

Black Rock Mining Ltd (BKT)

Rating: Buy | Risk: High | Price Target: \$0.46

17 October 2023

Next in Line. Initiation of Coverage

Key Information

Current Price (\$ps)	0.09
12m Target Price (\$ps)	0.46
52 Week Range (\$ps)	0.08 - 0.20
Target Price Upside (%)	441.2%
TSR (%)	441.2%
Reporting Currency	AUD
Sector	Materials
Avg Daily Volume (m)	0.5
ASX 200 Weight (%)	#VALUE!

Fundamentals

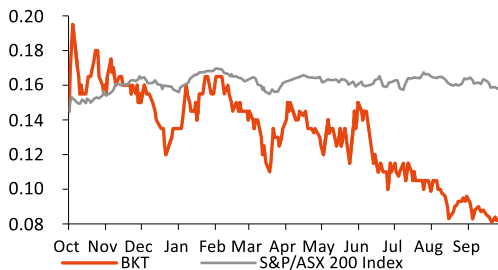
YE 30 Jun (AUD)	FY22A	FY23E	FY24E	FY25E
Sales (\$m)	0	0	0	0
NPAT (\$m)	(6)	(9)	(4)	(11)
EPS (cps)	(0.7)	(0.9)	(0.4)	(1.0)
EPS Growth (%)	(0.2%)	(38.4%)	56.5%	nm
DPS (cps) (AUD)	0.0	0.0	0.0	0.0
Franking (%)	100%	100%	100%	100%

Ratios

YE 30 Jun	FY22A	FY23E	FY24E	FY25E
P/E (x)	(22.1)	(9.3)	(21.5)	(8.8)
EV/EBITDA (x)	n/a	n/a	n/a	n/a
Div Yield (%)	0.0%	0.0%	0.0%	0.0%
Payout Ratio (%)	0.0%	0.0%	0.0%	0.0%

Price Performance

YE 30 Jun	1 Mth	2 Mth	3 Mth	1 Yr
Relative (%)	(8.3%)	(9.9%)	(20.6%)	(52.2%)
Absolute (%)	(11.5%)	(14.1%)	(22.7%)	(43.3%)
Benchmark (%)	(3.2%)	(4.2%)	(2.1%)	8.9%



Price performance indexed to 100

Source: FactSet

Major Shareholders

POSCO Holdings	11.5%
Copulos Group	11.0%

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Event

We initiate on Black Rock Mining with a Buy recommendation and \$0.46 price target. BKT's 84% owned Mahenge Graphite Project in Tanzania is favourable positioned to provide low carbon intensity high quality premium graphite feedstock to an emerging supply chain between POSCO and the rest of the world. We are bullish graphite over the medium-term given its status as both critical mineral and key component of lithium-ion batteries.

Highlights

- Black Rock's 84% owned Mahenge Graphite Project in Tanzania contains a world-class ore body: 213mt at 7.8% TGC, that has an ability to produce a clean graphite concentrate free of deleterious elements in high demand.
- Black Rock's main point of differentiation vs peers is the existence of POSCO as corner stone to the project.
- POSCO, 11.5% shareholder and world's largest anode producer outside of China, has secured 100% of fines (<150 microns) from module 1 and recently provided a MOU for future options for fines from module 2 and additional equity investment of up to US\$40m.
- POSCO's qualification of Mahenge ore and their presence on the share register is the strongest possible indication of confidence in Black Rock and signals further de-risking of the company's funding strategy.
- Mahenge is expected to produce at a high operating margin at the bottom end of the cost curve thanks largely to access to grid hydro power at US\$0.08/KWhr.
- Access to hydro power also means graphite from Mahenge will have a very low carbon intensity compared to peers and is likely to have one of the lowest carbon footprints of any graphite project globally.
- Black Rock are adopting a staged approach to construction of four modular processing plants, each with nameplate capacity of 1mtpa providing a concentrate at a grade around 8%.
- Construction of Module 1 is estimated to cost US\$215m including US\$33m for a 70km power line to the hydro project and we assume first product in FY26.
- The combination of high margin and low cost means that Mahenge should be one of the first graphite producers to supply into a tightening graphite market.
- 70% of natural graphite globally is currently mined and produced in China. Further, virtually all graphite concentrate that is processed downstream into either precursor battery material or active anode material is done so in China.
- Such concentration of the critical minerals market poses a strategic challenge to the rest of the world that has seen the US, Europe, Australia and other countries announce funding aimed at diversifying supply and countering China's dominant position over minerals crucial to clean energy that includes graphite.
- Given the forecast graphite supply shortages coming, and that there are few shovel-ready projects poised to meet the forecast demand anywhere in the world, this suggests graphite prices must move up to incentivise new production.
- The next share price catalyst is project financing which could include a strategic partner coming in at project level as well as traditional debt and equity. Black Rock has received initial stage credit approval from a wholly owned subsidiary of the Government of South Africa and intends commence construction in 2025.

Recommendation

We initiate on Black Rock Mining with a Buy recommendation and \$0.46 price target.

Black Rock Mining Ltd

Materials Materials

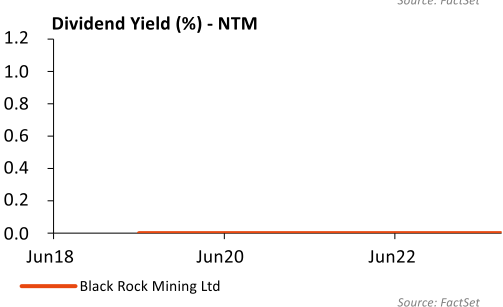
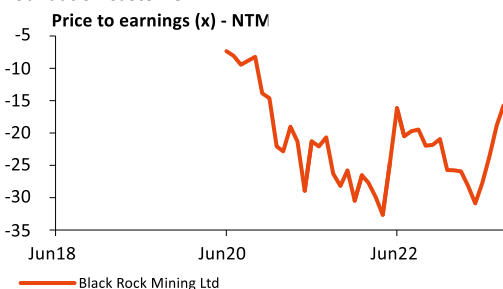
FactSet: BKT-AU / Bloomberg: BKT AU

Key Items

Key Items	Data
Recommendation	BUY
Risk	HIGH
Price (\$ps)	0.09
Target Price (\$ps)	0.46
52 Week Range (\$ps)	0.08 - 0.20
TSR (%)	441.2%

Company Description

Blackrock Mining is developing the Mahenge Graphite Project in Tanzania. Mahenge is a world-class deposit in terms of size and grade. Blackrock aims to become a leading producer of graphite for lithium-ion batteries. Posco is a foundation customer.



Financial Year End: 30 June

Investment Summary (AUD)	FY21A	FY22A	FY23E	FY24E	FY25E
EPS (Reported) (cps)	(0.7)	(0.7)	(0.9)	(0.4)	(1.0)
EPS (Underlying) (cps)	(0.7)	(0.7)	(0.9)	(0.4)	(1.0)
EPS (Underlying) Growth (%)	n/a	(0.2%)	(38.4%)	56.5%	nm
PE (Underlying) (x)	(21.3)	(22.1)	(9.3)	(21.5)	(8.8)
DPS (cps) (AUD)	0.0	0.0	0.0	0.0	0.0
Dividend Yield (%)	0.0%	0.0%	0.0%	0.0%	0.0%
Franking (%)	100%	100%	100%	100%	100%
Payout Ratio (%)	0.0%	0.0%	0.0%	0.0%	0.0%
Profit and Loss (AUD) (m)	FY21A	FY22A	FY23E	FY24E	FY25E
Sales	0	0	0	0	0
Net Interest	0	0	0	(6)	(16)
Pretax Profit	(3)	(6)	(9)	(6)	(16)
Tax	0	0	0	2	5
Tax Rate (%)	0.0%	0.0%	0.0%	(30.0%)	(30.0%)
NPAT Underlying	(3)	(6)	(9)	(4)	(11)
Significant Items	0	0	0	0	0
NPAT Reported	(3)	(6)	(9)	(4)	(11)
Cashflow (AUD) (m)	FY21A	FY22A	FY23E	FY24E	FY25E
Balance Sheet (AUD) (m)	FY21A	FY22A	FY23E	FY24E	FY25E
Total Assets	34	57	61	303	409
Short Term Debt	0	0	0	0	0
Long Term Debt	0	0	0	120	240
Total Liabilities	0	2	4	120	237
Ratios	FY21A	FY22A	FY23E	FY24E	FY25E
ROE (%)	(16.8%)	(13.6%)	(16.6%)	(3.7%)	(6.3%)

Black Rock Mining – Next in Line

- We initiate on Black Rock Mining with a Buy recommendation and \$0.46 target price.
- Black Rock’s 84% owned Mahenge Graphite Project in Tanzania contains a world-class ore body: 213mt at 7.8% TGC, that has an ability to produce a clean graphite concentrate free of deleterious elements in high demand.
- Black Rock’s main point of differentiation vs peers is the existence of POSCO as corner stone to the project.
- POSCO, 11.5% shareholder and world’s largest anode producer outside of China, has secured 100% of fines (<150 microns) from module 1 and recently provided a MOU for future options for fines from module 2 and additional equity investment of up to US\$40m.
- POSCO’s qualification of Mahenge ore and their presence on the share register is the strongest possible indication of confidence in Black Rock and signals further de-risking of the company’s funding strategy. We expect debt term sheets in 2H23 with Black Rock already through initial stages with a subsidiary of the Government of South Africa.
- POSCO aims to invest US\$93bn between now and 2030, 46% of that in the lithium-ion battery chain, and, along with CATL, LG Energy and BYD, is aiming to join the ranks of the world’s top secondary battery materials.
- We forecast Mahenge will produce a premium high value concentrate product generating an average sales price of US\$1,700/t.
- An updated definitive feasibility study was released in October 2022 that confirms Mahenge as a standout high margin, low capex development-ready graphite project.
- Mahenge is expected to produce at a high operating margin at the bottom end of the cost curve thanks largely to access to grid hydro power at US\$0.08/KWhr.
- Access to hydro power also means graphite from Mahenge will have a very low carbon intensity compared to peers and is likely to have one of the lowest carbon footprints of any graphite project globally.
- Black Rock has signed a framework agreement with the Government of Tanzania that covers the ownership, development and management of the Project. The agreement provides for a special mining license and 30% tax rate, 4% royalty rate and 16% free carry to the Government.
- Black Rock are adopting a staged approach to construction of four modular processing plants, each with nameplate capacity of 1mtpa providing a concentrate at a grade around 8%.
- Construction of Module 1 is estimated to cost US\$215m including US\$33m for a 70km power line to the hydro project and we assume first product in FY26.
- The combination of high margin and low cost means that Mahenge should be one of the first graphite producers to supply into a tightening graphite market.
- Currently 70% of natural graphite is mined and produced in China. The US, Europe, Australia and other western countries, concerned about access to future supply, have all recently announced funding aimed at diversifying supply and countering China’s dominance of the global market for critical minerals which includes graphite.

Figure 1: Black Rock Mining valuation assumptions

WACC	
Risk Free Rate	4.0%
Equity Risk Premium	6.0%
Beta	1.2
Cost of Equity	11.2%
Target Gearing	20%
Cost of Debt	10.0%
Tax Rate	30%
WACC	10.4%

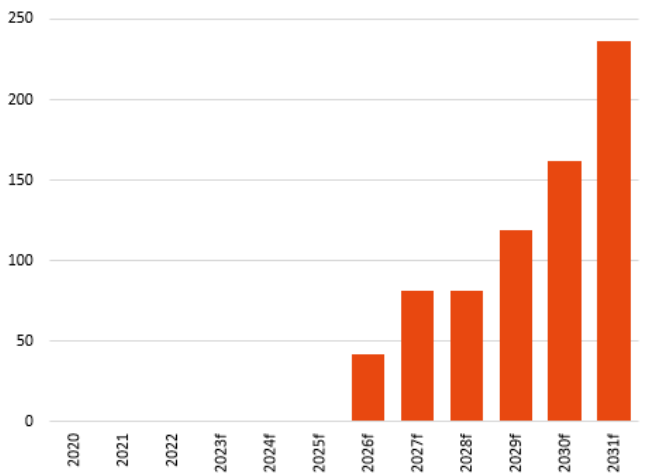
Source: Company reports, Shaw and Partners analysis

Figure 2: Black Rock Mining valuation

Black Rock Valuation	A\$m	A\$ps
Mahenge	451	0.46
Cash	10	0.01
Exploration upside	0	0.00
Corporate costs	-15	-0.02
Total Valuation	446	0.46

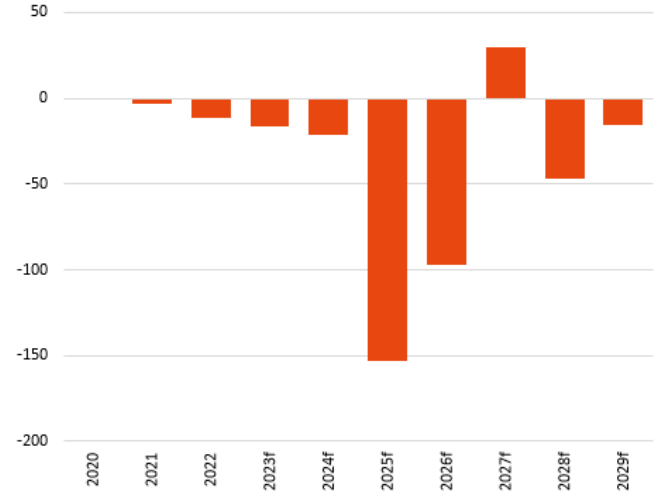
Source: Company reports, Shaw and Partners analysis

Figure 3: Mahenge concentrate produced (t)



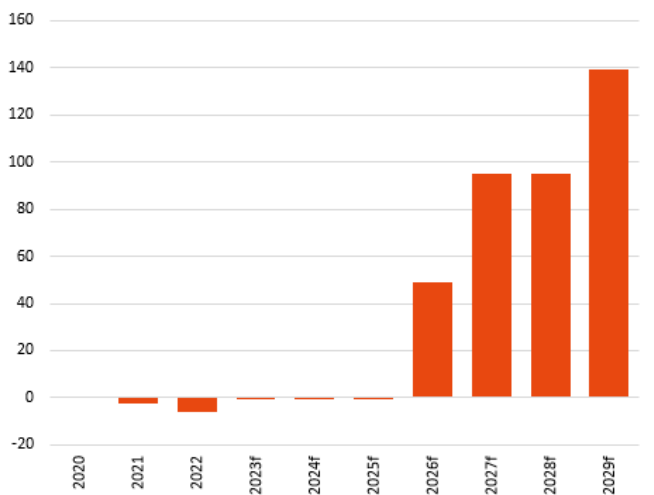
Source: Company data & Shaw and Partners analysis

Figure 4: Free cash flow strongly positive



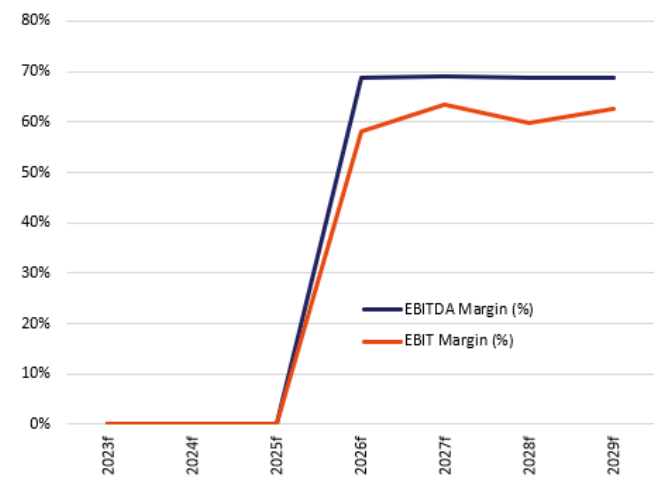
Source: Company data & Shaw and Partners analysis

Figure 5: EBITDA



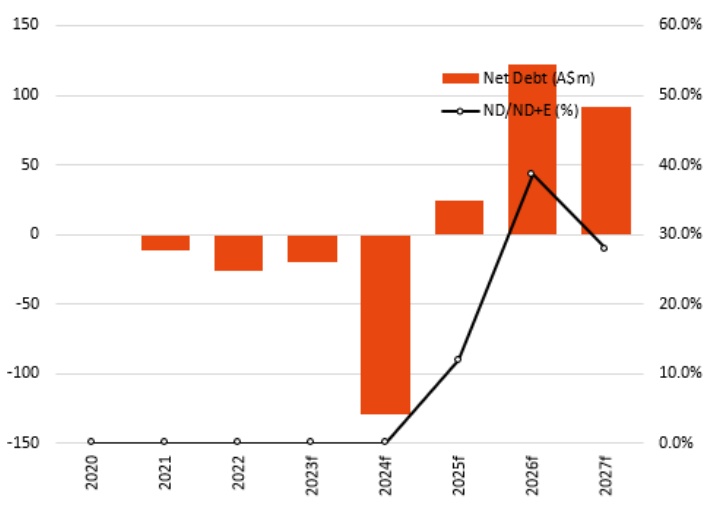
Source: Company data & Shaw and Partners analysis

Figure 6: Margins (%)



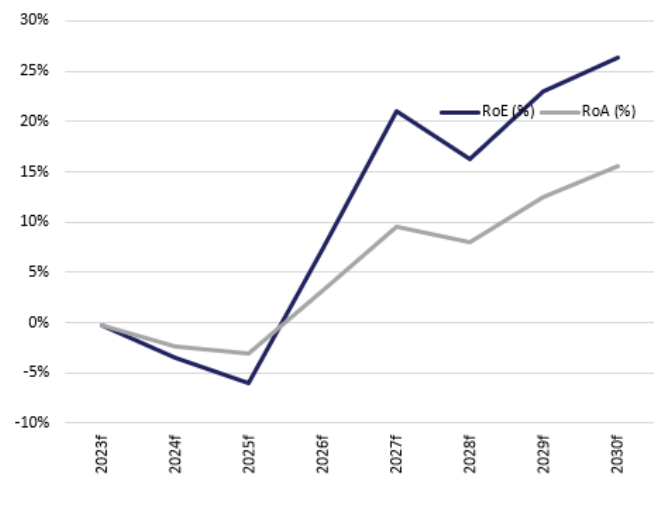
Source: Company data & Shaw and Partners analysis

Figure 7: Net debt and gearing (US\$m, %)



Source: Company data & Shaw and Partners analysis

Figure 8: Returns (%)

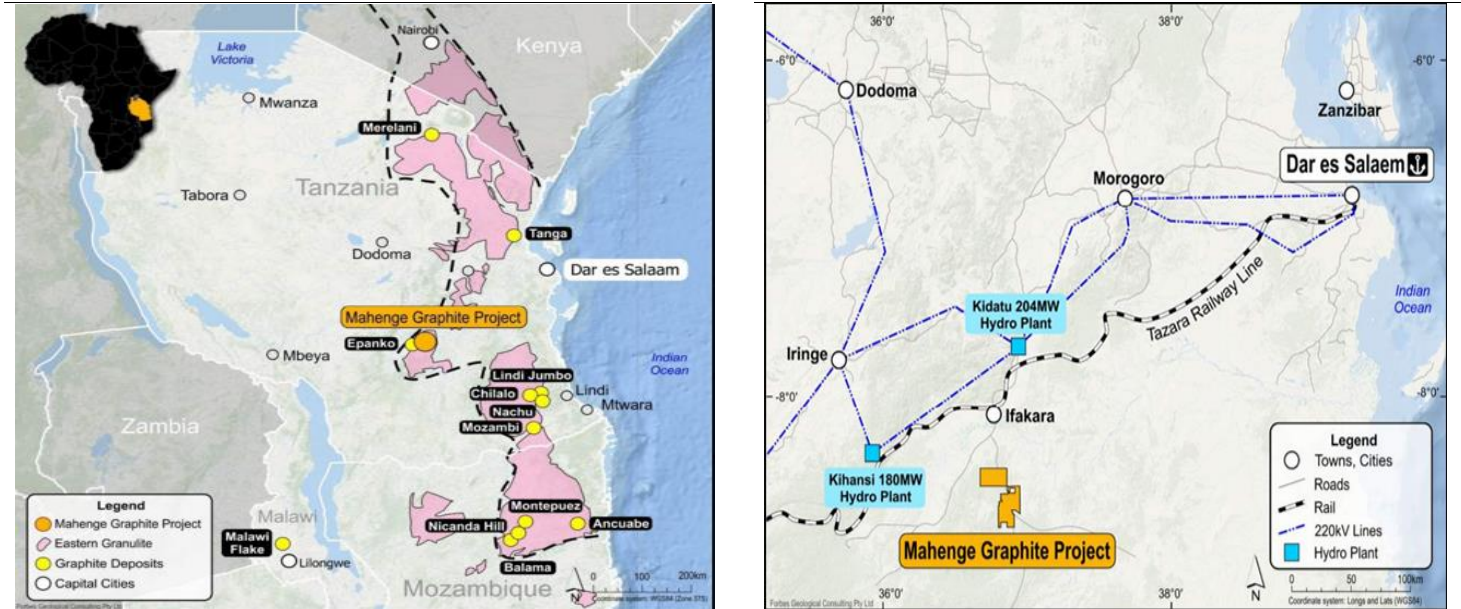


Source: Company data & Shaw and Partners analysis

Mahenge overview

Black Rock Mining has been developing the Mahenge Graphite Project in Tanzania since 2014 after predecessor company Green Rock Energy acquired the project. 84% owned Mahenge is located 250km north of the Mozambique border and 300km southwest of Tanzania’s largest city, Dar es Salaam.

Figure 9 and 10: Project location



Source: Company reports

Black Rock’s key differentiation is its upstream and customer-focussed operating model. The geology of Mahenge is low in deleterious impurities and has favourable metallurgy which allows Black Rock to produce very high purity graphite concentrates (up to 99%) using simple low-cost conventional flotation. Crucially, very few graphite developers can demonstrate customer demand for the product as robustly as Black Rock can thanks to its strategic alliance and offtake with POSCO Group.

POSCO is a South Korean conglomerate that owns the country’s biggest steelmaker. The company recently aggressively lifted targets to invest US\$93bn through 2030 on batteries and hydrogen. POSCO Future M (formerly POSCO Energy) and POSCO International have previously outlined investment plans in the production of battery components including anodes, cathodes, nickel and lithium processing. The POSCO Future M division produces high-performance anodes that maintain a stable structure after numerous charges and discharges. The division aims to produce 370kt of Battery Anode Material annually by 2030.

Black Rock has chosen to focus on producing graphite concentrate rather than running a simultaneous downstream operation in partnering with POSCO. In so doing, BKT also avoids competing with its key customer. Qualifying Mahenge graphite concentrate to meet battery grade requirements as Lithium-Ion Battery anode pre-cursor material was a four year process that culminated in November 2020, following the Strategic Alliance and Development Memorandum of Understanding announced in June that year.

An additional feature of the POSCO agreement is price discovery. Mahenge -195 concentrate will be priced using a reported index from Asianmetals.com, a widely reported metals reporting agency. This means investors and financiers can be directed to an independent and transparent pricing source to support a debt package.

Mahenge History

Black Rock floated on the ASX in December 2003 as Mokuti Mining, a gold explorer in WA. Mokuti changed its name to Green Rock Energy after acquiring the geothermal energy licences adjacent to Olympic Dam in March 2005.

2014 July - Green Rock acquires Mahenge for 167m Green Rock shares and \$600k in committed exploration spend. Changes name to Black Rock Mining.

2016 February – Maiden JORC Resource of 131mt at 7.9% TGC, 40% Indicated. The fourth largest JORC compliant resource globally.

2016 March – Scoping Study highlights include US\$57.3m capex for 52ktpa production at C1 cost US\$458/t. Payback period two years after commercial production.

2016 September – First spherical tests deliver battery grade specifications.

2016 December – Expands PFS to 120ktpa in two stages with initial 60ktpa production.

2017 March – John de Vries appointed Chief Operating Officer, interim CEO April 2017, CEO August 2017.

2017 April – PFS highlight include US\$159m capex for two 83ktpa staged modules with second module self-funded at C1 cost US\$485/t (stage 1).

2017 July – Tanzanian mining legislation overhaul. Unprocessed ore ban, 1% clearing fee on mineral exports, increased royalties, 16% Government free carry, etc.

2017 August – PFS optimisation adds third staged module for 250ktpa production.

2017 October – Richard Crookes appointed Chairman.

2018 May – Pilot plant production of 99%+ graphite concentrate under floatation.

2018 September – Mahenge receives Environmental Impact Assessment Certificate.

2018 October – 90ktpa offtake signed with Heilongjiang Bohao Graphite Company.

2018 October - Mahenge DFS for three-stage 250ktpa production for US\$268.7m and LOM C1 US\$401/t (Phase 1 83ktpa for US\$115m capex).

2019 February – Mahenge receives Mining Licence Approval.

2019 July - DFS optimisation adds fourth staged module for 340ktpa production.

2020 June – Strategic alliance and development MOU with POSCO.

2020 November – POSCO confirms Mahenge concentrate meets battery grade requirements as lithium-ion battery anode pre-cursor.

2020 December – POSCO invests US\$7.5m for 15% of BKT at 23% premium, secures LOM offtake for 100% of Module 1 fines via US\$10m prepayment. Appoints BKT Director.

2021 December – Framework Agreement signed with Government of Tanzania.

2023 May – POSCO non-binding MOU to supply 6kt of large flake from Module 1, in addition to 100% of fines.

2023 September – POSCO to provide additional equity up to US\$40m, or a 19.99% BKT stake, to secure long-term fines offtake from Module 2.

Mahenge Mining and Processing

Mahenge is the fourth largest measured JORC compliant natural graphite resource in the world. The first ten years of the mine plan, including 100% of Module 1 and 2, are underpinned by a Measured & Indicated mineral resource.

In total, the 213mt of graphitic carbon resource and 70mt reserve underpins a multi-decade mine life, with the graphite particle distribution mainly composed of high margin large flakes (70% of concentrate over 150 µm).

Figure 11: Resource and Reserve estimate

Category	Tonnes, mt	Grade, %	Contained Graphite, mt
Ore Reserves			
Proven	0	0	0
Probable	70.5	8.5	6.0
Total Ore Reserves	70.5	8.5	6.0
Mineral Resources			
Measured	31.8	8.6	2.7
Indicated	84.6	7.8	6.6
Total Measured and Indicated	116.4	8.0	9.3
Inferred	96.7	7.4	7.2
Total Measured, Indicated and Inferred	213.1	7.8	16.6

Source: Company report

Figure 12: Resource and Reserve estimate

Prospect	Category	Tonnes, mt	Grade, % TGC	Contained Graphite, mt
Ulanzi	Measured	19.6	8.8	1.7
	Indicated	46.2	8.2	3.8
	Inferred	48.7	7.8	3.9
	Sub-total	114.5	8.1	9.3
Cascade	Measured	12.1	8.3	1.0
	Indicated	20.8	8.3	1.7
	Inferred	27.3	7.9	2.2
	Sub-total	60.2	8.1	4.9
Epanko	Measured	-	-	-
	Indicated	17.6	6.4	1.1
	Inferred	20.8	5.9	1.2
	Sub-total	38.4	6.1	2.3
Combined	Measured	31.8	8.6	2.7
	Indicated	84.6	7.8	6.6
	Inferred	96.7	7.4	7.2
	Total	213.1	7.8	16.6

Source: Company report

The Project will be an owner-operator open pit mining operation based on mining the Ulanzi, Cascade and Epanko deposits using a conventional truck and shovel approach. Mining commences at Ulanzi in Year 0 followed by Cascade in Year 2.

In the early periods, 20t rear tipper trucks will be matched to 45t class excavators for site establishment. The mining fleet will be upgraded to larger 50t dump trucks and 90t excavators after year 1 to increase mine productivity and achieve economies of scale.

The strip ratio is low, 0.8:1, life of mine. Processing is conventional, involving a simple crush circuit followed by grinding. Testwork has indicated grades can be tailored to 95% or 97.5% TGC, by varying the number of stages of polishing and flotation.

Process Plants

Mahenge ore will be processed using a four-stage 1mtpa modular approach. Module 1 and 2 will process ore from Ulanzi while Module 3 and 4 will process ore from Cascade and Epanko.

Figure 13: LOM process parameters

Parameter	Units	Module 1	Module 2	Module 3	Module 4	Total
Commence Operation	year	1	2	3	4	-
Nominal mine life	years	-	-	-	-	26
Process Throughput	kt/y	1,061	1,061	1,061	1,061	-
LOM Ore Treated	mt	27.3	25.9	21.7	20.0	95.0
Average Feed Grade	TGC%	8.24	8.19	7.96	8.06	8.13
Recovery	%	92.8	92.8	92.8	92.8	92.8
Average Concentrate Grade	TGC%	97.3	97.3	96.1	96.1	96.8
Graphite Concentrate Production	mt	2.15	2.03	1.7	1.6	7.4

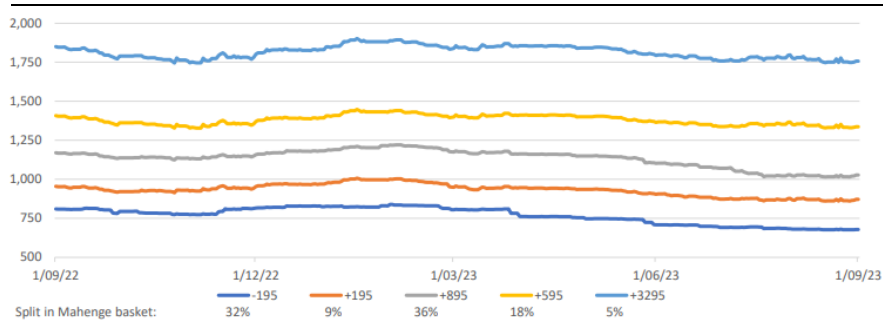
Source: Black Rock Mining enhanced DFS

Graphite concentrate is sold on a mix of term contract and spot. Chinese markets are typically spot priced. Volume contracts over a longer tenure will typically have repricing mechanisms on a frequent basis. Around 80% of volume is sold to China, the balance goes into industrial markets around the world. While graphite markets for steel making, lubricants and other industrial offer GDP+ style growth, the majority of growth over the next decade is forecast to come from the anode material of lithium-ion battery markets.

Figure 16 (below) shows pricing for Mahenge’s 5 different graphite products. The -195 and +195 products are suitable for battery markets and constitute 40% of the basket. The remaining 60% of the basket is suitable for industrial applications.

Graphite is split into a number of categories based on size, namely fines (+100 mesh, -100 mesh), large flake (+50 mesh, +80 mesh) and jumbo flake (+32 mesh). For the battery cell market, concentrate is converted into Spherical Purified Graphite, a precursor product, before being further processed and coated into Active Anode Material.

Figure 16: Graphite pricing by Mahenge product last 12mths, US\$



Source: RefWin, Asian Metals, ICC Sino, Black Rock Mining

Enhanced DFS

Black Rock completed its first Definitive Feasibility Study for Mahenge in October 2018. This was enhanced in July 2019 and then again in October 2022 in conjunction with Font-End Engineering Design as part of the debt financing process. FEED studies included detailed engineering, cost estimation, schedule optimisation, development of Project Execution and Operational Readiness plans, as well as tenders for long lead equipment items.

The FEED and eDFS Update reconfirmed Mahenge as a robust project with attractive returns. The completed work enables Black Rock to progress the debt finance process prior to a Final Investment Decision. We expect term sheets to be received and the debt process to complete in the second half of 2023.

Figure 17: eDFS update

eDFS Update	Project Metric	Consensus Forecast	Fastmarket
Module 1 capex	US\$m	182	
Average C1 cost first 10yrs	US\$/t	466	
Steady state production	ktpa	347	
Mahenge Basket price	US\$/t		1,709
NPV post tax (84%)	US\$m		2,837
IRR post tax (84%)	%	36	55
Payback period	years	4	3

Source: Black Rock Mining

One of the key differentiating features of Mahenge is its access to low-cost grid power in Tanzania. Grid power generation in Tanzania is sourced 40% hydro and 60% natural gas with the proportion of hydroelectricity expected to grow.

The nearby Julius Nyerere Hydro project is in construction with installed capacity of 2,115MW and has begun commissioning. As a result, graphite from Mahenge will have a very low carbon intensity compared to peers and is likely to have one of the lowest carbon footprints of any graphite project globally.

The eDFS assumed the ~60km power line to Ifakara to connect Mahenge to grid power would be built in parallel with the commissioning of Module 2. However, given the elevated level of diesel prices and the substantial benefit to Project economics and green credentials, Black Rock brought forward the construction of the power line to align with first production from Module 1 at a cost of US\$33m.

Figure 18: Julius Nyerere Hydropower Project (2115MW)



Source: Company reports

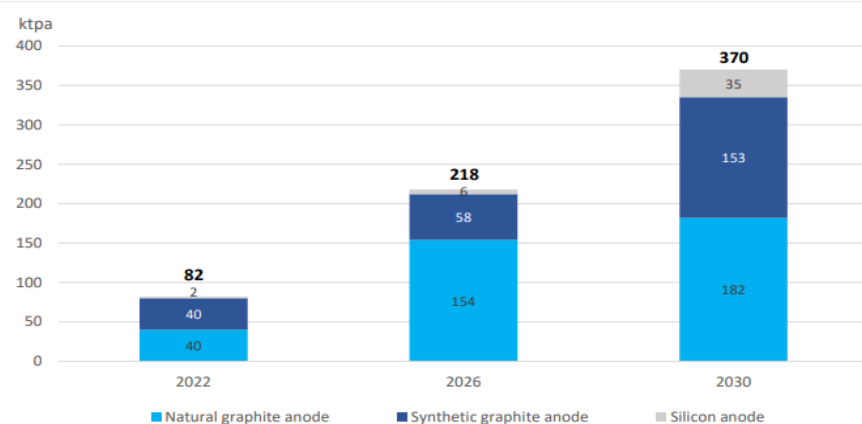
POSCO – the elephant in the room

Black Rock is one of the few graphite companies globally to have been qualified by an anode producer outside China: POSCO. Importantly, Black Rock has secured initial customer product acceptance *prior* to building the processing plant. This allows BKT to design and build the plant based on customer needs.

South Korean POSCO is the largest ex-China anode producer. POSCO aims to invest US\$93bn to 2030, 46% of that in the lithium-ion battery chain. POSCO also holds a 11.5% shareholding in BKT which is a strong indicator of POSCO’s confidence in the Mahenge’s quality.

POSCO, already world’s largest anode chemical producer outside China, has an aggressive growth strategy to meet the rising demand for EV batteries. The Company is looking to expand operations in the US to take advantage of the enormous Inflation Reduction Act. To achieve this growth strategy, POSCO needs to secure raw material supplies. Figure 19 illustrates the growth in the anode business in both synthetic and natural graphite anodes which is expected to increase 4.5x by 2030.

Figure 19: POSCO Future M’s growth plans for its anode business



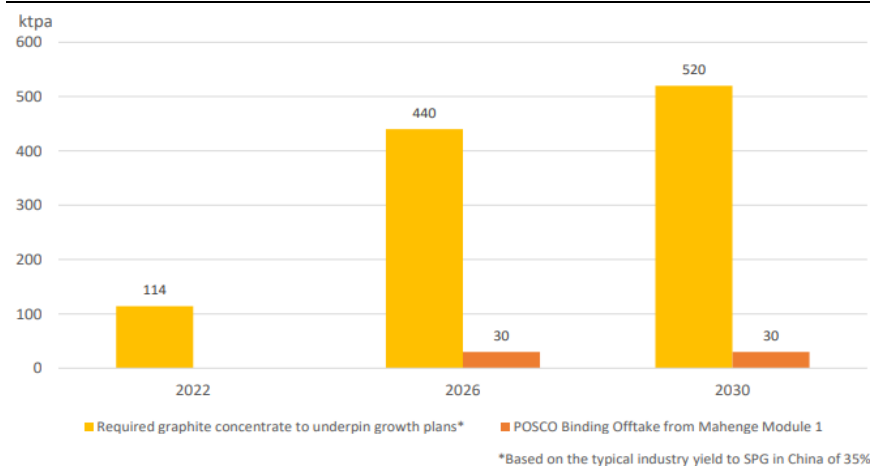
Source: POSCO Holdings Battery Materials Business Value Day Presentation, 11 July 2023

Source: POSCO

Despite POSCO’s ambitious growth plans, it is difficult to see where the anode pre-cursor product, graphite, will come from to meet these targets. It is in POSCO’s interest to see the Mahenge project into production and POSCO is certainly able to provide confidence to both debt and equity markets to see that happen.

Figure 20 converts this anode chemical back into the amount of raw natural graphite concentrate needed to meet POSCO's growth targets. Mahenge at full production comprises four modules for 120ktpa of graphite fines concentrate per annum. POSCO will need 4 Mahenge-sized projects to meet its growth targets.

Figure 20: POSCO Future M's required graphite concentrate to support its natural graphite anode growth plans



Source: POSCO

Non-binding MOU for Mahenge Stage 2 graphite fines

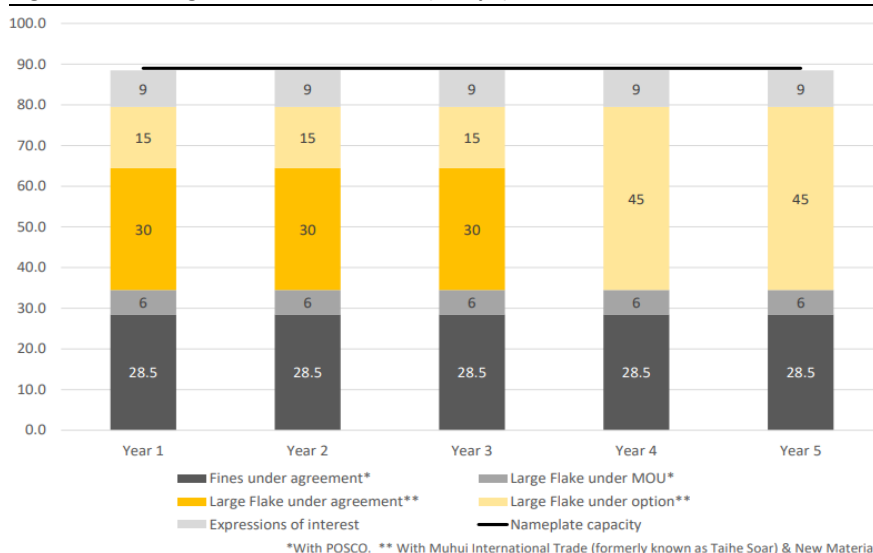
As part of the stage 2 offtake terms POSCO will commit (subject to final approval) to a strategic investment in BKT of up to US\$40m or an equity stake of 19.99% of BKT whichever is lower.

Module 1 offtake

89% of Module 1's 85kt pa processing plant capacity is under offtake to the following parties:

- POSCO (South Korea): 100% of -100 mesh fines LOM, 35-30ktpa plus 6kt of large flake (39% of volume in aggregate).
- Muhui (China): 20ktpa of +100, +80,+50 and +32 product over 3 years, plus an option for an additional 10ktpa.
- Qingdao Yujinxi New Material (China): ~10ktpa of +100,+80,+50,+32 product over 3 years, plus an option for an additional 5ktpa.

Figure 21: Mahenge offtake for module 1 (89ktpa)



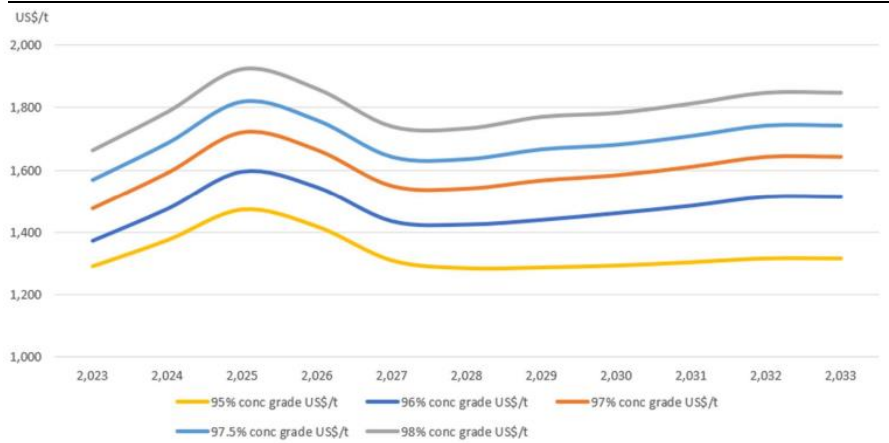
Source: Black Rock Mining

Pricing

The binding offtake with POSCO is referenced to the Asian Metals Flake Graphite Index, while the price for the two Chinese customers is to be referenced to the RefWin and ICC Sino indices.

We forecast Mahenge will produce a premium high value concentrate product generating an average sales price US\$1,700/t. We forecast average costs of US\$520/t.

Figure 22: Reporting agency graphite price forecasts for Mahenge Basket

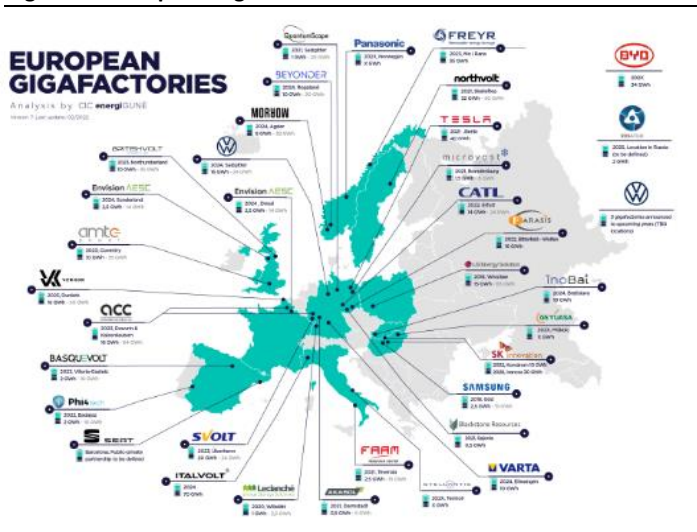


Source: Black Rock Mining

Graphite consumption is expected to continue to increase, owing largely to growth from the electric-vehicle market. The battery end-use market for graphite has grown by 250% globally since 2018. In the United States, 4 lithium-ion battery manufacturing plants are currently in operation, with an additional 21 in development. At full capacity, these plants are expected to require 1.2mt per year of spherical purified graphite, with perhaps half coming from synthetic.

Among the US domestic OEM's rushing to secure supply Tesla has been most active, entering into offtakes with Liontown Resources (LTR, Not Rated), BHP, Glencore and Syrah Resources (SYR, Buy, \$1.30). Other OEM's to have entered into similar offtakes include Stellantis with Pilbara Minerals (PLS, Not Rated) and Ford with Lake Resources (LKE, Not Rated).

Figure 23: European Gigafactories



Source: CIC energiGUNE, March 2023

Figure 24: European Gigafactories



Source: CIC energiGUNE, March 2023

BKT is nearing finalisation of funding arrangements for Mahenge. As well as traditional debt/equity, a potential alternate finance package including selling a stake in the Mahenge project may also be considered. A project finance decision is expected in 2HCY23.

Mahenge financial modelling assumptions

We have adopted a mining scenario as a basis for BKT valuation. We have largely adopted broad parameters from October 2022 DFS with cost inflation factored in.

Graphite will be sold as a concentrate to a basket of customers from module one initially, and then modules two through four as each comes on stream. We assume module one comes online in 2026 and ramps up to full production in 2027.

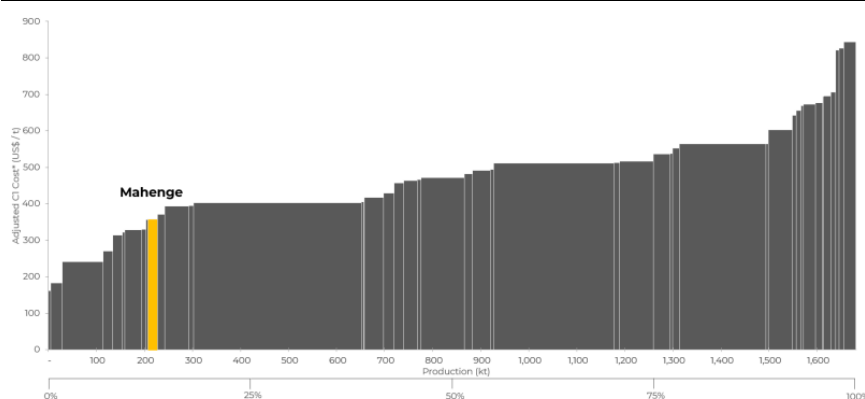
We assume Black Rock undertakes a one year capex pause in 2027 before beginning construction on module two in 2028. Again, we assume module 2 ramps up to full production in 2029. Modules three and four follow a similar pattern with a one year capex pause between finalising construction of one before commencing construction of the next.

For module one we model a flat 1,061ktpa process plant that will produce 81ktpa of graphite concentrate from year two of the 26-year life of mine. Total pre-production capex is in-line with the updated DFS estimate US\$215m, including US\$33m for the power line.

We assume flat recoveries to concentrate of 92.8%. If we lower recovery to 85% our valuation reduces to \$0.35. We assume flat prices received FOB of US\$1,700/t and will continue to track benchmarking agencies to refine estimates going forward.

Black Rock has prepared the 2024 Adjusted C1 Cost Curve below based on data provided by Benchmark Mineral Intelligence in its Flake Graphite Report Q2 CY22. The analysis confirms that Mahenge is well positioned compared to its global peers and sits comfortably within the first quartile of the cost curve.

Figure 25: Mahenge first quartile on the global cost curve



Source: Benchmark Minerals, Black Rock Mining June 2023

We value Black Rock Mining at \$451m, or \$0.46 per share factoring in project capex, government free carried interest, corporate overheads, future cash needs and \$15m in notional exploration upside.

Figure 26: Black Rock Mining valuation assumptions

WACC	
Risk Free Rate	4.0%
Equity Risk Premium	6.0%
Beta	1.2
Cost of Equity	11.2%
Target Gearing	20%
Cost of Debt	10.0%
Tax Rate	30%
WACC	10.4%

Source: Company reports, Shaw and Partners analysis

Figure 27: Black Rock Mining valuation

Black Rock Valuation	A\$m	A\$ps
Mahenge	451	0.46
Cash	10	0.01
Exploration upside	0	0.00
Corporate costs	-15	-0.02
Total Valuation	446	0.46

Source: Company reports, Shaw and Partners analysis

Financing - balance sheet and cash flow

Currently \$11.7m cash, no debt

Black Rock raised \$10m at \$0.115 in June 2023. Proceeds from the placement were used to support general working capital to complete the debt process and project level partner process. At the end of June BKT had \$11.7m cash and reduced cash spend of \$3m per quarter going forward until final investment decision for Mahenge.

Requirement to raise US\$130m equity in FY24

The October 2022 updated capital cost estimate for Mahenge module one was US\$182m plus US\$33m for the power line. Our valuation assumes that the company will raise US\$130m of equity in FY24, supported by POSCO, and US\$120m of debt (US\$10m POSCO prepay plus US\$110m project finance) across FY24 and FY25 to fund construction. We assume an average interest rate of 10%.

Gearing to peak at 78% in F26

On our numbers net debt peaks at US\$139m in FY29 for ND / ND+E of 45%. Although high for a single commodity, single asset company, we forecast debt to quickly be paid down as operational cash flow commences. Our base case has BKT net cash by FY31 at which time the company could consider paying dividends.

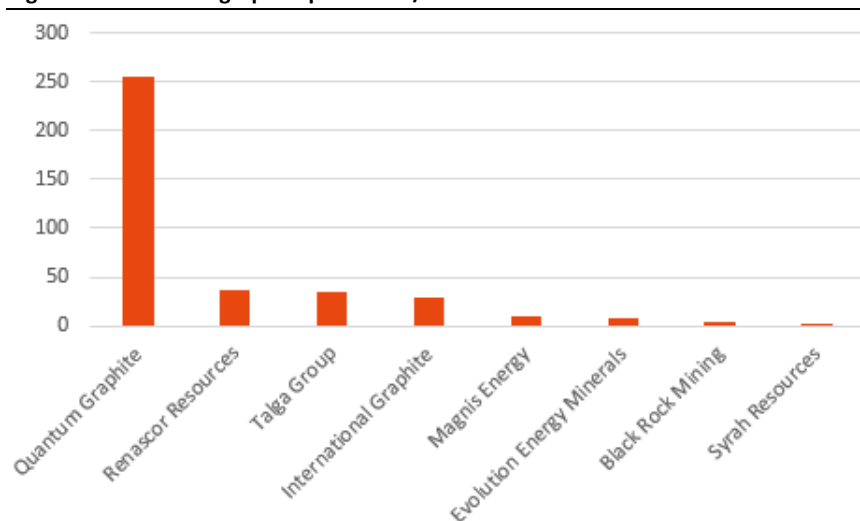
Debt servicing ratios will be very strong once in production – EBITDA/gross interest is 6x in FY29, Gross debt / EBITDA is only 1.6x in FY30.

Figure 28: ASX-listed graphite peers

Company	Asset	Location	Ownership	Mkt cap \$m	Cash \$m	EV \$m	Resource (mt)	Grade %TGC	EV/Resource/t	Reserve (mt)	Grade %TGC	EV/Reserve/t
Talga Group	Lulea/ Kiruna	Sweden	100%	509	39	470	72.7	18.6%	35	2.3	24.1%	847
Syrah Resources	Balama/ Vidalia	Mozambique/ Louisiana	100%	402	155	247	1,421	10.0%	2	107	16.0%	14
Renascor Resources	Siviour	South Australia	100%	368	129	239	87.4	7.5%	36	51.5	7.4%	63
Quantum Graphite	Uley	South Australia	100%	196	3	193	7.2	10.5%	255	-	-	-
Magnis Energy	Nachu	Tanzania	84%	106	22	84	174	5.4%	9	76.3	4.8%	23
Evolution Energy Minerals	Chilalo	Tanzania	84%	38	10	28	67.3	5.4%	8	8	10.5%	34
International Graphite	Springdale/ Collie	Western Australia	100%	30	4	26	15.6	6.0%	28	-	-	-
Black Rock Mining	Mahenge	Tanzania	84%	92	12	80	213.1	7.8%	5	70.5	8.5%	13

Source: Company reports

Figure 29: ASX-listed graphite peers – EV/ Resource t



Source: Company reports

Tanzania

Tanzania is a former British colony that gained independence in 1961 and became a republic within the Commonwealth of Nations in 1962. It is a one-party state with the Chama Cha Mapinduzi (CCM) in power since 1961.

President John Magufuli (2015-21) introduced new laws which significantly increased Governmental control over mining, oil and gas operations in response to a long-running tax dispute with Acacia Minerals. These changes heightened sovereign risk in Tanzania and the country experienced significant delays in finalising the mining act and in granting new mining tenements.

Barrick Gold paid US\$300m to the Tanzanian Government to settle the dispute following Barrick's takeover of Acacia in September 2019. The Presidential administration transitioned in 2021. The new administration under Samia Suluhu has adjusted its policies and programs to reflect an evolving social and economic context according to recent World Bank commentary.

Black Rock confirmed the Tanzanian Government's 16% non-dilutable free carried interest in Mahenge in December 2021 in return for approval to mine and export. Other key aspects of the agreement include a 4% royalty and 30% tax rate.

Other large mining leases and Framework Agreements put in place recently include Orecorp's gold project Nyanzaga, Peak Minerals' rare earths project Ngualla, and Strandline Resources' Fungoni mineral sands project.

Environmental, Social, and Governance

One of the key differentiating features of Mahenge is its access to low-cost grid power in Tanzania. Grid power generation in Tanzania in 2022 is sourced from ~40% hydroelectric and ~60% natural gas with the proportion of hydroelectricity expected to grow. The nearby Julius Nyerere Hydro project is in construction and will have an installed capacity of 2,115 megawatts and has begun commissioning. As a result, graphite from Mahenge will have a very low carbon intensity compared to peers and is likely to have one of the lowest carbon footprints of any graphite project globally.

Black Rock published a Sustainability and ESG Principles guiding document in March 2023. The company adheres to national standards and where appropriate the IFC Performance Standards and Version 4 of the Equator Principles. As a result, Mahenge meets the same standards as other Tier 1 resource developments.

The International Finance Corporation Performance Standards (IFC) set minimum requirements in terms of eight social, environmental, and corporate governance issues in projects primarily located in emerging markets to effectively manage related risks. The Equator Principles are intended to provide a minimum standard for due diligence, monitoring, and reporting to support responsible risk decision-making by project lenders.

Board and Management

Richard Crookes, Non-executive Chairman

Mr Crookes has over 30 years' experience in the resources and investments industries. He is a geologist by training having worked in the industry most recently as the Chief Geologist and Mining Manager of Ernest Henry Mining in Australia. Mr Crookes was most recently an Investment Director at EMR Capital and prior to that he was an Executive Director in Macquarie Bank's Metals Energy Capital division where he managed all aspects of the Bank's principal investments in mining and metals companies as well as the origination of numerous project finance transactions. Mr Crookes has extensive experience in deal origination, evaluation, structuring, and completing investment entry and exits for both private and public resource companies in Australia and overseas, as well as execution of Project Finance transactions in Africa..

Ian Murray, Non-executive Director

Mr Murray graduated with a Bachelor of Commerce in 1987 from the University of Cape Town, a fellow of the Institute of Chartered Accountants of Australia and New Zealand, and is a member of the Australian Institute of Company Directors. He has held senior management positions for companies such as KPMG, Price Waterhouse, Bioclones, DRDGold Ltd, and Gold Road Resources. More recently, as Chief Executive Officer and Managing Director, he successfully delivered Gold Road Resources' Gruyere Project, and has significant African experience through DRDGold.

John de Vries, Managing Director and CEO

Mr de Vries has over 30 years' experience in the mining industry. He started his career in 1984 working for WMC Resources and held operational roles such as Underground Manager, Senior Mining Engineer and Manager Mining. In 1998, he moved to AMC Consultants to become a Principal Mining Engineer responsible for Mine Optimisation. In 2003, he joined Orica Mining Services as Global Business Manager, Advanced Mining Solutions, before moving to BHP Billiton in 2007 as the Manager Strategic Mine Planning. Most recently from 2011 to 2015, he was General Manager Technical Services for St Barbara. After his success with St Barbara, Mr de Vries took an 18-month sabbatical before joining Black Rock Mining. Mr de Vries holds a Bachelor of Engineering, Mining, a Master of Science in Mineral Economics, a Graduate Diploma in Economic Geology, a Graduate Diploma in Financial Markets and is Advisory Committee Member-Mining of MRIWA. Mr de Vries holds a WA First Class Mine Managers Certificate of Competency. He is a member of the AusIMM, a fellow of FINSIA and a member of SME.

Key risks

- The graphite price is opaque, volatile and driven as much by China-centric demand as fundamental supply and demand. As such, the price of graphite is relatively difficult to forecast and the actual price may differ substantially from our forecasts.
- Availability of funding is not guaranteed and a lack of sufficient funding is a significant risk.
- Current battery technology is such that all lithium-ion batteries use substantial amounts of graphite. However, risk remains in the long-term should next generation batteries use alternative chemistries such as silicon anode or solid-state lithium batteries.
- Key person risk. If senior management depart the company then it could delay projects or exacerbate operational risks.

Core drivers and catalyst

- The next catalyst is the delivery of a complex funding package for Mahenge that involves project debt, equity and confirmation of Posco's involvement as strategic partner.
- Rightly or wrongly, Syrah Resources' Balama deposit is seen as the bellweather for the entire graphite sector. A decision to restart Balama would be positive for all ASX-listed graphite companies.
- Black Rock's key differentiation is its upstream and customer-focussed operating model. The geology of Mahenge is low in deleterious impurities and has favourable metallurgy which allows Black Rock to produce very high purity graphite concentrates up to 99% using simple low-cost conventional flotation
- Black Rock has chosen to focus on producing graphite concentrate rather than running a simultaneous downstream operation. In so doing, BKT also avoids competing with its key customer.

Rating Classification

Buy	Expected to outperform the overall market
Hold	Expected to perform in line with the overall market
Sell	Expected to underperform the overall market
Not Rated	Shaw has issued a factual note on the company but does not have a recommendation

Risk Rating

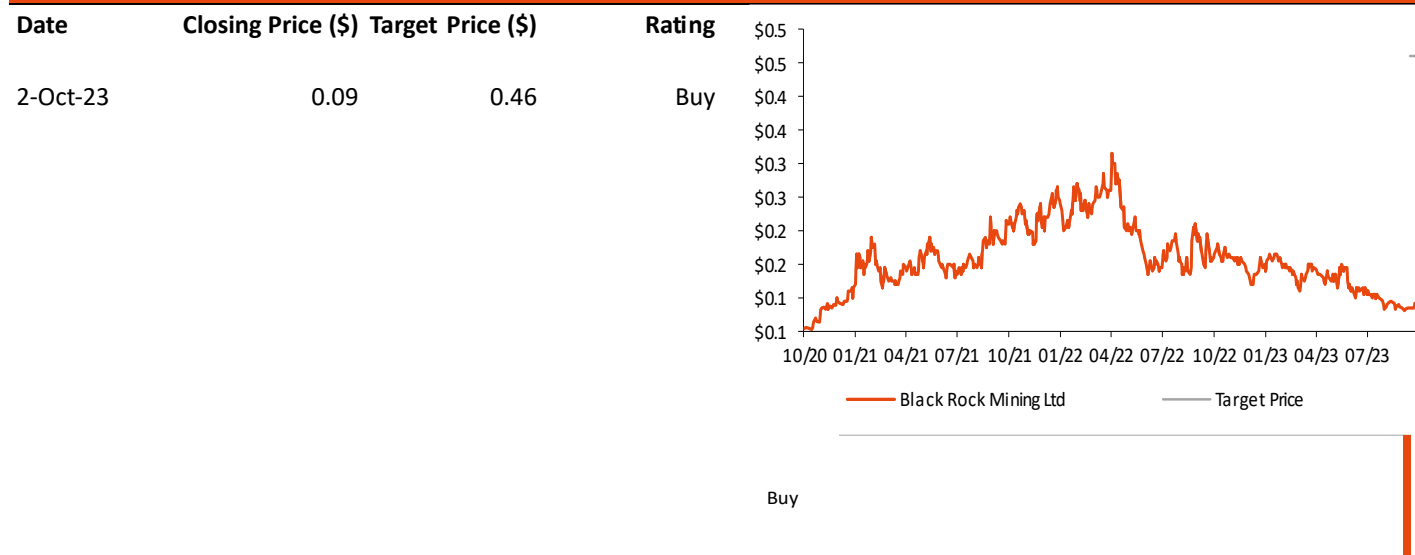
High	Higher risk than the overall market – investors should be aware this stock may be speculative
Medium	Risk broadly in line with the overall market
Low	Lower risk than the overall market

RISK STATEMENT: Where a company is designated as ‘High’ risk, this means that the analyst has determined that the risk profile for this company is significantly higher than for the market as a whole, and so may not suit all investors. Clients should make an assessment as to whether this stock and its potential price volatility is compatible with their financial objectives. Clients should discuss this stock with their Shaw adviser before making any investment decision.

Distribution of Investment Ratings

Rating	Count	Recommendation Universe
Buy	74	96%
Hold	2	3%
Sell	1	1%

History of Investment Rating and Target Price - Black Rock Mining Ltd



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