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Tesla electric car manufacturing plant, Germany



Copper concentrate



Stewart McDonald



Lithium mine

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Conference overview

Why shoring up future metal supplies is a global imperative

STEWART MCDONALD

On behalf of our team at Vertical Events, we are excited to welcome you to the 2022 New World Metals Investment Series, our 16th annual conference since it first started back in 2006.

In its infancy, the conference was called the 'Australian Uranium Conference', a name we kept for several years until the uranium market fell dramatically around the time of Fukushima.

We had to change tact a bit to reflect a broader thematic playing out in the mining sector and opened the conference up to include other elements such as base metals and battery metals like lithium, copper, and nickel, with the conference bearing its current name for eight years to date.

In the last three to four years, we have seen a push away from fossil fuels and a pull towards the electrification of the world, which

means a lot more of these 'new world metals' will be required to facilitate the decarbonisation transition.

One of the biggest trends in the market at the moment is the move by end users to seek greater control over their supply chain as demand for lithium, copper, and nickel continues to surge beyond future supplies.

We've seen this play out in various ways, the most notable example being with global automakers beginning to invest upstream in mining companies.

This year, we are delighted to feature 26 companies across the junior and mid-tier resources sector who are making an effort to sustain our environment for future generations.

In another milestone, what was previously a one-day event held in Perth is now being run as a series of

"One of the biggest trends ... is the move by end users to seek greater control over their supply chain as demand continues to surge beyond future supplies"

three one-day shows – one day in Perth, one day in Sydney and one day in Melbourne – because of the extra attention that has been given to new world metals.

We would like to take the opportunity to thank our keynote speakers, Eddie Rigg from Aragonaut, Trevor Beardsmore from the Geological Survey of Western Australia, and Alex Tonks from CRU, for taking the time to share their views and insights on the resources sector.



Car batteries

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MARKET INSIGHTS

Critical metals fire up ASX miners and explorers

Governments are increasingly focused on supply chain resilience

BARRY FITZGERALD

The global call for secure and growing supplies of critical metals is proving to be a major fillip for both ASX producers and explorers.

Metals used to be just metals. But now a growing list are seen to be critical to global decarbonisation and electrification efforts in pursuit of net zero emission targets.

Copper, nickel, lithium, rare earths, graphite, vanadium, high purity alumina, cobalt, manganese, zinc, uranium ... the list goes on.

All are required in increasing amounts, underpinned by super-charged growth forecasts for the adoption of electric vehicles (EVs) and renewable/low carbon energy.

Investors are switched on to a critical metals thematic while governments around the world are increasingly focused on supply chain resilience in response to ongoing geopolitical tensions and COVID-19 impacts.

This has remade the ASX mining sector as the industry responds to the favourable supply/demand fundamentals, and the resultant rise of incentive pricing across a suite of critical metals to encourage new production/exploration.

Lithium has been the standout in 2022 in response to prices for the battery material taking off to record levels as the EV revolution reshapes the global auto industry, and the storage of renewable energy takes off.

Two years ago, lithium stocks were unloved on oversupply fears. But predictions by forecasters of serious supply deficits until the end of the decade has prompted a buying frenzy in the lithium space.

Lithium producer Pilbara Minerals



Volkswagon ID Buzz electric van



Barry Fitzgerald



Wind turbines

“Metals used to be just metals. But now a growing list are seen to be critical to global decarbonisation and electrification efforts in pursuit of net zero emission targets”

(PLS) was a \$1 billion stock two years ago. Now it has burst through \$10 billion. It is a story repeated at other leading lithium stocks, with explorers/developers like Ioneer (INR), Galan (GLN), Infinity Lithium (INF) and others catching the wave.

The ASX rare earths sector has also fired up. China's dominance of the industry has long been a concern, one which is now heightened because of the surge in demand for the magnet rare earths used in wind turbines and EVs.

Long-established producer Lynas (LYC) has grown to a market value of \$8 billion as it sets about expanding its supply of magnet rare earths through the development of a processing facility near Kalgoorlie.

Junior companies are also responding to the supply challenge by either setting out to confirm new rare earths developments like RareX's (REE) Cummins Range project in WA, or exploring in frontier areas like the central Australia hunt of PVW Resources (PVW).

The recent \$16 billion combined value of bids by industry leaders BHP and Rio Tinto for copper producer OZ Minerals (OZL) and Canada's Turquoise Hill respectively is a clear demonstration of where they think copper demand/pricing is headed due to the global decarbonisation push.

Copper is what BHP calls a “future metal”, along with nickel which is a particular beneficiary due to its use in batteries.



Copper is a 'future metal'



Mining lithium from salt flats



Peter Farquhar

Making the case for lithium

Australia is home to some of the world's largest lithium resources. And it just got its first (hard) rock star.

PETER FARQUHAR

It takes a lot to shake a lithium believer loose of their prized battery metal penny stocks that they bought and have been holding since Elon was a paltry millionaire. But at the start of June, investment bank juggernaut Goldman Sachs scored a palpable hit, calling the top of the lithium boom, making several cases for a future oversupply scenario.

The analysts, investors and industry publications rounded on Goldman as one. But the damage was done and among the fallers on the day of the report, Pilbara Minerals (PLS) plummeted 22%.

Nearly a month later geothermal moonshot Vulcan (VUL) had fallen almost 40%. Penny darling Sayona (SYA) – down 45%. This was a disaster – and all off the back of what many felt were rubbery and optimistic assumptions about the ability of lithium producers in time to meet spreading global bans on ICE cars by 2035.

It's taken less than two months for most of them to recover and reach new all-time highs. Oversupply? Pah. Much more attractive are claims by the likes of Benchmark Mineral

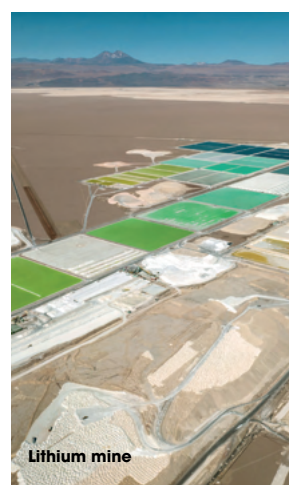
Intelligence that the world will actually come up short of lithium demand in 2040 somewhere in the order of 18 Pilgangooras.

Pilgangoora, for the uninitiated, is Pilbara Minerals' giant WA project, anchored on one of the biggest lithium ore deposits in the world. There probably isn't 18 more, let alone 18 that will be under construction in time to be producing by 2040.

As it turns out, all PLS needed to prove its chops was an earnings call in late August. It turned out PLS was far from an over-evangelised meme stock and soaring prices for its spodumene concentrate had driven it from a loss of \$51.4 million in FY2021 to a \$561.8m profit in FY2022.

Analysts say PLS could book FY2023 profits in the order of \$2 billion. In the same week, California added its name to the list of those banning ICEs by 2035.

The lithium rush is only just beginning. And right now, Australia is the world's biggest exporter, grinding out nearly half the world's supply, and more than twice that of its nearest competitor.



Lithium mine

THE NUMBERS

10%
Forecast ICE vehicle market share in 2035

US\$53 trillion
Size of EV market opportunity between now and 2050

500,000
Tonnes of lithium produced annually

4,000,000
Tonnes of lithium needed annually by 2030

700 GWh
Global lithium-ion battery demand 2022

4500 GWh
Global lithium-ion battery demand 2030

Source: Bloomberg; McKinsey

KEY POINTS

- **Company Name:** St George Mining
- **Company ASX code:** SGQ
- **Key Commodities:** Nickel, copper, cobalt, PGEs and lithium
- **Key Personnel:** John Prineas, Executive Chairman | Julian Hanna, General Manager, Growth and Development | Dave Mahon, Exploration Manager
- **Locations:** Western Australia
- **Market Cap as of 31/08/22:** \$16.08M
- **Share price range - Low/High:** \$0.024 - \$0.085
- **W:** stgeorgemining.com.au

INVESTMENT HIGHLIGHTS

AUGUST 23, 2022: Maiden diamond drilling program at Paterson Project returns potential for a large mineral copper-gold system at the project.

JULY 29, 2022: Results from June Quarter surveys at Mt Alexander combined with existing geophysical database to select most-prospective areas for nickel-copper-PGE deposits.

JUNE 23, 2022: High-impact exploration programs yield priority drill targets for nickel, copper and PGE at Ajana and Mt Alexander, and copper sulphides at Paterson.



JOHN PRINEAS
EXECUTIVE CHAIRMAN

ST GEORGE MINING

(ASX:SGQ)

COMPANY PROFILE

St George Mining is well set up to ride the electrification megatrend, with 100% owned projects that have opportunities for large scale development in five battery metals, including the nickel, lithium and platinum group elements (PGE), across WA.

At its flagship Mt Alexander Project, St George has already had considerable exploration success, finding high-grade nickel-copper-cobalt-PGE mineralisation only 30m from surface and occurring over a 4.5km strike.

To date, exploration has uncovered impressive intersections including 17.45m @ 3.01% nickel, 1.31% copper, 0.13% cobalt and 1.68 grams per tonne (g/t) total PGEs from only 37.45m.

St George says the intrusive nickel sulphide system being explored at Mt Alexander is geologically similar to many significant North American deposits that will help bridge the demand-supply gap as electric vehicle (EV) production continues to accelerate.

Nickel is a key ingredient of EV batteries, which led the International Energy Agency (IEA) to forecast in July that the world will need 60 new nickel mines by 2030 to achieve carbon reduction pledges.

St George is also completing lithium fieldwork at Mt Alexander, where pegmatite outcrops may be part of the same system that hosts the major nearby lithium discovery announced by Red Dirt Metals.

The Paterson Project in the East Pilbara lies in one of Australia's most highly endowed mineral regions, the Paterson Province. It is only 50km from Rio Tinto's major Winu copper-gold deposit and also in the same region as the hugely successful Nifty (2 million tonne copper) and Telfer (27 million ounce gold) deposits, and the Havieron Project being explored in a Newcrest-Greatland joint venture.

In an important milestone for St George's Paterson Project, the maiden diamond drill program was completed in late August and showed potential for a large copper-gold system. The company is now eagerly awaiting assay results, due next month, so it can better plan follow-up drilling.

The Ajana and Broadview Projects are the least developed of St George's projects, with discussions over access arrangements

progressing in advance of a maiden drill program at Ajana planned for Q4 2022.

Both Ajana and Broadview lie close to the western edge of the mineral-rich Yilgarn Craton, a large mineral-rich region that has spawned numerous major mines and has been described as "Australia's premier gold and nickel province".

Ajana is in the midwest, close to Geraldton and its major port, in a large unexplored area within the Northampton Block which hosts numerous base metal deposits. The project is prospective for intrusion hosted nickel-copper PGE mineralisation.

St George's Broadview Project is just 150km east of Perth and in the same region as market darling Chalice Mining's Julimar discovery, which currently boasts a 350 million tonnes nickel-copper-PGE (platinum group elements) resource. Broadview is also considered prospective for nickel-copper-PGE deposits as well as copper and gold.

Other tenement holders in the region include global mining major Anglo American, which has more than 10,000km² of ground, and fellow ASX lister Impact Minerals which is establishing its Arkun nickel-copper-gold project.

**KEY POINTS**

- **Company Name:** Technology Metals Australia
- **Company ASX code:** TMT
- **Key Commodities:** Vanadium, ilmenite
- **Key Personnel:** Ian Prentice, Managing Director | Michael Fry, Non-executive Chairman | Carmen Letton, Non-executive Director | Jacqueline Murray, Non-executive Director
- **Locations:** WA
- **Market Cap as of 31/08/22:** \$67.14M
- **Share price range - Low/High:** \$0.270 - \$0.620
- **W:** tmtlimited.com.au

INVESTMENT HIGHLIGHTS

AUGUST 5, 2022: The Integration Study for the Murchison Technology Metals Project (MTMP) increases mine life to 25 years and delivers an updated ore reserve of 44.8Mt at 0.89% vanadium oxide.

JULY 14, 2022: TMT kicks off a feasibility study to produce vanadium electrolyte utilising its own high-quality vanadium feedstock.

JUNE 8, 2022: An Early Works agreement for a gas pipeline is executed with APA Operations, a key mitigation activity.



IAN PRENTICE
MANAGING DIRECTOR

TECHNOLOGY METALS AUSTRALIA

(ASX:TMT)

COMPANY PROFILE

TMT's Murchison Technology Metals Project (MTMP) in Western Australia comprises the Gabanintha and Yarrabubba Vanadium Projects that combine to form a mammoth resource of 146.2Mt grading 0.8pc vanadium pentoxide.

Gabanintha, 40km south of Meekatharra, contains 5.5km strike length of high-grade mineralisation, one of the most highly-regarded vanadium deposits in the world.

It represents the bulk of the mineral resource and the site of the proposed processing plant and associated infrastructure, while Yarrabubba is a satellite deposit of the MTMP itself.

Yarrabubba represents an opportunity to

leverage higher vanadium production early in the mine's development due to higher concentrate grades and an additional ilmenite by-product.

Positioning itself as a long term, low cost and stable critical mineral supplier, Technology Metals hopes to take advantage of the burgeoning vanadium redox flow (VRFB) battery sector.

VRFBs are regarded as a safer alternative to lithium-ion and better suited to large scale applications such as stationary storage, and while they come at a higher upfront cost, they tend to have a far longer life compared to lithium-ion batteries.

Back in July, the company kicked off a feasibility study looking into the production of vanadium electrolyte to support the growing market for longer duration energy storage batteries.

Under the MoU with Japan-based partner LE System Co, TMT has not only established a wholly owned subsidiary - vLYTE Ltd - but will be working towards commercialisation of the vanadium electrolyte business.

"As we move closer to a development decision on the MTMP vanadium project, we are increasing our focus on these downstream project enhancement initiatives," managing director Ian Prentice said.

"With an increased need for optimisation of renewable energy generation and with Technology Metals on track to be the world's next pure low-cost vanadium producer, the company is well-placed to become the preferred supplier of vanadium for these batteries."

For the first half of 2022, TMT's main focus was on completing the final elements of the

Integration Study for Yarrabubba that kicked off in late 2021. The strategy was to combine the high grade, high quality Yarrabubba deposit with the Gabanintha vanadium deposit to form the Murchison Technology Metals Project.

The higher vanadium in concentrate grades (1.61% V₂O₅), excellent recoveries and the potential for highly sought-after ilmenite by-product revenue from Yarrabubba was expected to materially enhance the economic metrics in the early years of the project, lowering the MTMP development risk.

A key aspect of the Integration Study was the updated Yarrabubba ore reserve estimate of 15.88Mt at 0.87% vanadium pentoxide and 10.03% titanium oxide, a 69% increase on the previous ore reserve, and the company merged Yarrabubba into the MTMP plan in August 2022.

The study also generated a global ore reserve estimate for the entire MTMP of 44.48Mt at 0.89% vanadium pentoxide, which meets the investment criteria for Technology Metals to actively pursue the implementation phase of the project. The project is anticipating a target annual V₂O₅ production of 275Mlb per year and an annual average ilmenite production of 96,500 tpa in the first nine years.

A commercial tendering process to update the economics of the project is underway and is expected to lead to a development decision, due by the end of 2022.

