

An update on the graphite sector and what to expect in 2024 and beyond

written by Matt Bohlsen | December 20, 2023

2023 has been a rough year for all the EV metals and graphite was no exception. EV battery anodes contain a combination of spherical graphite (sourced from natural flake graphite) and synthetic graphite. Today we take a look at the key trends of 2023 and what we can expect in 2024 and beyond.

China's Tightening Control over the Global Graphite Market

written by Tracy Weslosky | December 20, 2023

China's Ministry of Commerce has announced that, effective December 1, export permits will be mandated for specific graphite products, citing national security reasons. Graphite, a pivotal component for electric vehicle (EV) batteries, finds China at its epicenter, producing 67% of the global supply of natural graphite. Additionally, China refines over 90% of the world's graphite, which is integral to almost all EV battery anodes.

Why Graphite Could be the Next Critical Mineral to Rise Steeply in Price

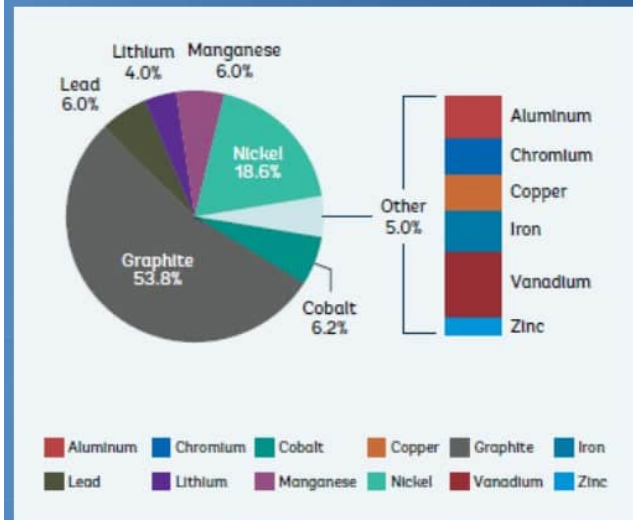
written by InvestorNews | December 20, 2023

Last July and August, I did a 6-part series called the “[Dean’s List](#)” which looked at North American explorers and miners that could benefit from government commitments to critical minerals, like the Inflation Reduction Act. This is especially important given how many of those materials are controlled, either through mining, ownership, or processing by China, which isn’t exactly “singing from the same hymn book” as the United States and many of its allies these days. Despite the current global tensions, it also comes down to math. There just isn’t enough of many of these commodities at present to meet the explosive growth being projected in the various segments of the “green” revolution.

One of [the articles](#) from last year’s series focused on graphite. I consider graphite to be one of the least publicized critical minerals, especially given this anode material is the single largest component (by weight) of lithium-ion batteries used in EVs (up to 48%) and energy storage technologies. On top of that, almost 80% of graphite mine production in 2021 came from China, while China makes almost 100% of the graphite anode material. Lastly, graphite also requires the largest production increase of any battery mineral in order to meet forecast demand.

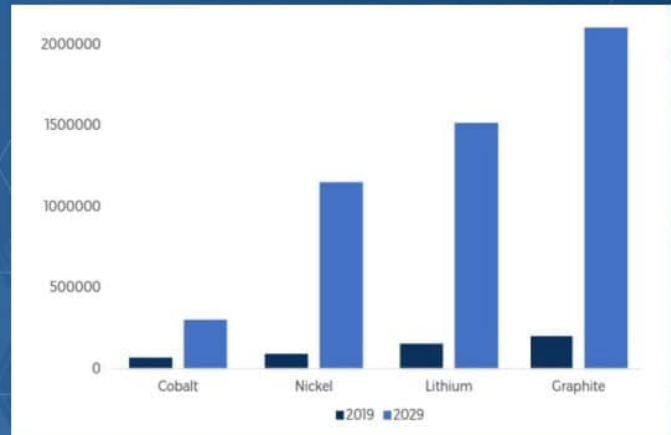
Graphite Growth Requirements for Battery Demand Forecasts

GRAPHITE REQUIRES THE LARGEST PRODUCTION INCREASE OF ANY BATTERY MINERAL



SHARE OF MINERAL DEMAND FROM ENERGY STORAGE
SOURCE: IEA

- Battery raw material demand will grow between 5x and 13x to feed the megafactories

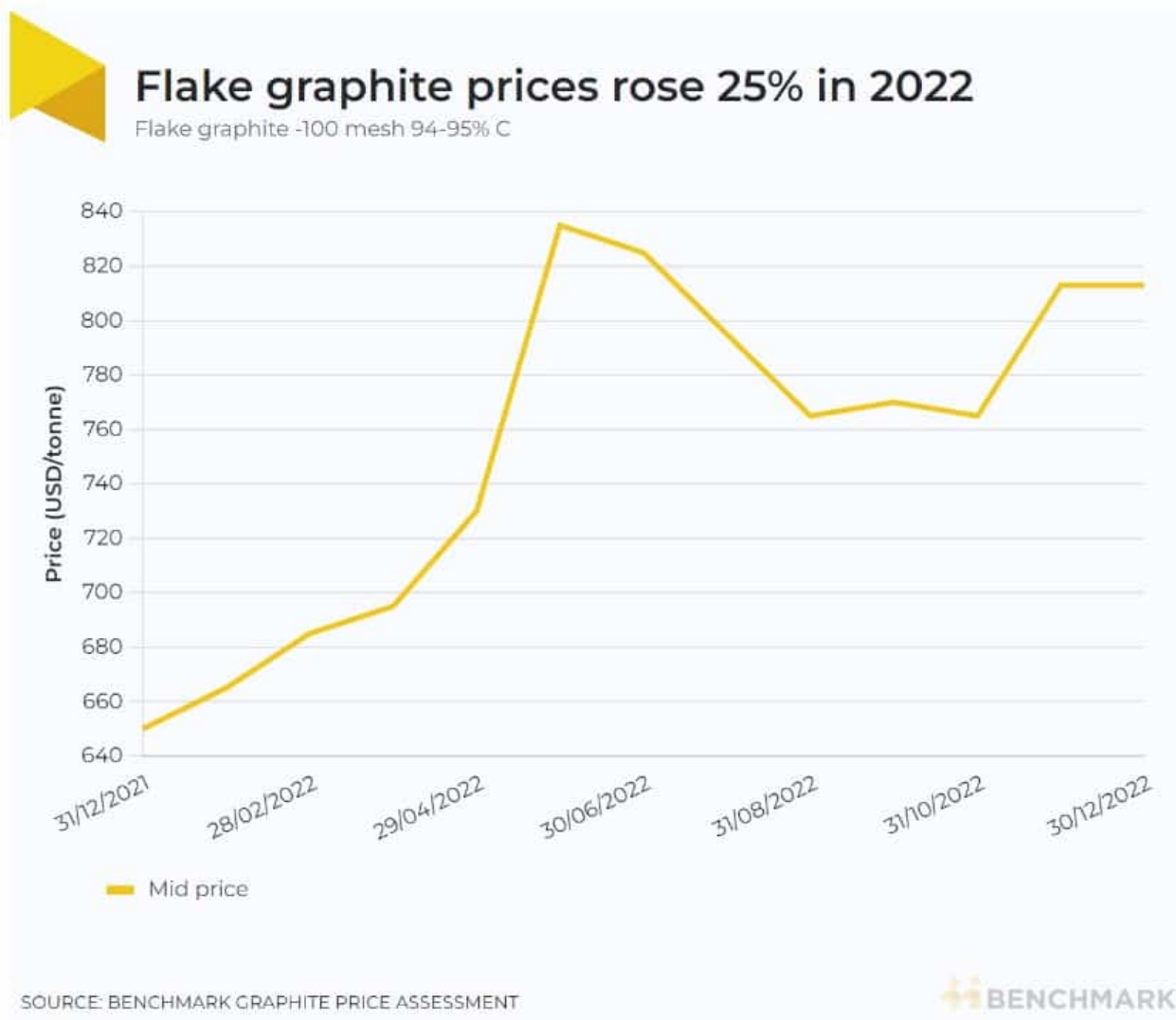


SOURCE: BENCHMARK MINERAL INTELLIGENCE

Source: Northern Graphite [Corporate Presentation](#)

Naturally one would expect that the price of graphite would be following a similar path as lithium, which was the second best-performing commodity in 2022, and despite coming off its recent highs, lithium is still triple its three-year average. However, it appears graphite is not following suit, despite all the table pounding about the growing supply/demand imbalance, at least not yet. Although there is a slight caveat to this comment as there are no standardized prices for natural graphite and there are no fungible spot or futures markets.

Flake Graphite Price – 2022



Source: [benchmarkminerals.com article](https://benchmarkminerals.com/article)

Graphite Prices

There are a couple of reasons that graphite prices haven't taken off like lithium prices and I'll try to provide some clarity on that. But as we go through this it will begin to appear that it's only a matter of time before graphite sees its time to shine. Unless of course, you are a consumer of graphite, then you might want to start working on how you will explain to Elon Musk why dropping all the prices of his Tesla models might not be a great idea.

Historically, industrial uses of graphite have always been the main driver of demand. Currently, steelmaking is still the

largest source of demand for graphite, but another interesting use, at least in the U.S., is over 7% of annual demand in 2021 came from brake linings. Graphite production for these well-established industrial uses has helped keep the market well supplied, reducing price volatility. In fact, weakness in steelmaking demand, along with a return to more normal graphite production post-COVID (remember that China didn't open up their economy until well after the rest of the world) is the primary reason for graphite prices to have come off the boil.

Synthetic Graphite

The second reason graphite prices haven't taken off (yet) has to do with the fact that anode manufacturers have an alternative, a synthetic graphite derived from petroleum coke (a carbon-rich, solid material that comes from oil refining). I could talk for hours about [petcoke](#) from my previous career but I think that would only be interesting to me and maybe one other person I know. As noted earlier, there are a lot of opaque corners in the world of graphite, but I was able to find the following comment: *"Today, synthetic graphite anodes dominate in terms of market share, accounting for approximately 57 percent of the anode market"* which is attributed to Benchmark Mineral Intelligence but it might be behind their paywall. I also found this quote in an [article](#) on the Benchmark Mineral website: *"Synthetic graphite anode supply grew by more than 30% during 2022, and is anticipated to even surpass that in 2023, given a supply deficit developing for natural graphite feedstock."* It appears a lot of the growing anode demand for graphite is being supplied by fossil fuels and not natural graphite.

The Time for Natural Graphite

My interpretation of all this information is that it is simply a matter of when, not if, graphite prices start to rise as we have

[seen with lithium](#). The reasons are multi-faceted and thus it could make for a slow and steady rally or if all factors coalesce at one time it could become a parabolic rise.

1. As anode demand becomes a more material component of overall graphite demand it removes any previous flexibility from the supply side. If steel making or any other industrial use for graphite returns to historic levels it will quickly put pressure on the rapidly growing anode component of the demand equation. The first graph above shows how just anode growth alone will impact the overall demand outlook, let alone any other industrial uses. In the grand scheme of things, I don't see steel consumption going to zero anytime soon freeing up that graphite supply.
2. The synthetic graphite derived from petroleum coke is going to be influenced by oil prices. If oil prices go back over \$100/bbl that is going to have a material impact on synthetic graphite prices. Granted, oil prices could just as easily go back to the \$50-\$60/bbl range and partially offset the overall graphite price rise due to general demand growth, but my personal opinion is that we'll see \$100/bbl before we see \$50/bbl (perhaps an article for another day).
3. But the biggest impact could come from the ESG side. *"The production of synthetic graphite can be four times more carbon intensive than that of natural graphite"*, another interesting fact attributable to Benchmark Mineral Intelligence that I could only find in [this article](#). Kinda makes you think we can't see the forest for the trees when you are making decisions like this in an effort to reduce carbon emissions. If battery makers demand low carbon anode material we could see a step change in prices, literally overnight, as natural graphite becomes the only

option.

It would appear now might be a very good time to be developing a natural graphite deposit outside of China.

These are the graphite leaders as we head towards a forecast graphite deficit in 2023

written by Matt Bohlsen | December 20, 2023

The flake graphite sector does not get as much attention as [lithium](#), yet the demand wave coming is also very significant. For example, in 2021 the International Energy Agency [forecast](#) that flake graphite demand could grow between **8x to 25x** from 2020 to 2040. Benchmark Mineral Intelligence [forecasts](#) we need **97 new (56,000tpa) natural flake graphite mines** from 2022 to 2035.

The calm before the storm

More recently in October 2022, Fastmarkets [stated](#):

*“Fastmarkets has forecast that demand for graphite from the battery sector in 2022 will rise by 40% year on year, in line with growth in the EV sector.....**We expect to see the graphite market tip back into deficit in late 2022.....**Graphite prices are in a lull, but this lull will prove to be temporary and may well be **the calm before the storm.**”*

Note: Bold emphasis by the author.

An 8 to 25x increase in demand, 97 new graphite mines, graphite deficit coming in late 2022! Yet no one is talking about graphite. Today we cover the main western graphite producers and touch on a few promising near term graphite producers, noting China currently dominates the graphite and anode sectors.

The western flake graphite leading producers

[Syrah Resources Limited](#) (ASX: SYR) – Syrah is an Australian company and one of the world's largest flake graphite producers from their Balama graphite mine in Mozambique. Syrah is also working towards becoming a vertically integrated producer of Active Anode Materials ("AAM") at their Vidalia facility, Louisiana, USA. In some exciting [recent news](#) for shareholders, Syrah was selected for a U.S Department of Energy grant of up to US\$220 million towards their Vidalia facility expansion (initial production targeted to begin in Sept. quarter 2023). This comes on top of the news late in 2021 that Syrah [signed a four year deal](#) to supply graphite anode materials to Tesla. Syrah also recently signed an [MOU with Ford and SK On](#) as well as an [MOU with LG Energy Solution](#). Clearly, Syrah Resources is in the box seat to become a critical supplier of both graphite and active anode materials this decade, especially for western OEMs.

The following companies are smaller scale western flake graphite producers:

- **Advanced Metallurgical Group NV** (AMS: AMG | OTC: AMVMF) – Is a diversified producer of critical metals. They mostly produce lithium and vanadium, but also [some high purity natural graphite production](#).
- **Ceylon Graphite Corp.** (TSXV: CYL | OTCQB: CYLYF) – Produces graphite from their '[vein graphite](#)' mine in Sri Lanka.
- **Mineral Commodities Ltd.** (ASX: MRC) – [State](#) they have the

“world’s highest-grade operating flake graphite mine with mill feed grade averaging ~25%C”. Also that they are “the biggest crystalline graphite producer in Europe and the fourth largest producer globally outside of China and accounts for around 2% of global annual natural flake graphite production” at their Skaland Graphite Operation in Norway. They also own the Munglunup Graphite Project in Western Australia and [have received Critical Minerals Grant funding](#) to build a pilot scale battery anode plant in Australia.

- **Northern Graphite (TSXV: NGC | OTCQB: NGPHF)** – Recently completed the [purchase](#) from Imerys of the Lac des Iles producing graphite mine in Quebec and the Okanjande graphite deposit/Okorusu processing plant in Namibia. They also own the Bissett Creek graphite project located 100km east of North Bay, Ontario, Canada and the nearby Mousseau West Graphite Project.

Near term western potential flake graphite producers

- **NextSource Materials Inc. (TSX: NEXT | OTCQB: NSRCF)** – Completion of construction activities and the start of mining activities is expected in [November 2022](#), at their Molo Graphite Project in Madagascar. Phase 1 of the Molo Mine is designed to operate at a production capacity of [17,000 tonnes](#) per annum.
- **Westwater Resources Inc. (NYSE: WWR)** – Owns the [Coosa Graphite Plant](#) (2023 production start targeted) in USA. The Company plans to source natural graphite initially from non-China suppliers and then from the USA from 2028.
- **Nouveau Monde Graphite Inc. (NYSE: NMG | TSXV: NOU)** (“NMG”) – Own the Matawinie graphite project, located in Quebec, Canada. In September this year it was [announced](#) that Tesla had recently visited their project in Quebec. Also recently the Company [announced](#): “NMG, Panasonic

Energy and Mitsui announce Offtake and Strategic Partnership supporting the supply of active anode material plus US\$50 million private placement by Mitsui, Pallinghurst and Investissement Québec.”

- [Lomiko Metals Inc.](#) (TSXV: LMR | OTCQB: LMRMF) – Earlier stage but 100% owns the promising [La Loutre Graphite Project](#) in Québec, Canada, where a PEA has been completed.

Closing remarks

An 8 to 25x increase in demand by 2040, 97 new graphite mines needed by 2035, graphite deficit coming in late 2022! Investors should not forget about graphite, and particularly focus on those graphite miners that are working towards being able to manufacture value-added active anode materials (spherical graphite), as that is where the real money is.

We may be experiencing ‘the calm before the storm’ (before graphite deficits push up prices), which means the sector still offers many great opportunities for investors.

Disclosure: The author is long Syrah Resources (ASX: SYR) and Advanced Metallurgical Group NV (AMS: AMG).