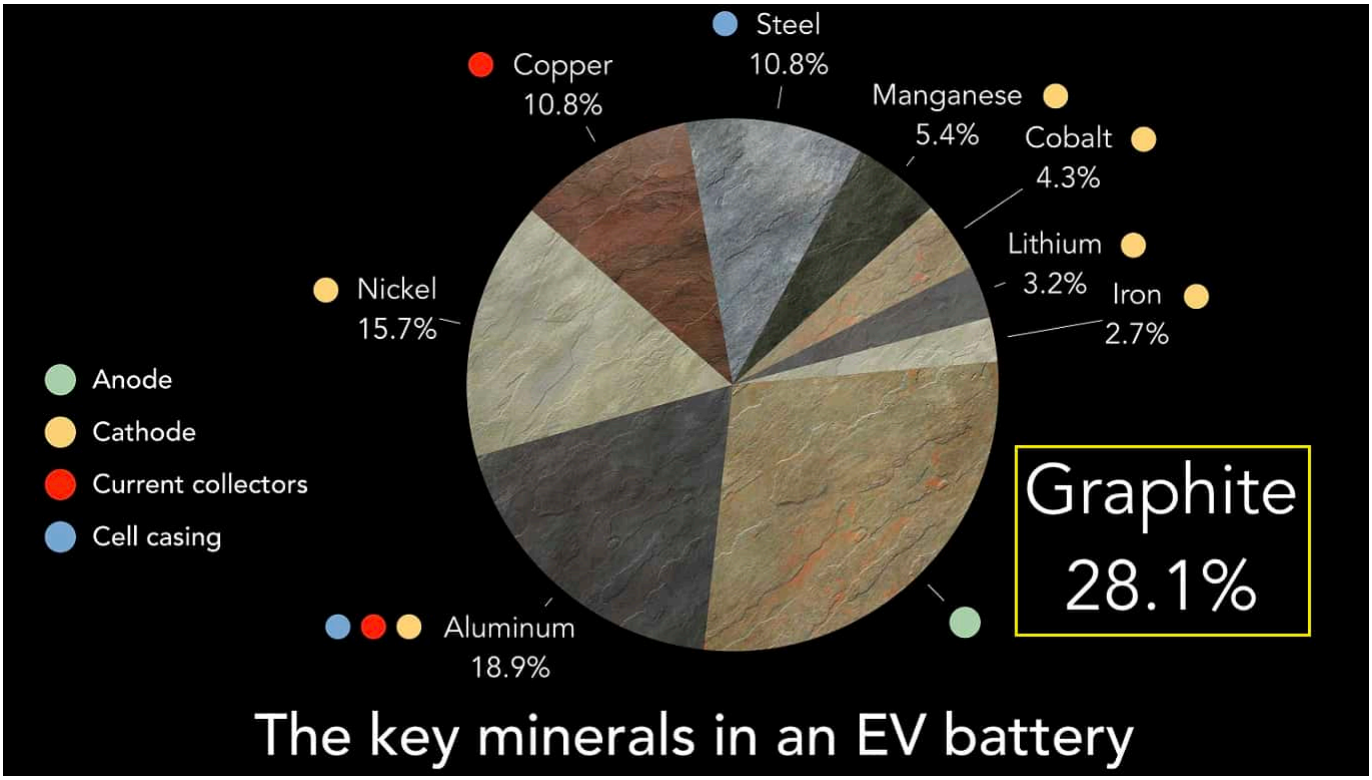
Can the Western graphite and anode industry rise to meet China's challenge?

written by Matt Bohlsen | October 25, 2023

China to impose some graphite and processed graphite materials 'export permits' from December 1, 2023

Last week it was reported that China, the world's top graphite producer plans to curb exports of key battery material by implementing export permits for some graphite products from December 1 to protect national security. Another report stated: "China graphite export restrictions could hinder ex-China anode development….if it lasts into the longer term, it is likely to accelerate the build-out of a localized graphite and battery anode supply chain outside China."

Graphite is the number one metal required for lithium-ion batteries making up about a 28% share. It is used in the anode.



The key metals and minerals in a battery of an electric vehicle

The world is very dependent upon China to supply processed graphite material and anodes for Li-ion batteries

The reason why this is huge news in the graphite world is that China produces 67% of global natural flake graphite supply and refines more than 90% of the world's graphite into active anode material (typically spherical graphite). If China were to deny or delay permits for spherical graphite it will cause major problems for anode manufacturers outside China, such as those in South Korea, Japan, or North America.

China currently produces ~77% of global lithium-ion batteries and 75-80% of global electric cars, thereby completely dominating the industry. If the West is shut out from sourcing

processed EV battery materials from China then they will have a major problem producing their own EVs. China plans to prioritize EV battery materials for their own needs. This is why President Biden introduced the Inflation Reduction Act (IRA) and the EU introduced the EU Critical Raw Materials Act. Both are designed to address the shortages in the EV supply chain and the forecast shortages of future supply of critical raw materials. The problem is the IRA has done little to address the supply of raw materials and the EU Critical Raw Materials Act is woefully inadequate and targets fall way short of what will be needed.

Which western graphite companies can rise to meet the challenge to establish an ex-China graphite supply chain

The leading western graphite companies that are working to establish an ex-China supply chain for flake graphite, synthetic graphite, and spherical graphite include:

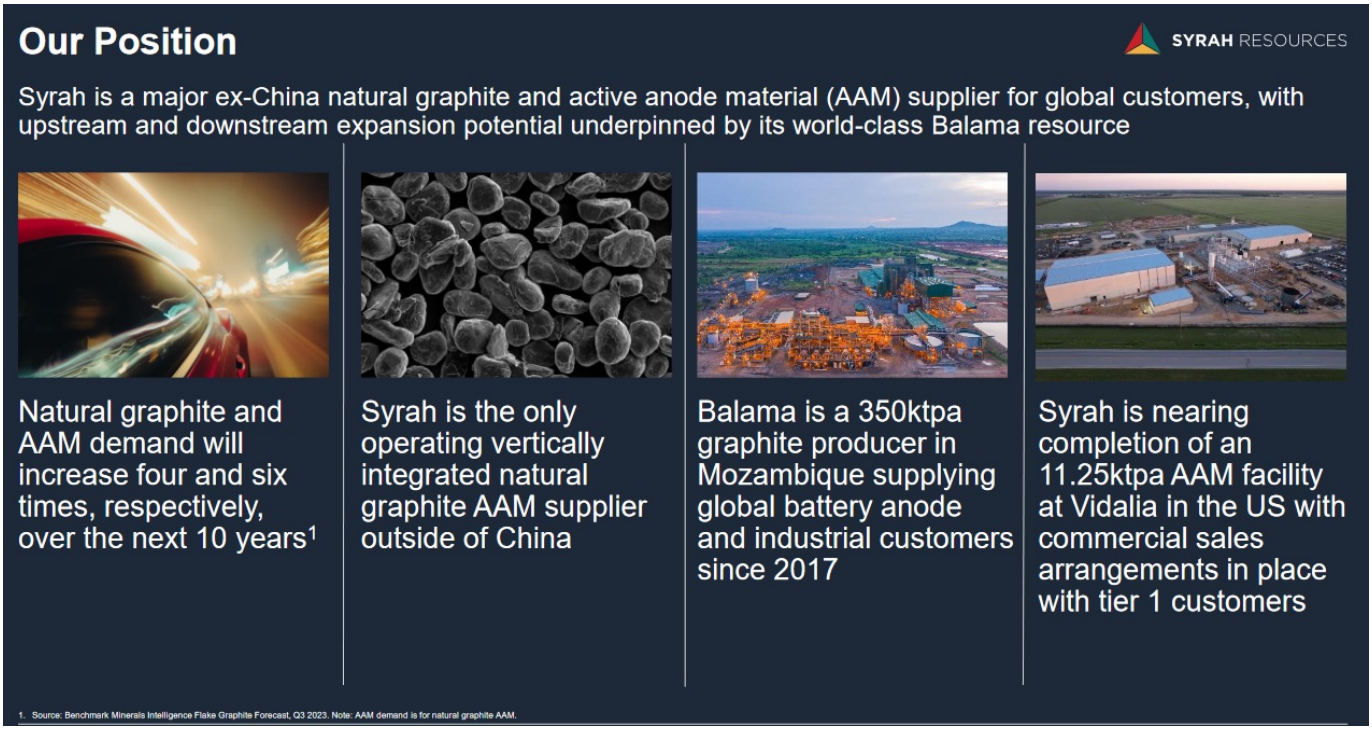
- **Syrah Resources Limited (ASX: SYR)** – Largest western flake graphite producer with their 350,000tpa flake graphite capacity Balama Mine in Mozambique. Currently constructing the Vidalia spherical graphite facility in Louisiana, USA with Stage 1 production plans to produce 11,250tpa of spherical graphite. Longer term they plan to expand to 45,000tpa in 2026 and then to >100,000tpa by 2030 with an Europe/Middle East facility. Syrah already has an off-take agreement with Tesla (NASDAQ: TSLA). Syrah's stock price has surged ~80% higher the past week following the release of the China export permits news.
- **Nouveau Monde Graphite Inc. (NYSE: NMG | TSXV: NOU)** – Is

rapidly progressing their plans for their Matawinie Graphite Mine and Bécancour Battery Anode Material Plant in Quebec, Canada. The company is working with Panasonic to qualify their graphite anode material. Panasonic supplies Tesla with batteries.

- **Northern Graphite Corporation (TSXV: NGC | OTCQB: NGPHF)** – Owns graphite producing and past producing mines in Quebec, Canada and Namibia. They also own the Bissett Creek graphite Project in Ontario, Canada. The Company state that they are "North America's Only Significant Natural Graphite Producer". The Company plans to develop one of the world's largest battery anode materials facilities in Baie-Comeau Québec with 200,000tpa of capacity.
- **NextSource Materials Inc. (TSX: NEXT | OTCQB: NSRCF)** – A new graphite producer from their Molo Graphite Mine in Madagascar with Phase 1 capacity of 17,000tpa of flake graphite production and plans to expand to 150,000tpa. The Company's short term plan is for a Battery Anode Facility in Mauritius and longer term for similar facilities in USA/Canada, UK, EU.
- **Magnis Energy Technologies Ltd.** (ASX: MNS | OTCQX: MNSEF) – Magnis aims to produce high performance anode materials utilising ultra-high purity natural flake graphite from their Nachu Graphite Project in Tanzania. Magnis' partially owned U.S.-based subsidiary Imperium3 New York, Inc ("iM3NY") operates a gigawatt scale lithium-ion battery manufacturing project in Endicott, New York.
- **Talga Group Ltd. (ASX: TLG)** – Own the integrated mine to anode Vittangi Graphite Project in Sweden. In September 2023 Talga broke ground on their 19,500tpa anode facility, stating "the refinery is projected to be the first commercial anode production in Europe for electric vehicle Li-ion batteries".

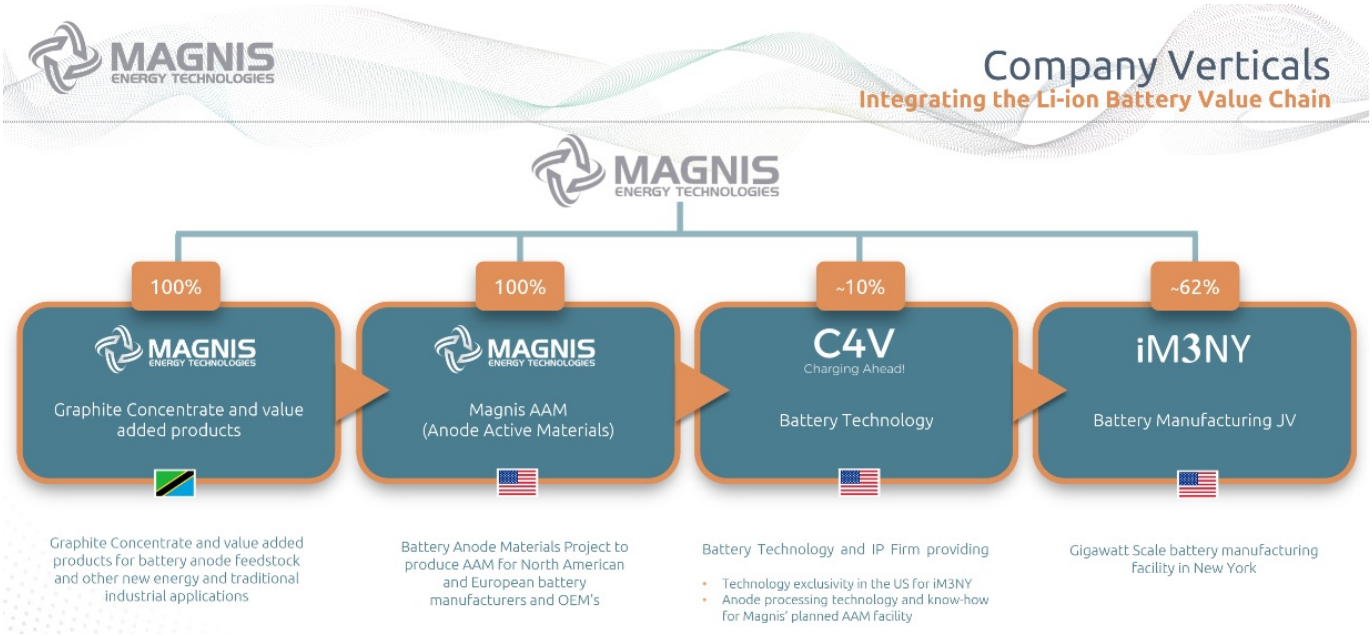
- **Novonix Limited (NASDAQ: NVX | ASX: NVX)** – Has a production capacity target of up to 20,000 tpa of synthetic graphite anode material from their Tennessee facility in the USA.
- **Anovion Technologies (private)** – The USA anode producer plans to invest US$800 million to produce a 40,000tpa synthetic graphite anode material facility in Georgia, USA with plans to expand to 150,000tpa by 2030.

Syrah Resources leads the West's attempt to build an ex-China flake graphite and anode material supply chain



Source: Syrah Resources September 2023 Quarterly Activities presentation

Magnis Energy Technologies is working towards becoming a graphite producer, anode materials producer and is already a small scale JV battery producer in the USA



Source: [Magnis Energy Technologies company presentation]

Closing remarks

The Western world received a loud wake-up call the past week. The China graphite products 'export permits' may only serve to restrict or slow down some anode material supply from China, but it puts the West on notice of how dependent they are upon China.

Given the world is rapidly moving to electric vehicles, the West must urgently build up its EV materials supply chains or risk being left behind in the global EV race.

The USA is making some bold moves and the companies discussed in this article are moving in the right direction. Let's just hope that the western EV supply chain build out accelerates rather than stalls like [GM's latest electric pickup truck plans]. I think Americans will want U.S.-branded electric cars and I know Europeans will want European branded electric cars. If we are not careful our only choice one day might be Tesla and Chinese electric cars. Stay tuned.

China’s Tightening Control over the Global Graphite Market

written by Tracy Weslosky | October 25, 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.

The Dean’s List – Part 3: What graphite company could benefit from Canada’s commitment to critical minerals?

written by InvestorNews | October 25, 2023

Part 3: Northern Graphite Corporation

It's time for another installment in our series that looks at Canadian companies in the mining sector that could be impacted by Federal and Provincial government announcements with respect to critical materials, supply chain, EV battery manufacturing, etc. As a reminder, the province of Ontario first announced in March its strategy for 'critical minerals' followed shortly by a C$4.9 billion electric vehicle battery plant in Windsor, Ontario. This was followed in April by the Federal Government's Budget 2022 proposing up to C$3.8 billion in support over eight years to implement Canada's first Critical Minerals Strategy. The Fed's followed this up in late June with a House of Commons Standing Committee on Industry and Technology report entitled: Positioning Canada as a Leader in the Supply and Processing of Critical Minerals. Just to highlight a few of the momentum building actions in the sector.

Today we're going to have a look at what I consider to be the least publicized critical mineral that comprises a lithium-ion battery (LiB) – graphite. Not only is graphite the largest component in a lithium-ion battery (up to 48%), it also requires the largest production increase of any battery mineral in order to meet forecast demand.

Source: Northern Graphite Corporate Presentation

Conversely, over 80% of graphite mine production in 2021 came from China, while China makes almost 100% of the graphite anode material for lithium-ion batteries. Does this sound like a recipe for disaster for the rest of the world to you? Perhaps it's stats like these that have put graphite on the critical minerals list of virtually every country that is attempting to develop a critical minerals strategy.

Assuming governments get their strategies at least partially right, that could result in opportunities galore for miners and explorers of these critical materials. This includes Northern Graphite Corporation (TSXV: NGC | OTCQB: NGPHF), a Canadian company focused on becoming a world leader in producing natural graphite and upgrading it into high-value products critical to the green economy. Northern is the only significant graphite producing company in North America and will become the third largest non-Chinese producer when its Namibian operations come back on line in the first half of 2023. The Company also has two large-scale development projects, Bissett Creek in Ontario and Okanjande in Namibia, that will be a source of continued production growth in the future. All projects have "battery quality" graphite and are located close to infrastructure in politically stable countries.

Looking a little closer at the Bissett Creek project, testing has indicated that graphite from Bissett Creek is very well suited for the manufacture of high capacity, durable, long-life lithium-ion batteries. Bissett Creek is projected to produce 20,000 tonnes of graphite per year in phase 1 of development and has the resources to increase production to approximately 100,000 tpy as demand grows. By comparison, Canada's graphite production in 2020 was estimated to be only 10,000 tonnes. An independent study has rated Bissett Creek the highest margin graphite project in the world, including existing producing mines. This is due to its very high percentage of valuable large flake graphite, simple metallurgy and favorable location which provides ready access to equipment, supplies, labor, grid power, natural gas and markets.

Why is this important? Along with the above noted Windsor battery plant JV between Stellantis and LG Energy Solution, the latter has also announced two projects in Michigan, just across the US border from Ontario. It is investing US$1.7 billion to

expand its LiB cell plant in Holland, Michigan and has a third joint venture with GM to build a US$2.5 billion cell plant in the City of Lansing and Delta County, Michigan. Combined with the investment in Ontario, LG will have a collective LiB production capacity of 200 GWH in North America, requiring 250,000 tpy of graphite. And Bissett Creek is the nearest graphite deposit to these megafactories which provides Northern Graphite with a unique opportunity to deliver a secure, local, responsibly sourced supply of graphite.

It seems Northern Graphite might be sitting pretty as LG Energy Solution looks to start sourcing supply for all its facilities. This could dovetail nicely with two upcoming milestones the Company has stated. In Q3, 2022 Northern is planning to announce an LiB anode production strategy, which also aligns with two of the Ontario government's strategies: Growing domestic processing and creating resilient local supply chains and Investing in critical minerals innovation, research and development. Then come Q4, 2022 they are looking to arrange financing for the Bissett Creek Project which could potentially include government support or possibly loan guarantees, a strategic offtake agreement with LG Energy Solution or just an old-fashioned capital raise. Regardless, the appetite should be there for whichever means the Company determines is its best course of action with the current tailwind for critical minerals.

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Did you miss a previous edition? *Check it out….*

The Dean's List – Part 2: What nickel company will benefit from Canada's commitment to critical minerals?
The Dean's List – Part 1: What rare earths company will benefit from Canada's commitment to critical minerals?

Northern Graphite Greg Bowes InvestorIntel Summit Presentation

written by InvestorNews | October 25, 2023

May 30, 2018 – “Why should you be interested in graphite? As I mentioned earlier, graphite is the anode material in lithium-ion batteries. That is a $20 billion dollar a year business that is growing at over 20% a year. That chart is historical. That is not a forecast.” states Gregory Bowes, CEO and Director of Northern Graphite Corp. (TSXV: NGC | OTCQX: NGPHF), in a recent presentation at the 7th Annual InvestorIntel Summit – Buds, Batteries & Blockchain 2018.

Gregory Bowes: Northern Graphite is a company that is based in Ottawa, Canada. We have about 65 million shares outstanding. We consider that we have the best new graphite project. I am sure everybody says that so my job today is to convince you why it actually might be true in our case. It starts with location. If any of you want to do a site visit you can jump in a car and you would be there in 4½ hours. It is between North Bay and Ottawa, off the Trans-Canada Highway. It has a reasonable capital cost. It has a realistic production target relative to the size of the market. It is the highest percentage of the more valuable large flake production. It has the lowest marketing risk of any new project. It has the highest margin and the best economics. It is not a junior exploration story. We have a full feasibility study and we have our major environmental permit. The next step is $100 million dollars Canadian and building a mine. We have

developed a patent pending battery material technology, which I will tell you a little bit more about, which converts that graphite mine concentrate or helps convert it into the anode material for lithium-ion batteries. Why should you be interested in graphite? As I mentioned earlier, graphite is the anode material in lithium-ion batteries. That is a $20 billion dollar a year business that is growing at over 20% a year. That chart is historical. That is not a forecast. As usual the best investment advice comes from looking around you. We all know the proliferation of personal devices, cameras, cell phones, laptops. All of that market is driven by lithium-ion batteries. This is lithium-ion battery manufacturing capacity that is in the pipeline. It is set to quadruple by 2021. If that happens we are adding 300 gigawatt hours of production capacity. You can see at the bottom that would require a doubling of annual graphite production. Even if these plants were only to operate at 20% or 30% or 40% of capacity due to lower than expected growth in EVs, you would still need multiple new graphite mines. This is a little bit of a comparison. The three main battery minerals are graphite, lithium and cobalt, obviously. The different in the graphite market you can see it is quite a bit bigger than the other two. In terms of battery demand, it still has not got to where the other two are yet. That is one of the reasons that the graphite price has not performed as well, nearly as well, as lithium and cobalt. The interesting story is that if you add 100 gigawatt hours of battery manufacturing capacity or demand, you are looking at 160% increase in graphite demand so there is much greater leverage there than there is in the other two minerals. That leverage comes from two factors that people do not often consider. You talk about how much lithium you need and how much graphite you need in a battery…to access the complete presentation, click here

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