

ASX Announcement – 3 July 2023

## Hexagon Completes Pre-Feasibility Study for WAH<sub>2</sub> Project

Hexagon Energy Materials Limited (ASX: HXG) (“Hexagon” or the “Company”) is pleased to present the results of the Pre-Feasibility Study (“PFS”) for its 100% owned WAH<sub>2</sub> low-emissions ammonia project (“WAH<sub>2</sub>” or the “Project”), to be located in the Western Australian Maitland Strategic Industrial Area.

### Highlights:

- Pre-Feasibility Study completed on time and budget.
- Class 4 engineering and cost estimation undertaken by Petrofac, a leading energy services company.
- Positive results support commitment to Pre-Front End Engineering Design (“Pre-FEED”), which is scheduled to start mid-2023.
- PFS analysis indicates significant project scale, with Phase 1 based on 600 kTPA production capacity, doubling to 1200 kTPA once Phase 2 operational.
- PFS cost of supply<sup>1</sup> considered competitive at US\$552 /T ammonia (NH<sub>3</sub>). Targeting reduction to less than US\$500 /T NH<sub>3</sub> prior to entering FEED based on opportunities already identified.
- Base Case Phase 1 project NPV<sub>8</sub> of A\$248 M at an ammonia price of US\$552 /T, robust to most downside outcomes.
- Expected emissions intensity of 1.1 kg CO<sub>2</sub>e /kg H<sub>2</sub>e is better than international benchmarks, with opportunities for further improvement identified.
- Use of proven technology and leveraging existing infrastructure has shortened expected schedule and reduced project risk and costs.
- The Company will seek to advance its Project Financing Plan which will include a mixture of debt, equity and government incentives in parallel with the technical workstream and ongoing commercial discussions.

### Prefeasibility Study Outcomes

The completed PFS demonstrates the technical and financial feasibility of the WAH<sub>2</sub> project and supports Hexagon’s commitment to pre-FEED analysis with the aim of supplying low-emissions ammonia to its target, electrical co-generation, market in Asia.

Countries such as Japan and South Korea have mandated emissions control standards for the power generation industry that can be met in part by co-firing low-emissions ammonia in currently coal-fired power stations (with the proportion of ammonia consumed increasing over

<sup>1</sup> The ammonia price that delivers the project a 10% real rate of return; free on board Dampier

time). In recognition of this, Japan and South Korea are each seeking to establish secure supply chains for low-emissions ammonia.

The PFS has been completed with engineering and cost estimation undertaken by Petrofac in parallel to Hexagon's commercial discussions with potential gas suppliers, CCS<sup>2</sup> service providers, utility providers and ammonia customers.

The PFS Base Case is an 'islanded project' that builds, owns and operates dedicated facilities for the supply of utilities, production of ammonia and production export. This provides for a project that is, as far as practicable, independent of others and therefore offers Hexagon a high degree of control. It also facilitates the evaluation of potential benefits of third-party provision of services and shared infrastructure.

The Base Case Phase 1 development is estimated by the PFS to have a capital cost of A\$1620 million (AACE Class 4) based on the following parameters:

- 600 kTPA of potential NH<sub>3</sub> production capacity with an emissions intensity of 1.1kg CO<sub>2</sub>e/kg H<sub>2</sub>e, bettering international low-emissions benchmarks;
- A levelised cost of supply<sup>3</sup> of US\$552 /T NH<sub>3</sub> which is considered competitive;
- At this ammonia price the project would deliver NPV<sub>8</sub> of A\$248 M and is robust to most downside outcomes.

The Base Case Phase 2 development PFS analysis has been completed based on an assumed doubling of production capacity and makes use of some existing infrastructure. At an ammonia price of US\$552 /T, the combined Phase 1 and Phase 2 development would be expected to deliver an NPV<sub>8</sub> of A\$486 M at an IRR of 10.5%.

Hexagon is aiming to achieve a levelised cost of supply of less than US\$500 /T NH<sub>3</sub> prior to entering FEED based on significant opportunities that have already been identified. These relate to plant optimisation, shared infrastructure, third-party provision of services, accessing the value of Australian Carbon Credit Units, and Government funding and incentives.

Hexagon Chairman Charles Whitfield commented:

*"The positive outcome of the WAH<sub>2</sub> Pre-Feasibility Study shows a significant opportunity to be a low-cost operation with an attractive NPV and IRR. This is another step in the path to bring the WAH<sub>2</sub> project to fruition. This follows the grant of land for the project by DevelopmentWA last month. We intend to move immediately to progress the Front-End Engineering Design, offtake, financing, and approvals workstream and the Company hopes to be able to announce progress with strategic tie-ups in the near future."*

## Way Forward

WAH<sub>2</sub> project risks have been reduced to a level considered appropriate to commence Pre-FEED, which is planned to start mid-2023 and will focus on:

- Progressing commercial discussions with respect to ammonia offtake, gas supply and provision of CCS services to secure conditional<sup>4</sup> agreements prior to FEED entry;
- Maturing opportunities for shared water supply, CO<sub>2</sub> transport and ammonia export infrastructure to access economies of scale and further lower unit costs;
- Maturing opportunities for third-party supply of power to increase renewables penetration, capture synergies with plant and reduce overall costs;

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<sup>2</sup> Carbon capture and storage

<sup>3</sup> The ammonia price that delivers the project a 10% real rate of return; free on board Dampier

<sup>4</sup> Conditions precedent to include WAH<sub>2</sub> Final Investment Decision

- Optimising plant design to reduce unit capital and operating costs;
- Progressing commercial discussions with potential equity participants and financiers;
- Exploring opportunities related to Government funding and incentives;
- Executing Option to Lease with DevelopmentWA over allocated land; and
- Developing and executing a stakeholder management plan to build and maintain stakeholder support.

Pre-FEED studies are intended to support concept selection at the end of 2023 and FEED entry in early 2024.

The project target remains FID at the end of 2024 leading to first production aim in 2027.

## Financing

Hexagon will execute its Project Financing Plan in parallel to the planned technical and commercial Pre-FEED workstreams. This will involve examining a range of debt, equity and government incentive solutions for construction and working capital under a capital structure suitable to debt financiers, investors, partners, off-takers and shareholders.

Hexagon expects that financing will be facilitated by:

- Long-term, take-or-pay ammonia offtake contracts with high-credit counterparties;
- Long-term gas supply and CO<sub>2</sub> sequestration contracts; and
- Equity participation by strategic partners. This could include customers wishing to participate in the supply chain, gas suppliers wishing to de-carbonise a stream of their production, or infrastructure investors seeking exposure to low-emissions energy assets.

Confidential discussions are ongoing with a variety of counterparties and the Company will inform the market as and when agreements are finalised.

## Regulatory Support

Australia released its National Hydrogen Strategy in 2019 which set a goal for Australia to be a global hydrogen leader by 2030. In support of this, Australia recently conducted a National Hydrogen Infrastructure Assessment to assess the investment required in Australia's supply chain infrastructure to underpin the rapid scale-up required over the next decade.

The Australian Government has announced several funding initiatives relevant to low-emissions energy projects such as WAH<sub>2</sub>. These include the:

- Regional Hydrogen Hubs Program, investing A\$526 million to support development of eight regional hydrogen hubs across Australia, which includes Hexagon's production site at Maitland SIA;
- Clean Energy Finance Corporation's ("CEFC") Advancing Hydrogen Fund which has earmarked up to A\$300 million to support the growth of a clean, innovative, safe and competitive Australian hydrogen industry; and
- Northern Australia Infrastructure Facility ("NAIF") whose mandate includes providing concessional financing to infrastructure projects in Northern Australia that drive public and economic benefit. As at January 2023, NAIF had committed A\$4 B of its initial allocation of A\$5 B of Commonwealth funds.

Further to the initiatives provided by the Australian Government, the Japanese Government has released medium- and long-term goals to achieve its ambition of a 'hydrogen society' and

has allocated significant funding to help establish supply chains for low-emissions hydrogen and ammonia. This includes:

- The Supply Chain Subsidy Program which includes US\$60B (A\$89B) of funds earmarked to establish international low-emissions hydrogen and ammonia supply chains, with much of the funding expected to be allocated to projects outside Japan;
- JPY\$98.9 B (A\$1 B) for FY2022 research and development activities that include verification testing for co-firing of ammonia in coal-fired power plants; and
- Establishment of the Green Innovation Fund with a budget of JPY\$2 trillion (A\$21B) to be administered by the government-controlled New Energy and Industrial Technology Development Organisation (“**NEDO**”).

## **PFS Summary Report**

A report summarising the WAH<sub>2</sub> Project Pre-Feasibility Study is available on the ASX Announcements page of the HXG website [www.hxgenergymaterials.com.au](http://www.hxgenergymaterials.com.au) or by following [this link](#).

**Ends**

## About Petrofac

Petrofac is a leading international energy services company that designs, build, manages and maintains oil, gas, refining, petrochemicals and renewable energy infrastructure and offers international experience in low-emissions hydrogen and ammonia.

## About Hexagon Energy Materials Limited

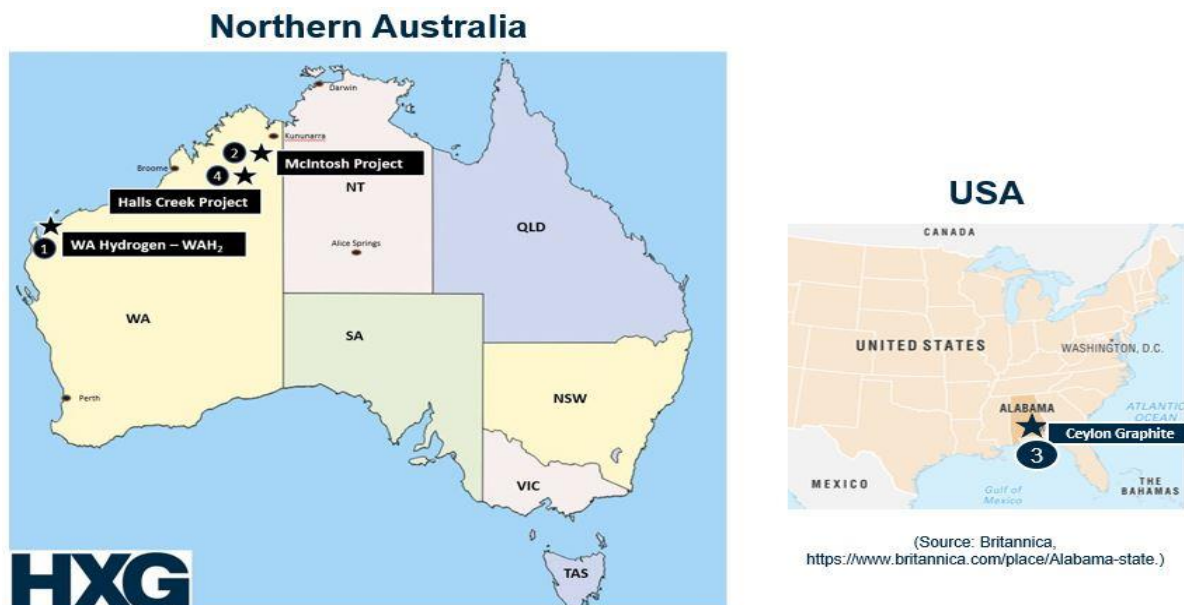
Hexagon Energy Materials Limited (ASX: HXG) is an Australian company focused on future energy project development and energy materials exploration and project development.

Hexagon 100% owns the McIntosh Nickel-Copper-PGE and Graphite project in Western Australia and the Halls Creek Gold and Base metals project in WA. On 14 February 2022 Hexagon announced a binding Graphite Mineral Rights Earn-in agreement (up to 80%) had been entered into with Green Critical Minerals Pty Ltd, with McIntosh Graphite expected to become part of an ASX Initial Public Offering during 2023. In the USA, Hexagon has an 80 per cent controlling interest of the Ceylon Graphite project located in Alabama, over which South Star Battery Materials Corp (TSXV: STS) on 7 December 2021 signed an Option to develop and Earn-In up to 75% interest.

Hexagon is developing a business to deliver low-emissions hydrogen/ammonia into export and domestic markets at scale, via Hexagon's WA<sub>H<sub>2</sub></sub> Project.

Hexagon plans to use renewable energy in its low-emissions hydrogen/ammonia production as far as practicable.

Hexagon's overarching goal for 2023 is to secure and leverage technical and commercial alliances by commodity across its project portfolio whilst maintaining a core focus on Northern Australian Future Energy and Future Energy Materials project development, in-house.



*Locations of Hexagon's projects*

To learn more please visit: [www.hxgenergymaterials.com.au](http://www.hxgenergymaterials.com.au).

## Authorisation

This announcement has been authorised by the Board of Directors.

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Cautionary Statement:

Forward looking statements can generally be identified by the use of forward looking words such as, 'expect', 'anticipate', 'likely', 'intend', 'should', 'could', 'may', 'predict', 'plan', 'propose', 'will', 'believe', 'forecast', 'estimate', 'target', 'outlook', 'guidance', 'potential' and other similar expressions within the meaning of securities laws of applicable jurisdictions.

There are forward looking statements in this document relating to the outcomes of the Pre-Feasibility Studies and ongoing work on the WAH2 project. Actual results and developments of projects and the market development may differ materially from those expressed or implied by these forward looking statements. These, and all other forward looking statements contained in this document are subject to uncertainties, risks and contingencies and other factors, including risk factors associated with the hydrogen business. It is believed that the expectations represented in the forward looking statements are reasonable but they may be affected by a variety of variables and changes in underlying assumptions which could cause actual results or trends to differ materially, including but not limited to price fluctuations, actual demand, currency fluctuations, loss of market, industry competition, environmental risks, physical risks, legislative, fiscal and regulatory changes, economic and financial market conditions in various countries and regions, political risks, project delay or advancement, approvals and cost estimates.

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