

CRITICAL

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STRATEGIC METALS

Your monthly guide to the latest information on the world's strategic metals

Rare Earths Fall

The Market Vectors Rare Earth/Strategic Metals ETF (NYSEArca:REMX) has been one of the worst performers among all the exchange traded funds (ETFs) over the last six months. It fell by almost 33% over this period. With China's tight restrictions on rare earth exports only getting tighter, prices had initially spiked upwards. However, many industries strategized to get out of that position by reducing their use of rare earth metals. And that triggered a downward spiral, both in terms of price and the ETF that tracks companies that mine rare earths.

Magnetic rare earth metals are used in the electronics industry and global prices of these metals have fallen by almost 33% since August this year. Prices of light rare earths have fallen by almost 66% over the same period.

In a news report, Chief Executive and President Mark Smith of Molycorp was quoted to have said, "We all learned a hard lesson in July and August, how high these prices can go before customers begin yelling."

Large corporations in Europe, Japan and the United States, that use rare earth metals in their manufacturing processes, are adopting different measures to manage their position better. They are lowering their inventories, moving to set up shop in China, lowering production or replacing rare earth metals with other metals. The consequent fall in demand for rare earths in non-Chinese markets brought on another fall in prices as speculators started selling.

To generate support for their projects, certain rare earth companies have begun highlighting the importance of heavy rare earth elements (HREE), which have a smaller market share but are more valuable. For example, HREE dysprosium is generally used together with the lighter neodymium in the powerful magnets critical for the functioning of wind turbines, electric motors, stabilizers of nuclear reactors and in hard disk drives. Price wise, dysprosium oxide (FOB) is selling at \$2,000–2,020 per kilogram while neodymium oxide is selling at about \$108 per kilogram. Similarly europium oxide, which is used in certain military applications, is selling at \$3,780–3,800 per

kilogram. Other valuable HREE are ytterbium, terbium and erbium selling at similarly high prices.

Last month we reported that China's Inner Mongolia Baotou Steel Rare-Earth (Group) Hi-Tech had halted production to push prices upwards and Baotou's move has been followed by other Chinese companies. China Minmetals and Ganzhou Rare Earth Mineral Industry Co. are two others although the latter has quoted maintenance reasons for ceasing production.

China has been actively trying to regulate its domestic rare earth industry and to clamp down on small and illegal producers. There have been moves by several companies to consolidate their businesses. Another move announced by the Chinese Ministry is to implement a system of invoices under which only companies with permits can operate in the market. Such a system might drive smaller businesses without permits to sell off their stockpiles and that would lead once again to declining prices. End users could stall their buying decisions and that could cause a further fall in prices. Of course what will actually happen would be obvious only after the invoicing system is implemented on a large scale. The industry opinion until then is that prices of rare earths will further fall. End users are likely to wait and watch.

Chief Executive Constantine Karayannopoulos of Neo Material Technologies said that because of the lower demand, Chinese exporters will be shipping only 20,000–25,000 tons of rare earths this year. Companies that have not utilized their full quota for this year will pay a price, as the Chinese Commerce Ministry has already lowered their quotas for next year. That would mean another supply shortage in the global rare earth market. According to Dudley Kingsnorth from rare earths consulting firm IMCOA, the non-Chinese demand for rare earths next year would be about 40,000 tons, a drop of 18,000 tons from his earlier forecast of 58,000 tons. Kingsnorth also believes that in 2015, the figure would drop to 50,000 tons from his earlier forecast of 74,000 tons.

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Rare Earth Prices Pushing Adoption of Alternatives

The sharp fall in rare earth prices is partly because large manufacturing companies in Europe, Japan and the United States, that use rare earth metals are turning to alternate materials and lowering the demand for rare earths. The trend has been most largely seen in the automobile industry. For example, Continental AG, a German Parts supplier, has invented an electric motor that operates without permanent magnets. Rare earth metal neodymium is commonly used to manufacture these magnets. Auto company Renault has already begun deploying the new motor in two of its electric vehicles.

Günter Fella, head of purchasing in Continental automotive division said, "We are trying to reduce the effect of [rare earth] cost increases by optimizing our processes and using alternative materials. But it's essential that the industry finds a commercially sensible arrangement involving the entire supply chain."

Another company that has eliminated the need for neodymium-based magnets is Germany's wind turbine manufacturer Enercon, which has started using an electrical system to generate the magnetic field required by its generators.

Last year, General Electric announced the development of a 'super alloy' that could replace rare earth metals. However, there is still a long way to go. Frank Johnson, a

materials scientist with GE said, "We're exploring several different hard and soft materials but haven't selected a special chemistry yet."

The trend to try and replace rare earth metals is not surprising considering the fact that the cost of neodymium has increased by 10 times over the last two years. The cost of the rare earth dysprosium, also used during the manufacture of magnets for electric vehicles, has gone up nearly 20 times in the last one year.

Meanwhile researchers at the DOE's Ames Laboratory in Iowa are working on replacing rare earth elements in magnets with electrolytic manganese. Larry Reaugh, CEO of American Manganese Inc. said, "The rare earth squeeze has made companies go full bore looking for alternatives, and manganese has been found to be one of the more diversified metals out there as an alternative. Researchers are looking to manganese to replace rare earths in magnets, which may even be stronger."

Ames Laboratory reported that such technologies "hold the potential to double the magnetic strength relative to current magnets while using raw materials that are inexpensive and abundant." The success of such a technology bodes well both for the manganese market and the rare earth market.

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Low Rare Earth Prices: Stockpile or Wait?

US Representative Michael Coffman of Colorado recently said that the US is far too dependent on rare earth metals imported from China. He called China an "unreliable trading partner" and announced his support for the creation of a strategic rare earth reserve. He has also made known his support for the creation of a rare earths inventory, primarily for security purposes.

According to analysts, the proposal to build a strategic rare earth reserve is likely to receive the green light soon now that China's Inner Mongolia Baotou Steel Rare-Earth has announced a month-long halt in production. The supply shortage will drive demand and would in fact, give the US rare earth industry a much-needed push.

CEO Donald Ranta of Colorado based Rare Element Resources has a slightly different opinion. He believes that creating a stockpile now would only worsen the shortage outside China. He believes that the US should wait for a few years until Colorado's Molycorp and Australia's Lynas have become successful producers of rare earth metals.

Molycorp's annual production capacity is expected to touch 40,000 metric tons by late 2013. The creation of a US

stockpile would enable Molycorp to operate at full capacity and avoid fears of falling demand. Rare earth prices are likely to receive a boost as well.

In other parts of the world, the Planning Commission of India has announced a proposal to set up a nodal agency that would source rare earths and strategic metals and increase exploration activities. India's proposal is also in response to China's domination of the rare earth market.

China is soon expected to announce its 2012 production and export quota for rare earths and analysts are of the opinion that the numbers will either remain the same or go down further. Recent news reports have forecast that China's export quota would be a maximum of 30,000 tons since 2011 supplies have not been completely consumed and demand is sluggish.

Rare earth prices have declined by about 27% from their highest values this year. Because of the falling prices, Molycorp CEO Mark Smith said that new rare earth mine developers are likely to face problems while funding new operations. He said, "The pricing environment today really is not going to help them utilize sales contracts as collateral for financing purposes."

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