

Creating a Battery Hub in Africa's Graphite Triangle

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Given China's overwhelming dominance in the production of all steps of the battery anode supply chain, diversifying global graphite production is essential to a secure global energy transition. Africa's graphite triangle (Mozambique, Madagascar, and Tanzania) is already the largest source of natural graphite outside of China and has potential to be developed further with U.S. engagement. Creating a sustainable relationship with the governments of Africa's graphite triangle should, however, involve assisting these countries in developing downstream capacities beyond raw graphite extraction. Despite significant challenges, supporting the development of downstream added-value industries in the graphite triangle, would position the U.S. as a more appealing partner than China.

Lack of Suitable Regional & Friendshored Graphite Resources to meet North American Demand

Graphite by weight is the largest metal component of lithium-ion batteries, making control and provision of suitable graphite supplies central to both U.S. national security and climate goals.¹

Demand for graphite from growing North America battery manufacturing is, however, set to rapidly outpace the ability of the U.S. and its close allies to ramp up matching production from their reserves.² Planned battery manufacturing capacity in the U.S. & Canada is expected to grow by 438%, requiring based on current planned production ~ 1.5 million metric tons (Mt) per year of graphite by 2030.³ Known major reserves of graphite in North America (located in Mexico) total only ~3.1 Mt.⁴

Total graphite resources in North America are significantly higher than 3.1 Mt (with ~30 million metric tons located in Canada), but the commercial viability of extraction is unknown. Even if all North American graphite reserves prove to be commercially viable to extract, it is highly doubtful whether existing reserves can be scaled up at a pace sufficient to meet expected 2030 demand. Given that North

¹ Bhutada, G. (2022, May 2). The Key Minerals in an EV Battery. Visual Capitalist.

<https://elements.visualcapitalist.com/the-key-minerals-in-an-ev-battery/>

² Goldman, J & Allan, B. (2023). *Why Adding Australia to the Defense Production Act's Domestic Sources is a Powerful Tool*. Net Zero Industrial Policy Lab.

<https://static1.squarespace.com/static/64ca7e081e376c26a5319f0b/t/65cbaa2d43b36f638d44ea2d/1707846189793/PB02+DPA-Friendshoring+vf%283%29.pdf>

³ Turner, J. (2023, December). US Electric Vehicle Supply Chain IRA + 605 days. <https://www.charged-the-book.com/na-ev-supply-chain-map>

⁴ USGS. (2024). Graphite (Natural). <https://pubs.usgs.gov/periodicals/mcs2024/mcs2024-graphite.pdf>

American production of graphite in 2021 was only 14.1t, even if we assume a growth curve equivalent to the last commodity super cycle (1995-2010) with a CAGR of 2.8%, North American production only grows to 18.1t by 2030.⁵ America's sluggish pace of mining development, from exploration to extraction, is also a handicap.

	2021 US-CAN-MEX Production of Selected Mineral (t)	2030 US-CAN-MEX Production of Selected Mineral Commodity supercycle scenario, (t)	2030 Demand from NA Battery Production (t)	2030 NA Demand as a % of 2021 Production	2030 NA Demand as a % of Additional Production
Graphite³	14,100	18,078	1,505,495	10677%	37846%

Efforts to secure sufficient supplies of graphite should focus on increasing the pace of graphite resource development both domestically and in friendshored jurisdictions. It will, however, not be possible for the U.S. to meet the materials needs of its planned battery manufacturing build out, without sourcing graphite from outside a close circle of U.S. allies.² The U.S. is going to have to make some new friends.

The Global Landscape of Graphite Extraction, Processing, and Relevance to U.S. national security

China holds the largest reserves of graphite globally at 78Mt (27%).⁴ China has also been able to develop its reserves to a much greater extent proportionally than the rest of the world. The majority of global graphite extraction (77%) is within China.⁴ The majority of production of graphite into high-value downstream graphite products is also done in China, with 75% of natural graphite anodes produced in-country.⁶ Even worse from a diversity of supply standpoint, China dominates the mid-stream step of graphite spheroidization converting natural flake graphite into coated purified spherical graphite (CPSG), with 99% of global production (See Annex I for the full graphite supply chain).⁶ China has also been able to create synergies between its large coal base and graphite reserves. Coal derived needle coke can be used to create synthetic graphite, enabling China to lead in both synthetic and natural graphite production.⁷ Combinations of both natural graphite and synthetic graphite are used in EV batteries.⁸

⁵ USGS. (2023). Graphite (Natural). <https://pubs.usgs.gov/periodicals/mcs2023/mcs2023-graphite.pdf>

⁶ Benchmark Minerals. (2023, November 7). Infographic: China Controls Three-quarters of Graphite Anode Supply Chian. <https://source.benchmarkminerals.com/article/infographic-china-controls-three-quarters-of-graphite-anode-supply-chain>

⁷ Wood Mackenzie. (2019, May 30). IMO 2020, EVs, and Steel – a Perfect Storm in the Needle Coke Sector?. Mining.com. <https://www.mining.com/web/imo-2020-evs-steel-perfect-storm-needle-coke-sector/>

⁸ Morris, C. (2023). A Closer Look at Graphite – Its Forms, Functions and Future in EV Batteries. Charged Electric Vehicles Magazine. <https://chargedevs.com/features/a-closer-look-at-graphite-its-forms-functions-and-future-in-ev-batteries/>

China's near total geographic control of graphite production is unique. Normally China operates a hub-spoke model of minerals production with value added domestically, but raw materials extraction conducted in third countries. China's commanding lead in both extraction and processing therefore presents a challenge. Addressing Chinese dominance throughout the battery anode vertical requires the development of entire alternate upstream supply chains up to the level of active anode materials (AAM's). Otherwise, in a business-as-usual scenario, the largest component in today's battery chemistries will continue to be supplied primarily by America's greatest geopolitical competitor.

Chinese dominance of graphite extraction is not pre-destined by geography, as the distribution of graphite reserves is heterogeneous across the Earth's surface. **Error! Bookmark not defined.** Brazil is home to the 2nd largest global graphite reserves at 76 Mt and is 4th in extraction (4.6%). **Error! Bookmark not defined.** While a joint industrial policy with Brazil focused on further developing the nation's graphite is worthy of further exploration, this is not the focus of this memo.

Mozambique and Madagascar hold the 3rd and 4th largest graphite deposits at 25 Mt and 24Mt respectively. They are the next largest producers of graphite after China (100kt and 96kt).⁴ In fact, global graphite mining can be more accurately described as a predominantly Chinese industry, with a small alternative production base in Mozambique (6.2%), and Madagascar (6%).⁴ Alongside China, Mozambique and Madagascar are the only two countries with more than 5% of global production. Rounding out the top 5 global graphite reserves is Tanzania, though the nation has been far less able to capitalize on its graphite reserves than its neighbors ranking 9th in production globally. **Error! Bookmark not defined.**

If the democratic world wants to source sufficient graphite to meet the buildout of its battery infrastructure from Non-Chinese sources, it will need to engage deeply with the emerging African Graphite Triangle.

Existing Graphite Economy in Madagascar, Mozambique, Tanzania

Africa's graphite triangle is a promising opportunity to develop a new source of anode active material (AAM).

Mozambique's total expected annual graphite output from all projects under-construction or onward is ~40% of expected North American battery demand in 2030. Including active and near extraction projects in Madagascar and Tanzania brings the region's output up to ~66% of expected graphite demand from North American battery manufacturers.

Table 1. Advanced or Active Projects in the African Graphite Triangle⁹

⁹ Identification of graphite deposits used data from Miningdataonline, Digbee, and African Energy's Graphite Projects in Southeastern Africa Map. Company reports were used to provide expected mine production figures

Location	Project	Firm	National Origin	Stage	Grade	Tonnes Milled LOM	LOM	t's/yr
MZ	Balama	Syrah	Australia	Production	16%	17,500,000	50	350,000
MZ	Ancuabe	Triton Minerals	Australia	Construction	6.20%	1,620,000	27	60,000
MZ	Montepuez	Tirupati Graphite	UK	Construction	9.27%	2,500,000	50	50,000
MZ	Nippe	DH Mining Development Limited	China	Construction	n/a	2,920,000	20	146000
MD	Molo Mine	Next Source Materials	Canada	Production	7.10%	1,350,000	30	45,000
MD	Sahamamy/Vatomina	Tirupati Graphite	UK	Production/ Construction	4.2%	3,240,000	40	81,000
MD	Antsirakambo/Marovintsy	Etablissements Gallois	France	Production	10.00%	n/a	n/a	140,000
MD	Loharano / Mahefedok	Bass metals	France	Production	4.00%	n/a	n/a	20,000
MD	Antsirabe	Unknown	Chinese	Production	n/a	n/a	n/a	n/a
MD	Maniry / lanapera	Envion Group	Australia	Construction	6.58%	1,184,400	21	56,400
TZ	Lindi Jumbo	Walkabout Resources	Australia	Construction	10.80%	960,000	24	40,000

Including the expected total output of projects that are in the permitting and feasibility stages, provides a total regional output of graphite approximate to expected 2030 North American demand. Tanzania's significant number of early development projects, makes it a very promising environment for the deployment of U.S. patient capital. U.S. public financing could allow for the development of additional Non-Chinese graphite capacity beyond that brought forward by market forces alone.

Table 2. Projects in the Exploration, Feasibility or Permitting Stage in the African Graphite Triangle⁹

Location	Project	Firm	National Origin	Stage	Grade	Tonnes Milled LOM	LOM	t's/yr
MZ	Balama Central	Tirupati Graphite	UK	Permitting	11.06%	1,566,000	27	58,000
TZ	Bunyu Graphite	Volt Resources	Australia	Permitting	6.5-5.4%	346,920	14	24,780
TZ	Chilalo	Evolution Energy Minerals	Australia	Permitting	10.60%	884,000	17	52,000
TZ	Mahenge Liandu	Armadal Capital Plc	UK	Permitting	9.80%	1,488,000	15	109,000
TZ	Nachu	Magnis Energy Technologies	Australia	Permitting	4.60%	3658000	15.5	236,000

where available, when not figures from Miningdataonline or the British Geological Survey's report *Graphite Resources, and their Potential to Support Battery Supply Chains*, was used. Full list of sources available upon request.

TZ	Epanko	EcoGraf	Australia	Feasibility	8.41%	960000	18	60,000
MZ	Nicanda Hill	Triton Minerals	Australia	Feasibility	11.10%	n/a	n/a	n/a
MD	Vohitsara/Marofody	DNI Metals	Canada	Exploration	5%	n/a	n/a	n/a
MZ	Nipacue	Frontier Rare Earths	Luxembourg	Exploration	n/a	n/a	n/a	n/a
MZ	Calua	New Energy Minerals	Australia	Exploration	13.40%	n/a	n/a	n/a
TZ	Kimoingan	Walkabout Resources	Australia	Exploration	8-12%	n/a	n/a	n/a
TZ	Merelani-Arusha	EcoGraf	Australia	Exploration	6.50%	n/a	n/a	n/a
TZ	Tanga	EcoGraf	Australia	Exploration	n/a	n/a	n/a	n/a

Not all extracted graphite can be shipped to North America, nor is such an outcome desirable from a national security perspective. Diversified offtake agreements by graphite suppliers, such as Syrah to the U.S. & South Korea, and Next Source Materials to Germany's Thyssenkrupp, are promising first steps of a global graphite supply chain diversifying from Chinese dependence.¹⁰¹¹ Ensuring American non-dependency of Chinese production for key materials in battery anodes is essential, but so is removing the dependency of U.S. allies, and the international community, to minimize Chinese leverage.

China is already active in Southeastern Africa given its interest in Mozambique's coal resources, and Madagascar's other battery metals (cobalt and nickel). China also has already begun to engage with the region's emerging graphite economy with one Chinese firm developing a project, and another inking an offtake agreement with a Non-Chinese miner.¹²

If the U.S. seeks to keep China out of the largest Non-Chinese natural graphite extractive base globally, it must accelerate the development of the Africa's emerging graphite triangle. However, to keep China out more effectively of the emerging Southeastern African graphite sector, the U.S. should engage in a deeper relationship than just the financing of more raw-materials extraction. A deeper relationship between the U.S. and the countries of Africa's Graphite Triangle means helping the region develop downstream segments of what is currently a raw materials industry.

Rationale for the Development of Added value Components of AAM Supply Chains in Southern Africa

The US is already taking policy steps to further support Non-Chinese extraction of graphite in Mozambique, though not yet in Madagascar. Australian firm Syrah resources, received \$150 million in

¹⁰ CLBrief. (2024, March 5). Syrah Resources Boosts Supply of Mozambique Graphite to South Korea. <https://www.clbrief.com/syrah-resources-boosts-supply-of-mozambique-graphite-to-south-korea/>

¹¹ Syrah Resources. (2024). Vidalia Active Anode Material Facility. <https://www.syrahresources.com.au/our-business/vidalia-active-anode-material-facility>

¹² Colt Resources. (2024). Bunyu Graphite Project, Tanzania. <https://voltresources.com/assets/bunyu-graphite-project/>

financing from the DFC to maintain and expand infrastructure at its Balama project.¹³ Two separate streams of U.S. financing (a \$102.1mn DOE loan, and a \$220mn DOE grant) have also been approved to support the expansion of Syrah's Vidalia processing facility in Louisiana.¹⁴¹⁵

However, the financing received by Syrah is representative that the U.S. is following existing extractive patterns of development in regards to Southeastern Africa. It may make short term sense to outside powers from the standpoint of their economic interests, and their respective political economies, to export raw materials without investing in added value components in country. Perpetuating, extractivist development models in Southern Africa, however, leaves an opening for China to offer a better development relationship to the region's governments. Leadership of emerging economies don't want to be strip mined for raw materials and left with the lowest value add industries. Instead, leaders of emerging economies are seeking development partners that will help them add-value to their resources, and serve a growing market for complex green energy products.

China has already pursued development models with certain countries it is reliant on for natural resources (Indonesia, Chile), where it assists these nations in building domestic downstream manufacturing capacity.¹⁶¹⁷ China, so far though, has only pursued joint added-value industrial policies in nations that possesses leverage. China has no choice but to offer Chile or Indonesia investments more in line with their leadership's development visions, as these nations possesses commanding positions in the global minerals' economy (in lithium and nickel/cobalt respectively). Contrast China's relationship with Indonesia, and Chile, to that of Africa, where the CCP has been quick to repeat extractivist, and borderline colonial, development patterns. One Chinese firm has even been caught in blatant violation of one country's raw export ban, designed to add value to mineral resources domestically before their export.¹⁸

America and its allies have the opportunity to one-up the Chinese model of development when engaging with the nations of Southeastern Africa. Political support of the African graphite triangle governments

¹³ DFC. (2024). Public Information Summary.

<https://www.dfc.gov/sites/default/files/media/documents/9000105358.pdf>

¹⁴ DOE. (2024). Syrah Vidalia. <https://www.energy.gov/lpo/syrah-vidalia>

¹⁵ NS Energy. (2022, October 21). Syrah Secures \$220m Grant from US DOE for Vidalia Expansion.

<https://www.nsenergybusiness.com/news/syrah-secures-220m-grant-us-doe-vidalia-expansion/>

¹⁶ Reuters. (2023, April 20). China EV Maker BYD to Build \$290 Million Battery Component Plant in Chile.

<https://www.reuters.com/business/autos-transportation/china-ev-maker-byd-build-290-mln-battery-component-plant-chile-2023-04-21/>

¹⁷ Tritto, A. (2023). How Indonesia Used Chinese Industrial Investments to Turn Nickel Into the New Gold. Carnegie Endowment for International Peace. <https://carnegieendowment.org/2023/04/11/how-indonesia-used-chinese-industrial-investments-to-turn-nickel-into-new-gold-pub-89500>

¹⁸ Nyaungwa, N. (2023, October 24). Namibia Orders Police to Stop Chinese Firm's Lithium Exports. Reuters.

<https://www.reuters.com/world/africa/namibia-orders-police-stop-chinese-firms-lithium-exports-2023-10-24/>

will go to the outside powers that can help them develop downstream industries reliant on their graphite.

IP required for Southeastern African countries to move up the value chain is also not so complex as to be out of reach. Canadian Next Source Materials has already indicated it plans to establish a CPSG production plant in neighboring Mauritius to process flake graphite from its Molo mine in Madagascar.¹⁹ Other graphite firms such as Sarytogan, and Nouveau Monde Graphite, have plans to build spheroidization infrastructure in the country of extraction (Kazakhstan, and Canada respectively).^{20 21} It would not be a far step to support greater graphite processing capacity in Southeastern African graphite extractors, and perhaps from there even AAM production, though the latter is a much harder lift.

Challenges to the Development of Downstream Added Value Components of AAM

Developing the downstream industries of a battery anode cluster in Southeastern Africa is, easier said than done. All three nations score low on the Human Development Index.²² However, Mozambique and Madagascar in particular face a challenging mix of infrastructure, security, and human capital deficits.

Madagascar lacks a national grid, with the national utility primarily running localized grids.²³ Mozambique, as of 2021 had less than 1/3rd of its populace with access to electricity less than but comparable to Madagascar.²⁴ New natural gas extraction in Mozambique is coming online with fields under development by Exxon, Total, and Eni.²⁵ Mozambique's natural gas deposits are, however, located ~5,000 km's away from existing graphite extraction, creating a challenge of resource mismatch.

25

¹⁹ Mining.com. (2024, April 10). NextSource Stock Jumps on Lease Agreement to Build Graphite Plant in Mauritius. <https://www.mining.com/nextsource-materials-stock-jumps-on-lease-agreement-to-build-graphite-plant-in-mauritius/>

²⁰ Philips, M. (2024, March 5). Sarytogan goes nuclear with “five nines” Kazakhstan Graphite. <https://www.smh.com.au/business/companies/sarytogan-goes-nuclear-with-five-nines-kazakhstan-graphite-20240305-p5f9ys.html>

²¹ Nouveau Monde Graphite. (2023). From Ore to Battery Materials a North American Integrated Source of Graphite-Based Solutions for the Energy Transition. <https://nmg.com/wp-content/uploads/2023/03/NMG-Annual-Report-2022.pdf>

²² UNDP. (2024). Human Development Index. <https://hdr.undp.org/data-center/human-development-index#/indicies/HDI>

²³ Kingsland, P. (2017, July 2). Powering Madagascar. Power Technology. <https://www.power-technology.com/features/featurepowering-madagascar-5852461/?cf-view>

²⁴ World Bank. (2024). Access to Electricity (% of Population). <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS>

²⁵ (Matt Sugihara former ExxonMobil Safety/Security/Health/Environment Coordinator, personal communication, February 4, 2024).

If the energy picture is more promising in Mozambique, the security situation is worse. The active Al Shabab insurgency in the graphite mining region of Cabo Delgado remains a threat to development.²⁶ Graphite and other mining projects have already faced attacks from the militant Islamist group.²⁷

The most significant roadblock impeding Mozambique and Madagascar from developing downstream graphite industries, however, is the lack of suitable human capital. Sufficient human capital is essential for any nation that wants to move not just one step up the value chain to CPSG production, but to the more technologically intensive step of AAM production. Graphite spheroidization is a technology that dates back to the 1970's, but the process used to convert graphite into AAM's currently used in Li-ion chemistries was only discovered as late as the 1990's by Sony.²⁸ Infrastructure can be built, insurgencies can be crushed, but you can't instill an entire workforce with advanced manufacturing skills over a short timespan. Aside from a nickel refinery, Madagascar has no major manufacturing in country beyond textiles.²⁹ Mozambique, is in a slightly better position regarding necessary expertise in value-add manufacturing given its indigenous aluminum smelter Mozal, established in the 1990's, and the 2nd largest in Africa.³⁰ Of the three, Tanzania is best positioned. With manufacturing capacity in chemicals, plastics, and steel, Tanzania possesses the greatest chances of success in moving further into downstream industries of the battery anode supply chain.³¹

Given the lack of manufacturing expertise in certain countries, if the U.S. wants to assist in the development of a battery anode cluster in Africa's graphite triangle, it must pursue a more regional strategy. Tanzania given its relative human capital advantage, could serve as a more senior partner to the US in the region, doing more of the heavy lifting in terms of industrial development. Consequently, it might make sense for the U.S. to support the development of an industrial park on the Tanzanian-

²⁶ Agence France-Presse. (2024, February 21). Upsurge in Violence in Northern Mozambique Displaces Thousands. VOA. <https://www.voanews.com/a/upsurge-in-violence-in-northern-mozambique-displaces-thousands-/7497674.html>

²⁷ Hanlon, J. (2022, June 23). Mozambique: Insurgents Surge South – Hit Graphite Mine, Make First Attacks in Nampula, Moce Closer to Pemba. AllAfrica. <https://allafrica.com/stories/202206230772.html>

²⁸ Asenbauer, J., Eisenmann, T., Kuenzel, M., Kazzazi, A., Chen, Z., & Bresser, D. (2020). The success story of graphite as a lithium-ion anode material – fundamentals, remaining challenges, and recent developments including silicon (oxide) composites. *Sustainable Energy & Fuels*.

²⁹ Hendrix, C. (2022). *Building Downstream Capacity for Critical Minerals in Africa: Challenges and Opportunities*. Peterson Institute. <https://www.piie.com/publications/policy-briefs/building-downstream-capacity-critical-minerals-africa-challenges-and>

³⁰ South 32. (2024). Aluminum, Alumina and Bauxite.

[https://www.south32.net/what-we-do/our-commodities/aluminium-alumina-bauxite#:~:text=Maputo%2C%20Mozambique,Aluminium%20smelter%20in%20South%20Africa\).](https://www.south32.net/what-we-do/our-commodities/aluminium-alumina-bauxite#:~:text=Maputo%2C%20Mozambique,Aluminium%20smelter%20in%20South%20Africa).)

³¹ DOC. (2024). Tanzania – Country Commercial Guide. <https://www.trade.gov/country-commercial-guides/tanzania-manufacturing#:~:text=Most%20of%20the%20manufacturing%20activities,of%20the%20country's%20policy%20priorities.>

Mozambique border, focused on processing locally mined graphite into AAM's. Graphite deposits are concentrated in the north of Mozambique and the South of Tanzania, making a transborder industrial cluster a logical geologic fit. The northern side of the Mozambique-Tanzania border also has a surplus of relevant infrastructure capacity, as Shell invested heavily in infrastructure for a gas project in the Mtwara province that never went online.²⁵ Both sides of the Tanzanian-Mozambique Rovuma river border speak Swahili creating a shared language environment that could support joints industrial development.²⁵

Alternatively, looking to Mozambique's Southern neighbor, South Africa could play the role of senior partner in the development of a regional battery anode supply chain. South Africa has the most advanced manufacturing sector on the continent, and the largest by economic valuation. Profoundly in the nation's favor for taking a larger role in the regional battery anode supply chain, South Africa is the only country in the region that has existing battery manufacturing infrastructure, and plans to develop additional capacity.³²³³

Beyond its ability to provide relevant, regional, human capital, it is also in the strategic interest of the US too engage more deeply with South Africa given current geopolitical competition. Peer competitors such as China and Russia can be checked if emerging economies outside the traditional western camp can be brought into the economic fold of the global north as equals, or at the very least kept from further integration into a China-Russia axis. In the fallout from Russia's invasion of Ukraine, South Africa's relatively neutral position, up to and including pursuing naval exercises with Russia and China, is increasingly at odds with the pro-western camp.³⁴ South Africa's stance is so deleterious, as given its size and political history, the nation has a disproportionate influence among the non-aligned middle powers the west seeks to court. Integrating South Africa into a regional battery supply chain and helping the nation's leadership meet their own added value manufacturing objectives for the energy transition would go a long way towards tilting South Africa back towards the western camp.

Conclusion

Whether it is a graphite triangle, of Mozambique, Madagascar, and Tanzania, or quadrangle bringing in South Africa, a diversified global battery anode supply chain runs through Southeastern Africa. A US supported graphite battery anode industrial cluster in Southeastern Africa would in summary bring the Americans in, help the Africans raise themselves up, and keep the Chinese out. If the world wants a

³² Kuhudzai, R. (2023). Construction Has Started at Africa's First Dedicated Gigawatt-Hour Battery Factory in Cape Town. Cleantechnica. <https://cleantechnica.com/2023/08/23/construction-has-started-at-africas-first-dedicated-gigawatt-hour-battery-factory-in-cape-town/>

³³ Whitehouse, D. (2023, October 17). South Africa: Aqora Plans Africa's First Battery-Cell Gigafactory. the Africa Report. <https://www.theafricareport.com/325054/south-africa-aqora-plans-africas-first-battery-cell-gigafactory/>

³⁴ Atlantic Council. (2023, February 28). What we Learned from the Russia-China-South Africa Military Drills. <https://www.atlanticcouncil.org/blogs/new-atlanticist/what-we-learned-from-the-russia-china-south-africa-military-drills/>

diversified Non-Chinese dominated battery mineral supply chain, Southeastern Africa, despite the development challenges, is profoundly important towards unlocking that objective. If the U.S. wants to one-up the development model China is offering the continent, and position itself as a more appealing partner, it will assist the nations of Africa's Graphite Triangle in developing downstream industries reliant on their graphite resources.

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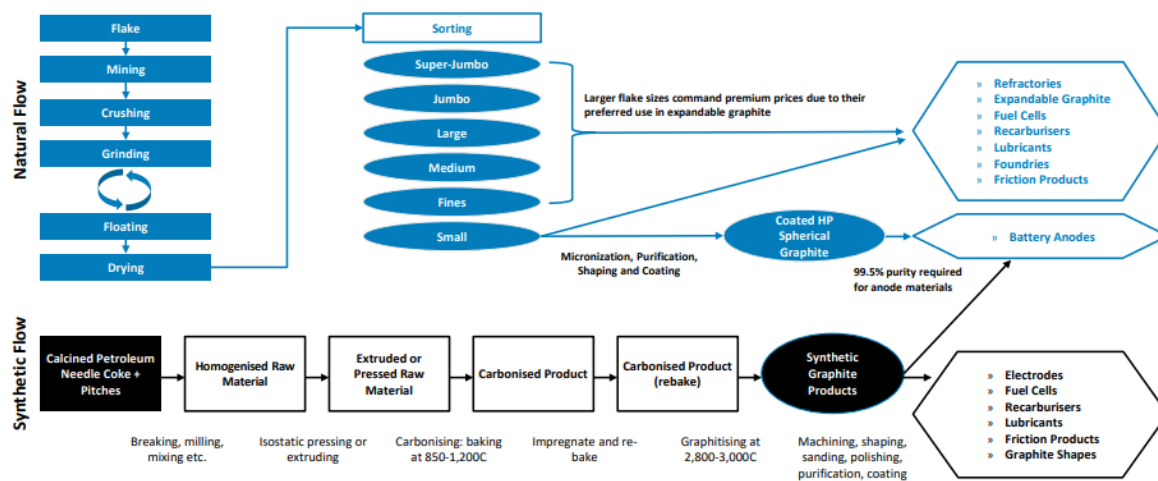
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Annex 1:

+ OVERVIEW OF GRAPHITE PRODUCTION, PROCESSING AND KEY USES



Source: Nouveau Monde Graphite. (2023). From Ore to Battery Materials a North American Integrated Source of Graphite-Based Solutions for the Energy Transition.

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Annex II:

