

# Superalloy and Magnet Producer Neo Performance Materials is Buying its own Stock, Should You?

During the first half of 2020, Neo Performance Materials Inc. (TSX: NEO) purchased US\$1.3M of stock under its Normal Course Issuer Bid Program. Neo believes that its current share price trading range does not adequately reflect the value of the Company.

Neo's share buyback could be a signal that it is time for investors to look at the Company's current business and future sales prospects. As an added bonus, the Company also pays a dividend that is currently yielding 3.4%.

## Markets Include EVs and Wind Turbines

As countries attempt to re-boot their economies after COVID-19, there is a push for decarbonization and a greener economy, which bodes well for Neo as it supplies superalloy and magnets used in electric vehicles, wind turbines, and high-efficiency motors.

Headquartered in Toronto, Canada, Neo operates as a global advanced materials manufacturer with sales and production in 10 countries: Canada, China, Japan, Estonia, Germany, Singapore, South Korea, Thailand, the United Kingdom, and the United States.

## 3 Key Operational Segments

Neo currently operates 3 divisions:

- Magnequench: LTM Revenue of US\$152.9M
  - Creates rare earth powders for bonded and hot

deformed magnets.

- The magnetic materials enable increased energy efficiency in motors across the Hybrid/Electric Vehicles, Industrial Automation, Residential Appliances, and High-Efficiency Motor segments.
- Chemicals & Oxides: LTM Revenue of US\$124.5M
  - Produces advanced industrial materials for end markets that include automotive catalysts, rare earth separations, multi-ceramic capacitors, and water treatment.
- Rare Metals: LTM Revenue of US\$78.2M
  - Makes tantalum-based and gallium-based specialty products with the largest end market being aerospace applications.

Revenue for the first half of 2020 was US\$158.4M, down almost 25% compared with the same period in 2019. All three divisions reported decreases in revenue caused by slower economic activities due to the COVID-19 pandemic. The downturn in the global automotive industry negatively impacted the Company's sales as, collectively, it is Neo's single largest end market.

But even with lower revenues, Neo's core business remained strong. The Company remained operationally profitable for the first half of 2020 and posted an Adjusted EBITDA of US\$10.8M.

### **Demand Fuels US\$5M Expansion**

The Magnequench division saw demand growth in compression molded magnets and the Company plans to expand its existing production capacity at its two existing facilities in China by investing US\$5M. The expansion was expected to be completed by late September 2020.

"This increase in demand for Magnequench's value-added NdFeB magnetic materials underscores the market confidence in the precision, quality, product development capabilities, and customer service that Neo provides to its customers,"

commented Constantine Karayannopoulos, Neo's President and CEO.

Neo will host its Third Quarter 2020 earnings conference call on November 16. Currently, analysts' consensus revenue estimate for Q3/2020 is US\$79.7M, down almost 29% from the same period in 2019, but up 7.4% quarter over quarter, so revenue is trending in the right direction.

Moreover, the Company has a strong Balance Sheet with US\$78.7M in cash and US\$6.2M in undrawn credit facilities. Neo is well-positioned to ride out the economic downturn but able to capitalize on the restart of the Chinese economy. The Chinese market currently comprises 31% of Neo's revenue and is its largest geographic segment. China is forecasted by the IMF to be the only country with a positive growth forecast in 2020.

Looking beyond the end of the current health crisis, if you believe the renewable energy sector and electric vehicles will continue to be two of the hottest growth areas, Neo could be a way to profit from these trends.

---

## **Neo Performance Materials manufactures high performance materials including very valuable rare earth magnetic powders**

High performance materials, especially those involving rare earths magnet powders, are about to experience a huge demand

as several massive macro trends develop this decade. Two of the biggest trends will be electric vehicles (EVs) and renewable energy (notably solar and wind). An important component for the best electric motors is powerful rare earth magnets.

Did you know?

- By 2030, global demand for the two main rare earth metals (neodymium and dysprosium) used in wind turbines and electric vehicles is forecast to grow by 2.1x (that's over 100% growth).
- In a 100% EV world the demand for rare earths is forecast to grow by 655%.

Whilst China dominates rare earths processing and end products, there is one 'Western' company that is globally diversified and not fully dependent upon China.

**Neo Performance Materials Inc.** (TSX: NEO) manufactures the building blocks of everyday products and emerging technologies, including very valuable rare earth magnetic powders. The Company is headquartered in Canada but has operations in China, U.S., Germany, U.K., Canada, Thailand, South Korea, Singapore, and Estonia. Neo has over 1,800 staff. Neo is positioned to benefit from key macro trends including vehicle electrification, industrial automation, consumer electronics, energy efficient lighting, air and water pollution control, and greater use of superalloys.

**Macro trends that drive demand for Neo's advanced industrial materials**



Source: Company investor presentation

Neo's materials deliver a range of powerful properties to the products in which they are used, including magnetic, catalytic, luminescent, electrochemical, thermal stability, and superconductive.

Neo's three main operational segments (with revenue % in brackets) are:

- Magnequench (42%) – Production of magnetic powders used in bonded and hot deformed fully dense magnets.
- Chemicals and Oxides (35%) – Distributes a broad range of light and heavy rare earth functional materials.
- Rare Metals (23%) – Sources, produces, reclaims, refines and markets high value metals and their compounds, such as tantalum, niobium, hafnium, rhenium, gallium and indium.

Neo has a balanced and well-diversified customer base that includes large industrial, consumer electronics and chemical processing companies. A significant portion of revenue contribution is from customers who have been with Neo for 10+

years. As western companies look to diversify their supply chains away from China Neo stands to be a potential winner.

## Neo Performance Materials has a diversified and long standing customer base

### Representative Longstanding Customers



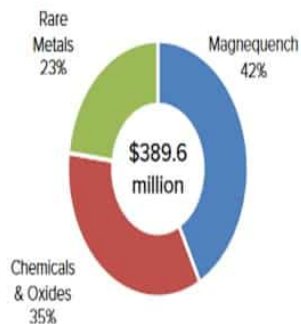
Source: Company investor presentation

Neo is a profitable, dividend-paying company with a strong balance sheet and robust cash-flow generation. As you can see in the chart below revenue was impacted negatively in 2019 and so far in 2020 due to the global slowdown from the trade war and COVID-19 pandemic. Naturally the stock price was also impacted; however this is the opportunity for investors.

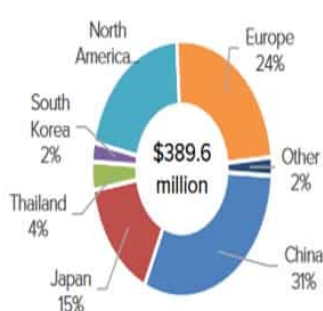
The current market cap is C\$326 million. 2021 and 2022 revenues and margins are forecast to improve on 2020. 2021 forecast PE looks attractive at 14.0 and 2022 is 12.8. Analyst's consensus is an 'outperform' with a price target of C\$10.42, representing ~20% upside. Risks revolve around the length of the current global slowdown, demand for Neo's specialty products, and Chinese competition.

## Neo Performance Materials revenue breakdown

LTM Revenue by Segment<sup>1</sup>



LTM Revenue by Geography



Consolidated Revenue / Adjusted EBITDA  
2016 - Current



Quarterly Dividend of C\$0.10/share and Strong Net Cash Balance of \$78.8 Million<sup>1</sup>

Source: Company investor presentation

### Closing remarks

Neo Performance Materials offers investors a safe jurisdiction and exposure to some of the biggest macro trends ahead this decade.

The EV boom is set to take off this decade and so is renewable energy which includes wind turbines and numerous energy efficient products, as well as superalloy and other high performance materials. Added to this there will be a surge in demand for auto catalysts to reduce air pollution. Neo supplies the specialty materials for all these areas.

Investors can consider buying Neo during the current market lull knowing that once the global demand for Neo's materials picks up, the Company will also pick up. Neo Performance Materials is somewhat under the investment radar, but this could well change soon once word gets out and revenues start to turn higher again.

# North American rare earths race heats up with patent advantage

Greg Andrews, President and CEO of Search Minerals Inc. (TSXV: SMY), in an interview with InvestorIntel's CEO Tracy Weslosky discuss Search Minerals progress towards becoming the next producer of rare earths and sustainability challenges in North America (NA). With a technology advantage, Greg discusses Search Minerals' metallurgy patent which increases recovery rates and reduces the cost of production for rare earths. Specifically, Search is taking their 99% pure rare earth oxide to refineries, which will obviously increase the NA supply. Greg will be presenting at InvestorIntel's 6th Annual Cleantech and Technology Metals Summit on Monday and Tuesday, May 15th and 16th in Toronto, Canada at the Omni King Edward Hotel.

**Tracy Weslosky:** Greg, it's so exciting to have what is unquestionably the next producer of rare earths in North America.

**Greg Andrews:** We want to be that next rare earth producer for North America. We just released our metallurgy report, which was very exciting and exceeded our expectations.

**Tracy Weslosky:** We were just talking to Dr. David Dreisinger about your pilot plant operation and your rare earth oxide. Can you tell us more about this?

**Greg Andrews:** We're really excited because we've been able to prove the metallurgy from our ore sample at Foxtrot right to the end product, which is a high purity 99% mixed rare earth oxide. The next step for us now is taking it to the refineries. It opens up a whole new audience to us for strategic investors, investors, offtake agreement partners.



It's fantastic news for us...to access the full interview, [click here](#)

Disclaimer: Search Minerals Inc. is an advertorial member of InvestorIntel Corp.

---

## Stop calling them “rare” earths, says noted earth scientist

✘ There are all of 2,550 rare minerals around the world. And rare earths are not (repeat: not) contained within that list, and are definitely not deserving of that description, say two experts who have catalogued what they consider really to be the world's really “rare” minerals.

As usual, Shakespeare has the apposite quote:

*“There are more things in heaven and earth, Horatio,  
Than are dreamt of in your philosophy.”*

Hamlet hit the nail on the head, as we now learn, according to a new list published by two academics. For example, geologists working in Azerbaijan recently discovered Barikaite, an antimony-containing mineral.

And we learn from Museum Victoria in Melbourne, Australia, that a team of scientists (including the museum's geoscientist Stuart Mills) has found a mineral that could be a natural solution to purifying water affected by excess nitrate, the type of water pollution caused by fertilizer run-off (a global problem as that run-off is responsible for algae blooms). The newly discovered mineral, Mössbauerite, was discovered on the

French coastline near Mont Saint-Michel in Normandy. Dr Mills said the new find is mixed with other green rust minerals; green rusts are being used to remove algae in problems areas of Brittany. "This is just the beginning," he added. Mills believes these minerals could shape the whole water treatment scene well into the future.

The lead researcher who has now catalogued the 2,550 rare minerals, earth scientist Dr Robert Hazan of the Carnegie Institution in Washington, has estimated there are still 1,500 undiscovered minerals to be found. (His co-author is Jesse Ausubel of The Rockefeller University.)

According to the authors of their new paper, *On the Nature and Significance of Rarity in Mineralogy*, the greatest value of finding these many rare minerals is that they provide tell-tale clues about what is happening (and has happened) below the Earth's surface.

The authors also tackle the name of rare earth elements. We should drop that tag, they argue. "Uses of the word 'rare' in the context of 'rare earth elements' or 'rare metals' are simply misleading as many thousands of tons of these commodities are produced annually," they wrote in their paper,

(And you can see their point: how many articles have you read in the mainstream media since rare earths became a fashionable topic five or six years ago that include, somewhere near the beginning, the important proviso that rare earths are not really rare and are found in many places?)

No, Hazen says the word should be saved for things that really are rare – like ichnusaite, a mineral created by interaction between thorium\* and molybdenum. Only one specimen has ever been found, and that was located in Sardinia. The authors also point out that precious stones, such as diamonds, rubies, emeralds, are found at numerous locations and sold in commercial quantities, and so the word "rare" in relation to

those is inappropriate. “If you wanted to give your fiancé a really rare ring, forget diamonds,’ says Hazan. “Give her Sardinian ichnusite.”

There are 5,090 known minerals on Earth, and fewer than 100 of those make up 99% of the planet’s crust.

Hazen has even had one of these rare minerals name after him. Hazenite (identified by a former student of his) is found only in Mono Lake in the California desert. Classified as  $\text{KNaMg}_2(\text{P}_04)_2 \cdot \text{H}_2\text{O}$ , it is a product of the action of microbes in the highly alkaline lake. Mono was formed 750,000 years ago and its lack of an outlet causes high levels of salt.

Now that is rare – unlike cerium, of course.

*\* The mention of thorium reminds me to ask: why has the whole thorium discussion gone so quiet? Especially when the nuclear debate is still dominated by fears of disasters caused by using uranium.*

---

## Meanwhile, Back in Tokyo

✘ The Japanese have been very busy for at least the last 15 years attempting to construct, expand, and maintain a total rare earth supply chain for the Japanese domestic manufacturing industry, so that it can break free of China and Chinese involvement. Recent moves by Japanese rare earth permanent magnet (REPM) makers, such as, for example, Hitachi, to move some production to China a step that Hitachi, among others, said just 4 years ago, that they wouldn’t do – has been interpreted I think wrongly as a “surrender” to the inevitable dominance of China in the sourcing of raw materials for rare earth permanent magnets. In fact, I suspect that even

though Hitachi most likely moved production of commodity (i.e., wide-spec or no spec) REPMs to China, it has, in true Japanese fashion, kept the production of specialized proprietary tight-spec REPMs as well as R&D for REPMs at home, or close to home but not in China.

Hitachi, as an example, is a Tier One supplier to the German OEM automotive transmission supplier, ZdF at its, ZdF's, manufacturing plant in China Grove, North Carolina. REPM alloy made, I suspect, in both China and Japan is shipped from those places to Malaysia where the blocks are machined to shape. Then the shaped magnet alloy is shipped to North Carolina where it is installed and magnetized in ZdF automatic transmissions for, among others, the Ford Motor Company. I doubt that Malaysian labor rates and utilities are much cheaper than their equivalents in mainland China but I think they are no more or not much more than Chinese rates for the same overheads. Malaysia, however, offers Hitachi an added value, a venue where its trade secrets can be less likely to be stolen. Additionally, and perhaps most important of all, the Malaysian machining facility can switch suppliers without political fallout. Magnet alloy made in Japan, Vietnam, or even one day Malaysia or the USA can be substituted for Chinese made material at any time.

The recent fuss over the operating license for Lynas LAMP facility in Malaysia was due to a previous attempt by Japan's Mitsubishi to process local monazite bearing sands for rare earths in the late 1990s. The result of that venture was a fiasco where the Malaysian government had to pay a substantial sum along with Mitsubishi to clean up a thorium residue issue, and the project was terminated. This did not endear either rare earths or Mitsubishi to Malaysian regulators, and the residue of ill will was the main driver behind the ludicrously named Save Malaysia Stop Lynas movement that held up the license for the LAMP for at least two expensive years.

Nonetheless the Japanese REPM industry has for the last two

years been looking at the viability of Malaysia for additional supply chain development due to the availability of didymium from the LAMP and of terbium and dysprosium from xenotime extracted from tin processing residues and from ionic adsorption clays in Sarawak (Malaysian Borneo).

Nearby to Malaysia in Vietnam there is already a variety of Japanese investment in a total rare earth supply chain. The REPM manufacturer, Shinetsu has a magnet alloy/magnet plant there using, among other feed stock, REPM scrap. The Japanese magnet alloy producer, Showa Denko, also has an operation in Vietnam. Toyota operates a plant in Vietnam recovering rare earths from Nickel Metal Hydride batteries as does, I believe, Honda. Toyota is also a principal investor in the development of the Dong Pao rare earth deposit in Vietnam and if and when production begins there it can be apportioned for separation to the two Chinese owned total rare earth separation facilities already operating in Vietnam as well as to the Shinetsu, Showa, and Toyota facilities with separation capabilities and/or alloy and or magnet making capacity. There are at least four solvent extraction plants in Vietnam for the separation of rare earths.

Toyota is also a principal investor in the large (8000 ton per annum capacity) monazite fed separation plant in Kerala, India that is either ready for operation or in operation today.

In Brazil Mitsubishi and/or Sumitomo is processing tin-processing tailings from Pitinga to extract some of the substantial xenotime resident in it. I believe that the separation processing of this xenotime is done in Vietnam, but it may be done in Japan or even China for the account of Mitsubishi's Japanese clients.

In North America we know that Toyota's trading company took a position in Matamec and has looked extensively at many other properties, but politics and environmental issues seem to have inhibited any further Japanese investment in North America.

The Japanese REPM industry has voted with its pocketbook and its engineers for involvement in the global rare earths trade. The purpose of all of this is to make Japanese REPM manufacturers independent of the Chinese total rare earth supply chain.

**The USA is very far behind the Japanese in this.** Basically this can be ascribed to two reasons:

1. The demand for REPMs in the USA as component parts of goods to be assembled in the USA is less than 1000 tons per year, and
2. No one has re-established even a minimal total domestic American rare earth supply chain here since Magnequench departed.

What the USA needs right now is a 500-1000 ton capacity total rare earth supply chain that is profitable at current pricing. Such an operation would seed a larger capacity supply chain when it becomes necessary due to Chinese internal absorption of their entire output or a real cutoff of our supply, whichever comes first.

---

## **The Chinese rare earth tax and the separation technology revolution**

December 3, 2014 – In a special **InvestorIntel** interview,  the Editor-in-Chief and Publisher Tracy Weslosky speaks with Jack Lifton, Founding Principal of Technology Metals Research, LLC talk about the new Chinese heavy rare earth tax rumor, the latest rare earth separation technology processes

and the impact on the Chinese-Australian free trade agreement on the resource market.

**Tracy Weslosky:** I'm going to start first with that rumor that we had – in a story that we placed on our site where our Asian correspondent talks about a new heavy rare earth potential tax from the Chinese. We haven't had anything like this since 2011, of course the markets went crazy. Talk to me about this. *Do you think this is real?*

**Jack Lifton:** Yes, I do. It's the way that China has resolved the issue of how to conserve and protect its very limited heavy rare earth resources, which are so important. This is not a surprise to me. We did it to ourselves. We made it a big fuss about, well, there's this and that and the Chinese have just reviewed their history of western capitalism. They said, oh – all we need to do is put a big export tax on, that's okay. So, they did it. Look, they've been looking for a way to do this for four years. They will now do it.

**Tracy Weslosky:** Okay. If they're going to do what they did in 2011 everybody should get ready for a very busy Christmas day because I believe they put that news out in 2011 on Christmas. Jumping next to other news, we have a lot of big news in the market. Of course, Ucore put out their, you know, revolutionary, what is it, molecular recognition technologies. Now I'm just . . .

**Jack Lifton:** Right.

**Tracy Weslosky:** I'm just an investor. I don't know what an MRT is. I need you to talk to me about that.


**Jack Lifton:** Well, let's say that molecular recognition technology it is basically a way of separating metals from each other by utilizing chemicals, organic chemicals, that selectively bind to one or the another and then they can be separated and they can be then relieved of their burden of the

specific metals. Now what I'm saying is there's no way to explain this in a few moments and to people who don't have the particular background. Just let me say this, all separation technologies are the same. They're trying to separate things from each other that are closely related chemically. In the case of the rare earths, they're the most closely related long string of elements in the periodic table. Very difficult to separate from each other. It can be done. It's very expensive. The thrust of MRT, continuous ion exchange, accelerated solvent extraction, all of these technologies that are now underway is to lower the cost. The technology is to accomplish the same thing, separating the rare earths. It's the cost that's always been the issue, the enormous cost. I believe that we will see now in the next year to year and a half scale up of one or more of these technologies, rocketing down the cost and completely changing the landscape for junior rare earth companies.

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

---

## **Jack Lifton debunks the Lynas and Molycorp rare earth leader myth**

I note that the Australian press is reporting today that  Lynas Corp. ('Lynas') will move its administrative headquarters to Kuala Lumpur, Malaysia, from Sydney and close down its other two administrative centers in Australia to consolidate operations in Malaysia. The company's mine, the Mt Weld deposit, of course cannot be moved, but it is not expected to be called upon to produce any new material until



the end of 2015. It has accumulated an above ground inventory sufficient for at least one year of full production by the LAMP operation in Kuantan, Penang Province, Malaysia. I believe that the Mt Weld ore concentrate is now shipped to Malaysia for all downstream processing beginning with roasting.

I think, as a cost savings, this administrative consolidation is a very good idea. Malaysian infrastructure overheads and office costs are far lower than those anywhere in Australia. In addition shipping costs from Malaysia to existing Lynas' customers in Japan and elsewhere in Asia are lower cost, which is anyway one of the reasons that the LAMP was built in Malaysia. I would also say it was a good move for Lynas' public relations in Malaysia except for two things:

1. Given this new target location for Lynas HQ it must be noted that the those Malaysians who vehemently oppose Lynas operations in Kuantan, Penang Province, at the LAMP are always going to be much more likely to stage their protests in Kuala Lumpur than in Kuantan, because Kuala Lumpur is Malaysia's capital and is a far more pleasant venue for protests than what the Australian news media unfairly, in my opinion, call the "peat swamps" of Kuantan, and
2. Because the new CEO of Lynas is a woman making 1.2 million dollars a year.

I was leaving Kuala Lumpur late last year after attending a meeting of the Rare Earth Task Force sponsored by the Malaysian Academy of Science, and when I stepped up to the check-in counter for KLM, the Dutch owned international airline, I was shown a notice that stated that the senior pilot, the captain, of the airliner I was scheduled to fly that evening from KL to AMS was a woman. I asked the check-in person, a Dutch woman, why this notice was posted, since I had never in my life seen any such notice, and she told me that some Malaysians object to a woman having such a position of

authority over them. This was an aspect, I was told, of the Moslem attitude towards women "working in men's jobs" in general. She pointed out that the airline would offer anyone who objected a seat on another flight captained by a man.

I respect anyone's right to live their life the way they want to providing that they give me the exact same opportunity to live my life as I want to. As I boarded the KLM airliner I saluted the tall woman at the entry port wearing the uniform of a senior captain for KLM.

Malaysia is a shining jewel of multi-cultural democracy with a strong adherence to the rule of law and a regard for the rights of personal property in a sea of much less developed nations Malaysia is a country where the GDP is growing at 6% a year. Malaysia is a beautiful country with warm charming friendly people. Malaysia is also a country that although officially secular is majority Moslem. To the best of my knowledge it is the only Moslem country in the world that has a large operational rare earth separation facility, and one of only two countries, the other being the United States, where domestic monazite was processed in the past, but is no longer processed due to the co-production of thorium being considered detrimental to the environment. As I told the Lynas operational people in Kuantan two years ago when the Malaysian Academy of Science asked me to participate in a survey of the LAMP the Lynas problem is public relations and is exacerbated by a bit of tone deafness. The Mt weld deposit is principally monazite. The low thorium levels and the safe disposal of what thorium is produced is what needed to be emphasized to the Malaysian public from day one.

*Good luck to Lynas in becoming a Malaysian company in all but name.*

**Next topic:** A recent Reuter's analytical article, "Rare earths industry teeters as Australia's Lynas heads to full ramp-up" posted on InvestorIntel on July 3, 2014, struck me, in some

particulars, as misleading for investors of all sizes, and in other particulars as just plain wrong.

I was struck by two quotations, in particular, in the article:

1. ...“The pressure is on Lynas and Molycorp to demonstrate that rare earths is a viable business,” said Dudley Kingsnorth, a rare earths expert at Curtin University in WesternAustralia, whose forecasts are widely used in the industry...”
2. *And* – A sub-headline of the Reuters’article that reads “[Lynas CEO] Says project profitable even at current depressed prices”

This “projection” of profitability s only mentioned again in the body of the article as follows: “...But more than two years later it [Lynas] has yet to hit stage 1 capacity of 11,000 tonnes a year, racked by opposition to the project on environmental grounds and by technical problems. Once it reaches that rate, Lynas will be cash flow positive, CEO Amanda Lacaze, who took the role in June, said on Wednesday...”

Let’s first look at Mr Kingsnorth’s statement.

I would say that:

In fact the pressure is on both Lynas and Molycorp, which are two different companies with two different deposits and two different business models, to demonstrate that either their own particular or, in fact, any business model that projects a competitive edge in the production and further downstream processing of the light rare earths against the existing Chinese producers in the Bayanobo region of Inner Mongolia can, in fact, be profitable under current conditions of price, existing supply and current and future demand.

Note that I am not saying that the Chinese projects have to be profitable but that, to survive, any non-Chinese light rare earth based project MUST be profitable while selling its own

products at or below the delivered cost of Chinese products in whatever market they are being offered for sale. In short, prices are set by the producers of the majority of the products, who are today the Chinese. We assume that we know Chinese costs but in fact we only know their selling prices. We therefore MUST target their selling prices.

As I said here on InvestorIntel earlier this year ([click here](#)) I believe that both Lynas and Molycorp are too big and in the case of Molycorp, too congested by non-core, irrelevant, inefficient, or non-performing "assets" for either company to achieve competitive advantage over the existing Chinese producers unless security of supply is taken into consideration and heavily capitalized by long term customers. Now as to the statement attributed to Ms. Lacaze, the new CEO, of Lynas, it does not follow, logically, from the statement printed in the article that a positive cash flow equals profitability in the sense of ongoing profitability, or more importantly that such positive cash flow would be or could be sufficient to cover existing debts, working capital, or retained earnings in the foreseeable future picture of rare earth prices and demand.

The attempted (so far) revival of the rare earth industry outside of China got its impetus in 2007 when Chevron divested itself of the moribund Molycorp that it had acquired in 2004 when it bought Unocal.

Molycorp's new owners were financial managers with one exception, Traxys, which is a large resources trading company. I believe that they, the new owners of Molycorp, chose to promote the story that military demand for the rare earths was critical, large, and growing. They may even have believed it. It turns out that this story is not true. The US Military, which by itself, accounts for at least one-half of the world's military budget and is the most technologically advanced military in history has published figures showing that it uses about 150 tons a year of neodymium iron boron rare earth

permanent magnets all of which are modified by dysprosium. By contrast, just the US OEM automotive industry uses 7,500 tons per year of that type of rare earth permanent magnet.

The fact is that today the world supply of the light rare earths that are the only products of the mining operations of both Molycorp and Lynas is in surplus. The Chinese company, Baotou, has said publicly that by itself it could supply the entire global demand for light rare earths indefinitely. Of course it would ONLY continue to be able to do so if it remains the lowest cost producer and if the Chinese government allows export volumes to be determined by market forces.

If China adheres to the recent WTO decision then Baotou's cost structure at the moment, as reflected in its pricing, will allow it to continue to dominate the global market. Note that In the last reporting year even though prices for the rare earths fell dramatically from their previous year's levels Baotou still made a small profit.

In fact though it has become obvious that the future geography of the global rare earth supply chain will depend on deposits that can produce mid-range (SEGs) and heavy rare earths (HREEs).

[SEG is shorthand for Samarium, Europium and Gadolinium – the mid-range rare earths all of which have product uses: magnets, phosphors, and medicine.]

I am going to predict that those non-Chinese deposits being  developed to produce the most SEGs and HREEs, as a percentage of their total production, have the best chance of also becoming profitable producers of LREEs.

Almost all of the HREE developments can or would produce some LREEs. The critical nature of the HREEs, even in the Chinese domestic markets, makes it likely that SEG/HREE producers will also be able to sell their LREEs to their customers using the time-honored Chinese developed sales method of "if you want

dysprosium you must also take neodymium. If you want a better deal or an assured supply then you must take lanthanum as well."

Molycorp's original business model took no account of HREEs; this flaw has dogged the company all along. Acquiring (or as seems more and more likely being acquired by) Neo materials gave Molycorp some Chinese HREE processing capability but no HREE new material sourcing capability whatsoever. For whatever reason this flaw has not, even now, been fixed although it could have been easily fixed many times. It is probably now too late, financially, for such a fix to rally the market.

Lynas is in a similar predicament. The company has, however, among its Mt Weld properties significant HREE bearing deposits. Even the Mt Weld material contains 5% of SEG/HREEs. At 11,000 tons per annum the output of the LAMP would include 550 tons per year of SEG/HREEs. Neither Molycorp nor Lynas has any non-Chinese capacity for downstream processing of SEG/HREEs. But only Lynas would immediately have any to process in any case.

Therefore I predict that end-users looking for non-Chinese materials will focus on the total output of the right sized producers now in late development. I think that North American domestic demand for ALL rare earths will be filled by the operations of one of or all of Rare Element Resources, Texas Rare Earths, and Ucore. A successor-in-interest to today's Molycorp may well produce some light rare earths from its dedicated mining operation if the separation facility at Mountain Pass can be stripped of its global overheads and accumulated debt. The facility there would be an ideal location for tolling without those global overheads. It would of course have to be upgraded to be able to process HREEs.

I think the LAMP, shorn of debt and global overheads, would also be ideal as a central LREE tolling operation, but it would, as would Molycorp, by the way, have to add a

hydrometallurgical engineering group to adjust the plant's operations for different feed stock compositions. Ideally a Malaysian group might take over the LAMP or partner with existing management and build a SEG/HREE downstream processing facility on the property. In fact a total rare earth supply chain could be constructed on the basis of the LAMP to serve all of non-Chinese (Austral) Asia with hydrometallurgy, separation, metal and alloy making, and magnet and specialty alloy and chemical production. Australian HREE juniors such as Northern Minerals might and should look towards a Malaysian central processing facility I will go out on a limb and predict that one or the other of the above scenarios will come to pass. Perhaps even both.

I don't want to leave out Europe, so let me say that it is possible that Solvay might turn La Rochelle into a central processing operation anchored upon the production from Tasman in Sweden and from AMR in Turkey. It is more likely today than in the recent past that a third party will set up a central European processing (tolling) operation using not only Tasman and AMR feed stocks but also some from Russia or Central Asia. The common problem for all toll refiners is "normalizing the feedstocks." This is not a trivial problem, but it is not insurmountable. It does, of course add cost. Lastly, my Canadian friends (and relatives) might wake from their slumber and promote the creation of a central Canadian tolling facility for the rare earths. This would completely change the dynamics of costing most of the Canadian located rare earth junior mining ventures.

Did I mention that both Africa and South America can produce the lowest cost LREE ore concentrates, and, in at least two instances already do so as a consequence of existing very profitable operations?

There's a whole lot going on in the non-Chinese rare earth sector that has nothing to do with the mining operations at Mountain Pass or Mt Weld.

I think that the non-Chinese world is on the cusp of putting into place the right ideas to process the right amounts of rare earths from right-sized and right-proportioned rare earth deposits. I won't be too surprised if Chinese investors make the first credible overtures to achieve this goal. I will be surprised if non-Chinese governments make such investments easy.

Please, *please stop thinking* that either Molycorp or Lynas have the "right" model and that the entire rare earth industry outside of China will rise or fall with their survival or lack of it. In fact both companies are stuck in a rut. The rare earth business model has not been static.

**Disclaimer & Note from the Publisher:** In addition to our Disclaimer that is easily accessed underneath all of our articles, we have had all of our writers edit and update their bios listed underneath all of their InvestorIntel articles to disclose any Directorial roles or consultancy agreements with any public companies. For further questions or inquiries, please send to [info@investorintel.com](mailto:info@investorintel.com).

For instance, Jack Lifton is currently a non-executive Director for Texas Rare Earth Resources Corp. (OTCQX: TRER) and AMR, a private Turkish mining venture. He is a paid business operations/marketing consultant to Rare Element Resources (TSX: RES | NYSE MKT: REE), Ucore Rare Metals (TSXV: UCU | OTCQX: UURAF), Tasman Rare Metals (TSXV: TSM | NYSE MKT: TAS), and NovX21 (TSXV: NOV). He is also the founding co-principal of Technology Metals Research, LLC. His consulting is done through Jack Lifton, LLC, a consultancy he began in 1999 upon his retirement as the CEO of an OEM automotive supply company specializing in process chemistry and metals trading.

Jack Lifton, LLC is a member of the Minor Metals Trade Association ([www.mmta.co.uk](http://www.mmta.co.uk)) and Jack is an advisor to the Malaysian Academy of Science in Kuala Lumpur, and he is a



member of that Academy's Rare Earth Task Force.