

Auxico Resources is making a splash in the rare earths world by shipping monazite from the DRC

written by Raj Shah | October 7, 2022

[Auxico Resources Canada Inc.](#) (CSE: AUAG) is a new entrant into the rare earth supply chain story. This year they have made [4 shipments of monazite sands concentrate](#) from the Democratic Republic of Congo (DRC) totaling 720 tonnes of concentrate for a combined value of US\$3.8 million. Auxico keeps 15% of this amount or US\$570k and the balance going to Central American Nickel (CAN). Pierre Gauthier, a Montreal businessman, is the Chairman of Central American Nickel and Executive Director of Auxico Resources. Auxico has signed a sales agency agreement with CAN and according to their website the offtake agreement is for 5 years for a minimum amount of 18,000 tonnes of concentrate, or about 300 tonnes per month (TPM), and has a target of 1,000 TPM. The recent sale was analyzed to have approximately 60% total rare earth oxides (TREO) which is good and a Neodymium (Nd) level of 14.95% and Praseodymium (Pr) of 3.4%, which is higher than Mt. Pass levels.

Looking at the prices of Neodymium and Praseodymium from July, the sales price received is around 30% of the contained value of Nd and Pr, which is in the typical range paid by the Chinese for concentrate. No destination is indicated but China would be the logical destination. The only other places would be [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR) in the USA which can handle monazite or possibly [Neo Performance Materials Inc.](#) (TSX: NEO) plant in Estonia. In the future, the Saskatchewan Research

Council could also be a client once their pilot plant is completed. Since the middle of the year prices for Nd and Pr have dropped around 40%, so revenues per tonne should drop accordingly to around \$4,000 per tonne. Their goal is to reach 1,000 TPM by year end, which would generate total revenues of \$4 million/month or \$600K USD for Auxico as its monthly 15% share.

Two recent additions to Auxico are noteworthy. [Frederick Kozak](#) became President after having been President at [Appia Rare Earths & Uranium Corp.](#) (CSE: API | OTCQX: APAAF). He replaces Pierre Gauthier who had been Chairman and CEO. Also added to the board was [Melissa Sanderson](#), a leader in ethically sustainable growth and previously served as a senior diplomat, including as Charge d’Affaires of the US Embassy in Kinshasa, DRC, so she brings on the ground experience to Auxico as it deals with ethically sourcing concentrate from North Kivu, DRC cooperatives. Melissa sits on the Board of the [Critical Minerals Institute](#).

Auxico is also involved in projects in South America. Of note is the Massangana tin tailings project. In June of this year, Auxico announced an agreement with Cooperativa Estanifera de Mineradores da Amazônia Legal Ltda. (“CEMAL”) concerning the production of tin, niobium and rare earths from the Massangana tailings estimated to contain 30,000,000 tonnes in the State of Rondonia, Brazil. As some of you know I am a fan of tailings as a source of critical minerals as the heavy lifting has already been done to get the material out of the ground. This deposit has 30 million tonnes of tailings. A study done by the German Mineral Resources Agency and the Geological Survey of Brazil indicates that three types of products could be generated from the tin tailings: (A) a monazite concentrate; (B) a columbite Concentrate; and, (C) a cassiterite concentrate. According to their press release the following concentrates can be produced:



The TREO level in the tailings is better than some greenfield mines being promoted currently.

As noted in Auxico's [June press release](#) a feasibility study is to be done to process 3 million tonnes per year which would give a project life of 10 years. The objective of this project is to produce 135,000 tonnes of monazite concentrate per year, 19,500 tonnes of cassiterite concentrate (tin), and 45,000 tonnes of columbite concentrate (50% niobium + 5% tantalum). If the monazite concentrate is 37% as noted above, this would produce 50,000 TPY of TREO, which is significant as this would be around 25% of the current world production, which I estimate at 175-200,000 TPY. The tin output would be around 10,000 TPY in a market which in 2019 was estimated at 310,000 tonnes, so it will not have a large impact in the market. The columbite would generate over 22,000 tonnes in a market which last year Statistica estimated at 75,000 tonnes. The largest Niobium producer is CBMM which is also based in Brazil.

Auxico uses a separation and recovery technology called Ultrasound Assisted Extraction (UAEx), which has been proven successful at recovering rare earths as well as other critical minerals.

Overall, Auxico has a lot to watch on multiple fronts.

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North American Rare Earth Juniors Consolidate Capabilities to Advance Towards a Total Domestic Supply Chain

written by Jack Lifton | October 7, 2022

There were otherwise unrelated announcements last week, but, with a common purpose, by separate pairs of rare earth juniors: The common purpose was **the advancing of the creation of a domestic American rare earth enabled product(s) total supply chain.**

In one case the Canadian rare earth Junior miner, **Search Minerals Inc. (TSXV: SMY | OTCQB: SHCMF)**, entered into a [non-binding MOU](#) for the future delivery of a rare earth mineral concentrate supply, containing 500 tpa of Neodymium/Praseodymium, with one of its investors, privately owned, **USA Rare Earth LLC**, which has committed itself to producing commercial tonnages of rare earth permanent magnets in the United States as early as 2022-23. Another [announcement](#) was made by the Canadian rare earth junior critical metals' processor, **Ucore Rare Metals Inc. (TSXV: UCU | OTCQX: UURAF | FSE: U9U)**, which announced that it had entered into an MOU with

Australia's **Vital Metals Ltd. (ASX: VML | OTCMKTS: VTMXF)**: for a supply of rare earth ore concentrates from Vitals' already underway mining operations in Canada's Northwest Territory, to be first processed into a mixed rare earth carbonate in a facility funded by Canada's Saskatchewan Research Council in Saskatoon, Saskatchewan, and then shipped to Ucore's proposed Strategic Metals (processing) Center in Ketchikan, Alaska, USA, for separation into individual rare earths.

These announcements are indicative of a sea-change in the thinking of an increasing number of non-Chinese junior rare earth companies. In the last rare earth boom from 2007-2012 hundreds of juniors had the same goal, the production and sale of a "mixed con" of rare earths, in other words, of an ore concentrate or a concentrate of mixed rare earth solids prepared by hydrometallurgical treatment of ore concentrates. It was commonly believed at that time that Chinese rare earth separation companies, then the only customers, would pay 65% of the "basket value," defined as the market price of separated versions of the rare earths contained in the mixed concentrate. This was magical thinking based on a complete misunderstanding of the value of, and the markets for, either ore concentrates or mixed rare earth concentrates. Even today some juniors still insist that their ore concentrates have a basket value based on the values of finished goods. Chinese separators typically have offered 40% of the basket value, delivered into China for high grade ore concentrates free of elements that interfere with solvent extraction separation of mixed rare earths.

The "[supply chain crisis](#)" has clarified the thinking of many juniors. They realize that their product must have an immediate determinable-price demand and that this demand must be by processors who add enough value, so that they can afford to buy the junior's product at a price that allows the junior to make a profit. This may seem trivially obvious, but it was blithely

overlooked in the 2007-12 rare earth boom.

A new factor has entered the calculus for determining the price of mixed rare earth ore concentrates or of mixed rare earth solids free of both radioactive and of SX interfering contaminants. That factor is any added value governments and industries are willing to pay for non-Chinese, or domestic, materials of these descriptions.

So far, only one non-Chinese vendor has entered the market with mixed rare earth carbonate (solids) free of radioactive and SX interferences. That is America's **Energy Fuels Inc. (NYSE American: UUUU | TSX: EFR)**, which is processing non-Chinese monazite ore at its White Mesa, Utah, uranium processing mill. The mixed rare earth carbonate solids are being sold, at a profit to Energy Fuels, to Canada's **Neo Performance Materials Inc. (TSX: NEO | OTCMKTS: NOPMF)**, which has them delivered to its rare earth separation facility in Estonia, where the material is separated into individual rare earths for further processing by Neo or its customers into rare earth permanent magnets, phosphors, ceramic additives, and other fine chemicals. The European Union is already well ahead of the USA in organizing a financial facility to underwrite the creation of a European domestic rare earth enabled products total supply chain without Chinese participation at any level.

In the United States and Canada the supply chain issue is downstream of mining, and is manifested in the total lack of commercial facilities for rare earth separation, metal and alloy making, magnet making, and end use manufacturing.

Europe has existing facilities for up to 12,000 tpa of rare earths separation, a thousand tpa of rare earth metals and alloys, and substantial capacity and existing expertise to make rare earth permanent magnets of the most widely used, sintered,

type. Further, both the UK and the EU governments have already begun to support the expansion of existing rare earth processors financially.

The United States and Canada should take a lesson from the UK and the EU: Get industrial end users involved from the very beginning. The UK and the EU speak with industrial experts as well as academics and bureaucrats. The difference is really beginning to show.

A uranium company making waves in the rare earths space

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“One Ring to rule them all” is a central plot element in J. R. R. Tolkien’s fictional novel ***The Lord of the Rings***, as well as Peter Jackson’s movie trilogy, both of which I highly recommend. The One Ring was one of the most powerful artifacts ever created and was crafted by Lord Sauron. Sauron’s intent was to enhance his own power, and to exercise control over the other Rings of Power as he hoped to gain lordship over the Elves and all of the other races in Middle-earth. A pretty powerful theme for a fictional story, but where might I be going with this in real life today? Bear with me, it’ll take a bit to follow the tangled way my brain works.

At the recently concluded G7 meeting there was seeming consensus to chastise both China and Russia for various assorted reasons. It’s a reasonable bet that those nations may not be as cooperative with their abundant natural resources on a go

forward basis as a result of being singled out. The G7 communique noted the need for supply chain resilience and technology standards so that democracies are aligned and supporting each other. I read into that, rare earths that the developing world requires to meet its climate objectives, amongst other things. Right now China basically owns that space between control of resources and the processing of those resources into useable products. Assuming the West isn't already too late in light of what InvestorIntel's Jack Lifton wrote about in [this article](#), we shall soldier on.

The West needs its One Ring, albeit not to rule them all, but to control its destiny. The leading North American candidate to craft that ring (so to speak) is [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR). [To quote](#) President and CEO, Mark Chalmers "Without a doubt, Energy Fuels is making major strides toward restoring critical U.S. rare earth supply chains. In late-March, we began to ramp up production of an intermediate rare earth product at our White Mesa Mill in Utah using monazite from Chemours. This is expected to be a high-value product ready to be separated and refined into value-added rare earth products at [Neo Performance Materials Inc's](#) (TSX: NEO) plant in Europe. At this time, no other U.S. company is producing a product this far down the rare earth value chain. However, we have much bigger rare earth plans, and the momentum is building rapidly as we execute our purposeful strategy. We are now taking real steps toward designing and building fully integrated, U.S. rare earth production capabilities."

The 800 pound gorilla in North American rare earths right now is MP Materials Corp. (NYSE: MP) but they are focused on their own production at Mountain Pass and have an offtake agreement with Chinese based entities. Additionally, they are still in their Stage 2 development process which would only get them to where Energy Fuels is capable of today. The other differentiator with

Energy Fuels is that many, if not most, rare earths ores contain low levels of radioactive materials, including uranium and thorium, necessitating extensive radioactive materials licensing requirements. Energy Fuels 100% owned White Mesa Mill has existing infrastructure (licensed, constructed and in operation) with a 40 year history of “responsibly managing low-level radioactive materials”. Energy Fuels is in a unique, industry-leading position with this asset to process monazite ores into rare earth carbonate. In other words, a recipe for success in light of the current political environment.

The Company has several collaborations with the U.S. government and national laboratories on various rare earth initiatives, including being granted [a \\$1.75 million contract](#) by the U.S. Department of Energy to perform studies that complement work to develop rare earth separation capabilities at their White Mesa Mill. As well, Energy Fuels has deals with [The Chemours Company](#) and [Hyperion Metals Limited](#) to process ore from their respective mines at the Offerman Mineral Sand Plant in Georgia and the Titan project in Tennessee. Energy Fuels will process the monazite sands into a mixed rare earth carbonate for use as feed material for Neo Performance’s separated rare earth production plant in Europe.

Energy Fuels and its White Mesa Mill are uniquely situated as the only North American facility to be able to process an intermediate rare earth product. The company is flush with cash, with approximately \$57 million having finished Q1/21 with \$44 million plus raising [\\$13 million throughout April and May](#) via an at the market share issuance. Additionally, the Company has an available inventory of saleable uranium and vanadium with a market value of approximately \$28 million. The fact that it is also a uranium company is responsible for the wash out in the stock price yesterday (down 9.4%) on news of a potential issue at a Chinese nuclear facility. This news caused a broad brush

destruction of market cap across the whole uranium sector. However, if you see the rare earth side of the Energy Fuels business being the potential future of the company then perhaps this is a buying opportunity.

Jack Lifton on Rare Earth Supply Chains and Value Chains

written by Jack Lifton | October 7, 2022

Rare earth sector analysts have finally recognized that a project's place in a total supply chain is very important to its economic viability. Before a junior mining deposit goes into (usually expensive and time consuming) development into a producing mine there must first be an evaluation of what possible product(s) of that mine are demanded by the next step in the supply chain and what price(s) they may bring when the mine begins production. Most such evaluations are at best extrapolation and at worst pure speculation due to unpredictable commodity price cycles. Even for producing mines like MP Materials Corp. (NYSE: MP) and Lynas Rare Earths Limited (ASX: LYC) their places in the total supply chain differentiates them from each other because of the different value of their current respective delivered products.

The sale of rare earth permanent magnets brings a majority of the revenue in the total rare earth products supply chain. But no non-Chinese company has ever been vertically integrated from a mine to a magnet maker. The closest that a Western owned company (Canadian) has come to being a total rare earth permanent magnet supplier is [Neo Performance Materials Inc.](#)

(TSX: NEO), which has everything (in the total rare earth permanent magnet supply chain) but a mine. Neo Performance sells rare earth products (oxides and chemicals) as well as rare earth enabled products (e.g., magnets) and has been consistently profitable with revenues exceeding \$500,000,000 per year. This year, 2021, Neo will shortly begin taking delivery from America's [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR) of 70 tons per month of clean mixed rare earth carbonates (MREC) extracted from domestic American monazite. Energy Fuels is the first American company to produce rare earth concentrates free of radioactive elements and interfering ions in at least 25 years. The MREC can be put into solution directly at Neo's European rare earth separation plant and fed into the system as a pregnant leach solution (PLS). Thus, Neo Performance can deliver to its customers downstream products, such as separated oxides, metals and magnet alloy powders and bonded magnets (made at its Thailand operations) that are produced by a total rare earth supply chain with no Chinese involvement.

Energy Fuels reports that its monazite extraction/purification system to produce clean MRECs is profitable. MP says that its bastnaesite ore concentrates now sold exclusively to China's Shenghe Resources are profitable. Lynas says that its in-house separated rare earth oxides are sold at a profit. For rare earth juniors, the successful (I.e., profitable) sale of ore or clean mixed rare earth carbonates is the key metric and few of them succeed.

The total rare earths' (enabled products) supply chain has the following composition:

1. Mining,
2. Extraction of the rare earths from the mining concentrates and the preparation of a clean, pre-PLS, mixed rare earths product,

3. Separation of the mixed rare earths into individual oxides and blends,
4. Manufacturing of chemical products, such as phosphors and catalysts, and of individual metals and alloys forms, and
5. Manufacturing of rare earth permanent magnets from rare earth alloys.

Historically mining companies have done steps 1,2, and sometimes 3, while specialized smaller companies have done steps 4 and 5 as separate ventures.

The rare earths' value chain is not the same as the supply chain. It is very difficult to make money mining, extracting, or even separating mixed rare earths into individual rare earths and blends. Lynas, for example, has become profitable by reducing the costs of separation to where they are comparable to those of the Chinese. Lynas' monazite ore body is much richer than, for example, MP's bastnaesite or even that of China's Bayan Obo. Lynas is now profitable selling individual rare earth salts and blends, but it has taken a decade and \$2 billion to reach this point, and the company's survival was actually due to long term low interest loans from a Japanese government agency designed solely to give Japan a backup to Chinese sourcing.

MP Materials is today only an ore concentrate producer, and its original capital needs were only to re-open a relatively recently closed large-scale well-run mining and ore concentrating operation. MP basically acquired some \$2 billion of sunk costs for about 1% of that. The real challenge now is for MP to (attempt to) match the Lynas model, and deliver separated rare earths and blends just as the original MolyCorp did until 20 years ago. I am told that MolyCorp II's Project Phoenix ran first just before the bankruptcy, but I only get silence when I ask if it was running economically and efficiently. I am very skeptical about MP's announcements that

they will be separating rare earths at Mountain Pass in 2022 if by that they mean economically and efficiently.

Lynas has never advanced beyond separation in the supply chain, and I have never heard it said that they plan to do that or want to do it. The Lynas 22,500 tpa operation in Kuantan, Malaysia, took seven years and \$1.3 billion to begin commercial operation, and it is limited to processing monazite to extract and separate light rare earths only. If Lynas chooses to build a light rare earths separation plant in the USA as has been announced I suspect it will take 2 to 3 years to build and burn-in and that if it is to be a 5000 tpa system as announced, and that it will cost far more than \$60 million on a greenfield site in Texas.

Project Phoenix was to be a 20,000 tpa system. It never ran commercially even though well over a billion dollars was expended on it over a four-year period. It is extremely unlikely that Project Phoenix can be resuscitated and brought into profitable operation in just one year, if ever.

Molycorp II, in its attempt to vertically integrate bought the rare earth permanent magnet alloy making operations of Santoku, America, in suburban Phoenix, Az. In 2011 for \$17 million. Within two years the operations were shut down as the necessity to buy Chinese metal as feedstock made profitability impossible.

Energy Fuels is buying monazite concentrates and removing the uranium and thorium as well as non rare earth elements in its existing White Mesa uranium mill in Utah. Less than \$2 million was needed in additional equipment to give the mill the capacity to process 2500 tpa of monazite to recover the contained 55% of total rare earths.

Neo Performance can distribute costs across its almost total in-house supply chain. It can thus maximize profits in its highest margin end-use products. MP is literally a start-up beyond the

mine, and the jury is out on its potential for success. Lynas' operations were designed by former Solvay chemical engineering managers with the longest continuous experience in rare earth separation in the world. The chemistry chosen for Kuantan was that proven by experience and use by Solvay, China. Neo Performance Materials is the successor in interest to Neo Materials, which was founded in the 1990s and is helmed today by one of its original founders. Neo Materials perfected the bonded rare earth permanent magnet and is today the supplier of 80% of the world's supply of them.

Energy Fuels has been in business since the late 1980s, and is America's sole licensed uranium mill and thorium storage site. From the inception of the plan to process monazite until commercial operations took just one year. Uranium is purified by solvent extraction, and Energy Fuels has more than 500 man-years of experience with solvent extraction. The company is doing a scoping study on a dedicated rare earths solvent extraction system and has been awarded a contract by the US Dept of Energy to study the separation of rare earths derived from coal and phosphate-acid residues.

MP and Lynas are the largest, rare earth miners outside of China. Lynas and Neo Performance are the largest processors of rare earths to separate them by solvent extraction outside of China, and Energy Fuels is the sole producer of clean mixed rare earth carbonates in the Americas.

I am watching the following juniors: USA Rare Earths, Rare Element Resources Ltd. (OTCQB: REEMF), [Vital Metals Limited](#) (ASX: VML), and [Appia Energy Corp.](#) (CSE: API | OTCQB: APAAF).

The next five years will be the critical time for the development of a domestic American or European total rare earth enabled products supply chain. Canada is at a crossroads; it may

build a domestic supply chain anchored on mines and going downstream with licensed European separation, metal and alloy making, and magnet making, or it may build a trans-Atlantic one with the EU.

The game's afoot.

Jack Lifton on the real challenge of China Incorporated on the global supply of rare earths

written by Jack Lifton | October 7, 2022

China's recent re-enactment of its export "[prohibition](#)" list illustrates the differences between the impact of the West's "financial globalization" and of China's approach to globalization under "Socialism with Chinese Characteristics" on the individual nations' security of supply of [critical materials](#) (rare earths) as enabled by what are the two principal competing economic systems in today's world, "free market" capitalism and state-controlled capitalism (also known as Socialism with Chinese characteristics).

It's easy to say that China's recent revisions to and the republication of the law that makes the export of named technologies from China either subject to governmental approval or simply illegal, is retaliation for the American (Trump[?]) (and now also the Japanese and EU) administrations' technology

import and use bans applied recently to Chinese cybertechnology, but for the Rare Earths these restrictions have been in place for more than a decade, and their updating and reaffirmation in Chinese law tells a much more nuanced and worrisome story.

Looking carefully at those of China's export restrictions that are focused on rare earth "processing" technology, they show that China does not want any of its companies, state-owned or "private", to give any assistance to foreign entities to develop any aspect, at all, of a total rare earth supply chain.

I have been told that China originally acquired rare earth separation (by solvent extraction) technology from the first Molycorp in the early 1980s when that company was seeking to lower its costs by exporting the rare earth separation technology it had developed in the 1960s and 70s to China where bastnaesite, the same mineral as was being mined at Mountain Pass by Molycorp, was being recovered in large quantity as a byproduct of iron ore mining in Baotou, Inner Mongolia. I believe that Molycorp also then began sending some ore or ore concentrates from California to China at that time for separation in China. I have been told that the "blueprint" for a rare earth separation plant supplied by Molycorp was stolen and illegally "sold" into alleged operatives from China in the first Chinese "rare earth processing rush" in the 1980s during which dozens of dedicated solvent extraction systems for rare earths were built outside of Molycorp's control.

Deng Xiaoping, the real founder of modern China's economic system famously said during this period of rapid growth for China's rare earth "processing" industry that **rare earths were to China what oil was to the middle east**. Besides encouraging the development of a rare earth industry and to support it, this pronouncement also encouraged the creation in Chinese universities of departments of "separation science" in

departments of chemistry and chemical engineering. Today, in 2020, thousands of Chinese chemists and chemical engineers specialize in rare earth “processing.” The State Key Laboratory for Separation Science at Peking U., alone, has four locations with more than 400 researchers, more than 150 of whom hold PhDs! It is estimated that several thousand Chinese researchers are dedicated today to the field of rare earth studies in China.

All of the raging commentary about Chinese intellectual property theft from the West, America in particular, has masked the fact that regarding rare earth processing downstream of ore concentration China has an existing and growing advantage technologically over all of the West. While it is certainly true that we do not know the true costs of mining and refining rare earths in China, because China doesn't seem to capitalize health and safety concerns that are both significant and also highly regulated in the USA and almost all other Western countries, we must also concede the advantage of extensive experience to China in the effective production of rare earth metals, alloys, and magnets. The current method of choice, for example, for the production of rare earth metals, the electrolytic reduction of molten salts, has never even been practiced commercially in the USA.

The [unfortunate truth](#) is that the US and the West needs technological help. Particularly in scale-up, from China's large reservoir of downstream (of mining) rare earth processing knowledge and experience if, and only if, the goal is global competition with China for the 150,000 mta rare earth permanent magnet markets. If the goal is regional or national self sufficiency and security of supply then governments will have to either subsidize or get much smarter, with regard to economics and the selection of companies that have the necessary skill sets, about (re) establishing total domestic supply chains for critical materials and, especially,

the components manufactured from them.

The American federal bureaucracy is an assembly of the industrially inexperienced but well credentialed (not necessarily well educated!) who first and foremost speak with each other, and, when and if they must reach outside of their group, go only to academics for advice on policy.

Implementation of policy is simply not considered, and the excuse for that is it would look like overstepping their authority, favoritism, or worst of all, a mistake might be made that would reflect badly on the bureaucrat.

China's mandarin bureaucrats are chosen primarily for their experience and skills as well as their education and (Chinese Communist) Party connections. The China "State Council" sets the nation's industrial policies. The bureaucrats implement those policies. Those bureaucrats, speaking with the authority of the State Council and President, have a great influence on the lending policies of the People's Bank of China.

The current Chinese "President" has decreed (not recommended) that by 2025 China will be independent of the rest of the world in 10 key high technologies. Several of these technologies are critically dependent upon rare earth enabled components, especially rare earth permanent magnets.

China is today cleaning up its rare earths industry to meet global standards of health and safety. This has necessitated a sharp restriction on rare earth mining within China. China is today, in 2020, on a track to import nearly 40% of its needs for rare earth bearing ores for ALL of the rare earths.

In fact, heavy rare earth production from so-called ionic clays has essentially halted within China. Yet, notwithstanding the rare earth mining pollution "problem" the implementation of

China 2025 is advancing rapidly.

What does this mean for Western rare earths mining, refining, metal and alloy making, and rare earths enabled products' manufacturing? It means that China, Incorporated, is your competitor at every stage of the total supply chain. It means more importantly that as China's consumer economy grows and as long as China requires outside raw materials the rest of the world will be completely subjugated to Chinese pricing and export policy.

Neither the US (or any other allied) defense establishment can take the risk of having its rare earth permanent magnet and alloy supply cut off or curtailed by the Chinese government. Even more dependent upon China today, in permanent magnet volume alone, are the global OEM automotive and consumer appliance industries.

Investment outside of China in a total rare earths supply chain is a necessity for US defense and the continuation of an independent American manufacturing base for high technology consumer products. It is certainly not wise to put all of your eggs in one basket, but it is also very unwise to plan on just one company or one technology to solve America's (and the West's) dependency on the Chinese rare earth industry. The solution is to choose only those participating companies that understand the need to manage or have a total rare earth supply chain in view. The poor economics of some of the component operations of the total rare earths supply chain can be solved by legislation (e.g., the Cruz rare earth components tax relief bill) or by the distribution of costs among the supply chain components so that the whole is profitable.

It's time for a serious discussion of the rare earths supply problem. China is not planning to assist the development of

competitors in this field.