

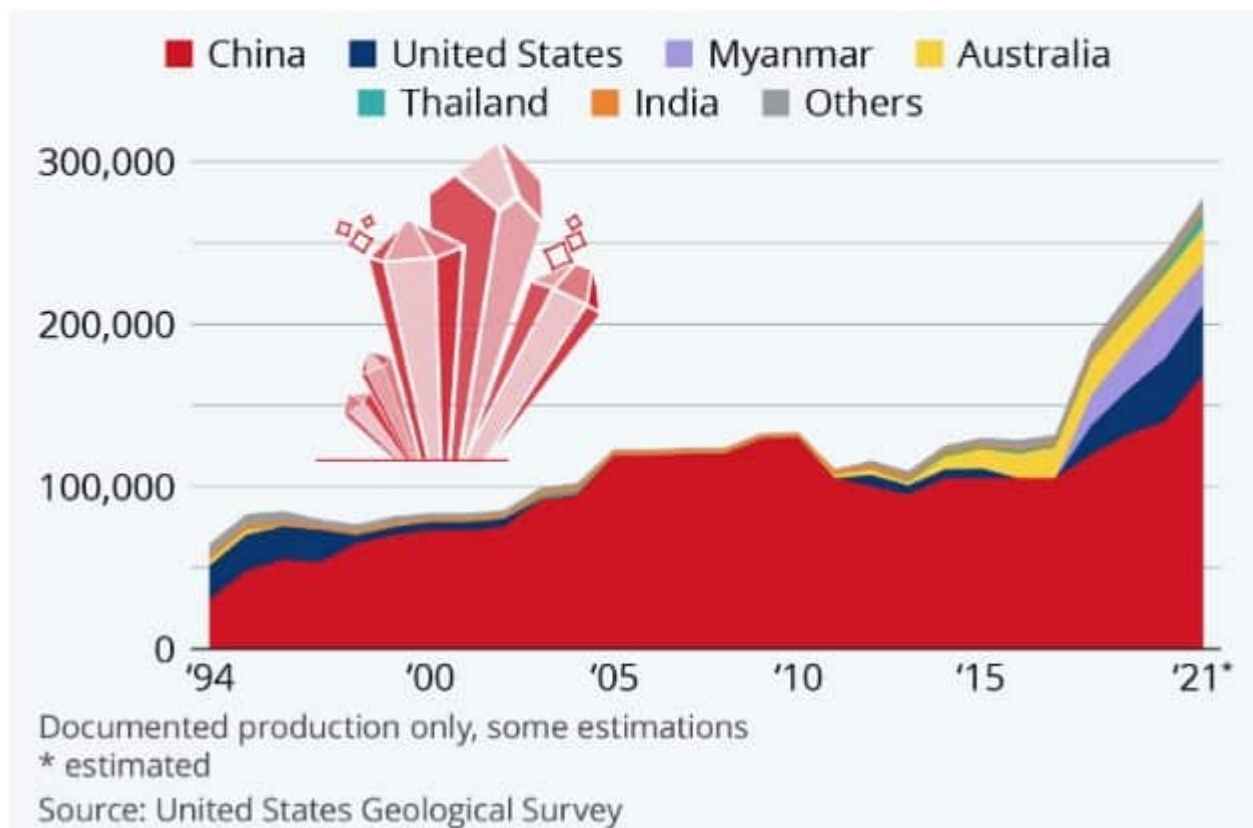
American Rare Earths is part of the global race to develop critical minerals in NA

written by Tracy Weslosky | November 16, 2022

The rare earths sector has had plenty of good news in 2022 including the recently announced proposal by the European Commission ("EC") for a [European Raw Materials Act](#). A very telling comment in the announcement gives a big clue as to which critical materials hold the greatest concern. The EC [stated](#): "Lithium and rare earths will soon be more important than oil and gas.....Our demand for rare earths alone will increase fivefold by 2030." The supply risk for key rare earths is a problem for all western countries. China dominates the rare earths supply chain ([58%](#) of mines, 85% of processing) and the production of powerful rare earth magnets used in EVs, wind turbines, and most military hardware that employ powerful magnets. The U.S has already started various initiatives to support the rare earths supply chain, including [some funding](#) from the Infrastructure Act. Last month the Biden administration announced [\\$2.8 billion of grants](#) for various critical materials and battery supply chain related projects in the USA.

So clearly the funds are now flowing and the race is on to develop both an EU and a U.S critical materials and battery supply chain. Given the rising global geopolitical tensions Europe and USA will now need to support the critical materials sector like never before – both funding and permitting.

China mines 58% of rare earths, but processes 85% at a time of rising geopolitical tensions.



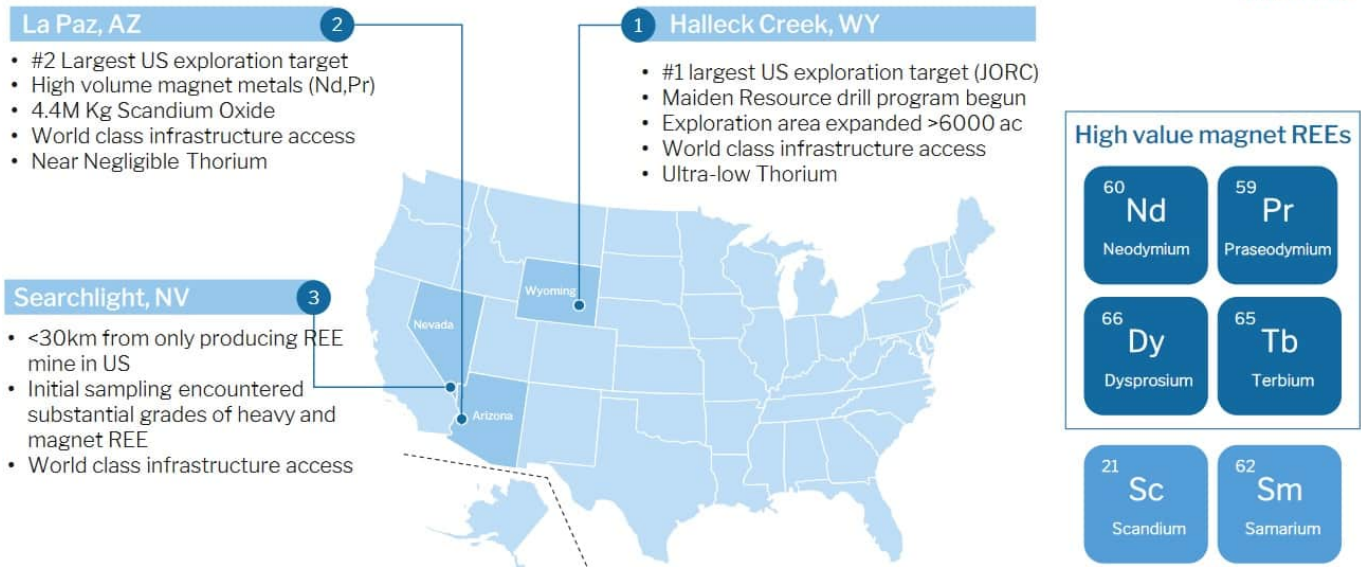
Source: [American Rare Earths company presentation](#)

Today's company is working as fast as they can to help create a U.S source of critical rare earths from their three USA rare earths projects.

[American Rare Earths Limited](#) (ASX: ARR | OTCQB: ARRNF) is focused on developing their 100% owned La Paz Scandium and Rare Earths Project in Arizona, USA. The Company's other two projects are the Halleck Creek Project in Wyoming and the Searchlight Rare Earths Project in Nevada, USA.

American Rare Earths' 3 USA rare earths projects currently being explored and developed

Resources: massive targets in friendly jurisdictions



Source: [American Rare Earths company presentation](#)

La Paz Project update

The La Paz Project has high-value magnet rare earths (NdPr) as well as scandium with a 2021 JORC Resource of [170.6 million tonnes at an average grade of 469ppm Total Rare Earth Oxide \("TREO"\)](#) (contained ~80 million kgs TREO, plus 4.4 million kgs of Scandium Oxide (Sc₂O₃)). American Rare Earths Limited has recently completed the metallurgical test work at La Paz. The results were successful using the Watts & Fisher's proprietary technology for the extraction of rare earth metals. [According](#) to the Company: "The technology shows good promise with further development, moving into piloting down the track. Rapid dissolution of rare earth values within 2 to 3 minutes at leaching temperatures above 225°C." Next steps at La Paz include South-West Area resource expansion and then a PEA.

The Halleck Creek Project update

At the Halleck Creek Project, the Company continues their drilling campaign to define a significant JORC Resource. The Company stated recently: “The drilling commenced early October and is progressing well. It is anticipated the campaign, analysis and subsequent announcements relating to a maiden JORC resource will be completed in the first quarter of calendar year 2023.” In good news for shareholders, the Halleck Creek exploration target has been increased by 328%, boosted by the newly staked claim area Bluegrass which indicates consistent rare earth mineralisation. Beyond that, the next steps include metallurgy testing.

American Rare Earths has also recently [stated](#) they are evaluating even more potential rare earth opportunities in North America. Finally, in more good news the Company’s wholly-owned US subsidiary, Western Rare Earths (WRE), and a consortium of companies (Phinix, LLC and Virginia) [were awarded US\\$500,000 in R&D funding](#). The consortium will use the funding to develop extraction and separation focused processing technology studies on rare earths ore. The project goal is to produce light, medium, and heavy rare earth oxide products of greater than 95% purity.

American Rare Earths Limited trades on a market cap of [A\\$91 million](#). Exciting times ahead for this fast-moving company – they are a member of the Critical Minerals Institute.

Momentum versus fundamentals, that is the question for Neo Performance Materials

written by InvestorNews | November 16, 2022

I can honestly say that the volatility around earnings the last 2 to 3 quarters has been unprecedented. A miss versus expectations or disappointing guidance can lead to enormous losses for a stock with a single day double digit percentage loss becoming increasingly common. I don't know if it's related to the lack of confidence in the overall market, the rise of the retail investor (Robinhood and Reddit come to mind), or the increasing influence of algo trading that exacerbates both positive and negative momentum, but something has changed making these massive one day moves far more frequent. I guess one possible benefit to this is that if you feel the market has overreacted it could make for a great short-term trade in the event the market re-evaluates all the information available and determines things aren't as bad as the market initially thought.

That introduction sets the stage for us to review a company that continues to see sequential top line growth, has an iron clad balance sheet, is squarely in the driver's seat of the green revolution but as a result of some input cost pressures and demand issues, the bottom line saw an unexpected quarterly loss leading to a 17% yard sale on Friday. That company is [Neo Performance Materials Inc.](#) (TSX: NEO), manufacturer of the building blocks of many modern technologies that enhance efficiency and sustainability. Neo's advanced industrial materials – magnetic powders and magnets, specialty chemicals, metals, and alloys – are critical to the performance of many everyday products and emerging technologies. Neo has a global

platform that includes 10 manufacturing facilities located in China, the United States, Germany, Canada, Estonia, Thailand and South Korea.

So let's see if we can diagnose what happened in [Q3](#) that caused the market to punish Neo, driving it down to lows not seen since the pandemic plunge in early 2020. As I noted above, revenue numbers continue to see sequential growth both quarterly and year over year in all three of the Company's business segments – Magnequench, Chemicals & Oxides and Rare Metals. For the three and nine months that ended September 30, 2022, revenues of US\$146.6 M and US\$481.1 M were 22.4% and 24.7% higher, respectively, than the corresponding periods of 2021. Unfortunately, there's more to earnings than just revenue and that's where some of the challenges in the quarter occurred.

Starting with the Magnequench division, where Neo is the world leader in the production of permanent magnetic powders used in bonded and hot-deformed, fully dense neodymium-iron-boron magnets, there was a decline in volumes compared to the corresponding periods of 2021. The recent spike in COVID-19 has affected the free flow of people and production supplies across many parts of Asia and the ongoing semiconductor chip shortage is continuing to impact customers in the automotive and other industries. Additionally, by the third quarter of 2022, selling prices for Magnequench powders declined 30% to 40% from the peak (in the first quarter of 2022) negatively affecting (when prices are falling) overall pricing and margins due to the lead-lag effect of higher cost inventory on hand. In addition to lower margin on sales in the quarter, Neo recorded \$8.0 M of provisions for inventories in the third quarter, related to higher cost inventory on hand, relative to lowered selling prices.

Moving on to the Chemicals & Oxides (C&O) division, which

manufactures and distributes a broad range of rare-earth-based industrial materials including automotive catalysts, permanent magnetics, consumer electronics, petroleum refining catalysts, medical devices, and wastewater treatment, we see a similar theme. This segment was the biggest drag on the quarter with the three months ended September 30, 2022, reporting an operating loss of US\$5.3 M, compared to operating income of \$7.1 M in the same period of 2021. The C&O segment continues to see strong demand for various rare earth products, particularly its magnetic-based products, although the segment was adversely affected by the earlier noted rapid decline of rare earth prices while processing higher cost inventory. C&O saw mixed volumes for rare earth elements but slower volumes in the environmental catalyst end markets driven by semiconductor chip shortages. The rapid decline in prices necessitated C&O to record US\$6.0 M of provisions for inventories.

As a potential investor, it's now up to you to decide if the headwinds faced in Q3 are transitory or not. Looking forward, Magnequench, which accounts for roughly 45% of Neo's revenue, has pass-through pricing agreements for rare earth magnetic elements on the vast majority of its sales contracts. Magnequench earns a targeted margin spread per ton when rare earth prices are stable and over the long term. However, the short-term timing mechanics of the pass-through agreements generally lead to increasing margins when rare earth prices rise and declining margins when rare earth prices fall. The C&O segment, accounting for a little over 1/3rd of revenue, continues to see strong demand for various rare earth products, particularly its magnetic-based products and the environmentally protective water treatment solutions business continues to perform well with higher volume and new customer adoption. The Rare Metals business continues to make progress in several key strategic initiatives, including selling more products outside

of the aerospace industry, expanding its customer base, and diversifying its total end-market exposure. Sales prices in a number of end markets have recovered and gallium-based products are exhibiting improved market demand.

Neo Performance Materials closed Friday trading at 9.2x trailing 12 month earnings, has a 4.4% dividend yield and C\$3.65/share of cash sitting on the balance sheet. Last week the Company [announced](#) it has been awarded a grant of up to 18.7 M Euros from the Government of Estonia under Europe's Just Transition Fund program to help pay for the cost of constructing a state-of-the-art sintered rare earth permanent magnet manufacturing facility in Estonia. The question is, are fundamentals the most important thing in the market these days or momentum trading?

With interest focused on smart nuclear, Sunday Mine complex mining operations prepare to restart in the New Year

written by Tracy Weslosky | November 16, 2022

The global energy crisis is causing chaos in 2022. This is a key topic at this year's climate conference (COP27), currently underway in Egypt; never mind the Critical Minerals Summit I just hosted on scalability challenges in Toronto yesterday for the Critical Minerals Institute. FACT: The world needs to switch to renewables but right now is suffering energy price shocks as Russia and OPEC hold the world to ransom. Global natural gas

prices have [roughly doubled](#) the past year, and have risen even faster in Europe. Coal prices have skyrocketed higher the past year [from US\\$148/t to US\\$339/t](#). Oil prices have also [risen significantly](#) in 2022. Little wonder we have a global inflation problem, as energy and oil prices push up the price to produce and deliver everyday items.

Climate change enthusiasts would say the answer is solar, wind, hydro and energy storage; however the truth is right now we rapidly need more baseload power and to move away from coal and gas as quickly as possible.

The answer is smart [nuclear](#). This idea is supported by [President Biden](#) and even [Elon Musk](#). Now to boost nuclear energy we need more uranium, ideally sourced not from Russia or Kazakhstan, which is another [potential problem](#).

Western uranium producers have been idling their mines for years waiting for the uranium surplus to decline, leading to higher uranium prices. Judging by the 2022 uranium price action ([now at ~US\\$50](#)) and forecasts for uranium deficits in the next few years, that time has now arrived.

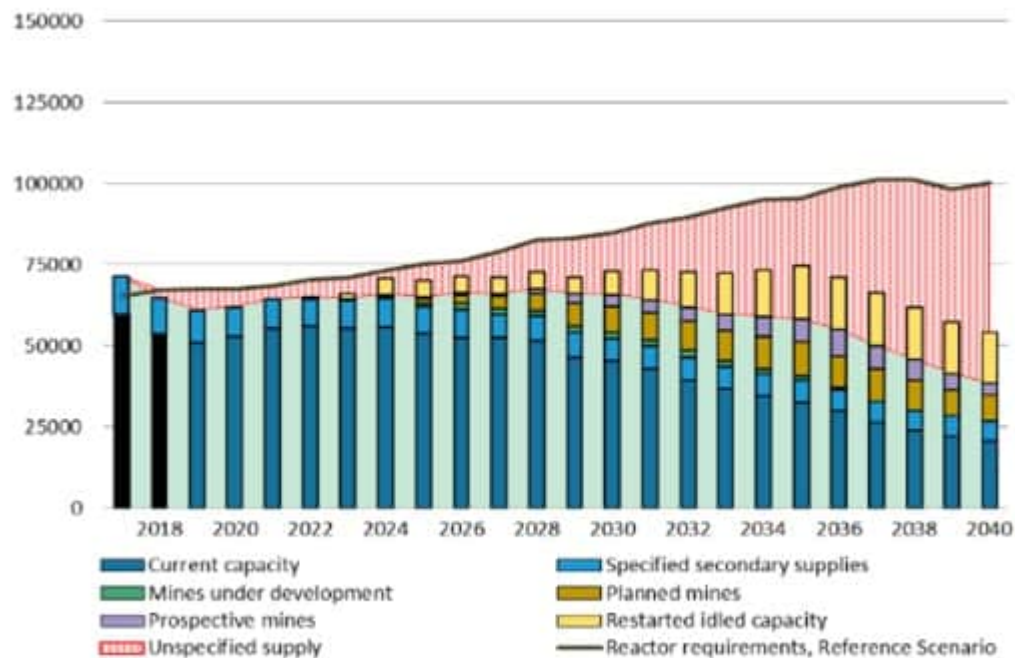
Today we look at a promising uranium company that also thinks uranium's time has finally come.

The company is [Western Uranium & Vanadium Corp.](#) (CSE: WUC | OTCQX: WSTRF).

Uranium demand is set to potentially exceed supply from now to 2040

Projection Uranium Production to 2040- Reference Scenario Supply (tonnes U) ⁽¹⁾

Figure 7: Reference Scenario supply, tU



⁽¹⁾ Source: The Nuclear Fuel Report: Global Scenarios for Demand and Supply Availability 2019-2040

[Source](#): Western Uranium & vanadium company presentation

Western Uranium & Vanadium Corp. (“Western”)

The world is short of affordable energy and demand is only set to grow further, especially as we rapidly move to electrification of the transport sector. The quote below sums up the current situation very well.

In a November 2022 market update Western President & CEO [commented](#):

“Western currently is observing positive catalysts across multiple levels of the nuclear fuel and uranium markets. At a micro-level the projected supply / demand imbalance is expanding.....There are multiple data points pointing to a depletion of the secondary supply overhang, which was prevalent for the last decade. At a macro-level, the electrification transition and climate change initiatives have increased global support for nuclear. Further, Russia’s invasion of Ukraine and

the ensuing global energy crisis has focused attention on security of supply and supply chain risks."

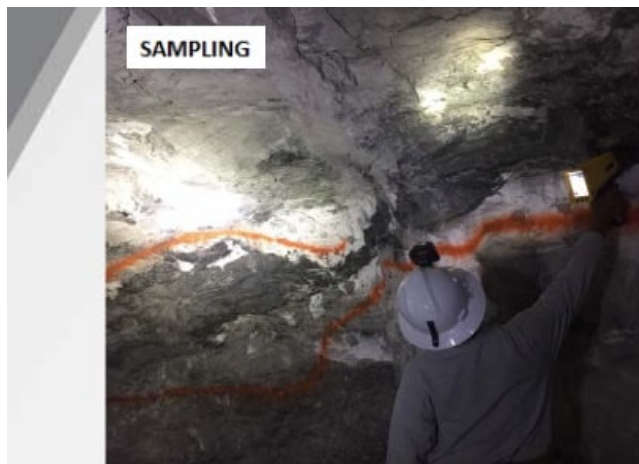
Right now in the U.S, there are less than a handful of uranium producers. Western is probably the lowest market cap of them all and is ready to quickly scale up uranium production.

Sunday Mine complex mining operations are targeted to restart in January 2023

In some very good news for investors, Western [announced](#) only last week, that as of January 2023 they will restart mining operations at their Sunday Mine Complex. Western [stated](#):

"Western has completed the build-out of its in-house mining capability. Additional employees for the first mining team have been hired over the last two months, facilities have been upgraded, and equipment and vehicles have been acquired and readied for deployment.....Mining operations are targeted to restart in January 2023."

Western's Sunday Mine Complex in Colorado USA



[Source](#): Western Uranium & vanadium company presentation

The Western Uranium & Vanadium market cap is [C\\$64 million](#), InvestorIntel will follow up in early 2023 to update our audience on how progress is going at the Sunday Mine Complex restart. Stay tuned,

Skyrocketing LFP demand has

experts asking, “How fast can Nano One scale production?”

written by Tracy Weslosky | November 16, 2022

Lithium iron phosphate (“LFP”) batteries are rapidly gaining market share due to their improved energy density, longer cycle life, improved safety, generally lower costs, and no requirement for nickel and cobalt. It certainly makes sourcing the critical materials much easier as lithium and graphite become the only critical materials needed. No need to source cobalt from the Congo or [nickel](#) from Russia.

Furthermore, the LFP trend is now expanding out from China to other regions as Chinese patents expire. In October last year, Tesla [announced](#) it is switching all of its standard range Model 3 and Model Y electric cars globally to LFP batteries. Multiple OEMs have since followed Tesla’s lead. The problem is now that the [Inflation Reduction Act](#) will only reward U.S or U.S free trade countries if their batteries are made locally (not in China), but there are very few western LFP battery facilities.

Nano One Materials now owns the only LFP battery facility in North America

In news [announced](#) on October 31, [Nano One Materials Corp.](#) (TSX: NANO) has now completed the acquisition of Johnson Matthey Battery Materials Ltd., who just happens to own the only LFP battery factory (the “Candiac facility”) in North America. Many in the market failed to appreciate the significance. And let me lay out – there is a massive demand for western made LFP batteries, and there is an extremely small current western supply to access.

Highlights of the announcement are:

"The Acquisition helps expedite Nano One's business strategy for LFP and other battery materials and includes:

- A talented and dedicated workforce of 46 professionals with almost 400 years of scale-up, commercialization, and cathode manufacturing know-how on LFP.
- **The only existing North American lithium iron phosphate ("LFP") production facility.**
- An 80,000 square foot, 2,400 tpa capacity LFP production facility on 9.5 acres, strategically located near Montréal.
- Certification systems supplying tier 1 cell manufacturers for the automotive sector."

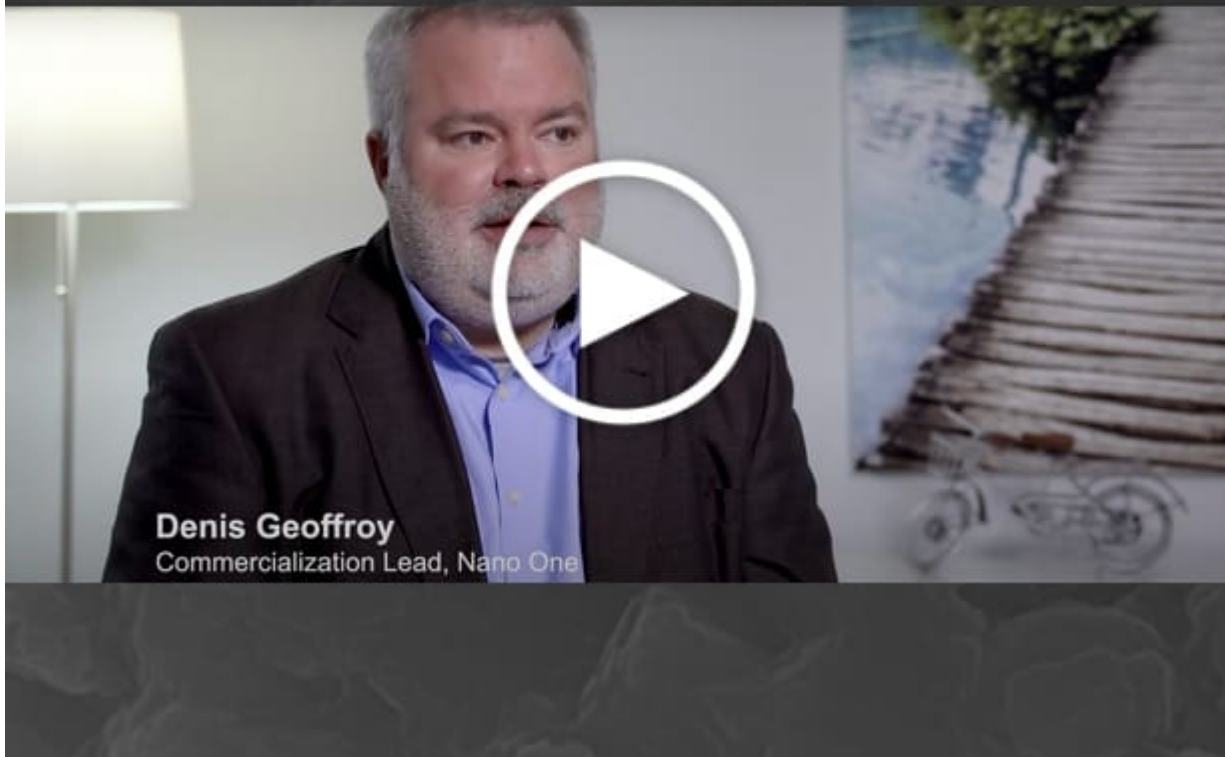
Note: Bold emphasis by the author.

Another key factor many in the market fail to appreciate is the difficulty in obtaining experienced battery manufacturing personnel. In the case of the above-mentioned deal, Nano One was able to secure a very key person, namely Denis Geoffroy. Denis was an early contributor to Phostech Lithium, which led the first commercial manufacturing of LFP cathode active materials globally. Nano One CEO Dan Blondal summed it up well [stating](#):

"Today marks the beginning of an exciting new chapter in the Nano One story. I am pleased to report that the entire team in Candiac has transitioned to Nano One and this positions us with the most experienced LFP workforce in North America."

Denis Geoffrey is the Chief Commercialization Officer of Nano One

We're building a commercialization team to scale our tech for a localized battery supply chain



Source: [Nano One Materials website](#) ([video link](#))

In terms of the next steps Nano One [states](#):

"The Company will begin with trials in the Candiatic facility to validate the production of LFP using the Company's patented One-Pot process. Results from these trials will drive business, commercial and plant conversion decisions in 2023."

One would think Tesla and other North American based electric car and battery OEMs would be taking notice of how this all develops, and off-take deals could potentially soon emerge.

The rise and rise of LFP batteries

LFP batteries outsold NMC batteries last year in China, rapidly gaining market share (see below).

LFP battery demand skyrocketing – LFP outsold NMC in China as of March 2022

‘Skyrocketing demand’

Like Wood Mackenzie, Clean Energy Associates (CEA) noted the competitive dynamic heating up between LFP and NMC batteries. Safety advantages, long lifecycle and lower costs have led to EV makers starting to accept the trade-off of lower energy density in adopting LFP batteries, both firms have noted.

LFP has already been accepted by the stationary battery energy storage system (BESS) sector, where energy density tends to be a less decisive factor.

CEA said LFP outsold NMC among batteries sold by Chinese manufacturers, with its market share growing through the year: of 100GWh of lithium batteries used for EVs and ESS, 44% were NMC and the majority of the remainder LFP.

Source: [Energy Storage News](#)

Looking ahead this decade it looks likely that LFP will continue to gain market share from NMC and become the preferred battery cathode type. Energy Storage News quotes research from Wood Mackenzie [stating](#): “Lithium iron phosphate (LFP) will be the dominant battery chemistry over nickel manganese cobalt (NMC) by 2028.”

Time will tell, but certainly, the current trend is towards LFP gaining market share globally. In North America the LFP demand will massively outweigh the supply, putting Nano One Materials in the box seat this decade, as a LFP battery manufacturer. The question really will be – **How fast can Nano One scale production?**

Nano One trades on a market cap of [C\\$266 million](#).

Jack Lifton addresses the problem of scalability of critical minerals in the EV supply chain

written by InvestorNews | November 16, 2022

In this video, [Critical Minerals Institute](#)'s (CMI) Executive Chairman Jack Lifton talks about the upcoming [Critical Minerals Summit](#) (CMS 2022) on Wednesday, November 9, 2022, at the historic [National Club](#) in Toronto, Canada from 9 AM to 4 PM EST.

Jack says that his opening remarks at the summit will try to address the problem of scalability of critical minerals in the EV supply chain. He adds that the problem is "severe but is the most ignored problem in critical minerals." With the demand for lithium per person grown by "5000 times between 2007 to 2022", Jack explains how we are moving towards "a world of the haves and the have-nots" when it comes to having access to non-fossil fuel energy.

To access the full episode, [click here](#)

Note from Publisher: Next week – on Wednesday, November 9th in Toronto, the inaugural [Critical Minerals Summit](#) is on! To secure a delegates pass, [click here](#) – READ: [Summit to Address the Impact of the \\$1.2 Trillion EV Market Demand by 2030 on the Critical Minerals Sector](#)

Don't miss other InvestorIntel videos. Subscribe to the InvestorIntel YouTube channel by [clicking here](#).

About The Critical Minerals Institute

The [Critical Mineral Institute](#) (CMI) is an international organization for companies and professionals focused on battery materials, technology metals, defense metals, ESG technologies and practices, the general EV market, and the use of critical minerals for energy and alternative energy production. Offering an online site that features job opportunities that range from consulting roles to Advisory Board positions, the CMI offers a wide range of B2B service solutions. Also offering online and in-person events, the CMI is designed for education, collaboration, and to provide professional opportunities to meet the critical minerals supply chain challenges.

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

written by Matt Bohlsen | November 16, 2022

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).

Defining Criticality

written by InvestorNews | November 16, 2022

Everybody is claiming to have “Critical Metals/Minerals” these days. Desperados in the copper space are the most shameless at touting this claim, while the most ludicrous are those in the gold space (though that goes without saying).

But how to measure what is and what isn't critical?

Rankings

Criticality and Chinese dominance have become popular themes over the last decade with the British Geological Survey's (BGS) first Criticality ranking in 2011 (in the midst of the Rare Earth boom) firing the starting gun on a race between countries to define what is critical to their own circumstances.

All attempts at ranking criticality are bound to run into criticism with different pundits and different economies perceiving different needs. Moreover, circumstances change, as Cesium showed when it went from being dominated by the US to being dominated by China when the US, fecklessly, let Sinomines acquire Cabot's specialty fluids division. In our perception, Tungsten is not as critical as it was due to numerous non-Chinese developments in the pipeline.

Of all the Criticality lists the BGS one was the only one giving scoring to the metals and then producing degrees of risk to supply. Moreover, it gives the impression of being focused upon which metals are at risk (largely from China-dominance, though unstated) rather than saying (as the JOGMEC list does) that certain metals are critical for a specific (i.e. Japan's) economy.

Criticality as Semantics

Metals rankings have now become like radio stations' Top 40 lists of days gone by. However, it may just be a matter of international semantics as to what the word "critical" actually implies.

Some are saying that this means a metal is vital to an economy (which of course iron ore is to every economy) but others are interpreting it as being that the supply is in some way threatened or vulnerable. And the latter is where the China Factor is invoked. Europe meanwhile wants to fence-sit and pretends that it is not accusing the Chinese of wielding a big stick threatening EU industries (when really the Chinese are being threatening indeed).

The BGS by using the word "Risk" did not mince its words. Everyone knew what it meant. Chinese dominance meant supply could be turned off.

Rising Tide of Concern?

The financial media chattering about Chinese dominance of particular metals is one thing, but it is when the average householder gets concerned that the issue really becomes popular. Giving a speech several years ago on Erbium and 5G we noted that few, if any, of the public even knew that the jump from black & white TVs to colour TVs was made possible by Europium and behind that lay the Mountain Pass mine.

For the public, the new 5G technology seems to come out of the ether, literally, and thus it is not a good idea to ask too many questions about what metals make it happen because one would find out that (notwithstanding Huawei's involvement) the REE component (Erbium) in 5G largely is China-sourced or China-processed. Who amongst the Great Unwashed (or experts) can tell us where other 5G inputs, like Scandium, Cesium and Tantalum, come from?

Alarm bells though have been ringing in the C-Suites (of Germany and South Korea, more than Detroit) about the vulnerability of the EV “revolution” to Chinese machinations and that has set off a furious hunt for non-Chinese supply chains.

Curiously though, the European list does not include Lithium amongst the critical metals, though this is probably predicated upon its upstream supplies being mainly from “friendly” sources such as Australia, Argentina and Chile. But with China dominating conversion of Lithium into Lithium ion batteries (and having a stranglehold on Cobalt from the DRC) it does not pay to be so simplistic in calculating where one’s sources might be.

Ergo, with China being the principal midstream processor, can one be so blithely dismissive of the criticality of Lithium?

The various surveys that followed on the heels of the original BGS Criticality rankings now reinforce the sheer number of metals at risk, though as one can see below each agency producing these lists has differing views of the criticality of different metals within their remit.



We can note from the lists above that the US regards most metals as having some degree of criticality.

Conclusion

The critical metals space is torn with rising demand for metals that have seen little, to no, development since before the Commodity Supercycle even began and is now seeing a secular decline in Chinese production due to over-production, exhaustion and environmental devastation. This makes for a rather dramatic tug of war.

It is now clear that the genie set free by Trump’s seemingly

prophetic “Trade War” of the Chinese threat to supplies cannot be put back in its bottle. The “love” of the US industrial complex’s for cheap Chinese minerals has now even been called into question. We doubt that the East Asians (i.e. Japan, Korea and Taiwan) and the Germans can ever be easily lulled back into a false sense of security (of supply) by the Chinese.

The legacy of underinvestment and the lack of capital markets’ interest in specialty metals stories (beyond momentary pump-and-dumps) combined with the Chinese massive own goal in splurging its resource base in predatory pricing and, frankly, dumping over three decades has made for a secular crisis in metals supplies.

This crisis is likely to be enduring and will definitely result in the long-term higher prices (even shortages).

All the chatter does not provide money for projects. Unfortunately, it is only metal price spikes that seem to do so. The soaring price of Lithium and Cobalt in 2017 was a case in point and then the Vanadium surge of 2018. However, the REE putsch of mid-2019 waxed and waned so fast that no party got any financings done before the brief window of opportunity slammed shut.

Less sexier metals never even get their day in the sun. Tellurium or Cesium could quadruple and it would not generate more than a muffled whisper in the trade journals. The same for individual Rare Earths such as Erbium and Dysprosium.

We are of the opinion that the critical “state” of the metals world will remain as long as the West is not self-sufficient in its supply of specialty metals. The Chinese have shown themselves to be malevolent players and that was while they had the whiphand in many metals. As they start to lose their grip the frustrations will start to rise, already we are starting to

see some rancour in relations with Burma over neo-colonial resources policies being imposed by China on its neighbour. Other Belt-and-Road “beneficiaries” have found that Chinese largesse comes at a hefty price. Is this mere sparring or the first shots in a monumental struggle over the world’s most crucial mineral resources?

In retrospect, Trump’s “Trade War” of 2018-20 may be seen as the “phoney war” phase of a much bigger tussle over access to the world’s scarce specialty metals resources. The criticality rankings are the playlists for the background music as this plays out.

Note from Publisher: Next week – on Wednesday, November 9th in Toronto, the inaugural [Critical Minerals Summit](#) is on! To secure a delegates pass, [click here](#) – READ: [Summit to Address the Impact of the \\$1.2 Trillion EV Market Demand by 2030 on the Critical Minerals Sector](#)

Summit to Address the Impact of the \$1.2 Trillion EV Market Demand by 2030 on the Critical Minerals Sector

written by Tracy Weslosky | November 16, 2022

CMI Presents “The Race to Achieve a Critical Minerals Supply Chain ROW” at the Critical Minerals Summit on Wednesday, November 9th

Toronto, October 31, 2022 – The [Critical Minerals Institute](#), which was founded for education, collaboration, and to provide professional opportunities to meet the critical minerals supply chain challenges, is pleased to announce the inaugural Critical Minerals Summit (CMS 2022) on Wednesday, November 9, 2022, at the historic [National Club](#) in Toronto, Canada from 9 AM to 4 PM EST.

“With automakers planning on spending nearly \$1.2 trillion by 2030,” says Critical Minerals Institute founder Tracy Weslosky, “it is equally as important to discuss not only where these battery materials are coming from and the technologies involved, but also where will we find the skilled professionals it requires.”

Themed ***The Race to Achieve a Critical Minerals Supply Chain***, the Chairman of the Critical Minerals Institute Jack Lifton will begin the event with opening remarks aptly titled ***Scalability, Why the EV Timelines Simply do not Work***.

Geoff Atkins, Founder of Cheetah Resources and previously Managing Director of Vital Metals who succeeded in bringing the Nechalacho rare earths mine into production will kick off the day with his keynote speech titled ***The Perfect Storm: Prioritizing the Demand Drivers Necessary for Mission Critical Minerals Supply Chain***.

A one-day, in person event, the Critical Minerals Summit is a bi-annual event designed to bring industry leaders and investors together to address scalability, resource and human capital

needs, not only to meet the EV market demands, but to achieve the aggressive legislative timelines set around sustainability and climate change.

In the context of this theme, a special presentation designed by Prof. Saleem H. Ali, Ph.D., Chair, Department of Geography & Spatial Sciences, who is a Blue and Gold Distinguished Professor of Energy and the Environment from University of Delaware, will be presented during lunch. Author of a new book on environmental systems titled *How Natural Laws Define Human Life* (Oxford Univ. Press), his presentation will be followed by a Q&A style interview on the Global Critical Minerals Market with international expert and renowned market leader Constantine Karayannopoulos, President, CEO and Director of [Neo Performance Materials Inc.](#) (TSX: NEO).

Throughout the day, a series of 5 panels will be hosted by CMI Directors and the “Who’s Who” of international critical minerals experts, with leading industry CEOs participating as panelists. Highlights include the following panels:

- ***Securing the Capital to build a Supply Chain for the ROW.***
- ***The Extraction & Processing Timeline Advantage***
- ***Global Challenges in Advancing the Critical Minerals Supply Chain***
- ***Dealing with the Resource Challenge, the Critical Minerals Shortage.***
- ***The Power of Politics: Government Investment in the Critical Minerals Market***

In addition to the above, the CMI will have Ed Buiel PhD, President & CEO, Coulometrics, LLC, speak on the paradox of producing graphite in North America and competing with China, along with special guest and Acting Consul-General, Greg Quinn from the British Consulate-General Toronto, who will address the key points from the recently released UK national critical

minerals strategy.

The Critical Minerals Summit will be held at the historic [National Club](#) in Toronto from 9 AM to 4 PM EST. Space is strictly limited. For more information go to CriticalMineralsInstitute.com. To purchase a delegate pass, [click here](#).

About the Critical Minerals Institute: The [Critical Mineral Institute](#) (CMI) is an international organization for companies and professionals focused on battery materials, technology metals, defense metals, ESG technologies and practices, the general EV market, and the use of critical minerals for energy and alternative energy production. Offering an online site that features job opportunities that range from consulting roles to Advisory Board positions, the CMI offers a wide range of B2B service solutions. Also offering online and in-person events, the CMI is designed for education, collaboration, and to provide professional opportunities to meet the critical minerals supply chain challenges.



Special Thanks to the following Critical Minerals Institute Corporate Sponsors: [ACME Lithium Inc.](#), [American Rare Earths Limited](#), [Appia Rare Earths & Uranium Corp.](#), [Auxico Resources Canada Inc.](#), [Avalon Advanced Materials Inc.](#), [Critical Metals PLC](#), [Elcora Advanced Materials Corp.](#), [Energy Fuels Inc.](#), [Grant Thornton LLP](#), [Imperial Mining Group Ltd.](#), [Neo Performance Materials Inc.](#), [Power Nickel Inc.](#), [Save Canadian Mining](#), [Texas Mineral Resources Corp.](#), and [WCPD Inc.](#)

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Solvay starts making noise in the rare earths sector with a Hastings MOU

written by | November 16, 2022

[Solvay S.A.](#) (BRU: SOLB | OTCQX: SLVYY) ('Solvay') has started making news in the rare earths space. Solvay, a Belgian chemical company, acquired Rhodia in 2011 and with it the rare earth division with plants in France and China. Since Ilham Kadri was appointed the new CEO of Solvay in March, 2019, their only press releases on its rare earth division have been about three patent infringement cases surrounding materials for catalytic converters and their treatment of exhaust gases from internal combustion engines. Then suddenly over September-October of this year, there were [3 news releases](#) that were focused on developments in Solvay's rare earths division.

On October 11, 2022, Solvay announced the signing of a non-binding offtake [memorandum of understanding](#) (MOU) with [Hastings Technology Metals Ltd.](#) (ASX: HAS) ('Hastings') where Hastings will initially supply Solvay with 2,500 tonnes per year of mixed rare earth concentrate (MREC) from its Western Australian Yangibana Project. The Solvay plant in La Rochelle, France was founded in 1948 and originally was built for the separation of rare earths from monazite. The reported capacity for La Rochelle is 10,000-15,000 tonnes per annum of rare earths concentrate, which if accurate, made it a significant producer in the 1980s and 1990s. This would mean however that the agreement with Hastings alone would not bring the plant back to full capacity,

unless Hastings expands production over time or Solvay sources concentrate from other producers.

This new MOU follows Hastings' recent move to take a [significant position](#) in [Neo Performance Materials Inc.](#) (TSX: NEO). NEO and Solvay compete vigorously in all aspects of rare earths but as noted above the main area is in the materials for catalytic converters. This move by Solvay with Hastings comes on the heels of Solvay announcing its plans to expand and upgrade its plant in La Rochelle to process rare earths and recycle rare earth magnets. NEO has also announced its plan to put magnet production capabilities in Estonia where it has a rare earth separation facility in Sillamae.

NEO's plant in Estonia has traditionally received its rare earth concentrate from Russia but given current political circumstances, it begs the question how long can this last? NEO does have an arrangement with [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR) to supply concentrate from Energy's uranium operation in White Mesa, Utah. This is the only uranium production facility in the USA. Energy Fuels is going to process monazite to produce RE concentrate. To that end, Energy Fuels [announced a deal](#) in May of this year to take a position in a heavy minerals deposit in Bahia, Brazil, which contains monazite.

Another [announcement](#) from Solvay this October was that it took 100% control of Solvay Special Chem Japan (SSCJ) through its purchase of the remaining 33% from Santoku Corporation. This facility, like La Rochelle, is focused on catalyst and semiconductor industries. Decades ago this plant was processing RE concentrate from China. When China stopped exporting concentrate in the late 1990s Anan Kasei, a Japanese joint venture between Santoku Chemical and Rhodia, stopped the separation of rare earths and bought intermediate products from

China again to produce more value-added products. Ilham Kadri, Solvay's CEO, commented on the transaction saying: "This transaction marks a logical step forward in our global plan to expand our leadership in Rare Earths specialties."

It will be interesting to watch Solvay and NEO position themselves in the European market which currently only has one metal/alloy producer, [Less Common Metals](#), and one magnet manufacturer, [Vacuumschmelze](#), a German producer. Let the games begin.

Biden Leads the build-out of an EV market critical minerals supply chain outside of China parade

written by Matt Bohlson | November 16, 2022

For the past decade it has been China that has massively supported its battery and EV industry resulting in China now being by far the leader in EV production globally; and quite frankly a threat of totally dominating the future global auto industry as it goes electric.

Now, finally, the tide is turning with the Western governments starting to make very significant moves to support the EV and energy storage sectors (including batteries & the electric grid) and its supply chain. Today's article gives a summary of major western governments' new policies to support the EV and energy

storage supply chain so far in 2022.

USA

As [announced](#) last week the DoE awarded **US\$2.8 billion** of grants to accelerate U.S. manufacturing of batteries for electric vehicles and the electric grid. As [stated](#) by Energy.Gov.:

"The 20 companies will receive a combined US\$2.8 billion to build and expand commercial-scale facilities in 12 states to extract and process lithium, graphite and other battery materials, manufacture components, and demonstrate new approaches, including manufacturing components from recycled materials."

A key component of the US\$2.8 billion in grants is that they will be matched with [US\\$9 billion](#) in recipient funds. Furthermore, the 20 company's projects are spread across the key areas of the battery supply chain with the key purpose to build a new U.S lithium-ion battery industry.

As shown below some of the winners were lithium companies Albemarle Corporation (NYSE: ALB) and Piedmont Lithium Inc. (Nasdaq: PLL | ASX: PLL), spherical graphite (soon to be a producer) company Syrah Resources Limited (ASX: SYR), nickel junior Talon Metals Corp. (TSX: TL0) and several others.

Location map showing the planned project locations of the DoE project grant recipients



Source: [Energy.Gov DoE](#)

Earlier in 2022, the U.S government announced funding in the [Inflation Reduction Act](#) of **US\$369 billion** towards clean energy and climate change initiatives.

The Biden Administration is certainly leading the West in supporting the environment and building up a new clean energy industry with factories and jobs in the USA.

Canada

Canada has recognized that it is extremely well positioned to be a [supplier of EV metals](#) and components due to its inherent wealth of critical raw material resources. In the 2022 Canadian Budget the government allocated an additional [“C\\$3.8 billion](#) for critical minerals, including those that feed into clean technologies”. Clean Energy Canada [stated](#):

“This new funding will help Canada realize its vision of building an “end-to-end” battery supply chain through which Canada can do it all, from sourcing the materials to building the parts, batteries, and clean cars.”

Specifically, the Canadian government will spend up to [C\\$1.5 billion](#) over seven years, starting in 2023-24, for infrastructure investments that would support the development of the critical minerals supply chain, with a focus on priority deposits. Many very promising Canadian projects, such as Frontier Lithium Inc.’s (TSXV: FL | OTCQX: LITOF) PAK Lithium Project, need roads to be built to help bring their projects to production. Canada has a plan to make this happen, albeit rather slowly.

Australia

The Australian government under Prime Minister Albanese has brought a new focus towards EVs and climate change. As announced last week the [“support for critical minerals breakthroughs”](#) policy is designed to accelerate the growth of the critical minerals sector. The announcement [stated](#):

“The Strategy will complement other Government initiatives including the National Battery Strategy and the Electric Vehicle Strategy. The National Reconstruction Fund will include the \$1 billion Value Adding in Resources Fund which will work alongside the \$2 billion Critical Minerals Facility.....The Government will also allocate \$50 million over three years to the Critical Minerals Development Program for competitive grants to support early and mid-stage critical minerals projects, building on the \$50 million recently committed to six key projects across Australia.”

The winning “six key projects” [are owned by](#) Alpha HPA Limited (ASX: A4N), Cobalt Blue Holdings Limited (ASX: COB), EQ Resources Limited (ASX: EQR), Global Advanced Metals Pty Ltd, Lava Blue Ltd., and Mineral Commodities Ltd. (ASX: MRC).

Europe

Last month the European Commission [announced](#) a new policy proposal called the ‘European Critical Raw Materials Act’. The announcement emphasized Europe’s need to secure a safe and secure supply of critical minerals, notably lithium and rare earths. The announcement [stated](#):

“Lithium and rare earths will soon be more important than oil and gas. Our demand for rare earths alone will increase fivefold by 2030. [...] We must avoid becoming dependent again, as we did with oil and gas. [...] We will identify strategic projects all along the supply chain, from extraction to refining, from processing to recycling. And we will build up strategic reserves where supply is at risk. This is why today I am announcing a European Critical Raw Materials Act.”

The European Critical Raw Materials Act is still being developed but it looks like it will follow along similar footsteps as the U.S Inflation Reduction Act, supporting and building local

supply chains, but also relying on ally countries. The European Commission [stated](#) one objective as:

“To facilitate the roll-out of targeted raw materials projects in the EU, the Commission should be empowered to list Strategic Projects – which would be labelled as of European interest – based on proposals from Member States. These projects could benefit from streamlined procedures and better access to finance.”

An excerpt from the recent 2022 State of the European Union address discussing the need for Europe to source critical raw materials



Source: [European Commission](#)

Some possible winners might be rare earths processing company [Neo Performance Materials Inc.](#) (TSX: NEO) and European Metals Holdings Limited (ASX: EMH | AIM: EMH | OTCQX: EMHXY). The former owns [the only commercial rare earth separations and rare metal processing plant in Europe](#) and the later has a JV 49% ownership of the [largest hard rock lithium project in Europe.](#)

Closing remarks

The Western governments have woken up from a decade long slumber and are now finally moving to build key critical raw material, battery, and EV supply chains both locally and with ally countries. Project funding and permitting are key obstacles being addressed as they are the reason why much of USA and Europe have virtually no EV supply chain today.

As we approach COP 27 starting on November 6, the 2022 awakening of the Western governments should lead to one of the biggest investment themes this decade. That is, investing in quality

companies that are likely to succeed in supplying the EV and energy storage supply chains as the Western world looks to gain independence from China.

InvestorIntel has been bringing attention to these companies for more than a decade and provides the ideal starting point to research and learn about promising critical raw materials companies. Stay tuned.

Disclosure: The author is long Albemarle Corporation, Piedmont Lithium Inc., Syrah Resources Limited, Frontier Lithium Inc., Cobalt Blue Holdings Limited, European Metals Holdings.

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