

A Tale of Two Critical Mineral (Rare Earths) Markets, the Subsidized and the Unsubsidized

written by Jack Lifton | May 28, 2023

The twenty-first century began with an unprecedented (outside of war) mammoth growth of demand for the ores of the structural metals (a/k/a base metals, such as iron, aluminum, copper and the alloying elements for steels). Brazilian, Australian, and Indian iron ore miners whose American, Japanese, and European markets had matured were thrilled. Chile, Jamaica, Africa, and Polynesia prospered. China, the source of the new demand, just grew and grew into the world's newest manufacturing center.

The ironically named "progressives" of the West are those who think that progress is attainable only under a benevolent central government run by elites dedicated to prosperity for all. Of course, this definition makes the logical error of self-reference, progress is whatever the progressives say it is. The simple fact that progress, defined as an uplifting of all, is only possible through wealth creation and its wide distribution and that, by far, the best system for doing this, so far created, has been free market capitalism, has been rejected by the self-serving "elites" who today hold elective office and control the permanent civil services of the West.

The fact that today's Western elites consider only themselves, their narrow clique, worthy of defining, being the beneficiaries of, and promoting progress has not escaped the attention of the 90% of the world that does not live in the United States or Europe.

In the nineteenth and twentieth centuries, the use of military power by European states was after the World Wars followed by the economic domination of the United States to continue to guarantee the flow of cheap mineral resources to the self-serving progressive fantasists of the West. That era is closing. The revolt against their exclusion, first by the Germans and the Japanese, was to mimic the imperial style of Britain and France. This failed in both instances as did the similar Russian (Soviet) attempt, but they bought the United States a century of world domination. This era is now closing as the progressive fantasists have destroyed its ability to create and fairly distribute wealth.

For the last generation the financializers who replaced the engineers as CEOs of American and European OEMs have moved the majority of manufacturing off-shore and witlessly (not unwittingly) caused the metals processing and fabricating industries to relocate closer to their raw material sourcing and new end-users. This second move, of the minerals and metals processing industry, perhaps even more than the move of the OEMs, was an unintended gift to a China that no one foresaw as a global industrial powerhouse aborning.

The perspective of necessary time must be examined to understand the deleterious effect of Western financialization on commodity production and pricing. There is an excellent example of this in the attempt to “reshore” a total rare earth permanent magnet supply chain.

The massive Chinese dominance in the total supply chain to produce rare earth permanent magnets did not occur overnight, and it will not and cannot be rectified (in the sense of being made irrelevant) in any short period of time. By which I mean years. In fact, China controls the market for rare earth permanent magnets, because it first built or acquired control

over the overwhelming majority of rare earth minerals on this planet. This occurred simultaneously with the West giving over to China the technology to separate the mixed rare earths extracted from the ore into individual rare earth compounds. This was followed by the technology to make rare earth metals, alloys, and permanent magnets. This overall agenda, supported by the building, in China, of a strong and focused educational system to support a world-class technologically advanced nation, has established in China a, long-term, holistic approach to acquiring, developing, supporting the mass production of, and deploying state-of-the-art technology to its people for the last 25 years. What does this mean for the West?

An example of the approach taken by America, the former leader, in technology and its deployment is illustrative: There are two separate domestic (North) American markets for rare earth permanent magnet (REPM) enabled devices; the military and the civilian. Dishonest attempts at promoting and marketing rare earth projects to investors have confused not only the low information "journalists" who cover this story but also the self-designated rare earth experts, in particular the ones who refer to their work as "intelligence."

The military "need" for REPMs can be defined very simply. The lighter the weight of the components of a weapons system the larger can be the weight of the explosives in the weapons. Rare earth permanent magnet motors (REPMs), are also, by weight, the most efficient converters of electricity to mechanical motion of all types of electric motors. Thus a warship whose propeller shaft is the rotor of a large electric motor is easier to maintain than one that is the end of a gear train from an immense diesel engine. Better to use the diesel engine to generate the electricity for the drive motor and have (lithium-ion) batteries for backup during diesel engine service or in case of breakdowns. And what about those electromagnetic

catapults on an aircraft carrier? REPMMs are a lot easier to maintain than AC motors and a battery backup can save an expensive aircraft and its pilot's life in an emergency where the electricity supply from the reactor/generator is interrupted. And the fin actuators on a "smart" bomb... The actual demand for REPMMs by the U.S. military is classified, but in 2013 it wasn't, and the number banded about then was 1000 mt/year. The coming into service of new stealth fighters and direct electric propulsion ships and electromagnetic catapults since then has surely increased the demand for REPMMs by the military. Let's say then that it must be 3000 tpa by now. Oh, and I forgot to mention all of these active military uses for REPMMs in extreme conditions mean that they run hot. This means they must be of the type that uses the very rare rare earths, dysprosium and terbium, as well as the even rarer metal, gallium, in their construction. As of this writing 100 percent of the world's supply of Dy and Tb is processed in China.

Now let's look at the North American civilian market for REPMMs. An internal combustion, fossil fueled vehicle produced in North America today has between 25 and 50 micromotors. All of which are REPMMs. The total demand for REPMs to construct these motors is 0.5kg/vehicle. Even so, in a typical model year, the domestic American OEM automotive industry uses 8,500 mt of REPMs. But now, a major change is in the wind. A drive motor for a battery powered electric vehicle, if it is of the REPMM type, uses 2.5 kg of REPM! Thus each BEV that uses a REPMM for traction (drive) requires 5-10x the amount of REPM that an entire ICE powered vehicle requires!!

What began as a financial system to maximize profits has now created a dual market in critical minerals, the Chinese and the Rest of the World, (C+ROW). The financializers, their work done and rolling in the profits of their selfish misdeeds have now returned the problem of the security of supply chains back to

the engineers. The dual commodity markets though will sharply reduce profits and the West's capital is in the hands of those whose only interest is in the accumulation of money not the creation of wealth.

The military can pretend that increased prices for the support of domestic self-sufficiency don't matter by subsidizing the military-industrial complex with "cost-plus" awards. The consumer economy does not have that luxury.

The latest existential crisis (the first such crisis was the ancient fear of God's wrath by floods), "climate change," has now pitched this dual commodity pricing problem to the forefront.

There is not enough of the critical metals for EV batteries and drive motors, not already under the control of China, to convert the global fleet of ICE vehicles to battery electric operation. Nor can there ever be.

China, alone, is and will remain self-sufficient in the critical metals necessary to convert its domestic ICE fleet to BEV operation and to produce enough stationary storage to be able to convert a large part of its domestic energy production by intermittent sources, wind and solar, to reliable maintenance of the grid.

The ROW (rest of the world), if it adopts the mandates of the Green Revolution, will have to choose winners and losers. There can be enough lithium, neodymium, praseodymium, dysprosium, and terbium produced outside of the control of China for some countries to achieve a significant fraction of their electricity by non-fossil fuel methods and the conversion of some of their transportation to electric operation. But those countries will have to together or individually create markets for the production and processing of those metals independent of Chinese

control and pricing. This means permanent subsidies to miners, refiners, fabricators, and consumer and military product manufacturers. This means a lowering of living standards to pay for the subsidies.

Perhaps it's time to rethink the Green New Deal. Are the consequences worth the decline of the West? Is climate variation really an existential crisis? And, how much longer can we ignore 90% of the world's population that has most of the critical minerals we need within their control??

Does Nationalization Loom for Critical Minerals

written by Peter Clausi | May 28, 2023

The world is finally starting to pay attention to the importance of 'critical minerals'. Different countries have different lists of what those minerals are, but every list includes lithium, rare earths ("REE"), cobalt, copper, nickel, and zinc. (One region mystifyingly includes rubber on its list, but I digress.)

The problem is, most people are missing the point of why these minerals are critical and what that means for private ownership. So let's go back to basics.

The Importance of Critical Minerals

One of the definitions of the word critical is "important or vital; irreplaceable". When it comes to the Green Revolution, that definition is spot on. Critical minerals are irreplaceable

in the march away from fossil fuels. Without those minerals, we will continue to use fossil fuels until a better technology comes along, decades from now, during which interlude we will choke out Mother Earth.

But saying 'we need those minerals to make rechargeable batteries and permanent magnets' is rather simplistic. That's not really the point. A recent article in *The Economist* gives better arguments about why the Green Revolution is good for countries, apart from saving the planet.

The article titled "[The green revolution will stall without Latin America's lithium](#)" argues that nationalizing critical mineral deposits and mines (and by extension, minerals like silver that aren't on critical mineral lists) offers benefits like a broadened tax base and more jobs within the country. Nationalization, it argues, can be good for the economy.

That argument rings hollow with me. Jobs can be created and taxes can be paid without the national government owning the assets. Mining rights can be exercised by foreign companies under a regime without the government getting into the mining business, plus does any government operate any business well? *The Economist* has missed the point.

Companies are Protecting Vertical Supply Chains for Critical Minerals

Before we get to the point, let's revisit the February 2023 announcement of a [General Motors Company](#) (NYSE: GM) investment into [Lithium Americas Corp.](#) (TSX: LAC), which holds among other assets Thacker Pass. Thacker Pass is the largest known potential source of lithium in the United States of America. We've seen other investments from auto manufacturers into lithium companies.

Do you think they're doing this as a long-term investment to be monetized at some point in the future? When one of the shadow Chinese investment companies invests in a critical minerals company, do you think it's for the portfolio?

No, these are not portfolio investments. These are functional investments into irreplaceable assets. Everyone is worried about the vertical supply chain for those critical minerals for their own uses.

GM is looking to ensure it has access to lithium for its own purposes. GM isn't going to share the lithium eventually produced at Thacker Pass (assuming Thacker Pass overcomes community challenges and gets into production).

[Mercedes-Benz Group AG](#) (XTRA: MBG) won't share the lithium it gets from [Rock Tech Lithium Inc.](#) (TSXV: RCK), northwest of Thunder Bay, Ontario. These investments are to help ensure a vertical supply chain of lithium. Expect other investments into other critical minerals.

Countries are now Protecting Vertical Supply Chains for Critical Minerals

What did *The Economist* miss? Countries aren't nationalizing or protecting mineral assets for tax or employment reasons. They are doing so to protect their own vertical supply chains for critical minerals. To do otherwise would be to turtle, to offer up a neck to be crushed by a foreign actor who has such minerals.

Countries like Peru, Argentina, Mexico, the Congo, and Kazakhstan have either announced or enabled plans to nationalize their natural resources.

Even nice Canada has taken some steps to put the ownership of

Canadian assets into more friendly hands (too little, too late).

These countries won't be the last.

When you're investing, jurisdictional risk just became one of the largest risks to consider.

Mining Industry Struggles with Inflation and Supply Chain Pose Challenges for a Low-Cost Green Future

written by InvestorNews | May 28, 2023

Despite the fact that consumers are starting to see faint glimmers of hope that inflation might finally be peaking and starting to hopefully roll over, the same can not be said for everybody. In the case of the mining community, where projects are developed over the span of years and decades, not days or weeks, the curses of the supply chain and inflation are continuing to rear their ugly heads.

There has been a spate of announcements suggesting that economics for these projects remain robust but costs are growing materially, or in one case, the company has put off the final investment decision until the second half of 2024. This is not encouraging when one thinks about how quickly governments around the world want to expedite the green economy and transition away from fossil fuels, given we are talking about the mines that will supply the resources to undertake this task.

Generation Mining's Marathon project's CAPEX just went up by 25%

The first example is [Generation Mining Limited](#) (TSX: GENM | OTCQB: GENMF), which is developing the [Marathon Project](#), a large undeveloped palladium-copper deposit in Northwestern Ontario. The Company released its initial Feasibility Study ("FS") in 2021, but keep in mind a lot has to happen between an FS and the start of construction, of which environmental assessments, permitting, and financing, are some fairly large and time-consuming components. Correspondingly, now that Generation Mining has received its environmental assessment approvals and [recently announced](#) an indicative offtake term sheet, it's time to get serious about financing. Naturally, the Company needs to review how much financing they will need to move forward, so a revised FS was undertaken.

Despite management's positive spin, the news wasn't pretty. At the end of March, Generation Mining [announced](#) a 25% (C\$224 million) increase to the initial construction CAPEX reported in the 2021 FS. Albeit, approximately 19% or C\$43 million was due to scope changes, which is reasonable, but 71% (C\$160 million) was due to cost escalation, and the final 10% (C\$22 million) was a result of increased contingency. That's a big chunk of change, although it is unlikely to slow the project down as the economics remain solid and [global demand for copper](#) seems to be bullish in the long run. As well, the project is touted as being one of the lowest CO2 equivalent intensity mines in the world, which is a factor I'm sure will continue to become more important as time goes on.

Trilogy Metals announces updated

Feasibility with CAPEX up 40%

Example number two is a similar story, [Trilogy Metals Inc.](#) (TSX: TMQ | NYSE American: TMQ) is advancing exploration and development at the [Upper Kobuk Mineral Projects](#), high-grade copper-zinc-lead-gold-silver-cobalt properties in Northwest Alaska. Very similar to Generation Mining, in mid-February Trilogy [announced](#) an updated FS for its [Arctic Project](#). But if you thought the Generation Mining results were exorbitant, wait until you see what happened to Trilogy. Granted it's not exactly apples to apples given the original Trilogy FS was a year older (2020) and there are somewhat different commodities in a different geographic jurisdiction but...

You know it's going to be a big number but I personally find it hard to conceive. The updated FS for Trilogy Metals' Arctic Project has gone from US\$1.22 billion to US\$1.72 billion or a 40% increase. On top of that, annual payable metals production is down from the 2020 FS, implying that little to none of the surge in CAPEX was due to scope creep. Sure there was more than a doubling in mine closure and reclamation expenditures (US\$205.4 million to US\$428.4 million), which could be regulatory changes or any number of uncontrollable issues. But that still leaves US\$271 million seemingly attributable merely to things getting more expensive.

This should be a bit of a wake-up call to investors everywhere who are banking on the optimism of "friend-shoring" natural resources. There are a lot of highly valued junior mining companies with a pre-feasibility study or possibly even less than that, who might be in for quite a reality check if/when the project starts to get serious.

Newmont delays Yanacocha Sulfides Project

All this might explain the simplicity of my third example. [Newmont Corporation](#) (TSX: NGT | NYSE: NEM) decided it wasn't even going to go there with its [Yanacocha](#) Sulfides project in Peru. Last September the Company [announced](#) it will delay the investment decision for the project to the second half of 2024. As part of the press release Newmont stated that evolving market conditions, including the continued war in Ukraine, record inflation rates, the rising prices for commodities and raw materials, prolonged supply chain disruptions, and competitive labor markets were part of its decision-making process. Unless I'm missing something, I would have to say that "war in Ukraine" is more of an acknowledgment than anything else, because I'm not sure how that impacts a mine in Peru. I would also think the rising price for commodities would be a good thing but maybe they intended it in a different way. Nevertheless, you see the recurring theme of inflation and supply chain in there, so I've included it in my synopsis.

Final thoughts

What's my point? I alluded to it earlier but I will expand on it. First off, I think there might be a little too much optimism baked into a lot of the junior explorers at present. Yes, [General Motors](#) (NYSE: GM), [Tesla](#) (NASDAQ: TSLA), [Ford](#) (NYSE: F) et al are signing deals left, right, and center with numerous companies, and that's a very bullish thing. But what if GM and Tesla are smart enough to sign deals that have the miner get stuck with all the mining cost increases? The examples above show how an initial Feasibility Study may not be overly relevant a couple of years down the road. So that begs the question "What are the REAL economics of a project?"

Lastly, and this is more of a thought experiment kind of

comment, in the grand scheme of things it would appear the world simply doesn't realize how much new critical minerals projects are going to cost. It seems that old metrics might not be overly relevant anymore. Inflation may have a much larger trickle-down effect than anyone imagined and the price of future EVs might cost a King's ransom, despite government subsidies.

Will 2023 be a breaking point for the EV revolution?

written by Jack Lifton | May 28, 2023

In 2023 well funded, or at least funded, development of deposits of critical minerals into mines will continue providing that the target production of the minerals is projected to be profitable, and the first product is projected to be delivered on time.

Savvy readers know that my above statement is just boilerplate for an OEM automotive annual report. It's tautological, its conclusion is contained in its premises. It is not at all certain that high-tech, critical minerals producers and processors, will be ready or even existent by the time the minerals can be delivered to their end-user manufacturers.

Even the car makers who have been so generous (or profligate) in their "investments" in critical mineral production and projects have finally begun to realize that their future demand projects, when measured against contemporary real world supply, have caused critical minerals prices to go too high to support their inclusion in the consumer products manufactured from them. [Lithium](#) is a prime example.

Worse than that the bankers who once viewed car makers as AAA investments are now very concerned at the profligate use of the enormous lines of credit by the car makers being used to fund critical minerals wannabes that the banks themselves would never consider. "Use retained earnings" has been the response of credit line providers asked to cover such "investments."

It's time that car makers performed a due diligence on the critical minerals' supply space.

They need to ascertain whether or not the supply of finished components necessary for the assembly of motor vehicles, such as batteries, traction electric motors, miniature accessory electric motors, and, yes, even catalytic converters can meet current and all future demand.

Simultaneously, they need to predict and mandate price maximums for critical minerals that they can afford if their products are to be saleable.

For the first time, they need to address the lifetimes, as well as the costs, of critical mineral enabled components, since consumers will have to keep the vehicles for much longer than in the past in order to be able to afford them at all.

They need to assess these factors for minerals, metals, and manufactured components dependent upon lithium, cobalt, nickel and the rare earths.

If car makers are to change over from ICE powertrains to BEVs then they need to do this right now, and they need to recruit managers and analysts who can do the job.

2023 is a breaking point if there is to be an EV revolution/transformation.

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

written by InvestorNews | May 28, 2023

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](#)

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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.

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

written by Tracy Weslosky | May 28, 2023

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 Buie 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.



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For more information email Tracy Weslosky at tracy@criticalmineralsinstitute.com or dial +1 416 792 8228 (CriticalMineralsInstitute.com | [Twitter](#) | [LinkedIn](#)).

Global changes coming in the rare earths and critical materials supply chain and EV manufacturing

written by InvestorNews | May 28, 2023

In this InvestorIntel PDAC 2022 Panel on “Building the Rare Earths and Critical Materials’ Supply Chain to Meet EV Market Demand”, host Byron W King is joined by “all star” guests [Ucore Rare Metals Inc.](#)’s (TSXV: UCU | OTCQX: UURAF) Chairman and CEO Pat Ryan, [Vital Metals Limited](#)’s (ASX: VML | OTCQB: VTMXF) Managing Director Geoff Atkins, [Stormcrow Capital Ltd.](#)’s President and Director Dr. Jonathan Hykawy, and Boyd Davis, Principal of [Kingston Process Metallurgy Inc.](#).

In the video, which can also be viewed in full on the InvestorIntel YouTube channel ([click here](#)), the panel discusses the race to supply North American rare earths needs and limitations on domestic production. Boyd Davis observes that over the next 10 to 12 years, “how much we want to get away from China will be dictated by the cost and supply security and the ability to get raw materials.” Dr. Jonathan Hykawy discusses China’s own domestic supply issues and how it imports lithium and heavy mineral sands for processing. Geoff Atkins also points out the risk of sole-suppliers with EV and other rare earths reliant manufacturers “needing a diversified supply chain and assessing their risks on single point of failure.” Regardless, he says EV manufacturing represents a shift from basic commodities to high technology materials. He and Pat Ryan of Vital Minerals agree that both North America and China will become increasingly reliant on automation to counter rising

labor costs.

The panel also discusses whether critical materials mining permitting and processing is likely to be fast-tracked in future to meet industry demand, and whether there will be more vertical integration by EV manufacturers.

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

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About Ucore Rare Metals Inc.

Ucore is focused on rare- and critical-metals resources, extraction, beneficiation, and separation technologies with the potential for production, growth, and scalability. Ucore has a 100% ownership stake in the Bokan-Dotson Ridge Rare Earth Element Project in Southeast Alaska, USA. Ucore's vision and plan is to become a leading advanced technology company, providing best-in-class metal separation products and services to the mining and mineral extraction industry.

Through strategic partnerships, Ucore's vision includes disrupting the People's Republic of China's control of the US REE supply chain through the development of a heavy and light rare-earth processing facility – the Alaska Strategic Metals Complex in Southeast Alaska and the long-term development of Ucore's heavy-rare-earth-element mineral-resource property located at Bokan Mountain on Prince of Wales Island, Alaska.

To learn more about Ucore Rare Metals Inc., [click here](#)

About Vital Metals Limited

Vital Metals Limited (ASX: VML) is Canada's first rare earths producer following commencement of production at its Nechalacho

rare earths project in Canada in June 2021. It holds a portfolio of rare earths, technology metals and gold projects located in Canada, Africa and Germany.

To know more about Vital Metals Limited, [click here](#)

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About Kingston Process Metallurgy Inc.

Kingston Process Metallurgy Inc. is a privately owned Canadian company located in Kingston, Ontario. Our interdisciplinary team includes engineers, scientists, chemists, technicians, and modellers, led by co-owners Boyd Davis and Alain Roy. Our clients include large multi-national mining and metallurgical companies, as well as companies specialized in industrial chemistry, advanced materials, and energy.

To learn more about Kingston Process Metallurgy Inc., [click here](#)

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If you have any questions surrounding the content of this interview, please contact us at +1 416 792 8228 and/or email us direct at info@investorintel.com.

Rare Earths and the Challenges of Building a Domestic EV Material Supply Chain

written by InvestorNews | May 28, 2023

In this InvestorIntel PDAC 2022 Panel on rare earths and "Building the EV Material Supply Chain", host Byron W King is joined by [Search Minerals Inc.](#)'s (TSXV: SMY | OTCQB: SHCMF) President, CEO, and Director Greg Andrews, [Appia Rare Earths & Uranium Corp.](#)'s (CSE: API | OTCQX: APAAF) President Frederick

Kozak, [Avalon Advanced Materials Inc.](#)'s (TSX: AVL | OTCQB: AVLNF) President, CEO and Director Don Bubar, and [Vital Metals Limited](#)'s (ASX: VML | OTCQB: VTMXF) Managing Director Geoff Atkins.

In the video, which can also be viewed in full on the InvestorIntel YouTube channel ([click here](#)), the panel discusses whether there is enough rare earths supply to meet the future demand for electric vehicles. Vital Minerals' Geoff Atkins talks about the shift from government pressure to move to electric vehicles to increasing consumer demand for EVs, especially outside the United States, and the different processing requirements for EV batteries and rare earths magnet components which make "just in time" supply chain inventory management impossible.

Avalon President Don Bubar notes that China's rare earths dominance came from how "they saw before anyone in the West how you have to create the downstream manufacturing and processing capacity in order to justify creating the primary supply, and that's a foreign concept to the traditional mining industry here in Canada." Greg Andrews agrees that the challenge is "trying to create rare earths industry in Canada that doesn't exist," but as Appia president Frederick Kozak points out, the new Saskatchewan rare earths processing facility makes domestic processing more attractive "as opposed to having to ship it to China for processing."

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

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

About Search Minerals Inc.

Led by a proven management team and board of directors, Search

is focused on finding and developing Critical Rare Earths Elements (CREE), Zirconium (Zr) and Hafnium (Hf) resources within the emerging Port Hope Simpson – St. Lewis CREE District of southeast Labrador. The Company controls a belt 63 km long and 2 km wide and is road accessible, on tidewater, and located within 3 local communities. Search has completed a preliminary economic assessment report for **FOXTROT**, and a resource estimate for **DEEP FOX**. Search is also working on three exploration prospects along the belt which include: **FOX MEADOW**, **SILVER FOX** and **AWESOME FOX**.

Search has continued to optimize our patented Direct Extraction Process technology with support from the Department of Industry, Energy and Technology, Government of Newfoundland and Labrador, and from the Atlantic Canada Opportunity Agency. We have completed two pilot plant operations and produced highly purified mixed rare earth carbonate concentrate and mixed rare earth concentrate for separation and refining. We also recognize the continued support by the Government of Newfoundland and Labrador for its Junior Exploration Program.

Search Minerals was selected to participate in the Government of Canada Accelerated Growth Service (“AGS”) initiative, which supports high growth companies. AGS, as a ‘one-stop shop’ model, provides Search with coordinated access to Government of Canada resources as Search continues to move quickly to production and contribute to the establishment of a stable and secure rare earth element North American and European supply chain.

To learn more about Search Minerals Inc., [click here](#)

About Appia Rare Earths & Uranium Corp.

Appia is a Canadian publicly-listed company in the rare earth element and uranium sectors. The Company is currently focusing on delineating high-grade critical rare earth elements and

gallium on the Alces Lake property, as well as exploring for high-grade uranium in the prolific Athabasca Basin on its Otherside, Loranger, North Wollaston, and Eastside properties. The Company holds the surface rights to exploration for 105,026 hectares (259,525 acres) in Saskatchewan. The Company also has a 100% interest in 12,545 hectares (31,000 acres), with rare earth element and uranium deposits over five mineralized zones in the Elliot Lake Camp, Ontario.

To learn more about Appia Rare Earths & Uranium Corp., [click here](#)

About Avalon Advanced Materials Inc.

Avalon Advanced Materials Inc. is a Canadian mineral development company specializing in sustainably-produced materials for clean technology. The Company now has four advanced stage projects, providing investors with exposure to lithium, tin and indium, as well as rare earth elements, tantalum, cesium and zirconium. Avalon is currently focusing on developing its Separation Rapids Lithium Project near Kenora, Ontario while continuing to advance other projects, including its 100%-owned Lilypad Cesium-Tantalum-Lithium Project located near Fort Hope, Ontario. Social responsibility and environmental stewardship are corporate cornerstones.

To learn more about Avalon Advanced Materials Inc., [click here](#)

About Vital Metals Limited

Vital Metals Limited (ASX: VML) is Canada's first rare earths producer following commencement of production at its Nechalacho rare earths project in Canada in June 2021. It holds a portfolio of rare earths, technology metals and gold projects located in Canada, Africa and Germany.

To know more about Vital Metals Limited, [click here](#)

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Is American Rare Earths sitting on the largest rare earth deposit in the USA?

written by InvestorNews | May 28, 2023

Commodities these days can be a bit of a fickle investment. They are definitely in demand for numerous reasons, including the world's move towards a lower carbon future. Putin's attack of Ukraine has placed further emphasis on security of supply, overall supply chains and the politics of commodities. However, we can't seem to align all the interested parties into coming up with a cohesive game plan to maximize the production of critical commodities, while optimizing their environmental and social impact.

What do I mean by this? In late February the White House ordered [action across the US Federal Government](#) to secure reliable and sustainable supplies of critical minerals and materials just before the first anniversary of Executive Order (EO) 14017, America's Supply Chains. However, a year after detailed reports of vulnerabilities in the critical mineral and material supply chains were produced by US federal agencies, detailing the over-reliance of the U.S. on foreign sources and adversarial nations for critical minerals and materials, posing national and economic security threats, the U.S. government isn't exactly

walking the walk. In the last year, we've seen Rio Tinto's (NYSE: RIO) [Resolution copper project](#) in Arizona and Antofagasta's (LSE: ANTO) [Twin Metals project](#) (copper/nickel) in Minnesota both get the red light from the Biden Administration. It has also taken steps to slow down development of a [lithium mine in Nevada](#) from Ioneer Ltd. (ASX: INR) to help preserve a rare flower. You could also include Northern Dynasty Minerals Ltd.'s (TSX: NDM | NYSE American: NAK) Pebble mine in Alaska in this list because there is a lot of copper as part of the resource, but to me, it's more of a gold mine so not necessarily critical.

I'm not saying that these actions to delay or cancel projects aren't justified for environmental and social reasons. I'm simply pointing out that it's easier said than done. Investors can't simply pick all the companies pursuing critical minerals in the U.S. and think it's going to be a slam dunk. Certainly, there is a renewed focus on addressing the critical minerals and materials supply chain, but it likely won't come at the expense of the neighbors of these projects. That's why one has to look a little deeper at any potential investments to ensure the project has a chance to see the light of day. You can't just have a viable, economic resource, you need to tick a lot more boxes.

That's my long-winded intro to an Australian listed company with assets in the growing rare earths sector of the United States, looking to help the U.S. diversify away from China's market dominance of the global rare earth market. [American Rare Earths Limited](#)'s (ASX: ARR | OTCQB: ARRF) mission is to supply critical materials for renewable energy, green tech, EVs, National Security, and a Carbon-Reduced Future. The Company owns 100% of the world-class [La Paz Rare-Earth Project](#), located 200 km northwest of Phoenix, Arizona and the Halleck Creek rare earth project in Wyoming, USA. La Paz is a large tonnage, bulk deposit, that is potentially the largest rare earth deposit in

the USA and benefits from containing exceptionally low penalty elements such as radioactive thorium and uranium. The Company is currently drilling in the new Southwest Zone of the project where an exploration target of approximately 742 – 928 million tonnes could be added to the 170.6 million tonne JORC compliant (Australian equivalent of NI 43-101) resource.

The size and the grades at La Paz are impressive, as well as close to surface, but remember it's not just about an economic resource. The reason I think American Rare Earths should be on an investor's watchlist, if you have any interest in the rare earths space, is their attention to politics. On March 4th the Company announced it had [welcomed a delegation of elected officials](#) from all levels of government to its flagship La Paz project. Key members of the group of 25 federal, state and county officials and staff delivered enthusiastic and encouraging speeches about American Rare Earths and its work underway to help secure the United States' domestic critical minerals supply chain. Additionally, Company executive Marty Weems will speak to several dozen State Legislators about La Paz at an event held in collaboration with the Arizona Mining Association. That's the type of proactive effort required to get your project to the finish line in the world of today.

From a macro perspective, there are significant tailwinds for domestic rare earths production from both a market pull and a government push. Additionally, there are several near-term catalysts for American Rare Earths with an on-going drill program at both properties and applications have been filed for 36 additional drill sites at La Paz. The Company is well funded, finishing 2021 with over A\$8 million plus having raised another A\$1.4 million in the first two months of 2022. With a market cap of roughly A\$161 million (US\$ 117 million) it's not your typical junior mining stock, but then again, your typical junior mining

stock isn't sitting on potentially the largest rare earth deposit in the USA.

Ucore targets to fill the processing gap in a Western rare earths supply chain by 2024

written by InvestorNews | May 28, 2023

As most investors familiar with the critical materials sector know, China currently dominates the space, especially in downstream critical materials 'processing'. This leaves the Western world very vulnerable to supply chain interruptions that can threaten the supply of end-user products such as electrical and electronic components, electric vehicles, wind turbines, solar panels, and/or military systems.

Today's company, [Ucore Rare Metals Inc.](#) (TSXV: UCU | OTCQX: UURAF) (Ucore), is working to bridge that gap, domestically, and become a USA 'processor' first of the rare earths, and ultimately of other key critical materials. They also plan to be a vertically integrated individual, separated, heavy rare earths producer.

Ucore is focused on initially developing an Alaska-based Strategic Metals Complex (SMC) rare earths' central processing facility with commissioning targeted for 2024. After that Ucore plans to develop its own magnet rare earths' deposit located on

Bokan Mountain on Prince of Wales Island, Alaska. The ultimate plan for Ucore is to have their Bokan-Dotson Ridge REE Project – containing the heavy rare earths' Dysprosium (Dy), Terbium (Tb) & Yttrium (Y) – feed their first, Alaska located, SMC processing facility. The underlying technology for this and other planned SMCs is the RapidSX™ REE separation technology platform, which will be operated by Ucore's wholly owned subsidiary, Innovation Metals Corp. (IMC).

Ucore plans to fill the processing gap in creation of a Western rare earths supply chain with their SMC facilities



Source: [Ucore news January 2022](#)

A key part of getting the Alaskan SMC processing facility up and running is to secure material supply agreements. The facility will have an initial 2,000 tpa total rare earth oxide (TREO) separation and purification capacity, ramping to at least 5,000t/year TREO by 2026.

Feedstock agreements are progressing well for Ucore's planned Alaskan SMC processing facility

[In October 2021](#) Ucore signed a non-binding Memorandum of Understanding (MOU) with [Vital Metals Limited](#) (ASX: VML | OTCQB: VTMXF) for the supply of a mixed rare earth carbonate, beginning H1 2024. The deal is for "Vital to sell to Ucore a minimum of 500t REO (ex-cerium)/year, commencing H1 2024. Vital to expand production to support a minimum of 50% of Ucore's envisioned 5,000t TREO/yr processing capability by 2026."

It also was [announced last week on April 20, 2022](#), that Ucore and Germany's ThyssenKrupp Materials Trading had executed a feedstock supply MOU for the Alaska SMC. Under the MOU

“ThyssenKrupp Materials Trading is expected to begin the supply of a minimum of 1,000 tpa of mixed rare earth carbonate to Ucore in 2024 for ten years.” The announcement also states that the non-binding MOU allows for increasing quantities in subsequent years and that the two parties will work towards a 10-year binding contract.

The above MOU is a great achievement and positive endorsement for Ucore, as ThyssenKrupp Materials Services is [the biggest mill-independent materials distributor](#) and services provider in the Western world with around 380 locations, in more than 30 countries.

The loud and clear message for investors is that Ucore is putting together a North American individual rare earths supply chain from mixed rare earths carbonate (concentrate) all the way to the final product of separated individual rare earth oxides, used to make rare earth metal alloys (including magnets) such as those required for many critical and green energy products. It will be a key initial step for the USA to gain rare earths processing independence from China, which currently dominates the sector.

Ucore is also developing processing technology for other critical metals in Ontario

As [announced](#) on April 19, 2022 Ucore is improving the management and technical team for their Ontario RapidSX™ Commercialization and Development Facility (CDF). The demonstration plant construction is ongoing and is scheduled for commissioning in mid-2022.

What I find most interesting is that Ucore is also working on nickel laterite ore processing technologies as well as lithium-ion battery recycling, including working with clients such as Li-Cycle Holdings Corp.

Full details on Ucore's 2022 plans can be read [here](#) and include:

- A commercial demonstration plant for their RapidSX™ technology in Ontario.
- Development of the Alaska SMC Project.
- Exploring the potential of developing an SMC in Canada.
- Accelerating the development of the Bokan Project as a vital US supply chain component to provide a long-term secure source of HREEs; the most expensive and scarce inputs of the permanent magnet alloys.

Ucore's business summary – Includes a target for construction of the Alaska SMC by 2023, subject to finance



Source: [Ucore Rare Metals Inc. website – Alaska 2023](#)

Closing remarks

The Western world needs to develop its own complete end-to-end supply chains for critical strategic metals. In the case of rare earths, Ucore is advancing well and steadily moving towards becoming a U.S. individual separated rare earths producer by 2024, all going to plan. Of course, investors should remember these dates are the best guide from the company only and are subject to variables such as successful funding.

Ucore Rare Metals Inc. trades on a market cap of [C\\$37 million](#). Ucore still has a long way to go with several hurdles and risks ahead, partially explaining the very low market cap. Still, if they succeed the potential reward could be significant.