

Disruptive Shift to Rare Earth Processing as Aclara Moves into American Market

written by InvestorNews | April 3, 2024

In an update on the disruptive industry news that broke this morning, Jack Lifton, Co-chair of the [Critical Minerals Institute](#) (CMI), offered a detailed analysis of [Aclara Resources Inc.](#)'s (TSX: ARA) strategic move into the U.S. rare earths processing market. Aclara, backed by the Hochschild Mining Group, has set its sights on exploiting ionic clay deposits from Chile and Brazil to secure heavy rare earth elements (HREEs) like Dysprosium and Terbium, pivotal for high-performance magnet manufacturing. This venture is marked by partnerships with the Saskatchewan Research Council and Hatch Ltd. for the development and engineering of a processing facility. However, Lifton expressed reservations about the ambitious timeline, stating, "The actual [announcement](#) says they've engaged with the Saskatchewan Research Council to develop a separation technology operation and with Hatch, of Toronto, to actually engineer whatever the plan that comes out of the Saskatchewan Research Council is into hardware, into an actual separation plant."

Lifton's insights illuminate the intricate challenges Aclara faces in pioneering rare earth separation technologies in North America, a domain where success has been limited. He juxtaposes Aclara's emerging efforts against established industry players like [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR), which has already made significant progress in light rare earth (LREE) separation and is now venturing into HREEs and alloys. This nuanced perspective raises doubts about Aclara's capability to swiftly navigate the complex technological and operational

hurdles inherent in rare earth processing.

The interview further delves into the competitive dynamics of the rare earth market, highlighting Aclara's entry into a space occupied by Energy Fuels, and buildouts already in play from [MP Materials](#) (NYSE: MP) and [Ucore Rare Metals Inc.](#) (TSXV: UCU | OTCQX: UURAF). Each company has its unique approach and strategic plans, indicating a fiercely competitive environment. Lifton's critique underscores a broader theme of Aclara's need for deeper industry integration and strategic partnerships, and suggested that this was perhaps a missed opportunity in which they should have engaged with Ucore.

Lifton's comprehensive analysis provides a crucial viewpoint on Aclara's bold yet fraught journey into the rare earths processing industry. While Aclara's plans signify a positive stride towards diversifying the global rare earths supply chain and enhancing geopolitical supply chain independence, Lifton underscores the formidable challenges ahead. This initiative marks a significant moment in the rare earth industry, setting the stage for Aclara's ambitious endeavor to navigate the technological, logistical, and competitive hurdles that lie in its path.

Industry Leaders Lifton and Karayannopoulos China's

Influence on Rare Earth Prices and Markets Today

written by InvestorNews | April 3, 2024

In a thought-provoking InvestorNews interview hosted by the [Critical Minerals Institute](#) founder [Tracy Weslosky](#), [Jack Lifton](#) and [Constantine Karayannopoulos](#), two renowned figures in the rare earths market, share their insights on the sector's current trends and future prospects. Constantine Karayannopoulos, reflecting on the state of the market, observes, "There is never a dull moment in the rare earths industry," highlighting the ongoing slide in prices for critical rare earth elements like neodymium and praseodymium. He expresses a cautious outlook, noting, "I'm a little pessimistic about the near term... it's a cyclical industry."

[Critical Minerals Institute](#) (CMI) Co-Chair Jack Lifton adds: "The low prices may be here for a while because the principal producer in the world is China, and China's having a very bad time economically right now." He emphasizes the opportunities presented by the current market conditions for strategic investments, advising, "This is the ideal time for real mining and real processing companies to get into the game."

Karayannopoulos also touches on the disconnection between market interest and actual market trends, suggesting, "There's always a disconnect between reality versus expectation." He elaborates on the nuanced dynamics within China, mentioning, "The Chinese consumer has not stopped buying, China grew at 5% last year... However, the main consumer of rare earths today, the magnet industry that feeds the electric vehicle production in China, it's not growing as fast as people thought it was going to grow."

Lifton further discusses the broader implications of supply and demand, cautioning, “As long as the supply is in excess, the prices are not going to go up.” He also highlights the strategic importance of investments in raw material sources and processing capabilities, particularly in light of China’s dominance in the market.

Through their conversation, Lifton and Karayannopoulos provide a nuanced analysis of the rare earths market, blending perspectives on economic trends, geopolitical strategies, and investment opportunities. To access the complete interview, [click here](#)

Attention set on rare earths in Canada and Brazil, Appia hits 2024 running

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[Appia Rare Earths & Uranium Corp.](#) (CSE: API | OTCQX: APAAF) (“Appia”) has several projects located across Canada and Brazil with rare earths and uranium potential, as well as some other valuable metals. The current focus for Appia is on advancing their two key rare earths projects Alces Lake Project in Canada and the PCH Ionic Clay Project in Brazil.

Today we give an update on Appia’s latest activity at these two projects.

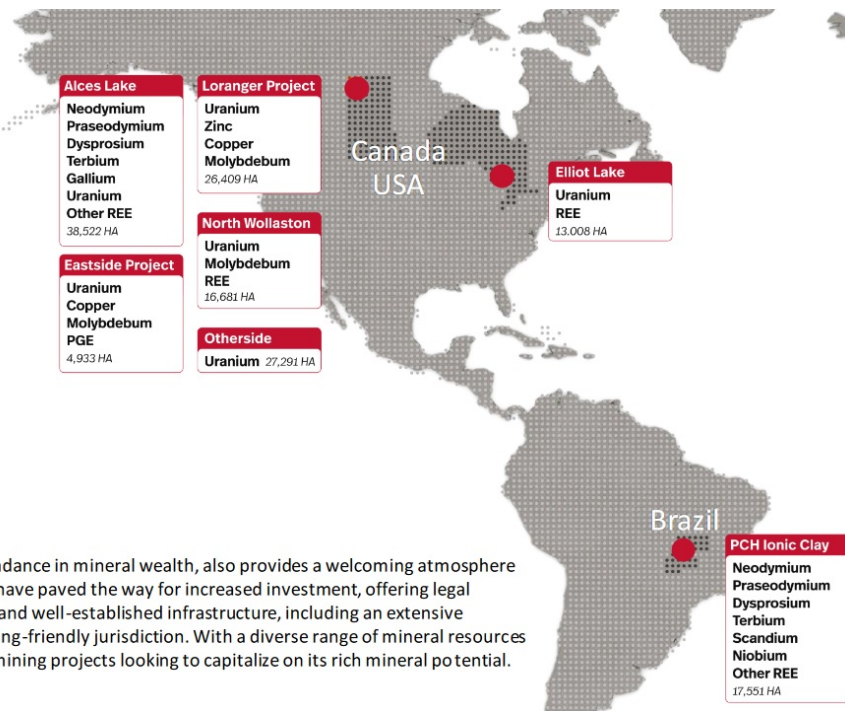
Appia’s projects are located in Canada and Brazil with a focus on rare earths and uranium

Our Projects

Appia is strategically positioned with mining projects in two of the world's most mining-friendly jurisdictions, Canada and Brazil. These locations offer an array of compelling reasons for our choice.

Canada, renowned for its political stability and robust legal framework, stands as a beacon of security for mining investments. With a rich endowment of mineral resources and a well-established mining industry, Canada provides a secure environment where investor interests are safeguarded. The nation's geological diversity opens up vast opportunities for resource exploration, and its experienced mining workforce ensures efficient project execution. Additionally, Canada's developed infrastructure and skilled labour force create an environment where mining operations can thrive with ease. **The Company holds a large uranium ground position in Elliot Lake and four highly prospective uranium exploration projects in the prolific Athabasca Basin area: Loranger, North Wollaston, Eastside and Otherside.**

In the southern hemisphere, Brazil, while boasting similar abundance in mineral wealth, also provides a welcoming atmosphere for mining endeavors. The country's regulatory improvements have paved the way for increased investment, offering legal certainty for mining operations. Brazil's geological accessibility and well-established infrastructure, including an extensive transportation network, further underscore its appeal as a mining-friendly jurisdiction. With a diverse range of mineral resources and a skilled workforce, Brazil represents an ideal location for mining projects looking to capitalize on its rich mineral potential.



Source: [Appia company presentation](#)

Alces Lake Project in Canada (100% owned)

The Alces Lake Project is located in Northern Saskatchewan and is known for having exceptionally high rare earths grades and gallium in favorable monazite ore. Appia [state](#): "Alces Lake Project in Saskatchewan's Athabasca Basin is the highest-grade critical rare earths prospect in North America and one of the highest-grade rare earths prospects in the world."

Appia is now starting to release their latest results from the 2023 drill campaign from the Magnet Ridge Zone at Alces Lake.

Appia [announced](#) on January 15, 2024: "Assays of **up to 1.57 wt.% (15,700 ppm) Total Rare Earth Oxides (TREO)** were returned, with thickness and grades increasing to the south-southeast...**Mineralization intervals occur from near surface to < 85 metres depth.**"

Appia also [announced](#) in January 2024 that they have signed a new Cooperation Agreement with the Ya'thi Néné Lands and Resources Office.

Near term catalysts from Alces Lake include further assay results from the 40 diamond drill hole summer 2023 exploration program.

The PCH Project in Brazil (option to acquire [up to 70% interest](#))

The PCH Project is potentially a very significant ionic clay rare earths project located in Goiás, Brazil. Ionic clay projects are favored as the extraction process for rare earths is a relatively simple and less expensive process, already widely practiced in China. Furthermore, Appia's PCH Project has all the key rare earths needed for the powerful magnets used in electric motors in most EVs. Most other projects don't have this complete spectrum as discussed by leading rare earths expert Jack Lifton [here](#).

Drill results [announced](#) in October 2023 from the PCH Project have been very encouraging, including Hole RC-063 that reported 24 metres of mineralization from surface **with a total weighted average of 27,188 ppm or 2.72% of Total Rare Earth Oxides (TREO)**. The hole remains open at depth and has extended the known area of Target IV.

Appia Geology Manager, Carlos Bastos, [stated](#): *"The assay results from PCH-RC-063 are highly promising, revealing sustained mineralization of essential elements including **Terbium (Tb), Dysprosium (Dy), Neodymium (Nd), and Praseodymium (Pr)**. Notably, several elements surpassed the upper detection limit of the assay method being used, and updated results will be reported*

once received.”

Note: Bold emphasis by the author.

On January 16, 2024, Appia announced [reanalysis](#) of Hole RC-063 resulting in even higher grades of a **Total Weighted Average of 38,655 ppm or 3.87% TREO**.

From the first 10 holes drilled at the PCH Project the total weighted average grade is 7,578 ppm or [0.76% Total Rare Earth Oxide](#).

The January 11, 2024 Appia [announcement](#) highlights the excitement that the Appia team has towards the PCH Project. They announced an extension of their existing mining claims at the Project from 17,551.07 hectares to an expansive 40,963.18 hectares across a total of 22 claim blocks. The substantial 133% increase in the current land package includes 12 new claims independently staked by the Company and incurred minimal costs.

The PCH Project is situated in a jurisdiction supportive of mining activities with many major mining corporations actively exploring and mining located just ~30 km from the city of Iporá. Access is good using well-developed regional roads with [optimal infrastructure](#) including water and power to the Project. Appia [says](#) that “the Project has the support of both local and state governments”.

Appia is targeting a Maiden Resource for the PCH Project Target IV in [Q1, 2024](#).

Typical differences between ionic clay and hard rock rare earth projects

	IONIC CLAY	HARD ROCK
Location	Mainly China, Brazil, Africa	China, USA, Australia Canada
Type of REE	Contain both Heavy and Light REE	Mainly Light REE
CAPEX and OPEX	Low CAPEX & OPEX	Same as other hard rock mining deposits – higher costs for drilling and blasting
Exploration and Mining	Quick, inexpensive, simple, shallow drilling in weathered granites; mainly found in top 10-30 metres. Easy mining without drilling or blasting. Environmentally friendly and therefore easier to permit.	More expensive exploration: Deeper, diamond core drilling, blasting, open-pit or underground mining; tailings
Processing	Simple leaching and very little radioactivity	High temperature cracking; tailings; often containing higher radioactivity

Source: [Appia company presentation](#)

Closing remarks

Appia is making steady progress on multiple projects with the key focus currently on the Alces Lake Project in Canada and the PCH Project in Brazil. Both Projects have strong potential with good grades and amenable ore, but will take time to develop. Appia also has their various uranium projects, but that's for next time.

Appia trades on a market cap of [C\\$27 million](#). 2024 could potentially be a very big year for Appia. Stay tuned.

Appia and the demand for the critical Heavy Rare Earths

written by Jack Lifton | April 3, 2024

The rare earths necessary for the manufacturing of the magnets needed for the type of electric motors that can drive electric

cars fall into two categories, the basic critical permanent magnet rare earths, neodymium (Nd) and praseodymium (Pr), and the critical, critical rare earths necessary for that purpose, dysprosium (Dy) and terbium (Tb). Without the addition of Dy and/or Tb to the alloy based on NdPr (a natural mixture called didymium) the magnetic material produced will not be able to maintain its (magnetic) strength at the high operating temperature and cycles of heating and cooling experienced daily by the electric drive motors to be used in EVs.

Fluctuations in Rare Earth Prices: Understanding the Dynamics

written by Tracy Weslosky | April 3, 2024

Rare earth elements, a crucial component in our modern technological world, have seen dramatic price fluctuations in recent months. I sat down with Alastair Neill, a Director for the Critical Minerals Institute (CMI), to get a better understanding of these market dynamics.

Energy Fuels Q2-2023: On the

Pathway to Reshape America's Critical Minerals Landscape

written by InvestorNews | April 3, 2024

In the constantly evolving world of critical minerals, every quarter brings about new promise and potential. But, when a company not only meets its benchmarks but pushes the boundaries of what's conceivable, it warrants a closer look. Energy Fuels Inc.'s (NYSE American: UUUU | TSX: EFR) Q2-2023 results have done just that.

Iluka Resources is building Australia's first fully integrated rare earths refinery

written by InvestorNews | April 3, 2024

Iluka Resources Limited (ASX: ILU) ("Iluka") is an Australian critical metals producer, specializing in mineral sand mining and processing. Iluka is the world's largest producer of zircon, a major producer of high grade titanium feedstocks rutile and synthetic rutile, and is set to become a significant global supplier of refined rare earths from 2025.

Appia adds another rare earths project to their portfolio, this time in Brazil

written by InvestorNews | April 3, 2024

Appia has now grown to own (including the 70% agreement to acquire the PCH Project) four significant rare earths/uranium projects globally. The very high grade Alces Lakes continues to be the flagship but now the new Brazil Project adds further to their portfolio. It also gives Appia a chance to significantly accelerate towards being a global rare earths producer at some point in the future.

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

written by Jack Lifton | April 3, 2024

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? REPMs 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 REPMs 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 REPMs 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

REPMs 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 REPMs. An internal combustion, fossil fueled vehicle produced in North America today has between 25 and 50 micromotors. All of which are REPMs. 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 REPM type, uses 2.5 kg of REPM! Thus each BEV that uses a REPM 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??

Examining the Pricing Challenges of Rare Earths in China's Market from a Global Perspective

written by Jack Lifton | April 3, 2024

Ten years ago during the last rare earths supply “crisis,” Mr. Yi Gang, then Vice Governor of the People's Bank of China, said,

“In addition to boosting the flexibility of the Yuan exchange rate, China also should adjust resource prices to address imbalances, as many resources are still traded in China at below their natural prices. China also should boost wages and social benefits to lift consumption, step up its enforcement of environment regulations and undertake other structural reforms to address imbalances.”

Repeat after me: *The selling prices of the rare earths and other commodities within China are still today too low.* Thus, if the Chinese Government did not strictly control their export then the market would drive much of, if not all of, the supply out of China chasing the higher prices in the foreign marketplace. One current driver for such a foreign accumulation would be the stocking of strategic materials (stockpiling) by governments to protect their domestic industry's security of supply. Another driver could well be inventory building by once-burned, twice-shy private corporations, finally reversing the 50-year reign of

the just-in-time, no-inventory philosophy, which was a principal driver in the creation of this problem.

Danger to China's industrial supply

Chinese central planning economists, however, also see this danger to Chinese industrial security of supply. And, by extension, potentially then leading to high unemployment in the very important domestic Chinese alternate energy, green, and cleantech sectors,

I don't think that the Chinese central bank, the People's Bank of China (PBOC) wants to buy commodities as an alternative to U.S. Treasury Bonds, because this could disrupt the commodities market. It would cause price volatility in the very asset trying to be used to stabilize prices and the currency. Even more importantly, no commodity accumulation of sufficient size to soak up excess Chinese liquidity would be likely to make a dent in reserves as large as those of China in any case, but it would certainly interrupt the flow of raw materials for industry.

Volatility in commodity prices

Note that the dramatic swings in commodity prices in the Western economies since 2008, a result of too much free money needing a home, known as the commodity "Supercycle" has massively damaged the manufacturing sectors of most of the world by driving up manufacturing costs and the prices of consumer goods while simultaneously fueling inflation. China has massively benefited from this foolish cycle because the prices of all of the commodities in the Supercycle are set by China's dominance in their sourcing, processing, and end-use. The increased prices that [Tesla](#) (NASDAQ: TSLA) pays for rare earth permanent magnet drive motors and lithium-ion batteries directly benefit China.

The PBOC is determined to force China to grow its consumer sector without causing inflation, one of the two of the PBOC's greatest fears. The other is a massively corrected and thus much more expensive Yuan. Yet by continuing to buy up surplus and hot money inflow dollars at a fixed rate, the PBOC feeds (and it knows it is feeding) inflation and increases the pressure on it (the bank) to revalue the Yuan or let it float.

Are rare earths priced too low in China

The prices of rare earths in China will have to increase soon or smuggling will become uncontrollable. That is human nature. In the long run, the production of rare earth metals outside of China will help the Chinese by increasing the global supply and reducing global prices and thus eliminating the need for export controls. This is doubly true when one considers that China itself is the world's biggest market for rare earth metals, and its neighbor, Japan, accounts for almost all of the rest of the global demand.

The rare earth mining economy within China is tiny as a proportion of the GDP. However, the number of jobs dependent critically on the properties of the rare earth metals required to manufacture green, clean, communication as well as entertainment technologies, is not trivial. China's central planners' dilemma is that it must keep rare earths cheap in order not to drive rare-earths-based component jobs offshore to lower-cost countries such as Vietnam or India. Its own entrepreneurs are already doing this, by the way.

The result for junior miners with rare earth claims is that the race is on to produce more of what China needs to be produced outside of China, to relieve the pressure on its two-tier pricing economy for commodities such as rare earths.

The Chinese government maintains strict overall control of China's economy from Beijing. Chinese businessmen, however, have the same mindset as any other businessmen, maximize profit and reduce costs. In today's China, the government wins. It just may use a meat ax rather than a scalpel to enforce its decisions, such as with the rare earths recently.

Final thoughts

But to think that Chinese economists and central bankers do not see the problem is foolish.

I believe that the selling prices outside of China of the rare earths will continue to be robust until, and if, there is significant non-Chinese production of rare earths. Then if demand exceeds supply, which I think is likely, there will be a massive culling of those companies not in production, or of those that are too large, or have too high costs, or are too skewed to light rare earths.

So long as China continues to maintain that its supplies are being exhausted, the prices of the heavy rare earths must continue to be strong and even climb. If China does not find domestic new supplies of dysprosium and terbium then it will become increasingly dependent on its "near shore (to China)" suppliers such as Myanmar and need to cultivate "friend shoring" from places like Brazil, which, in case you didn't notice, is happening right now!

Be cautious when investing in the rare earth sector. Very large forces are intersecting in it and could make prices very volatile in the near term, or even permanently.