

# MoU Executed with India's Tata Steel

## HIGHLIGHTS

Memorandum of Understanding (MoU) executed with Tata Steel Limited, one of the world's largest steel manufacturing companies.

The MoU establishes a framework for discussions regarding offtake of vanadium pentoxide and other downstream vanadium products.

The parties will investigate downstream technical collaboration with scope for joint development of ferrovanadium production facilities in Western Australia and India.

Discussions will also include potential investment by Tata Steel into Technology Metals Australia and / or the Murchison Technology Metals Project.

10 October 2022

Advanced vanadium developer, Technology Metals Australia Limited (ASX: **TMT**) (**Technology Metals**, or the **Company**) is pleased to announce that it has entered into a non-binding Memorandum of Understanding (**MoU**) with Indian steelmaking company Tata Steel Limited (**Tata Steel**), part of the global Tata Group.

Technology Metals is progressing the development of the Murchison Technology Metals Project (**MTMP**) in Western Australia to produce high purity vanadium pentoxide ( $V_2O_5$ ) and is investigating opportunities to move downstream including the production of vanadium electrolyte, ferrovanadium (**FeV**) and vanadium nitride (**VN**).

Tata Steel, with a consolidated turnover of US\$32,836 million for FY22 is the 10th largest steel producer in the world with an annual crude steel production capacity of 34Mtpa. Ferrovanadium and vanadium nitride are used in the steel alloying process in Tata Steel's facilities to increase strength and wear resistance.

### TMT's Managing Director, Ian Prentice, commented:

*"TMT is very excited to be partnering with Tata Steel, one of the world's largest steelmakers, as well as furthering Australia's important trade relationship with India. High purity vanadium pentoxide from the MTMP is important in producing lower emission ferrovanadium and vanadium nitride, which Tata Steel utilises in its steelmaking process.*

*"Together, TMT and Tata Steel can play an important part in reducing emissions in steel applications as the world progresses towards net zero carbon emissions."*

### Tata Steel's Vice President Group Strategic Procurement, Rajiv Mukerji, commented:

*"Vanadium is a key component in Tata Steel's steelmaking process to increase strength and reduce weight, and as our customers increasingly look to reduce their carbon emissions, we anticipate demand for these products to grow.*

*"Working with Technology Metals Australia Limited on opportunities surrounding primary vanadium and ferrovanadium production aligns with Tata Steel's strategy to ensure reliable, stable supplies of raw materials to meet our customers' future product requirements."*

Technology Metals is developing the high grade Murchison Technology Metals Project (MTMP), located 50km south of Meekatharra in Western Australia, to be a stable, secure, long term supplier of critical minerals, with targeted vanadium production of ~12,500 tpa (27.5 Mlbs pa)  $V_2O_5$  over an initial 25 year mine life. The MTMP hosts an Ore Reserve Estimate of 44.48Mt @ 0.89%  $V_2O_5$  divided between the Gabanintha and Yarrabubba deposits.

Under the MoU with Tata Steel, the parties will undertake discussions on the technical requirements for downstream vanadium processing in India and Australia, potential commercial collaboration in the MTMP and downstream production facilities, supply of vanadium pentoxide and other downstream vanadium products and potential investment by Tata Steel into Technology Metals and/or the MTMP.

The execution of this MoU and the discussions with Tata Steel are consistent with the Company's strategic objective of developing downstream opportunities to add value to the MTMP and Western Australia.

### Vanadium in Steel

Vanadium is utilised in the steel industry where it is primarily used in metal alloys such as rebar and structural steel, aircraft and automobiles. The addition of a small amount of vanadium can increase steel strength by up to 100% and reduces weight by up to 30%. Utilising higher strength steel reduces overall CO<sub>2</sub> emissions through increased efficiency of use, longer service life and higher capacity across a range of applications.

#### Benefits of using vanadium in high strength steel



Less micro-alloyed steel is required in construction applications to achieve the required structural performance, reducing consumption of raw materials and energy



Addition of a small amount of vanadium can increase steel strength by up to 100%. Stronger, longer lasting steel with greater seismic performance means higher service life



While increasing tensile strength of steel, adding vanadium also reduces its weight by up to 30%. Less weight in aircraft and automotive applications, for example, leads to less overall carbon emissions



Use of vanadium in steel is critical to the reduction in carbon footprint through increased efficiency and economy of material, especially in the construction and transportation sectors



The construction sector is the biggest consumer of steel products, and vanadium plays an essential role in providing cost-effective solutions by increasing the strength of reinforcing bars in buildings, tunnels and bridges, and strengthening steels to resist fire, earthquake and corrosion.

Vanadium is used in aerospace applications to provide low density, high strength, and strength at high operating temperatures, essential for components such as aero-engine gas turbines and airframes.

In automotives, the inclusion of vanadium assists in strength, reliability, ease of manufacture and highest strength-to-weight ratio to minimise fuel consumption and increase economic efficiency.

### Tata Steel Limited

Tata Steel Limited is part of the Tata Group, an Indian multinational conglomerate with operations across the world. Established in Jamshedpur (Jharkhand, India) in 1907, the company took shape from the vision of its founder Jamsetji Nusserwanji Tata and is today one of the world's most geographically diversified steel producers with operations and commercial presence across the world and an employee base of over 65,000.

Tata Steel's products include automotive steels, bearings, ferro alloys, pipes, precision tubes and structural steel. Ferrovanadium and vanadium nitride are used in the steel alloying process in Tata Steels' facilities to increase strength and wear resistance.

Focussing on Innovation, Technology, Sustainability and People, the Company strives to be the global steel industry benchmark for value creation and corporate citizenship and become the most respected and valuable steel company globally.

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### Key Terms Defined in the TMT – Tata Steel MoU

The MoU between TMT and Tata Steel establishes a framework for ongoing discussions, evaluations and negotiations regarding offtake, technical collaboration, financing support for TMT/the MTMP and/or downstream processing. Successful discussions would result in individual agreements on each aspect. The key areas of discussion that have been agreed upon in the MoU are:

- Technical collaboration between the parties assessing:
  - FeV/VN products, vanadium content and impurities and resulting impact on steel characteristics/quality and value in use
  - Optimal production processing routes, relevant environmental regulations, availability, and cost of required inputs for production within India versus Australia,
- Potential supply of vanadium pentoxide from MTMP for production of FeV/VN,
- Opportunity for investment into TMT/MTMP by Tata Steel to assist in accelerating production of a new primary source of vanadium, and
- Investigation of joint investment by the parties in downstream processing

The MoU is effective for five (5) years unless the parties mutually agree to formally terminate earlier.

Newland Global Group (NGG), a leading corporate advisory firm with a focus on leveraging Australia-India trade and investment relations, is acting as TMT's advisor in relation to investment, offtake, and technology-sharing opportunities within India. NGG has been advising companies since 2010 and are market leaders in the bilateral advisory space.

## AUTHORISED FOR RELEASE ON THE ASX BY THE COMPANY'S BOARD OF DIRECTORS

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## Forward-Looking Statements

This document includes forward-looking statements. Forward-looking statements include, but are not limited to, statements concerning Technology Metal Australia Limited's planned exploration programs, corporate activities, and any, and all, statements that are not historical facts. When used in this document, words such as "could," "plan," "estimate," "expect," "intend," "may", "potential," "should" and similar expressions are forward-looking statements. Technology Metal Australia Limited believes that it has a reasonable basis for its forward-looking statements; however, forward-looking statements involve risks and uncertainties, and no assurance can be given that actual future results will be consistent with these forward-looking statements. All figures presented in this document are unaudited and this document does not contain any forecasts of profitability or loss

## About Technology Metals Australia

Technology Metals Australia Limited (ASX:TMT) is an ASX-listed company focused on the exploration and development of its flagship, 100 per cent owned Murchison Technology Metals Project (**MTMP**) located 50km southeast of Meekatharra in the mid-west region of Western Australia. The MTMP is one of the highest-grade vanadium projects in the world and will have lowest quartile operating costs once developed.

The Company has finalised an Integration Study for the MTMP, bringing in high-grade ore from the satellite Yarrabubba deposit into the central processing hub at Gabanintha. The Integration Study completion has facilitated the progression of the Implementation Phase of the MTMP leading to a Decision to Develop expected in late 2022.

## About Vanadium

Vanadium is a hard, silvery grey, ductile and malleable speciality metal with a resistance to corrosion, good structural strength and stability against alkalis, acids and salt water. The elemental metal is rarely found in nature. The main use of vanadium is in the steel industry where it is primarily used in metal alloys such as rebar and structural steel, high-speed tools, titanium alloys and aircraft. The addition of a small amount of vanadium can increase steel strength by up to 100% and reduces weight by up to 30%. Vanadium high-carbon steel alloys contain in the order of 0.15 to 0.25% vanadium while high-speed tool steels, used in surgical instruments and speciality tools, contain in the range of 1 to 5% vanadium content. Global economic growth and increased intensity of use of vanadium in steel in developing countries will drive near term growth in vanadium demand.

An emerging and very significant use for vanadium is the rapidly developing energy storage (battery) sector with the expanding use and increasing penetration of the vanadium redox flow batteries (VRFB's). VRFB's are a rechargeable flow battery that uses vanadium in different oxidation states to store energy, using the unique ability of vanadium to exist in solution in four different oxidation states. VRB's provide an efficient storage and re-supply solution for renewable energy – being able to time-shift large amounts of previously generated energy for later use – ideally suited to micro-grid to large scale energy storage solutions (grid stabilisation).