

Metals of Africa

COMPANY SNAPSHOT

Reuters/Bloomberg:	MTA.AX / MTA AU
Market cap:	US\$11.1m
	A\$15.4m
Current price:	A\$0.06
Average daily turnover:	US\$0.02m
	A\$0.02m
Current shares o/s	266.1m
Free float:	100.0%

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All about off-take

- Metals of Africa (MTA) is advancing two potentially high quality, large scale graphite projects in the Cado Delgado province of Mozambique.
- MTA reports that these have the potential to be low cost suppliers to the rapidly expanding lithium-ion battery market.
- Off-take is key for MTA to secure its future in the industry with re-rating potential if the company can attract quality off-take partners.

East Africa - the premier graphite province?

The belt that extends through Mozambique and Tanzania is highly prospective for graphite as evidenced by the reported size and quality of deposits in the region. The Cabo Delgado province alone has more graphite than the rest of the world's Resources combined. This region has attracted the interest of investors and end-users and will likely play a big part in the future supply of graphite for the lithium-ion battery market. MTA's recently announced Montepuez Scoping Study is expected to be followed by a Scoping Study for Balama Central. The company is rapidly moving from exploration through evaluation.

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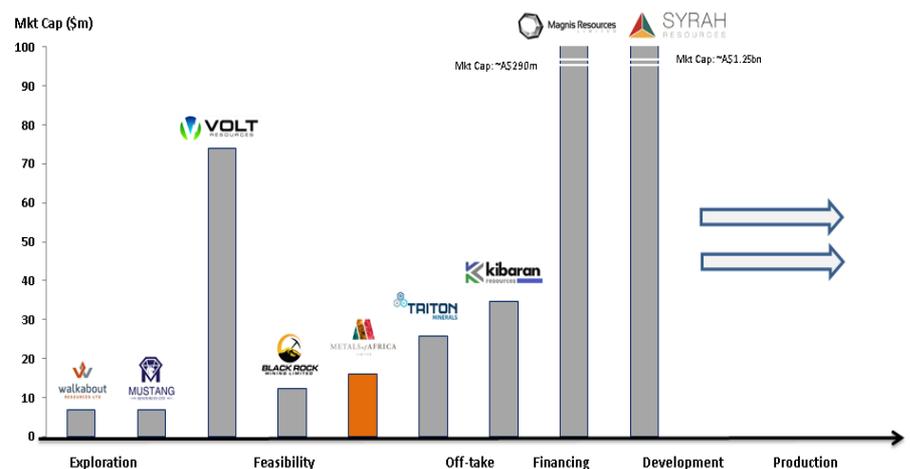
Who will supply the lithium-ion battery market?

There has been great anticipation about a wave of demand for graphite as a result of projected growth in the electric vehicle and energy storage markets. With a number of lithium-ion battery mega-factories anticipated from global companies such as LG, Tesla and Foxconn, graphite and lithium companies have been in the spotlight. However, to date there has not been an off-take agreement announced directly with a lithium-ion battery manufacturer. We believe the market is open for up-and-coming graphite companies, with off-take agreements potentially available.

Spherical Graphite Mill a clear advance

MTA has announced participation in the acquisition of a spherical graphite mill in the USA with three TSXV-listed graphite companies, a private industry partner and Coulometrics LLC. The mill is to be located at Coulometrics' battery production and test facility. This will allow MTA to process concentrate from Montepuez and Balama Central into battery-ready anode material for end user evaluation. This is a key step in securing an off-take agreement with end users who will make batteries from the concentrate. The product must be subjected to rigorous testing before off-take is secured. Our assessment is that the current market cap assigns little value to the potential for MTA's graphite assets to attract the attention of off-take partners as a pre-cursor to possible development. MTA's current market capitalisation suggests the market is underestimating how far progressed MTA's evaluations are.

Figure 1: East African graphite companies



SOURCES: MORGANS, COMPANY REPORTS

Metals of Africa projects

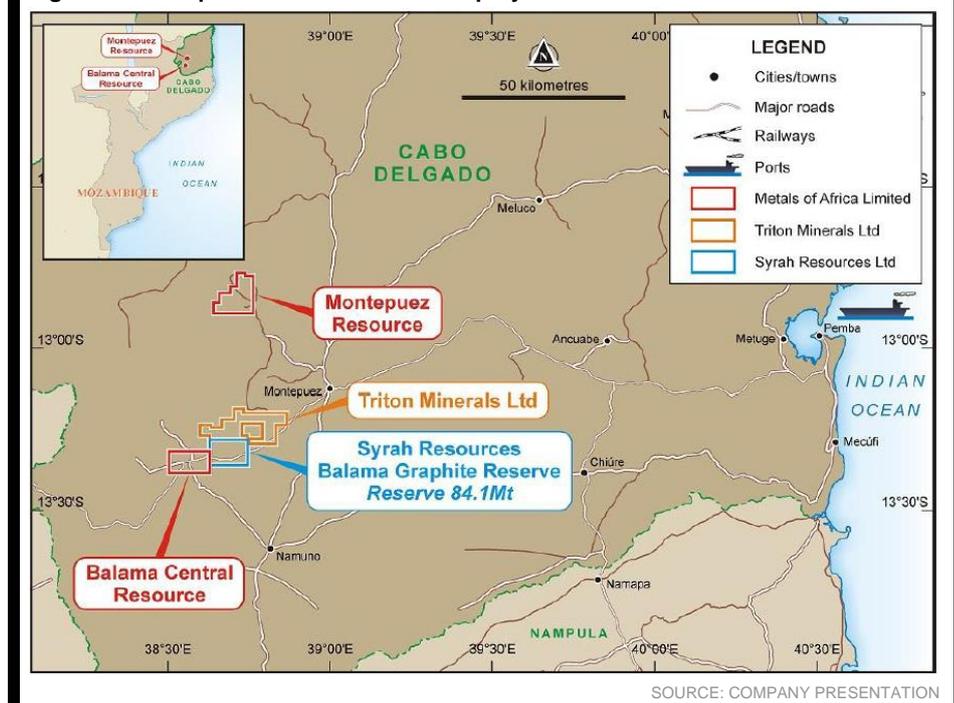
Graphite projects overview

MTA has two graphite projects in the Cabo Delgado province of Mozambique with the Montepuez project located ~40km north of Syrah Resource's (ASX:SYR) Balama project while MTA's Balama Central is along strike and adjacent to SYR's Balama project.

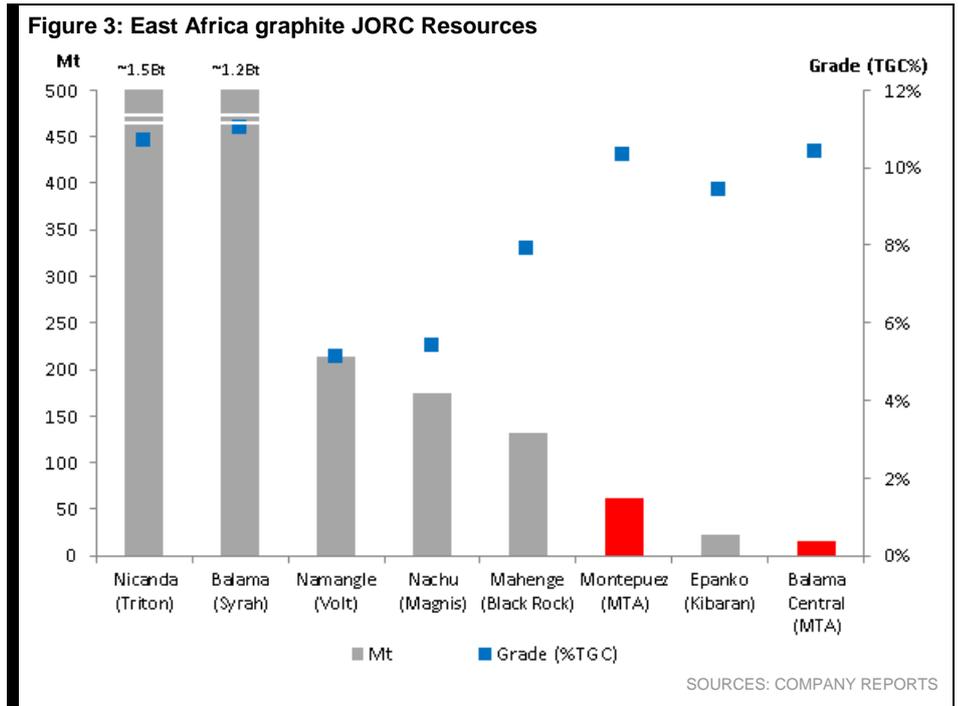
- Montepuez Resource (to JORC Code 2012 standards) **61.6Mt at 10.3% TGC**
- Balama Central Resource (to JORC Code 2012 standards) **16.3Mt at 10.4% TGC** (Exploration Target of 43- 78Mt at 9- 13% TGC)

Both projects exhibit strong exploration potential with both deposits open along strike and at depth. Only 5% of the prospective geology at Montepuez has been drilled to a shallow depth and the company reports significant upside to the existing Resource.

Figure 2: Montepuez and Balama Central projects



As shown in the following figure, MTA's graphite resources are relatively small in size compared to its peers; however, they are large enough to underpin a substantial mine life. At Montepuez, the existing 61.6Mt Resource (covering 5% of the prospective area) is sufficient for a 60-year mine life producing 100ktpa of flake concentrate. The Balama Central resource is considered by the company to be sufficient for a +10-year mine life and the Exploration Target implies a >50-year mine life. Importantly, work to date indicates that MTA's projects may prove to be amongst the higher grade graphite deposits.

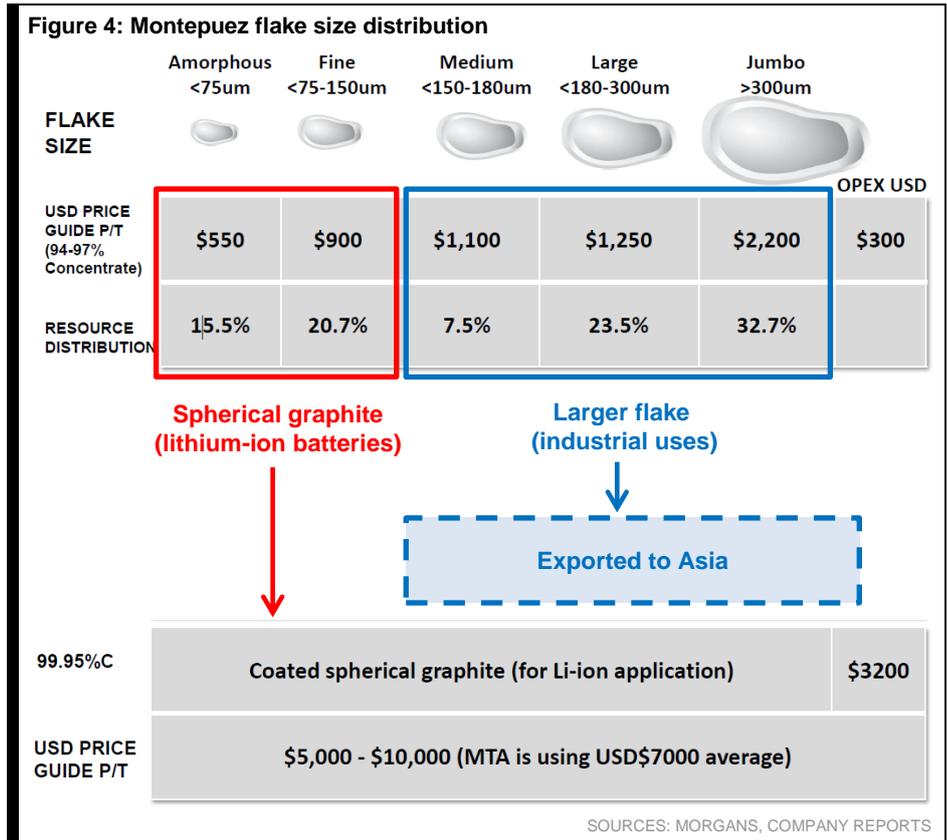


Montepuez Graphite Project

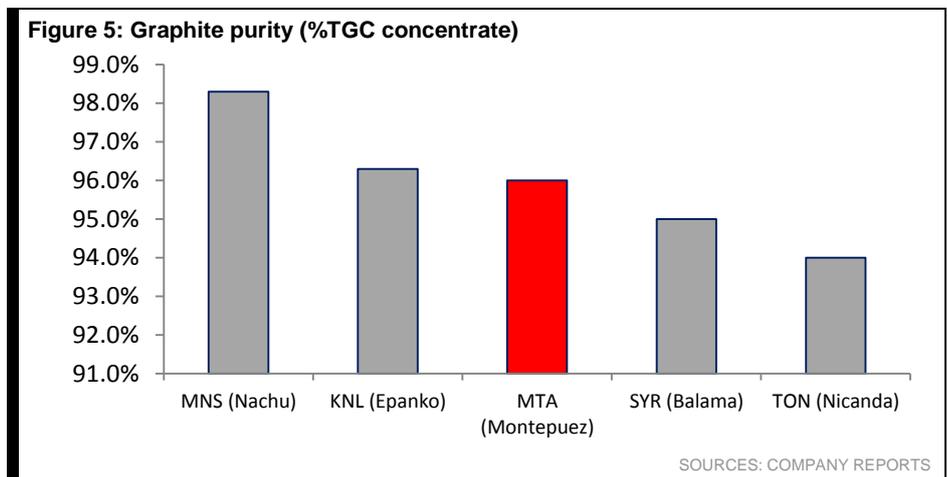
Flake size and purity

Grade is only part of the picture as flake size and purity (concentrate %TGC) are directly correlated to product price. As a rule of thumb, the higher the flake size and the higher the purity level, the higher the price received. However, the flake size will also determine the suitability of the graphite for different applications. For example, the finer graphite (<150µm) is typically used in Li-ion battery manufacturing while the larger size graphite is typically used for a variety of industrial purposes.

MTA's Montepuez project has a mixture of large and jumbo flake, as well as the finer material that can be used to produce spherical graphite for Li-ion battery production.



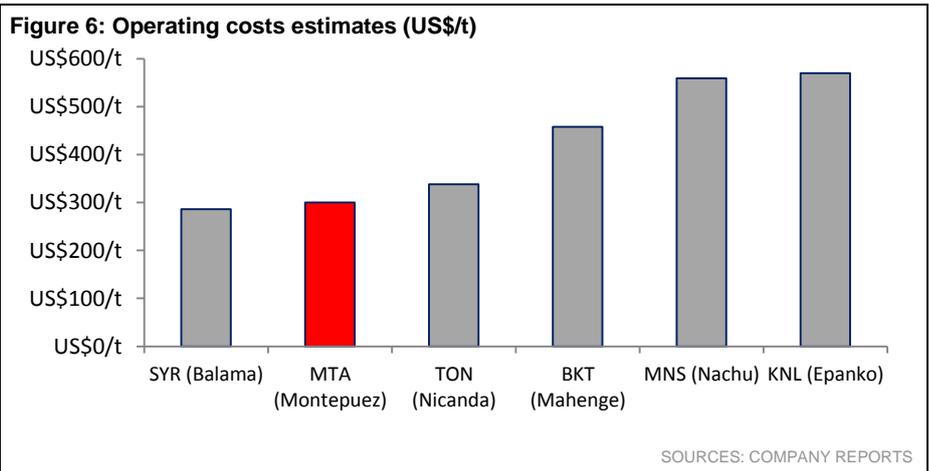
Purity is a key factor in both the price received and the cost of production, as additional processing is required to improve the concentrate to desired purity levels. Testing to date indicates that, with a readily achievable >96% TGC concentrate, the Montepuez project stacks up well as a supplier of a quality product that could be expected to achieve high prices.



OPEX estimates

Montepuez is reported to be a high grade graphite project well located 260km from the deep water Port Pemba, where there is existing ship loading capacity. It is proposed that concentrate will be trucked to port with 200km of the 260km over sealed bitumen. The project also boasts a modelled low strip ratio of 2.2:1 which has the potential to be further improved during optimisation in the PFS.

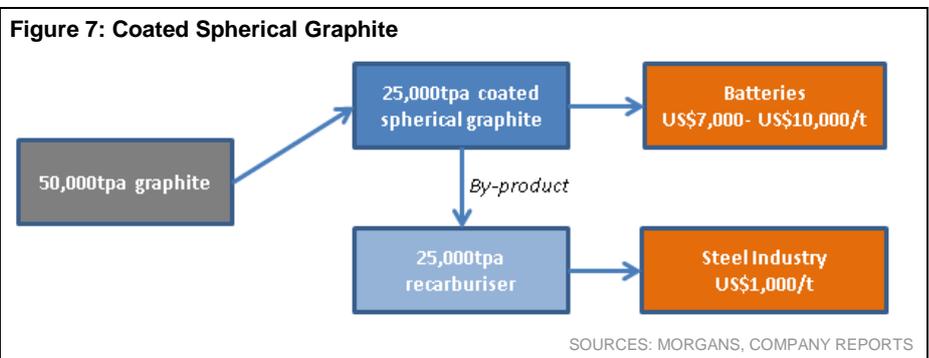
The Scoping Study notes that a combination of favourable logistics and projected high grade/quality product will position MTA as potentially one of the lower cost producers globally.



As highlighted in Figure 4, MTA proposes that 50% of the flake graphite (50,000tpa) will be exported to Asian markets while the finer material will be upgraded to spherical graphite for the Li-ion battery market. Coated spherical graphite is physically and chemically altered to increase purity (>99.9%TGC) for use in anodes for Li-ion batteries.

The Montepuez Scoping Study indicates that it will cost a further US\$3,200/t to upgrade the product to coated spherical graphite. This is comparable with Syrah Resources' FOB cost estimate of US\$3,200/t. Both SYR and MTA have indicated their intention to sell Recarburiser by-product which in SYR's case reduces OPEX to US\$2,735/t. There is currently no estimate provided by MTA but it is reasonable to estimate it would have a similar positive effect on the final OPEX.

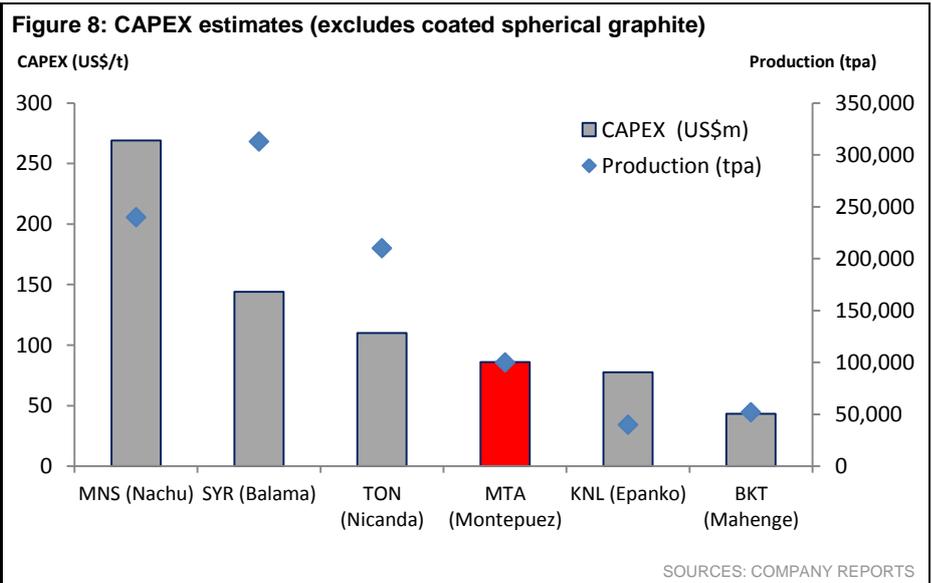
Currently coated spherical graphite is reported to sell for between US\$7,000/t and US\$10,000/t and there appears strong consistency between MTA's and SYR's mining studies to date.



CAPEX estimates

From MTA's Scoping Study the cost estimate for a 1.2Mtpa processing plant to produce 100,000tpa graphite concentrate at Montepuez was US\$86.2m (excluding contingency of US\$33.2m). Relative to its peers, the project has a low CAPEX and we believe project funding is achievable in the current environment if the company can secure binding off-take with one or more credible end users.

The Coated Spherical Graphite plant was initially estimated to cost a further US\$80m, also comparable with SYR's estimate for a 25,000tpa plant. The recent alliance with Coulometrics LLC, a provider of energy storage consulting services and advance battery component manufacturing services has provided indications that construction of a modular plant could achieve significant cost savings, and that if built in the USA, might attract energy-funding initiatives.



Off-take agreements

There is a scarcity of binding off-take agreements for natural flake graphite for industrial purposes. Reported agreements include:

- Syrah Resources - Chinalco (80,000tpa)
- Kibaran - ThyssenKrupp (20,000tpa) & European Trader (10,000tpa)
- Magnis Resources – Sinosteel (100,000tpa) & Sinoma (80,000tpa)

There are also no binding off-take agreements currently in place for spherical graphite (used for lithium-ion batteries). Syrah Resources (SYR.ASX) recently announced an MOU with Marubeni to secure off-take agreements with anode and battery producers in Japan and Korea by 30 June 2016.

It is reported that this market is open and there is good potential for MTA to supply future demand not yet contracted. The recently-acquired Spherical Graphite mill in the USA will support MTA's ambitions to advance testwork with end users in North America. This is seen as an important step on the road to securing binding off-take.

Key risks

Off-take

Graphite is not sold into an open market, it is an opaque and immature market. Graphite is a specialised industrial commodity with a number of different applications and end users. Inability to secure off-take may impede financing.

Financing

Mining is a capital intensive industry and an inability to secure financing would limit the company's ability to develop the projects.

Metallurgy

While the company has completed positive metallurgical testwork to date, further testwork is required. Poor metallurgical results from testwork or ultimately in production will affect the company's ability to secure off-take.

Exchange rate

MTA is not expecting to earn revenue in the near future. In Mozambique, costs are denominated in USD. Graphite prices and revenues are commonly denominated in USD.

Commodity prices

Graphite is sold in an opaque market where pricing is variable depending on the quality of the product. If MTA cannot secure pricing at the levels estimated in mining studies, it would affect the forecast project returns.

Sovereign risk

While Mozambique has a long established mining industry, any changes to government legislation, the fiscal regime and foreign ownership regulations may have a detrimental effect on MTA.

Graphite outlook

Graphite outlook

There are three factors which are expected to support the medium-term outlook for quality natural flake graphite:

- 1) **Flake spherical graphite to displace synthetic spherical graphite:** The synthetic spherical graphite is estimated to be a 1-2Mtpa market versus the existing market for spherical flake graphite which is around 150ktpa. Synthetic spherical graphite is derived from high temperature and acid purification processes involving petroleum coke and coal. Due to the number of processes required to obtain high purity levels, prices are currently 3- 4 times higher than for spherical graphite derived from natural flake. There is a significant cost advantage for spherical graphite derived from natural flake over synthetic graphite which price differential should see a gradual switch over time. Over time this switch will significantly bring down the price of Li-ion batteries.
- 2) **New demand will come from the 'green energy' market:** Traditional demand for graphite for industrial applications is experiencing slow growth which is expected to continue. It is the battery market which is expected to drive demand growth for flake graphite and the lithium-ion battery market is forecast to triple by 2020 (Industrial Minerals).
- 3) **Chinese 'dirty' supply:** Chinese producers dominate the graphite market from a supply perspective, providing +70% of the world's graphite. However, there has been criticism of China's 'dirty' mining operations with air pollution and contaminated waterways. There is already commentary that green energy end users such as car maker Tesla will not source raw material from such suppliers for its lithium-ion battery gigafactory (Bloomberg 14 March).

Summary

With a market capitalisation of \$16.2million, there is a large valuation gap between MTA and its peers. As the company continues off-take discussions there is re-rating potential if it can demonstrate progress towards securing binding off-take agreements with quality end users.

Key catalysts for the stock include: 1) delivery of Balama Central Scoping Study; 2) continued positive metallurgical testwork; 3) delivery of Montepuez and Balama Central PFS; 4) progress on off-take discussions; and 5) successful production of spherical graphite from the US-based spherical graphite mill.

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