ie green power generation and transmission related.
- The presence of an **existing deep water port** and access to land that was historically cleared of native vegetation, which will save development time and capital.
- Confirmation that the solar intensity of the **Tiwi Islands is competitive** to produce green hydrogen and that compression is 'load following' which minimises the need for additional battery and hydrogen storage.
- **Compression requires** only 1.0kWh per kg, which amounts to a **2% loss** of hydrogen. The compression facilities require less than two hectares of land.
- **Desalination** requires less than 1% of the capital and operating expenditure and accounts for a 0.2% loss of hydrogen for export.
- **Market proximity benefits** for the delivered cost to South-East Asian energy markets.
- Material social and economic **benefits for the Munupi landowners** and the broader Northern Territory economy with the generation of c 500 construction jobs and c 100 operational roles.
- At capacity, the 100,000 tonnes pa of green hydrogen could **offset up to 1m tonnes** pa of CO<sub>2</sub> emissions from energy intensive industries.
- The project has **strong ESG credentials** for green project financing and government funding as it aligns with both Northern Territory and Federal Government targets for export projects, including the Clean Energy Financing Corporation, the Australian Renewable Energy Agency and the Northern Australian Infrastructure Facility.

Subsequent to the end of the September quarter, the Northern Territory EPA advised the Tiwi H2 project that it will require an EIS with respect to the environmental assessment process. The scope of the EIS will be the subject of a terms of reference (ToR), with a draft of the ToR scheduled for Q1 2023. This will require a reset of the Tiwi H2 development schedule. Provaris anticipates announcing an update on the schedule once the final ToR for the EIS is issued by the Northern Territory EPA.

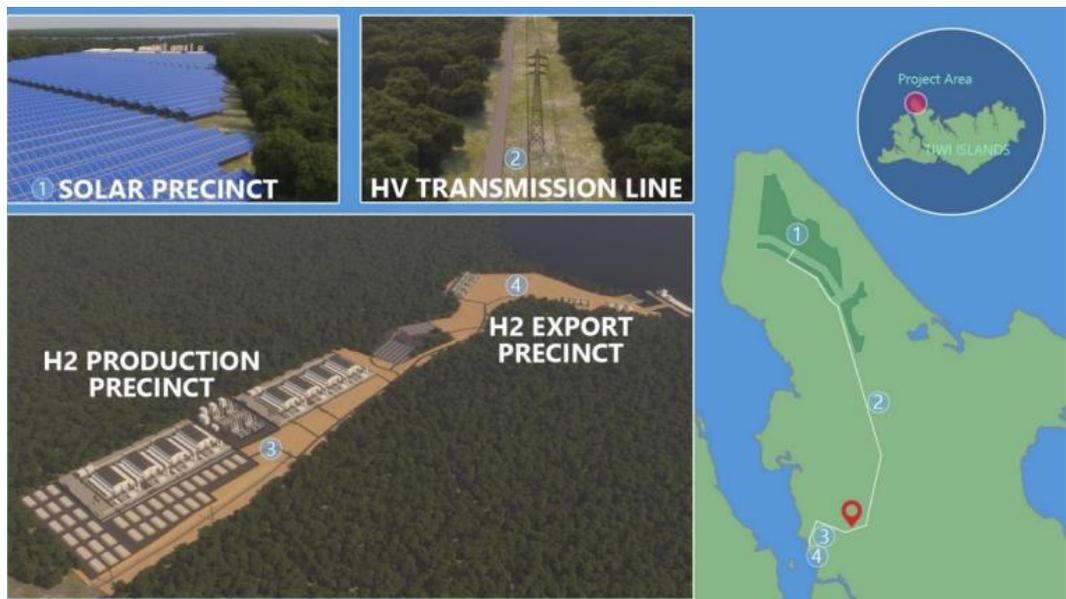
Also, in November Provaris appointed CE Partners as Owner’s engineers covering a number of aspects of the project for the renewable energy generation assets on Melville Island. These assets include the solar farm, battery energy storage system, substations and the transmission line connecting the Solar Precinct, to the H2 Production Precinct. CE Partners’ remit is to complete a 30% design-level package by the end of 2023 with a view to seeking construction proposals and then the selection of an engineering, procurement and construction contractor in early 2024, and also the procurement of operation and maintenance quotations

This is important because it paves the way for Provaris to demonstrate the viability and value of the project at the Financial Investment Decision stage when Provaris is likely to be considering selling a stake in the project to institutional financial investors. This assumes offtake, land access and permits are in place, and then subject to funding.

## Future Tiwi H2 milestones for December '22, March and beyond

First exports of green hydrogen from the Tiwi H2 project remain scheduled for 2027. In the meantime, preparation continues on the schedule of activities and timing for a decision to proceed to pre-FEED level studies which can now be aligned with scope of the draft ToR scheduled for Q1 2023, mentioned above. The overall schedule will be aligned with further permissions and consultation on commercial terms with the Munupi Clan on Melville Island.

**Exhibit 1: Visual overview of the Tiwi H2 project**



Source: Provaris Energy

Key activities for the Tiwi H2 project over the next two quarters include:

- **Ongoing consultation** with key stakeholders including key findings and the level of environmental impact to the Munupi Clan, and the Tiwi Land Council, as well as the Northern Territory and Federal Government agencies.
- **Engineering surveys and studies** will be undertaken in line with permissions already granted to Provaris.

- Prepare and commence **solar monitoring** at two locations for a 12-month period. Munupi Clan permission has been granted, to be followed by monitoring agreements with the Tiwi Plantation Corporation to be concluded in Q422.
- Receipt of the draft **ToR** for the EIS from the Northern Territory EPA, also in Q123.
- **Receipt of the outcome from the EPBC (Environmental Protection and Biodiversity Act) Referral** lodgement with the Australian Federal Government's Department of Climate Change, Energy, the Environment and Water.
- **Appointment of lead consultants to commence detailed designs across the solar and H2 production precincts** to support first H<sub>2</sub> production and exports in 2027.
- Ongoing discussions with strategic partners regarding **offtake, investment, development and future ownership** structures of the project.

**Exhibit 2: Tiwi H2 project; timeline of key work streams**



Source: Provaris Energy

## HyEnergy export study, Western Australia

In August 2021, Provaris entered into a non-binding MOU with Province Resources (ASX: PRL) and global renewable company Total Eren (together the HyEnergy Project partners) to support a technical and commercial feasibility study on exporting green hydrogen using compressed shipping from the 8GW HyEnergy Project located in the Gascoyne region, Western Australia, to nominated markets in the Asia-Pacific region.

The feasibility study is focused on a proposed phase one capacity of renewable energy generation for the export of 200,000tpa of compressed H<sub>2</sub> (out of a total of 550,000tpa). The study has received funding as part of the Western Australian Renewable Hydrogen Fund (Round 2). A link to our note discussing the project is [here](#).

In the September quarter, Milestones 3 and 4 were completed and Provaris submitted the outstanding Milestone 5 reports to the Western Australian government as part of the Western Australian Renewable Hydrogen Fund grant.

Provaris Energy has progressed with a number of workstreams, including shipping cycle time analysis, the design of shore-crossing and sub-sea pipelines to offshore mooring facilities, as well as a review of port infrastructure options in Singapore (see images below), the design of unloading terminal concepts and final commercial modelling. Final deliverables are now under review and awaiting completion. These include the Final Study Report and a public Knowledge Sharing Report, which will be made available publicly.

**Exhibit 3: Concept for unloading jetty; Singapore 1**



Source: Provaris Energy

**Exhibit 4: Concept for unloading jetty; Singapore 2**



Source: Provaris Energy

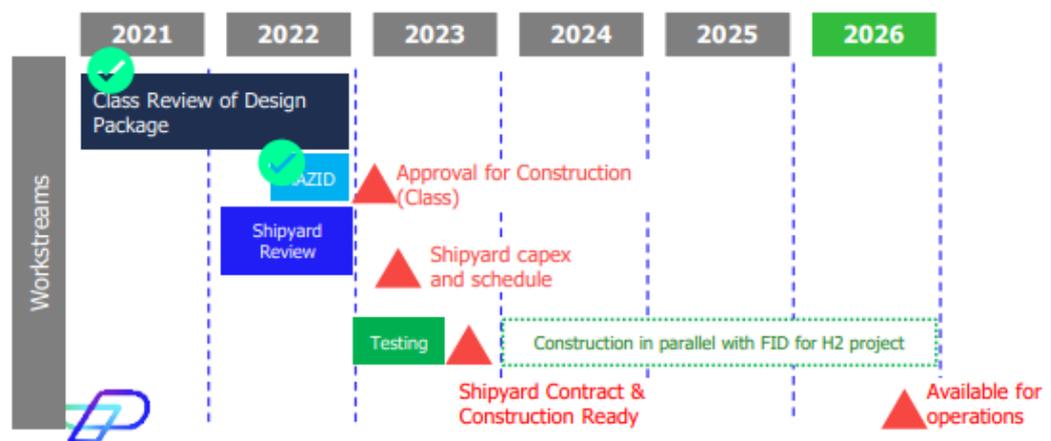
## H2Neo Design Approval for Construction due in December

The detailed Contract Design Package (CDP) for H2Neo, which was 90% complete at the end of the June quarter, has now been finalised and submitted to the American Bureau of Shipping (ABS) for final review. This includes cargo piping and instrumentation design which has been tested in various cargo loading and discharge simulations including assessments in conjunction with the process engineering team of a potential European receiving terminal.

The piping design was subjected to a gas dispersion, fire and explosion study by ABS Consulting, which verified the safety of the design and identified some operational procedures that will be included in the safety management system for green hydrogen (GH<sub>2</sub>) carriers. ABS Class also facilitated a second HAZID (hazard identification) workshop attended by ABS experts, plus representatives from Provaris, the ship designer Capilano, ship manager Northern Marine and the consultants designing the cargo containment and handling system.

ABS is now progressing a final FEED level review covering all of the studies mentioned above and has confirmed that it expects to issue a Design Approval for Construction letter in early December, thus significantly de-risking the project and making compressed H<sub>2</sub> an accepted transportation solution.

**Exhibit 5: Key development timeline (H2Neo)**



Source: Provaris Energy

In the September quarter, energy safety consultancy C-FER Technologies completed a report confirming the application of strain gauges to monitor the integrity of the cargo tanks and is also progressing small-scale testing of cargo welds and tests of the stainless steel liner material. Future tests will be conducted in a high-pressure hydrogen environment.

Finally, an Asian shipbuilder continues to review the CDP while confirming its interest in constructing the H2Neo. The shipbuilder is also in discussions with local steel mills to source compliant steel plate and other equipment suppliers.

## Business development activity in Asia and Europe

Provaris Energy continues to promote compressed GH2 as a mid-stream solution. In October, Provaris executed a joint marketing roadshow with Total Eren in Asia while also hosting its own marketing events in November. These initiatives are increasing the awareness of compressed H<sub>2</sub> as a solution and raising the probability of the signing of agreements leading to the firm offtake of volume, which would be a major milestone for Provaris. It is thought that the first offtake market for Tiwi H<sub>2</sub> is likely to come from an industrial user in Singapore, probably in 2023.

In Europe, Provaris is focusing on projects in Norway, a country that hosts nearly 50% of the European Economic Area's hydropower reservoir capacity. Provaris hopes to take advantage of this low-cost reliable energy source for H<sub>2</sub> production for export to key importation terminals in Germany and the Netherlands, supported by the Norwegian government, which is seeking solutions for hydrogen production, local consumption and exports of clean energy. The location of Norway in relation to potential European Union markets lies in the 'sweet spot' for Provaris. H<sub>2</sub> exports fed into mainland terminals would support the EU's dedicated [European Hydrogen Backbone](#) project. The appointment of Herman Hildan as a strategic advisor to fast-track opportunities in Norway and across Europe is expected to accelerate such opportunities.

## Co-operation MOU signed with Total Eren

In September, Provaris announced an MOU with Total Eren, a leading France-based renewable energy independent power producer (IPP), to further its co-operation on the development of green hydrogen projects in Asia and Europe where the application of Provaris's compressed H<sub>2</sub> storage and transport supply chain can be applied.

The MOU was the culmination of almost 12 months of technical and commercial analysis of Provaris's compressed H<sub>2</sub> carrier supply chain, and includes opportunities already identified to be assessed by Total Eren and Provaris for the feasibility of importing hydrogen into Europe and Asia using Provaris Energy's compressed hydrogen supply chain.

The agreement includes the development of solutions that will meet the requirements of offtakers, port authorities, shipyards and ship operators. Total Eren is developing a global portfolio of green H<sub>2</sub> projects in countries including Chile, Morocco, Australia and Tunisia, with a focus on the H<sub>2</sub> markets of Europe, Japan, Korea and Singapore. The agreement provides Provaris with a key partner to facilitate and accelerate the delivery of the first fleet of Provaris's H2Neo GH2 carriers, including investigation of a future financing scheme. It is also inclusive of a study underway with a port operator in Europe comprising the techno-economic analysis and preliminary engineering of a dedicated compressed H<sub>2</sub> terminal which would connect to Europe's dedicated H<sub>2</sub> backbone and salt caverns for storage.

A link to our initial comment relating to the MOU signed with Total Eren is [here](#).

Exhibit 6: Summary of Provaris Energy’s existing projects and areas of potential expansion



Source: Provaris Energy

**Exhibit 6: Financial summary**

	A\$m	2020	2021	2022	2023e	2024e
June year end		IFRS	IFRS	IFRS	IFRS	IFRS
<b>INCOME STATEMENT</b>						
Revenue		1.5	0.2	0.4	0.3	0.3
Profit Before Tax (norm)		(2.9)	(3.1)	(6.8)	(9.7)	(10.2)
Profit Before Tax (reported)		(2.9)	(3.1)	(6.8)	(9.7)	(10.2)
Reported tax		0.0	0.0	0.0	0.0	0.0
Profit After Tax (norm)		(2.9)	(3.1)	(6.8)	(9.7)	(10.2)
Profit After Tax (reported)		(2.9)	(3.1)	(6.8)	(9.7)	(10.2)
Minority interests		0.0	0.0	0.0	0.0	0.0
Net income (normalised)		(2.9)	(3.1)	(6.8)	(9.7)	(10.2)
Net income (reported)		(2.9)	(3.1)	(6.8)	(9.7)	(10.2)
Basic average number of shares outstanding (m)		393.5	417.3	512.9	579.5	648
EPS - normalised (c)		(0.7)	(0.7)	(1.3)	(1.7)	(1.57)
Revenue growth (%)		34.9	(84.0)	53.4	(29.2)	0.0
<b>BALANCE SHEET</b>						
Fixed Assets		6.3	5.8	5.4	5.0	4.6
Intangible Assets		6.2	5.8	5.4	5.0	4.6
Tangible Assets		0.1	0.0	0.0	0.0	0.0
Investments & other		0.0	0.0	0.0	0.0	0.0
Current Assets		3.2	6.7	12.0	8.1	5.6
Stocks		0.0	0.0	0.0	0.0	0.0
Debtors		0.1	0.1	0.3	0.3	0.3
Cash & cash equivalents		3.1	6.6	11.6	7.7	5.3
Other		0.0	0.0	0.0	0.0	0.0
Current Liabilities		(0.3)	(0.2)	(0.8)	(0.8)	(0.8)
Creditors		(0.2)	(0.2)	(0.8)	(0.8)	(0.8)
Other		(0.1)	(0.0)	(0.1)	(0.1)	(0.1)
Long Term Liabilities		0.0	0.0	0.0	0.0	0.0
Long term borrowings		0.0	0.0	0.0	0.0	0.0
Other long term liabilities		0.0	0.0	0.0	0.0	0.0
Net Assets		9.2	12.3	16.5	12.2	9.4
Minority interests		0.0	0.0	0.0	0.0	0.0
Shareholders' equity		9.2	12.3	16.5	12.2	9.4
<b>CASH FLOW</b>						
Op Cash Flow before WC and tax		0.0	0.0	0.0	0.0	0.0
Receipts from the ATO (Covid-19 cash boost)		0.1	0.1	0.0	0.0	0.0
Payments to suppliers and employees		(2.9)	(2.3)	(3.1)	(3.5)	(3.8)
Research and development		(0.1)	(0.0)	0.0	(3.0)	(3.0)
Project development		(1.0)	(0.5)	(1.9)	(2.5)	(2.8)
Interest received		0.0	0.0	0.0	0.0	0.0
Interest paid for lease liabilities		(0.0)	(0.0)	0.0	(0.0)	1.0
Research and development tax concession rebate		1.4	0.2	0.0	0.0	0.0
WA Renewable Hydrogen Fund grant		0.0	0.0	0.1	0.3	0.3
Working capital		0.0	0.0	0.0	0.0	0.0
Tax		0.0	0.0	0.0	0.0	0.0
Net operating cash flow		(2.5)	(2.6)	(4.8)	(8.8)	(8.3)
Capex		0.0	0.0	0.0	0.0	0.0
Acquisitions/disposals		0.0	0.0	0.0	0.0	0.0
Equity financing		3.5	6.3	10.5	5.0	6.0
Dividends		0.0	0.0	0.0	0.0	0.0
Other		(0.3)	(0.3)	(0.7)	(0.2)	(0.2)
Net Cash Flow		0.7	3.4	5.1	(3.9)	(2.4)
Opening net debt/(cash)		(2.4)	(3.1)	(6.6)	(11.6)	(7.7)
FX		0.0	0.0	0.0	0.0	0.0
Other non-cash movements		0.0	0.0	0.0	0.0	0.0
Closing net debt/(cash)		(3.1)	(6.6)	(11.6)	(7.7)	(5.3)

Source: Company accounts, Edison Investment Research

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