SOVEREIGN METALS LIMITED

10 June 2022

LEADING GLOBAL MARKET POSITION BECKONS FOR KASIYA'S LOW COST FLAKE GRAPHITE CO-PRODUCT

- **Graphite planned to be produced as a co-product from the Kasiya rutile operation is estimated to sit at the lowest end of the global flake graphite cost curve**
- **As one of the world's largest flake graphite deposits, Kasiya has potential for a dominant market position due to production scale of a coarse flake, high purity and highly crystalline product which should be suitable for lithium-ion batteries and wider traditional industrial uses**
- **Kasiya's graphite flake size distribution compares favourably to industry peers suggesting potential to achieve a high graphite basket price**
- **Independent Life Cycle Assessment Study demonstrates Kasiya's high quality natural graphite concentrate should have a significantly lower carbon footprint than Chinese-produced natural graphite**
  - **China currently produces over 75% of the world's natural graphite, almost 80% of the world's synthetic graphite and 100% of the world's natural graphite anodes used in lithium-ion batteries**
  - **Each tonne of graphite produced from Kasiya is expected to have a Global Warming Potential of only 0.2 tonnes CO_2e which represents 5x less greenhouse gas emissions compared to natural graphite produced in the Heilongjiang Province, China**
- **Recent independent studies published in the Journal of Industrial Ecology estimates global warming potential of synthetic graphite to be 20.6 t CO_2e i.e., 103x that estimated for Kasiya's natural graphite**
- **Updated Scoping Study for Kasiya on track and due for completion shortly**

Sovereign Metals Limited (ASX:SVM; AIM:SVML) (**the Company** or **Sovereign**) is pleased to report recent analysis of Kasiya Rutile Project's (**Kasiya**) graphite co-product, one of the critical raw materials contained with the Kasiya deposit.

Natural graphite concentrate would be produced as a co-product from Kasiya, the world's largest rutile deposit. Benchmarking of characteristics of Kasiya's natural graphite demonstrate that it can be produced in line with the 2021 Scoping Study with:

- one of the lowest potential production costs globally
- extremely low carbon footprint versus hard-rock operations or synthetic graphite production
- favourable flake size distribution suitable for a wide range of end uses including feedstock for the lithium-ion battery sector – technology crucial to tackling global climate change.

Sovereign's Managing Director Dr Julian Stephens commented: *"Not only is Kasiya the world's largest rutile deposit and one of the largest flake-graphite resources, but our latest graphite industry benchmarking also demonstrates the potential for Kasiya to be a globally dominant supplier and low-cost flake graphite producer at scale. Importantly, the very low graphite production costs at Kasiya should allow Sovereign to compete aggressively on price point across global graphite markets."*

ENQUIRIES

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In April 2022, the Company announced its updated Mineral Resource Estimate (**MRE)** for Kasiya which confirmed it as a Tier 1 natural rutile deposit and a potential major source of low CO_2 footprint critical minerals natural rutile and flake graphite.

The updated MRE positions Kasiya as the largest rutile deposit in the world with more than double the contained rutile as its nearest rutile peer, Sierra Rutile. Additionally, the graphite co-product MRE at Kasiya places it as one of the largest flake graphite deposits in the world.

ONE OF THE LOWEST POSITIONS ON THE GLOBAL COST CURVE

Sovereign undertook a benchmarking exercise comparing the co-product production cost of graphite from Kasiya based on the December 2021 Scoping Study results to peer flake graphite projects. Kasiya has an average LOM FOB (Nacala) operating cost of $US352/t tonne of product produced (rutile + graphite).

If flake graphite production is considered incremental to primary rutile production then the operating cost is US$155/t of graphite produced (FOB Nacala: December 2021 Scoping Study).

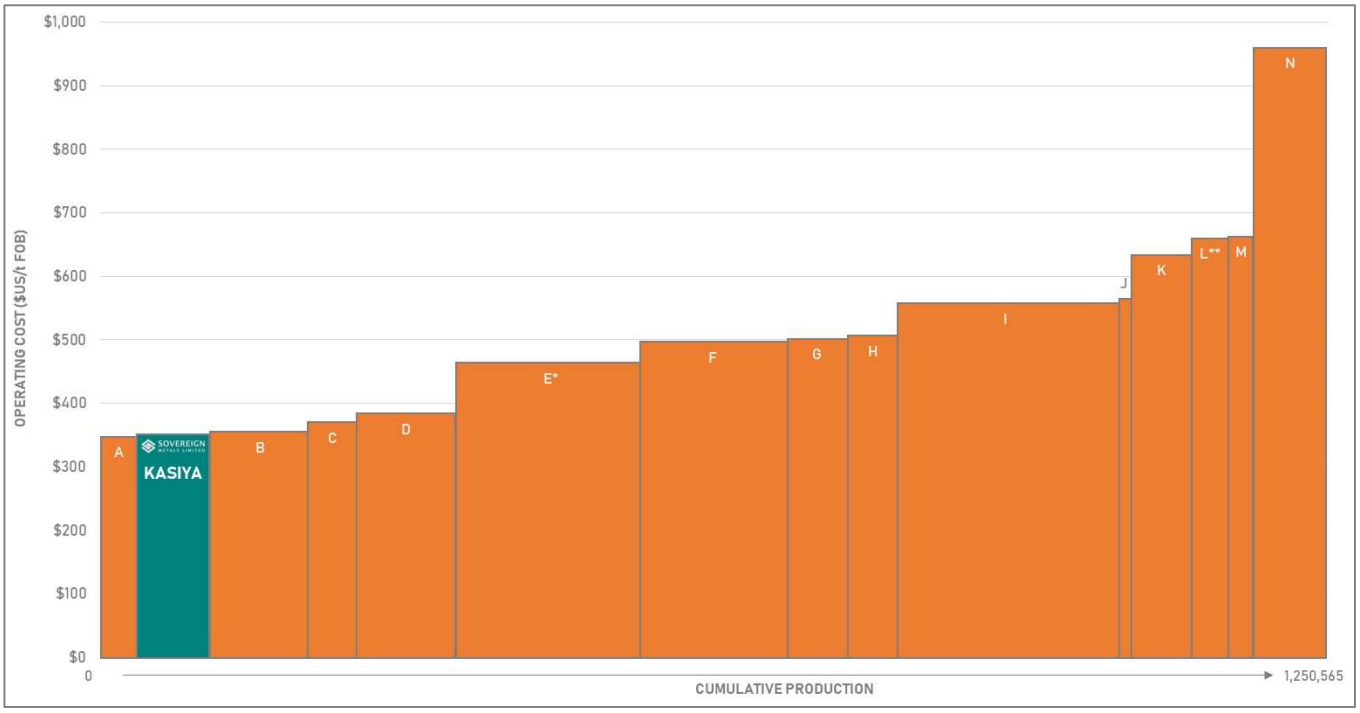


Figure 1: Actual and Forecast Graphite Production (non-Chinese)
(Sources: See Appendix 3; All costs presented as FOB and exclusive of royalties)
*Syrah Resources (E) is the only producer and is presented as US$464 per tonne FOB (Q1 2022 results) with production based on last reported quarter on an annualised basis
**Northern Graphite (L) costs and production include both Phase 1 (Feasibility Study) and Phase 2 (Preliminary Economic Analysis)

Such low flake graphite production costs at Kasiya can be attributed to several factors including:

- The uniqueness of Kasiya in that flake graphite will be produced as a co-product, whereas typically natural graphite mines produce graphite as the primary product with little or no co- or by-products.

- Proposed large-scale operation that will process soft, friable saprolite-hosted mineralisation mined from surface using low-cost hydro-mining methods. The significant cost savings, compared to hard-

rock graphite peers are realised by Kasiya having no requirement for drilling, blasting, digging, trucking or primary crushing or grinding in the processing plant (Figure 2).

- The project being project is located just 40km from Lilongwe, the capital of Malawi, which brings with it access to important infrastructure including bitumen roads, a high-quality rail line running through the deposit connecting to the deep-water of Nacala on the Indian Ocean and hydro-sourced grid power.

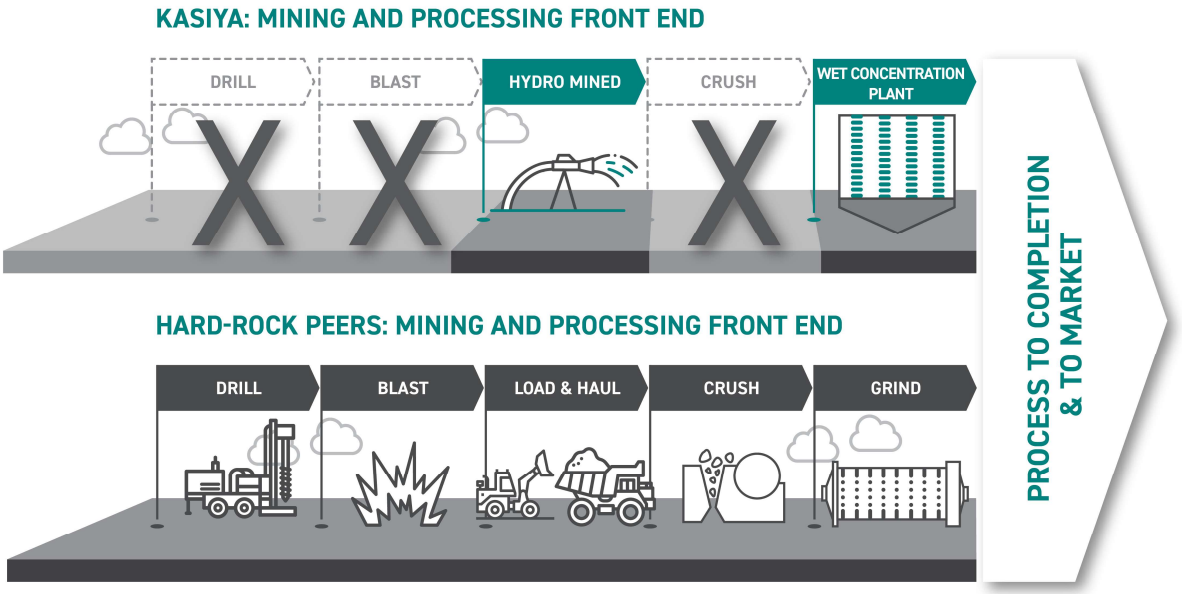


Figure 2: Schematic of Kasiya's by-product graphite mining and processing front end compared to hard-rock peers

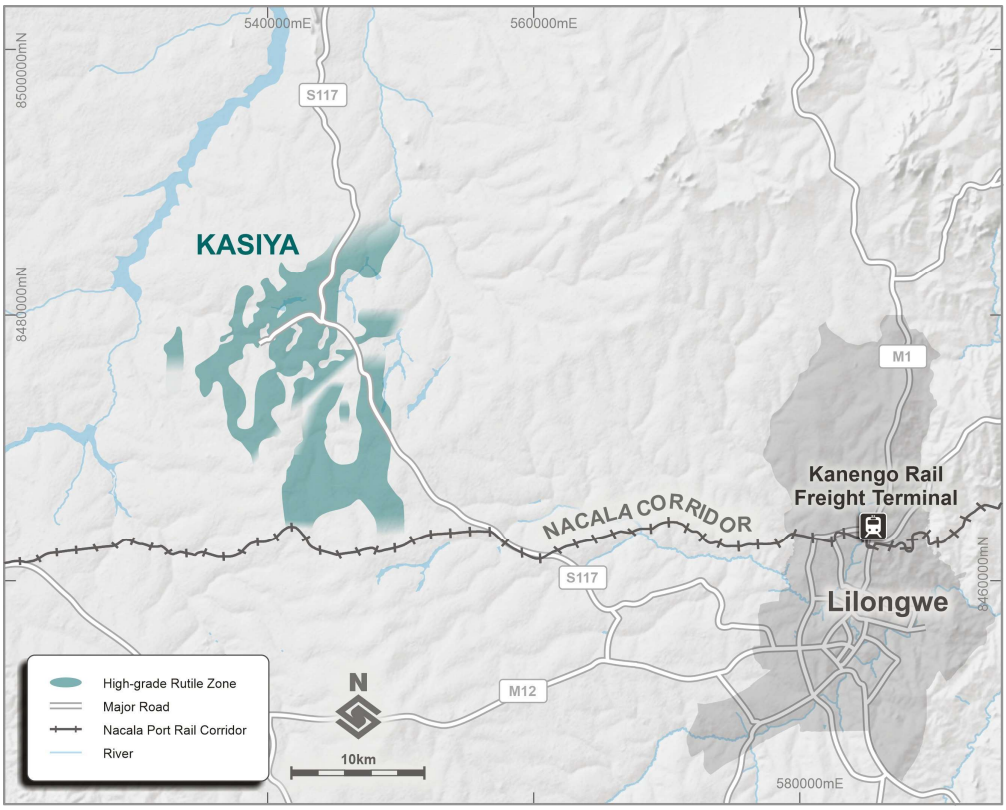


Figure 3: Kasiya's location near supporting infrastructure

FAVOURABLE FLAKE-SIZE DISTRIBUTION

Initial graphite metallurgical testwork at Kasiya demonstrates potential to produce a coarse-flake and high-purity natural graphite product at 96% TGC. This product has a favourable flake-size distribution (**FSD**) with over 60% in the large to super-jumbo fractions (+180µm) (Table 1) and overall graphite recovery from the raw sample to product of 62%.

This FSD compares favourably to global flake graphite peers (Figure 4) with Kasiya ranking in the top half of global projects in terms of large to super-jumbo fractions as a proportion of overall graphite production.

Table 1: Graphite Specifications

Particle Size		Carbon	Weight Distribution	Flake Category
Tyler Mesh	Micron (µ)	(%)	(% w/w)	
+32	+500	96.0	5.4	Super Jumbo
-32 +48	-500 +300	96.6	25.1	Jumbo
-48 +80	-300 +180	96.7	30.9	Large
-80 +100	-180 +150	96.8	10.9	Medium
-100 +150	-150 +106	96.1	14.4	Small/Medium
-150 +200	-106 +75	95.8	7.5	Small
-200	-75	93.8	5.8	Amorphous
Total		96.3	100	

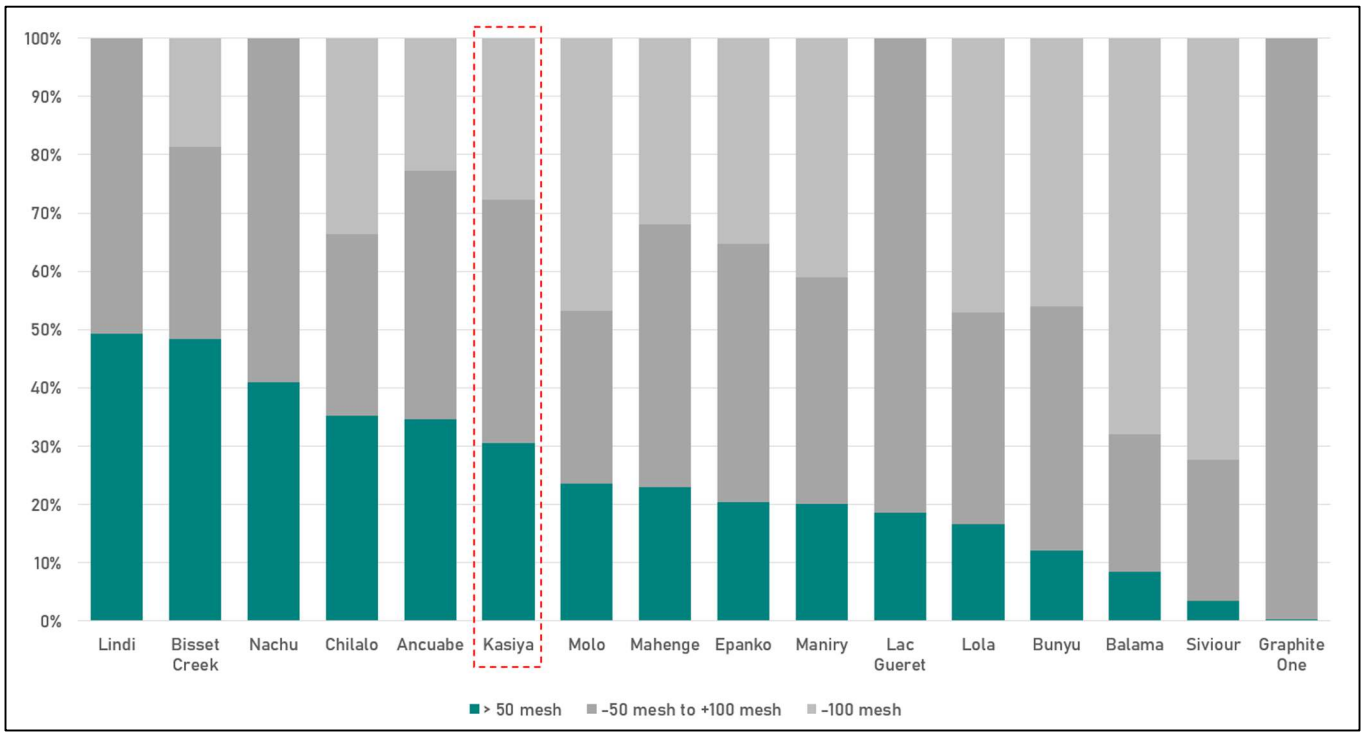


Figure 4: Flake Distribution of various graphite projects
(Sources: Company reports)

KASIYA'S GRAPHITE CO-PRODUCT CHARACTERISATION DEMONSTRATES SUITABILITY FOR WIDE RANGE OF END USES

Initial metallurgical and characterisation work on graphite from Kasiya shows a very high-quality product with premium chemical characteristics and high crystallinity indicating the product should be suitable for lithium-ion battery uses and traditional industrial applications – subject to further downstream testwork and analysis.

Sovereign has commenced a comprehensive bulk scale metallurgy and downstream test work program to build on these initial results and confirm the commercial potential of the graphite by-product from Kasiya.

The very low incremental graphite production costs at Kasiya suggest it will be highly competitive in a growing graphite market. Graphite rich mineral concentrate will be produced from the light fraction of the gravity spiral tails and processed in a separate graphite flotation plant to produce a high-quality graphite co-product.

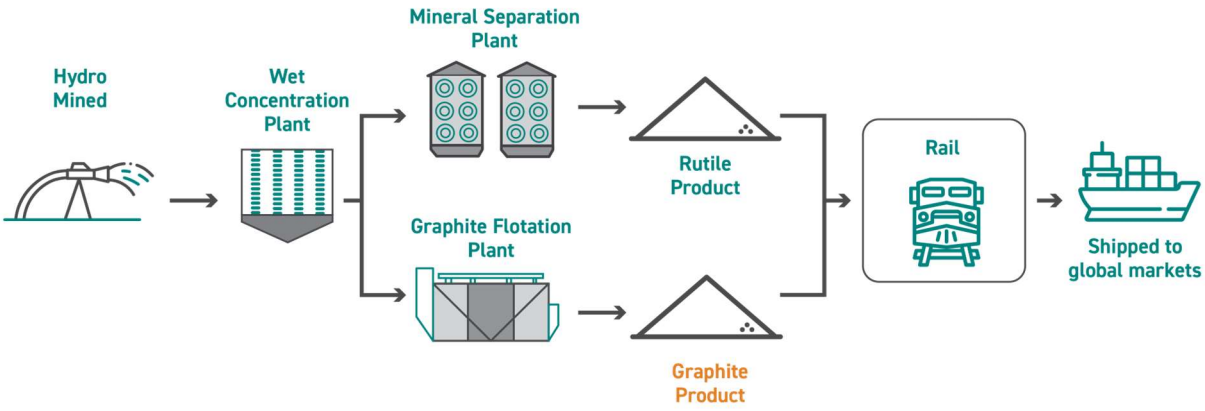
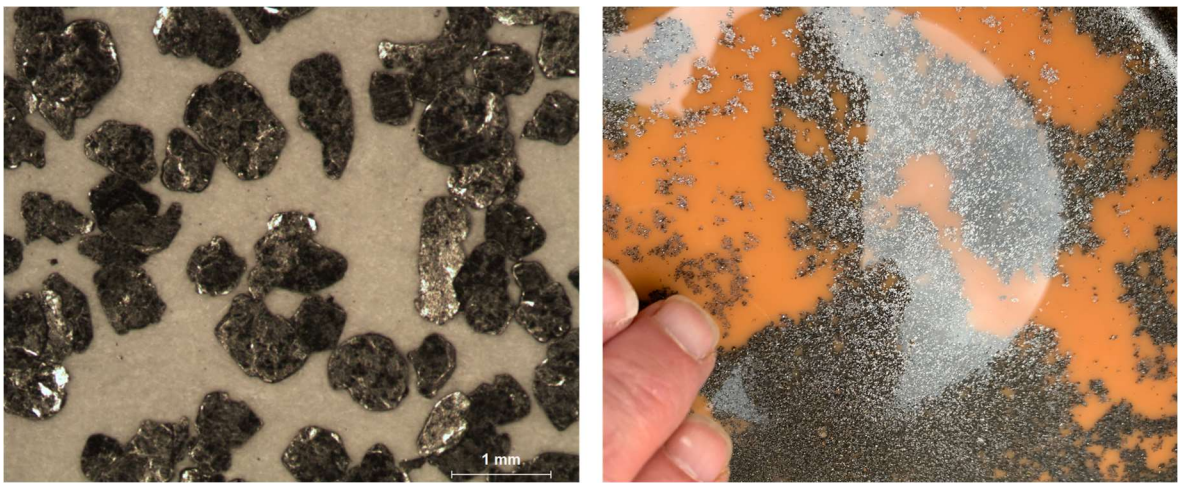


Figure 5: High-level operational schematic of the proposed Kasiya Rutile Project

High graphite purity and crystallinity are important features required use in lithium-ion battery anodes. The high crystallinity means that the graphite will have high electrical conductivity – a key requirement. High purity means the material will be easier to upgrade to 99.95% TGC, the minimum requirement for lithium-ion battery anodes.



Figures 6 & 7: Very coarse-flake graphite in +600µm sample fraction (L), graphite floating on soaking drill sample (R)

BENCHMARKING KASIYA NATURAL GRAPHITE GWP

The Life Cycle Assessment Study (**LCA**) benchmarked the Global Warming Potential (**GWP**) of Sovereign's natural flake graphite product versus natural flake graphite concentrate produced in the Heilongjiang Province, China. This benchmark was chosen as a comparison point as it is one of the largest global production centres for natural flake graphite.

The Study made efforts to ensure maximum comparability for the benchmarking exercise meaning that the Study focused on graphite produced at site and does not include transportation. The Study concluded that Sovereign's natural flake graphite concentrate has significantly lower greenhouse gas emissions than the Chinese produced natural flake graphite concentrate from the Heilongjiang Province.

Each tonne of Sovereign's natural graphite is estimated to have a GWP of 0.2 tonnes CO_2e (**carbon dioxide equivalent**) – 5x lower than producing natural flake graphite concentrate in the Heilongjiang Province, China which is estimated to have a GWP of 1.1 tonnes CO_2e for each tonne produced.

In addition to the results of the LCA, the Company's research noted a report published in the Journal of Industrial Ecology estimating the GWP of synthetic graphite. Synthetic graphite is manufactured by high-temperature treatment of by-products of hydrocarbon refining such as petroleum coke and coal tar pitch. Currently, the highest purity synthetic graphite is produced from petroleum needle coke which is a complex, emission and energy intensive process.

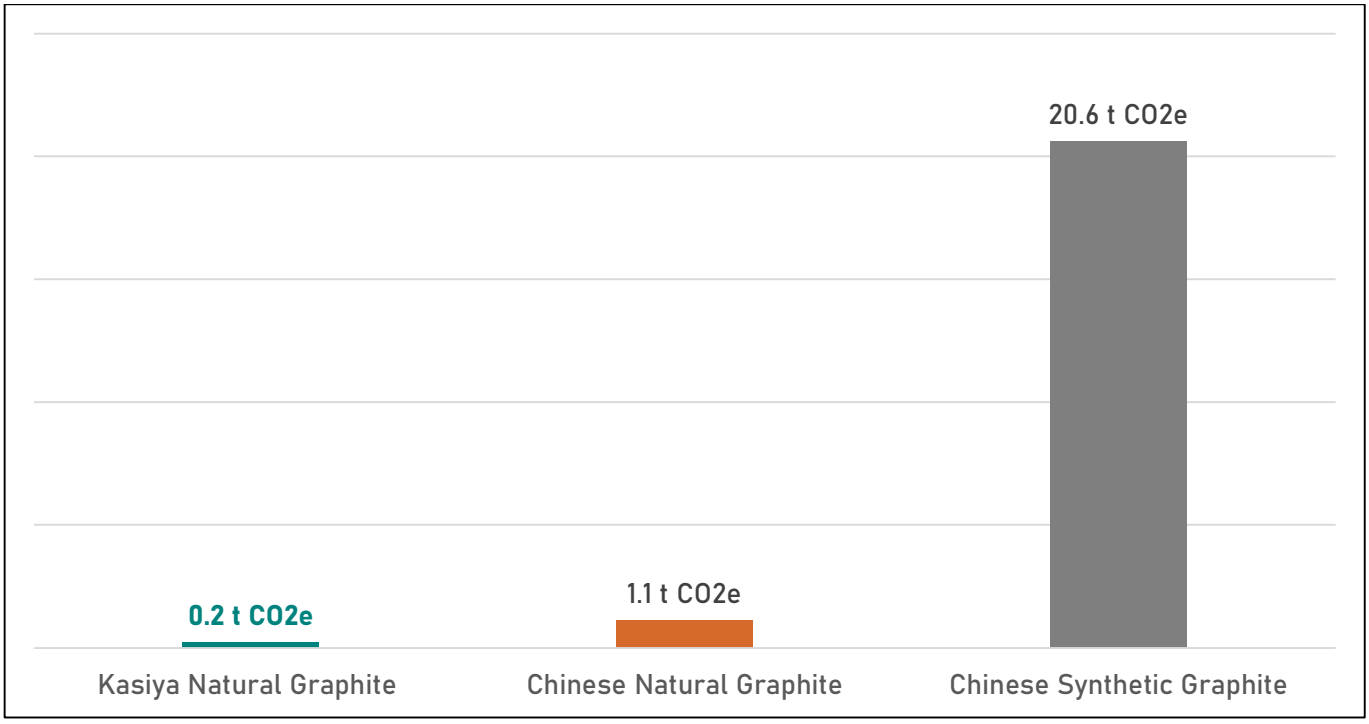


Figure 8: Global Warming Potential of Kasiya's natural graphite vs. natural graphite produced in Heilongjiang Province, China and synthetic graphite produced in China
(Sources: Minviro Ltd; Journal of Industrial Ecology)

LOW CARBON-FOOTPRINT NATURAL GRAPHITE - CRUCIAL FOR SUSTAINABILITY

The lithium-ion battery sector is the main emerging market for flake graphite. Greater capacity batteries, such as those required for electric vehicles, are expected to drive significant demand for graphite over the coming years. It is forecast the battery sector will drive the largest demand for graphite by 2028, with graphite making up to 50% of the composition of a lithium-ion battery.

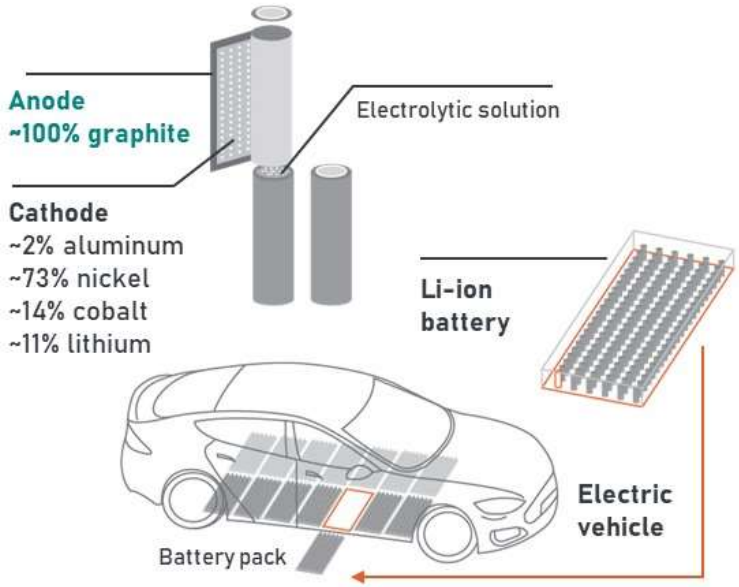


Figure 9: As the anode material, graphite can account for up to 50% of the composition of a lithium-ion battery used in an electric vehicle

Currently, China is the world's largest supplier of natural flake graphite. In 2020, leading data provider and market intelligence publisher Benchmark Mineral Intelligence reported that China produced 86% of all lithium-ion battery anodes from natural and synthetic graphite and 100% of all the world's natural graphite anodes.

Industry's interaction with supply chain participants indicates the progression towards higher proportions of natural graphite used in battery anodes will be supported by its lower cost and superior environmental credentials. Environmental footprint of electric vehicles will become increasingly important as electric vehicle penetration of the overall automobile market accelerates.

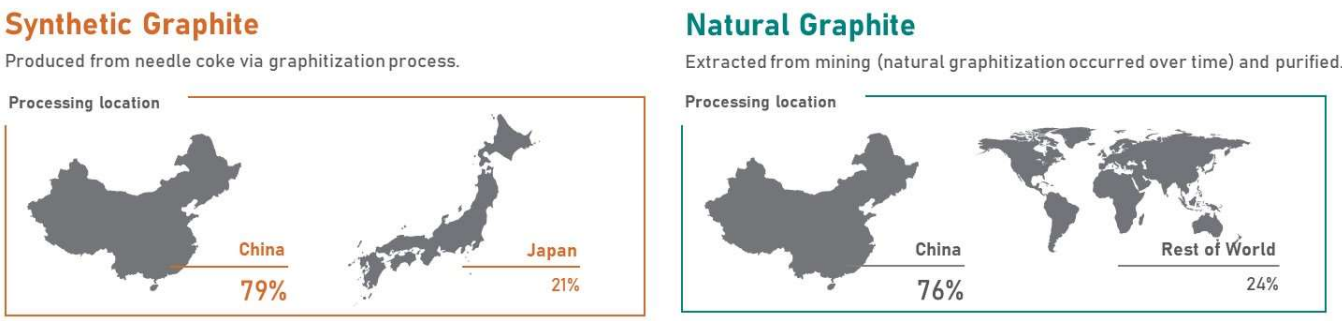


Figure 10: Synthetic and natural graphite production
(Sources: Morgan Stanley Equity Research "Better Anode, Safer Batteries", June 2019; Deutsche Rohstoffagentur "Supply and Demand of Natural Graphite", July 2020)

Forward Looking Statement

This release may include forward-looking statements, which may be identified by words such as "expects", "anticipates", "believes", "projects", "plans", and similar expressions. These forward-looking statements are based on Sovereign's expectations and beliefs concerning future events. Forward looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of Sovereign, which could cause actual results to differ materially from such statements. There can be no assurance that forward-looking statements will prove to be correct. Sovereign makes no undertaking to subsequently update or revise the forward-looking statements made in this release, to reflect the circumstances or events after the date of that release.

Competent Persons Statement

The information in this announcement that relates to the MRE is extracted from the announcement dated 5 April 2022. The announcement is available to view on www.sovereignmetals.com.au. Sovereign confirms that a) it is not aware of any new information or data that materially affects the information included in the announcement; b) all material assumptions included in the announcement continue to apply and have not materially changed; and c) the form and context in which the relevant Competent Persons' findings are presented in this report have not been materially changed from the announcement.

The information in this announcement that relates to Production Targets, Processing, Infrastructure and Capital and Operating Costs, is extracted from the announcement dated 16 December 2021 entitled 'Kasiya Scoping Study Confirms Globally Significant Natural Rutile Project' (**Announcement**). Sovereign confirms that: a) it is not aware of any new information or data that materially affects the information included in the announcement; b) all material assumptions and technical parameters underpinning the Production Target, and related forecast financial information derived from the Production Target included in the Announcement continue to apply and have not materially changed; and c) the form and context in which the relevant Competent Persons' findings are presented in this presentation have not been materially modified from the Announcement.

The information in this announcement that relates to the Metallurgy is extracted from the announcement dated 7 December 2021. The announcement is available to view on www.sovereignmetals.com.au. Sovereign confirms that a) it is not aware of any new information or data that materially affects the information included in the announcement; b) all material assumptions included in the announcement continue to apply and have not materially changed; and c) the form and context in which the relevant Competent Persons' findings are presented in this report have not been materially changed from the announcement.

This ASX Announcement has been approved and authorised for release by the Company's Managing Director, Dr Julian Stephens.

APPENDIX 1 – MINERAL RESOURCE ESTIMATE

Kasiya Mineral Resource Estimate at 0.7% Rutile Cut-off						
Mineral Resource Category	Material Tonnes (millions)	Rutile (%)	Rutile Tonnes (millions)	TGC (%)	TGC Tonnes (millions)	RutEq. Grade* (%)
Indicated	662	1.05%	6.9	1.43%	9.5	1.73%
Inferred	1,113	0.99%	11.0	1.26%	14.0	1.59%
Total	**1,775**	**1.01%**	**18.0**	**1.32%**	**23.4**	**1.64%**

APPENDIX 2 – OPERATING COST BREAK-DOWN

Description	US$/t Mined Tonne[1]	US$/t Product[2] (rutile & graphite)	US$ Annual[3] (rutile & graphite)	US$/t Product[4] (rutile)	US$/t Product[5] (graphite)
Mining	$1.77	$104	$21,240,000	$174	$0
Processing – Rutile	$2.00	$119	$24,000,000	$197	$0
Processing - Graphite	$0.69	$40	$8,280,000	$0	$104
General & Administration	$0.64	$38	$7,680,000	$63	$0
Total Mine Gate	**$5.10**	**$301**	**$61,200,000**	**$434**	**$104**
Logistics	$0.86	$51	$10,320,000	$51	$51
Total Operating Costs	**$5.96**	**$352**	**$71,520,000**	**$485**	**$155**

Notes:

1. Life of Mine (LoM) cost per mined tonne as per December 2021 Scoping Study
2. LoM cost per product (rutile and graphite) as per December 2021 Scoping Study
3. Annualised operating cost based on a 12Mtpa throughput
4. Incremental cost per tonne of rutile produced
5. Incremental cost per tonne of graphite produced

APPENDIX 3 – GRAPHITE PEERS INFORMATION

	Company	Project	Stage of Development	Operating Costs (FOB) *US$/t*	Steady State Production *tpa*	Current Production *tpa*	Source
A	Walkabout Resources	Lindi	Construction	347	40	n/a	ASX Announcement: Updated DFS Confirms Standout Graphite Project (7 Mar 2019)
B	Renascor	Siviour	DFS Complete	355	105,000	n/a	ASX Announcement: Siviour Definitive Feasibility Study (11 Nov 2019)
C	Mason Graphite[1]	Lac Gueret	FS Complete	370	51,865	n/a	SEDAR FILING: NI 43-101 Technical Report: Feasibility Study Update of the Lac Gueret Graphite Project (12 Dec 2018)
D	Nouveau Monde[1]	Matawinie	Construction	382	100,000	n/a	SEDAR FILING: NI 43-101 Technical Feasibility Study Report for the Matawinie Graphite Project (10 Dec 2018)
E	Syrah Resources[2]	Balama	Production	464	184,000	46,000	ASX Announcement: Q1 2022 Quarterly Activities Report (27 Apr 2022)
F	NextSource Materials	(Molo Phase 2)	PEA Complete	496	150,000	n/a	Press Release: MD&A March 2022 (16 May 2022)
G	Ecograf	Epanko	BFS Complete	500	60,000	n/a	ASX Announcement: Positive Response to Proposed US$60m Epanko Debt Financing (10 Mar 2019)
H	SRG Mining	Lola	FS Complete	508	55,000	n/a	SEDAR FILING: Lola Graphite Project NI 43-101 Technical Report - Feasibility Study (16 Aug 2019)
I	Magnis Energy	Nachu	BFS Complete	559	220,000	n/a	ASX Announcement: Nachu Bankable Feasibility Study Finalised (31 Mar 2016)
J	NextSource Materials	(Molo Phase 1)	Construction	566	17,000	n/a	SEDAR Filing: 2021 Annual Information Form (28 Sep 2021)
K	Triton Minerals	Ancuabe	DFS Complete	634	60,000	n/a	COMPANY PRESENTATION: Developing the World Class Ancuabe Graphite Project (16 Feb 2022)
L	Northern Graphite[3]	Bisset Creek	FS & PEA	660	44,000	n/a	COMPANY PRESENTATION: Building the leading public graphite company (May 2022)
M	Volt Resources	Bunyu (Stage 1)	FS Complete	664	23,700	n/a	ASX Announcement: Positive Stage 1 Feasibility Study For Bunyu Graphite Project, Tanzania (30 Jul 2018)
N	Graphite One	Graphite One	PEA Complete	960	60,000	n/a	NI 43-101 Preliminary Economic Analysis On the Graphite One Project (30 Jun 2017)

1. Canadian dollar (CAD) costs converted to US$ at CAD1.307 / US$
2. Operating costs shown are actual C1 cash costs for Q1 2022; Steady State Production is last quarter natural graphite production annualised
3. Includes Phase 1 (Feasibility Study Stage) and Phase 2 (PEA Stage)