

The Critical Minerals Institute Report (01.25.2024): U.S. government bans Pentagon battery purchases from major Chinese companies starting October 2027

written by Matt Bohlsen | January 25, 2024

Welcome to the January 2024 [Critical Minerals Institute](#) (CMI) report, designed to keep you up to date on all the latest major news across the critical minerals markets. Here is the CMI List of [Critical Minerals](#) or visit the [CMI Library](#).

Global macro view

January 2024 saw a slight rise in U.S. inflation [reported](#) from 3.1%pa in November to 3.4%pa in December 2023. This has led market commentators to suggest the proposed 2024 interest rate [reductions](#) may be pushed out to H2, 2024, or be smaller in nature.

The next U.S. Fed rates announcement is due on January 31, 2024, and no changes in rates are expected. Year to date, as of January 21, 2024, the [S&P 500](#) is up 2.04%. U.S. GDP looks set to slow in Q4, 2023 ([announcement](#) due 25 January 2024) with [forecasts](#) for 2% annualized growth, which would result in a [2023 GDP](#) of ~2.7%. 2024 U.S. GDP is [forecast](#) to be ~2.2%. The U.S. consumer remains resilient with U.S. employment [very strong](#).

China continues its property led slowdown with 2023 GDP recently

[reported at 5.2%](#) annualized. China's December new [home prices fell](#) at the fastest pace in almost 9 years. Despite this the Chinese Central Bank left rates unchanged, defying expectations for a 0.1% cut.

The Russia-Ukraine war continues as does the Hamas-Israel war which last month spread to include the U.S. and UK forces [bombing](#) Iran-backed Houthis over their attacks in the Red Sea. The Middle East is a hotbed ready to explode.

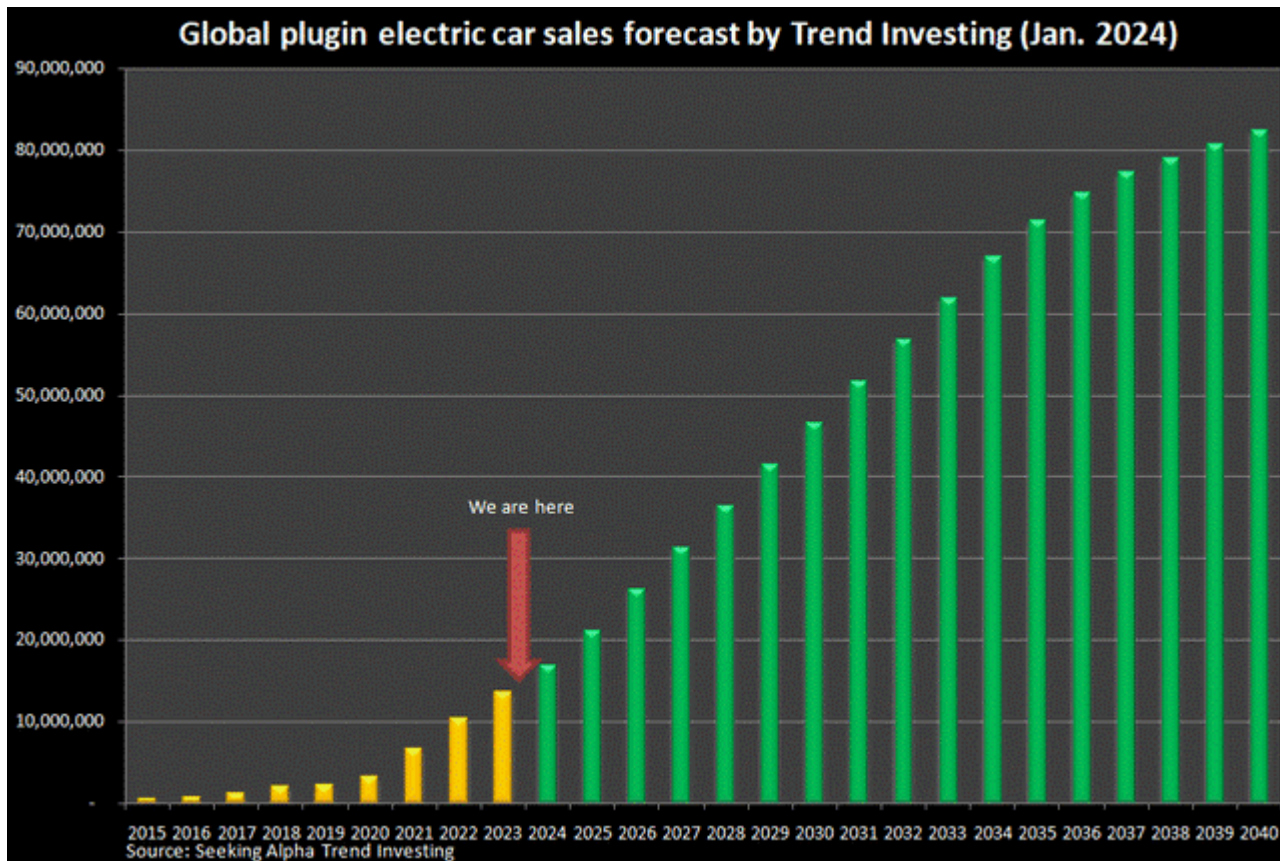
Global plugin electric vehicle ("EV") update

December 2023 saw the usual seasonal upswing in global plugin electric car sales reaching a record [~1.5 million](#). China led the way with a stellar result of [1.191 million units](#), up [46% YoY](#).

Global plugin electric car sales ended 2023 at [13.6 million units](#) (~16% market share), for a growth rate of [31% YoY](#) (a significant slowdown from the ~60% growth rate in 2022).

- Trend Investing [forecast](#) for 2024 is 17 million units (20% market share), for a growth rate of 25% YoY.
- BloombergNEF [forecast](#) for 2024 is 16.7 million units (~20% market share), for a growth rate of 21% YoY.

We are still at the very early stage of the EV boom.



Trend Investing's global plugin electric car sales forecast to 2024 (green bars)

In early January, news was released that [a record](#) 1.2 million EVs were sold in the U.S. in 2023, according to estimates from Kelley Blue Book. The report noted that U.S. market share [reached 7.6%](#) in 2023 and that 55% of EV sales were attributable to Tesla (NASDAQ: TSLA).

The UK announced that their Zero Emission Vehicle (ZEV) [mandate](#) to increase electric car sales has become law. Key rules include:

- **"ZEV Mandate demands makers up share of electric car sales to 22% in 2024.**
- Electric vehicles currently make up around just 18% of all registrations in the UK.
- **Mandate thresholds rise annually to an 80% share in 2030 – and 100% by 2035.**

- Failure to meet the ZEV mandate sales targets can result in huge fines for auto makers of £15,000 per model below the required threshold.”

EV battery news

The U.S. government continues to tighten the screws towards developing their own EV supply chain independent of Foreign Entities Of Concern (“FEOC”). On January 20 Bloomberg [reported](#): “US to ban Pentagon battery purchases from China’s CATL, BYD”. The ban will commence from October 2027 and include 4 other Chinese battery makers (Envision Energy Ltd., EVE Energy Co., Gotion High Tech Co., and Hithium Energy Storage Technology Co).

Global critical minerals update

There is an enormous amount of doom and gloom surrounding the EV and battery metals sector as we commence 2024. A key theme in recent months has been very depressed prices for many of the critical minerals, especially those related to the EV segment. A combination of the slowing EV growth rate in 2023 from ~60% in 2022 to ~31% in 2023, combined with an excess of battery inventory from 2022 and new EV metals supply has left most EV metal markets in surplus with prices collapsing.

MarketsCommodities

Battery Metal Price Plunge Is Closing Mines and Stalling Deals

- Prices for lithium, nickel and cobalt have tumbled from peaks

Source: [Bloomberg article, January 10, 2024](#)

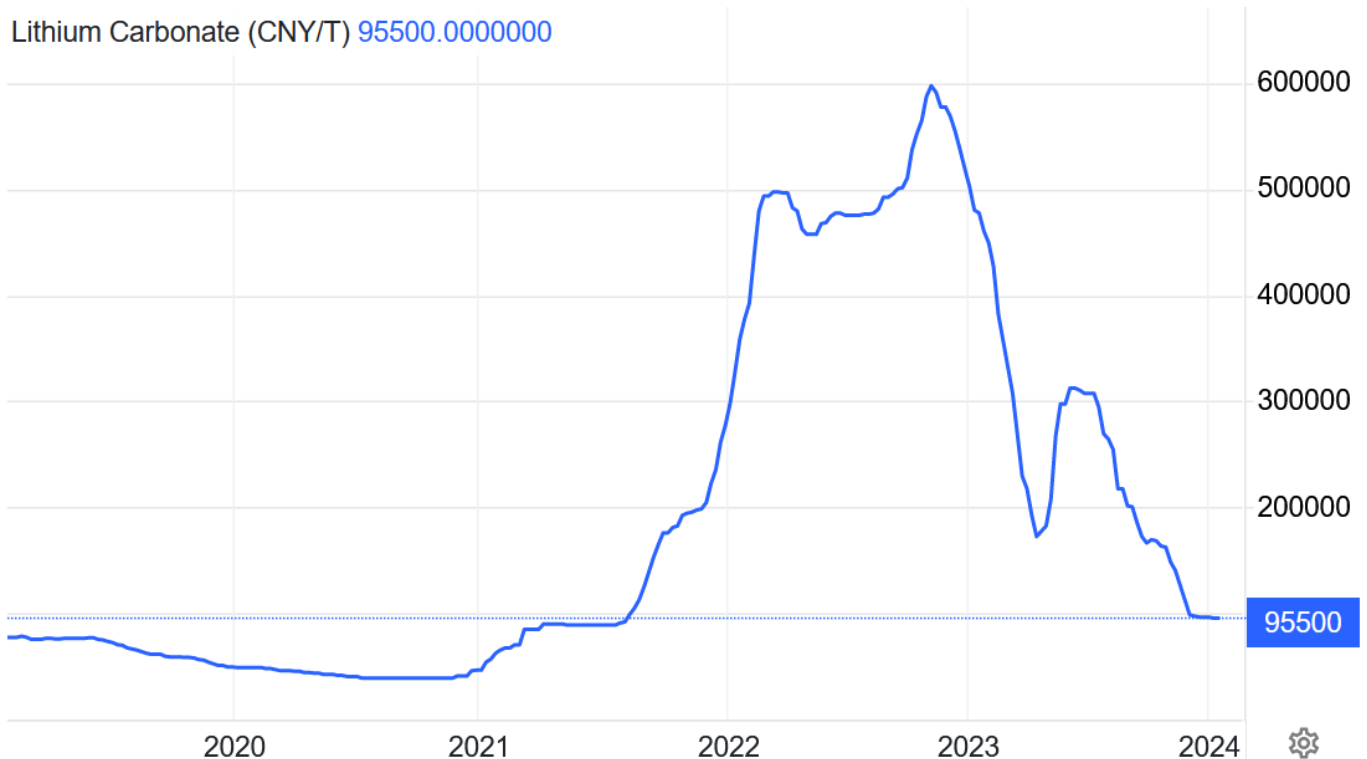
Lithium

China lithium carbonate [spot prices were flat](#) the past month, with the price now at [CNY 95,500/t](#) (USD 13,275/t). After an [~80%](#) fall from the high, lithium prices appear to have finally stabilized. This is logical given that prices are now at or below the marginal cost of production, especially for the higher cost China lepidolite producers.

Industry participants have been calling for a price bottom in recent months, with China Futures Co. analyst, Zhang Weixin, forecasting lithium prices to bottom out between [CNY 80-90,000/t](#) and average CNY 100,000/t in 2024.

The other key recent trend in the lithium sector has been several announcements from lithium producers either stopping production or reducing their expansion plans. Core Lithium (ASX: CX0) announced on January 5, 2024 it will [temporarily suspend](#) mining operations. Then on January 17, 2024, Albemarle Corporation (NYSE: ALB) [anno](#)unced “actions to preserve growth, reduce costs, and optimize cash flow”. This includes deferring plans to build a fourth lithium hydroxide processing train at their Kemerton LiOH facility.

The China lithium carbonate spot price has stabilized near the marginal cost of production



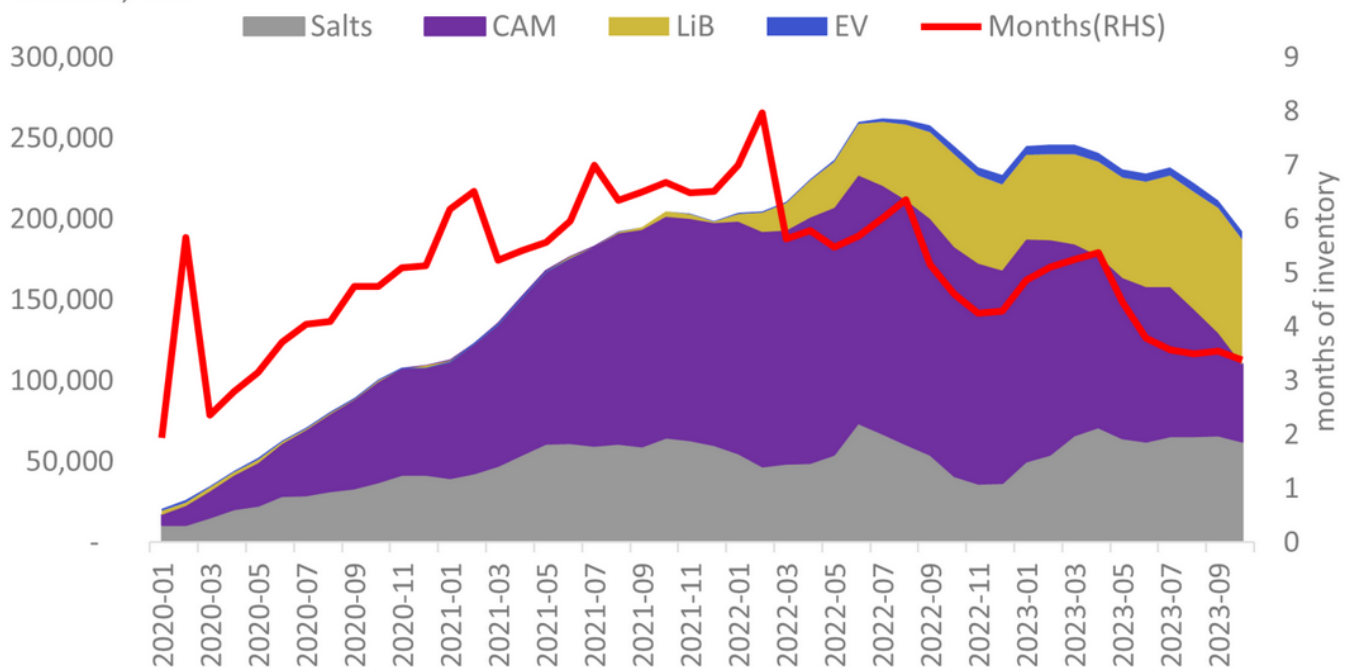
Source: [Trading Economics](#)

On the topic of when we might see some recovery in lithium prices. On January 19 Fastmarkets put out a report [stating](#): “...We expect orders to start flowing upstream again either towards the end of the first quarter or early in the second quarter.” If this proves correct and EV demand remains solid, then we could expect some lithium price recovery late Q1, early Q2, 2024.

Fastmarkets reports China lithium inventory levels are now back to the pre-boom levels with ~3 months of supply (red line)

Implied inventory on the way back to normalized level

Implied lithium inventory within China's supply chain
tonnes, LCE



Source: [Fastmarkets](#)

Magnet Rare Earths

Neodymium spot prices fell again the past month to [CNY 505,500/t](#). Prices peaked in February 2022 at CNY 1,506,530 and have been trending lower ever since then.

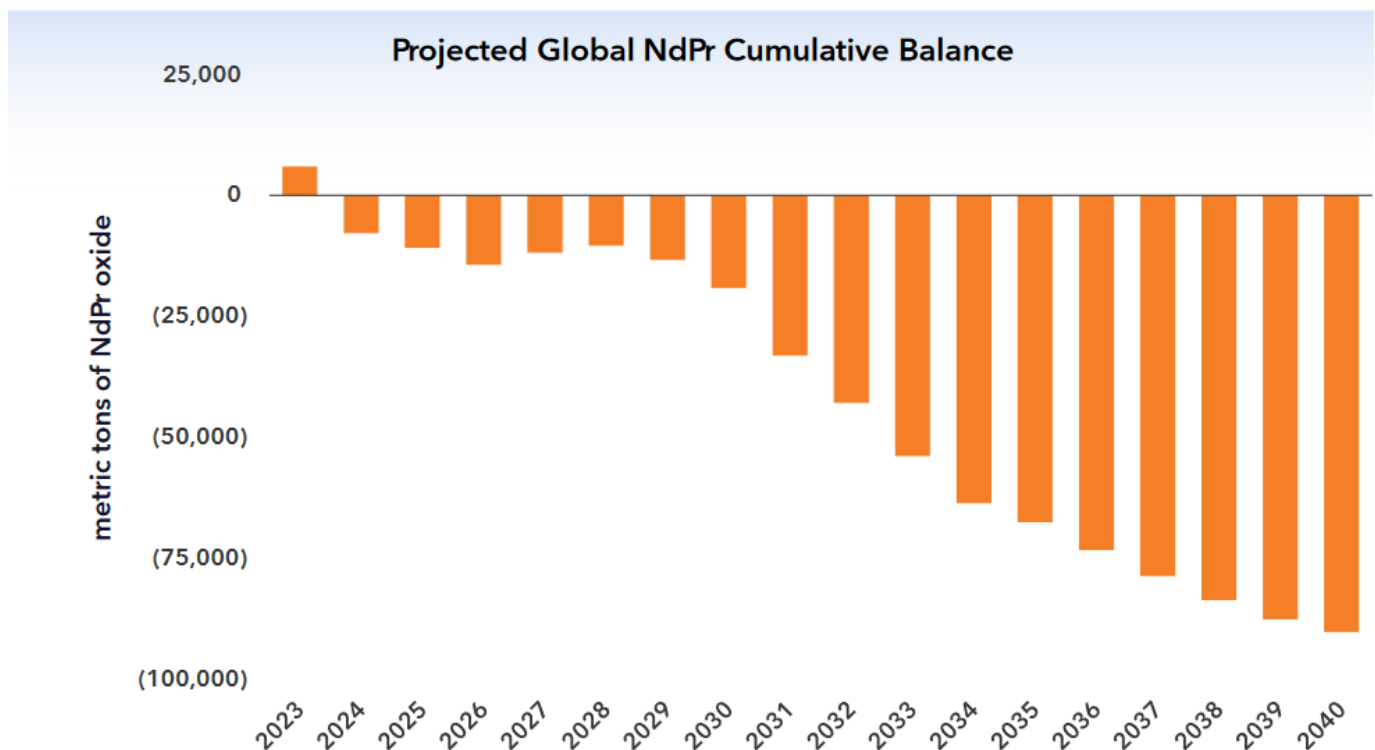
As discussed in a recent [InvestorNews article](#), the consensus of industry experts is for 2024 to be a consolidation year. The article states: "2024 should see a year of consolidation for the rare earths sector as some experts are telling me. Some [forecasts](#) are for NdPr supply deficit to begin as early as 2024; however, this will largely depend on China demand, the global economy, EV sales, and new NdPr supply hitting the market."

One interesting [news item](#) that emerged in January was of Rainbow Rare Earths Limited (LSE: RBW) ("Rainbow") and their Phalaborwa Project in South Africa. The key aspect being that the Project

[consists of gypsum](#) waste piles that contain large quantities of the magnet rare earths. Rainbow CEO Bennett [stated](#): “We’ve got no mining cost, no crushing, no milling, no flotation. I saw the advantages to lead to a low capital intensity and low operating cost environment project.” Rainbow targets first production for 2026.

Some analysts are forecasting deficits ahead for NdPr rare earths driven by strong EV and wind energy demand

A precarious supply-demand imbalance looms



Source: [MP Materials courtesy Adamas Intelligence](#)

Cobalt, Graphite, Nickel, Manganese and other critical minerals

Cobalt prices (currently at [US\\$12.90/lb](#)) were flat the past month and remain at very depressed levels. The cobalt market is

suffering from excess cobalt supply from the DRC which combined with a global slowdown in demand has led to cobalt prices dropping by almost 2/3 since their April 2022 peak. With LFP batteries gaining in popularity (no cobalt required) and a weak global consumer electronics market, there appears to be no short term turnaround for cobalt. Leading cobalt producer Glencore PLC (LSE: GLEN | OTC: GLCNF) has been stockpiling their excess material. At current prices, there is limited incentive for western producers to expand or enter the market.

Cobalt has lost two-thirds of its value since a recent peak in 2022



Source: [Trading Economics](#)

Flake graphite prices remain very weak with prices near the marginal cost of production and [down ~2%](#) over the past month.

A January 2024 Bloomberg [report](#) noted that natural flake graphite shipments slumped 91% in December from November 2023. Of course, sales surged prior to the Chinese export license permits being implemented in December 2023. December exports

were 3,973 tons compared to the past monthly average of ~17,000t, so still a very significant fall.

Despite the spate of recent bad news, graphite is one of the EV metals with the largest demand profiles ahead this decade. Several groups are forecasting deficits ahead this decade starting from 2024/25 for the various types of graphite including flake, spherical, and synthetic. You can read more on the graphite outlook [here](#).

Nickel prices fell again last month to [USD 15,799/t](#). The [1 year outlook for nickel](#) remains poor due to oversupply concerns from Indonesia. As a result of low nickel prices we saw [the collapse](#) of Panoramic Resources (ASX: PAN) in December and then on January 22, 2024, it was [reported](#) that BHP Group (ASX: BHP | NYSE: BHP) plans “to put parts of Kambalda nickel concentrator in Australia on care and maintenance” from mid-2024. This was caused by Wyloo Metals, which supplies ore to the plant, announcing a pause in mining operations due to low nickel prices.

Manganese prices were flat the past month and are now at [CNY 29.25/MTU](#).

Uranium prices have been the exception to the rule the past year as they continue to rise, now at [US\\$106/lb](#).

Uranium 5 year price chart



Source: [Trading Economics](https://tradingeconomics.com/uranium-price)

Conclusion

The biggest trend that looks to be emerging in Q1, 2024 for the EV metals sector is a negative supply response from producers. Producers are cutting CapEx, scaling back expansion, and in some cases reducing or stopping production. Expect to see a lot more of this in H1, 2024.

They say “the cure for low prices is low prices”. Well that’s exactly where we are now in the cycle. The next 3-6 months is likely to see the washout phase, where many miners collapse, reduce production or put their mine into care and maintenance. There is no point running a mine and selling a limited resource and making no profit. I will end with three well known sayings:

- “Bear markets are the author of bull markets”
- “*Bull markets are born on pessimism, grown on skepticism, mature on optimism, and die on euphoria.*”

- “You have suffered through the pain, now hang around for the gain.”

Given the EV metals markets have been in a bear market for the past 15-18 months the end is near, and we should expect some recovery during H2, 2024, assuming EV sales can grow at a reasonable rate.

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

written by Matt Bohlsen | January 25, 2024

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.

These are the graphite leaders as we head towards a forecast

graphite deficit in 2023

written by Matt Bohlsen | January 25, 2024

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 Munglinup 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).

Nouveau Monde Graphite COO, Karl Trudeau, on the upcoming Demo Plant

written by InvestorNews | January 25, 2024

You were director of Imerys mine at Lac-des-îles, Quebec which is known as the only North-American graphite mine currently in production. What have you seen in [Nouveau Monde Graphite Inc.](#) (TSXV: NOU | OTCQX: NMGRF) to make you resign from your position with a billion-dollar company to join a junior?

Karl Trudeau: Imerys is a good employer and I enjoyed my position as their mine director at Lac-des-îles. At this point in my career, I was in need of a new challenge, knowing that Lac-des-îles is likely getting on its last few years of production. The vision of Nouveau Monde's management team was enticing enough to make me do the move and become their COO.

Please tell us about your role at Nouveau Monde and how your

experience at Lac-des-îles relates to the challenges you will be facing?

Karl Trudeau: I have several years of experience mining and producing graphite at an industrial scale. Nouveau Monde was in need of a COO who would be instrumental in selecting equipment, in putting in place efficient and effective mining and processing operations and in building a team around these. One also needs to understand that graphite is a relatively opaque market so knowing who the key players are in the industry is clearly an asset for someone in my position.

Nouveau Monde has publicly announced the setup and commissioning of a demo plant by mid-2018. What are the key milestones of this project and how far are you already advanced?

Karl Trudeau: In early January, we started receiving the first pieces of equipment. To celebrate the milestone, we published pictures of these on our Facebook company page. What made it possible to achieve this so quickly was the signing, last fall, of a 3-year lease agreement with Louisiana Pacific, the owner of the industrial building where we're setting up our demo plant. The pictures that one can see are of the equipment pieces as they were delivered in our industrial plant. The facility is ready to accept additional equipment and we're actively working on placing orders for the pieces requiring long lead orders. So, in a nutshell, we are following our timeline and milestones are being met. We are confident that our demo plant will start producing flake graphite by mid-2018.

What is the vision behind this demo plant? What are you trying to achieve and how does it stand as a good chance of creating value for your shareholders?

Karl Trudeau: Selling graphite is tricky since there are no exchange-based marketplaces. A producer needs to establish sales

agreements which are typically known as “offtake agreements”. In the current market, buyers will only commit if they are reasonably comfortable that the producer can meet their specifications and can produce enough of the material. What we’re getting ready to do is having enough capacity to produce 1,000 tonnes of flake graphite per year which we will then sell to North-American buyers. This will allow them to qualify our products. We will also use the demo plant to produce 250 tonnes of value-added products such as purified spherical graphite, expandable graphite and graphene.

Our vision is to leverage our location in Southern Quebec and use cheap and green hydro-electricity as much as possible to keep production costs and the environmental footprint as low as possible. You can say that we are following in the foot steps of Nemaska Lithium where they were successful in using hydro-electricity as much as possible in their lithium refining process. They clearly innovated and were successful in getting government grants to that effect. This is what we want to emulate in the graphite space.

What are the key attributes that make Nouveau Monde unique among other graphite juniors? How does this demo plant leverage these attributes?

Karl Trudeau: Our flake size distribution is one key attribute. We have about 48% large and jumbo flakes, 12% of mediums and the remainder are fines. This distribution ratio will allow us to tap a large portfolio of potential buyers. Just like in the real estate market, our location is another key attribute as we are in proximity of existing infrastructures and in a mining friendly jurisdiction. As per our pre-feasibility study (PFS), we have a competitive production cost per tonne of flake graphite and the beauty is that once it’s produced, it’s already here in North-America. No need for overseas transportation which

is expensive and adds to the environmental footprint. So, our plans are to sell the most profitable flakes in the North-American market and further process what remains into value-added products using cheap and green hydro-electricity. I strongly believe that lithium-ion battery and EV manufacturers do care about the environmental footprint of their suppliers. The demo plant will allow us to demonstrate these capabilities and also delineate the costs of these processes at the commercial scale of 52,000 tonnes of flake graphite (about half will be further processed into value-added products).

What is the budget for this demo plant and are you fully funded to make it through the construction and commissioning phases?

Karl Trudeau: We've put up a budget of \$12M for the demo plant. We are fully funded to make it through construction, commissioning and the production of our first tonnes of flake graphite.

Will you be seeking out government grants and how significant could these grants be in the overall budget?

Karl Trudeau: Yes, we believe we have strong business cases for innovation and for other government grants in the areas of energy efficiency, value-added products, social acceptability and tailing management.

This demo plant is a complex endeavor, have you added key personnel in the last few months to make this vision a reality?

Karl Trudeau: We've worked hard to implement the CEO and Board vision. We've been successful in attracting some of the best graphite experts and we now have about 15 full-time employees (FTEs). By the end of the year, when the demo plant is fully operational, we expect to be about 35 FTEs. Our management team brings about 30 years of recent graphite experience.

Both the graphite deposit and the demo plant are located next to existing infrastructures and a town of potential employees. That's a blessing only if the population is fully behind the project. How are you managing social acceptability to ensure you've got the backing of the local people?

Karl Trudeau: You are right to say that both the graphite deposit and the demo plant are next to existing infrastructures. They are also only 5 km apart from one another. We do not foresee serious logistic challenges during the operations of our demo plant. On the topic of social acceptability, Nouveau Monde Graphite has been very proactive over the last 4 years. We held 3 public meetings with the local people to keep them informed of the project and more than 50 small groups or individual meetings. We've been very transparent with our stake holders and we opened our head office on the main street of the village. People are always welcomed to stop by and ask questions. That is why we enjoy strong support for our project. We were also proactive with the Atikamekw first nation. We involved them from the onset and they've been supporting us.