

STRATEGIC METALS

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

Rare Earths Tax Pushes Prices Even Higher

In December 2010, China's Ministry of Finance and State Administration for Taxation announced a new tax on rare earth minerals that would be effective from April 1, 2011. The tax rates depend on the type of rare earth mined – \$4.54 (30 yuan) per ton for light rare earths and \$9.15 (60 yuan) per ton for medium and heavy rare earth metals. Besides the financial implications, the new tax rates have drawn attention to the fact that China has – for the first time – differentiated between light, medium and heavy rare earth minerals.

China's export quota as it stands now makes no difference between the different types of rare earth metals. As a result, sellers prefer to supply the higher priced heavier rare earth metals. In fact, the lighter lanthanum and neodymium are sometimes unavailable in spite of being more abundant and in higher demand, while the scarcer heavies such as terbium and dysprosium are easily available. Analysts say that the new tax implies that China no longer plans to look at rare earths as a single group and its future export quotas might reflect the different demand profiles of each group.

The new tax is also seen as a move to discourage Chinese exporters and to enhance the earnings from its monopoly in the industry. China would like to attract more manufacturers using rare earth to the country to boost its employment scenario and to promote technology transfer.

China's export quota policy has forced a dramatic increase in prices since July last year. Prices reached a peak in February 2011. And prices continue to rise. The volume of trade out of China however, has been low. According to Zhang Zhong, general manager of the Baotou Steel Rare-Earth Hi-Tech Co, prices in February sometimes increased by almost 10,000 yuan per ton per day. Further, global importers of the metals are importing such large shipments that half the quota announced for 2011 had already been shipped out by February.

The new tax may also indicate that China plans to strengthen its strategic rare earth reserves. Yang Wanxi, director of a rare earth expert panel within the Baotou Municipal Committee of Sciences has reportedly suggested that revenues from the new tax could be used to finance the reserve building plan. Non-Chinese governments are naturally concerned that higher reserves will give China an opportunity to influence global rare earth prices even more.

China claims that its export quotas are necessary to protect the environment. Since the new tax will be paid by Chinese miners, China may actually be able to show that it is serious about environment protection. China's Ministry of Environmental Protection announced last month that stricter emission rules would be effective from October 2011. It is important to remember that according to WTO rules, quotas are acceptable if they will help protect the environment, though the efforts must be applied globally.

Ever since the new tax was announced, prices of rare earth metals and share prices of associated companies have almost doubled. Share prices of companies such as Baotou Steel Rare-Earth Hi-Tech Company, Rising Nonferrous Metals Share Company, Limited and Gengsheng Minerals Corp rose by 2–15%. Speculators reportedly bought all the material in the market, irrespective of the price. Speculative funds expecting huge returns are believed to have targeted the rare earth industry. The sudden influx of money caused a supply shortage, which pushed up prices even higher.

China's actions have benefited certain rare earth companies outside the country too. Share prices of companies such as Arafura Resources Limited (Australia), Lynas Corporation (Australia), Molycorp Incorporated (USA), Neo Material Technologies Inc (Canada), and Rare Earth Element Resources Limited (Canada) has seen an upward jump.

Molycorp is now trading at around \$75 per share, a jump of almost five times from its initial launch price of \$13.25 in July 2010. The company made its second acquisition in April – it acquired Santoku America (Tolleson, Arizona) from Japan's Santoku Corporation for \$17.5 million. Earlier, Molycorp had announced that it would acquire a 90% stake in Estonia's AS Silmet for \$89 million. Silmet operates one of the two facilities in Europe that does not depend on China for raw materials. Molycorp will transport the raw materials from its US-based Mountain Pass mine when it begins operations and enable Silmet to operate at higher capacities.

With these acquisitions, Molycorp plans to expand its manufacturing abilities and its rare earth product line. The acquisitions will take Molycorp one step closer to realizing its strategy of vertical integration in the rare earth supply chain.

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The *Other* US Rare Earth Deposits

Many junior rare earth mining companies of the US have labeled themselves as heavy rare earth element companies based on their HREE/TREO (heavy rare earth elements) / (total rare earth oxide) percentages. However, the CEO of Molycorp has pointed out that the company's Mountain Pass mine has a very high TREO in comparison to that of the juniors and the ratio does not consider the total amount of rare earth elements in a deposit.

For example, in the first NI 43-101 document for the Bokan-Dotson Ridge deposit, Alaska's Ucore Rare Metals Inc. has listed a HREE/TREO ratio of 39%. In spite of that impressive number, the actual breakup shows that the deposit has about 27,370 tonnes of TREO and 10,565 tonnes of HREO.

In comparison, when Molycorp begins production in late 2013, it will have a production capacity of 40,000 tonnes per year. Yet Molycorp's Mountain Pass mine has a HREE/TREO ratio of only 1%. This shows that when evaluating junior rare earth companies, it is important to take into account the HREO in the context of the ore body size.

Another reason for Ucore's low visibility is the fact that it is listed in the Toronto stock exchange while most US investors prefer to invest in companies listed in the US. Ucore's stock is below institutional grade and recently traded at 95 cents.

The publicly traded Rare Element Resources Ltd. (REE) owns the Bear Lodge property in Wyoming. The property reportedly contains one of the largest disseminated rare earth deposits in the country. The latest NI 43-101 compliant inferred mineral resource estimate report the existence of two rare earth element deposits containing 17.5 million tons and 4.4 million tons of rare earth oxides (3.46%) respectively. In spite of the large numbers, analysts do not consider Molycorp and REE to

be in the same league. Comparing mill recovery rates, REE's estimated production has been calculated at 8,500 metric tons per year instead of the original estimate of 10,400 metric tons per year. Further, even the aggressive start date of 2015 is a few years behind that of Molycorp.



Canada based Quantum Rare Earth Developments Corp owns the Elk Creek Property in Nebraska. The property has the potential to become one of the world's largest resources of Niobium and rare earth elements. Analysis has revealed that the deposit contains a huge 83 million tons of 0.62% Niobium oxide. The site was originally explored by Molycorp in the 1970s and 1980s but was shelved because it did not seem promising.

Texas Rare Earth Resources Corp is developing its Round Top Mountain project that involves rare earth-beryllium-uranium, and niobium, tantalum and gallium. The deposit is believed to contain more than 1 billion metric tons of rhyolite, which contains low grade rare earth elements. Geological conditions indicate the possibility of high grade deposits of rare earth elements as well.

Missouri based Wings Enterprises Inc. and Glencore International AG plan to jointly develop the Pea Ridge iron ore and rare earth mine. The mine is the only heavy rare earth mine that has been permitted to operate in the US.

The Lemhi Pass deposit on the Idaho-Montana border contains the largest known quantity of thorium and rare earth elements in the US. The deposit has been explored and is reported to have a measured proven reserve of about 16,425 tons of ore containing 153 tons of rare earth oxide and an additional inferred reserve of 332,329 tons of ore containing 1,080 tons of rare earth oxide.

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Manganese: A Powerful Green Ingredient

Manganese has traditionally been essential to the steel making industry. New research shows that the element's future lies in battery technology. The metal has the potential to change the mobile electronics and automotive industry. It could also be a catalyst to generating clean energy.

Manganese when added to lithium-ion batteries significantly increases the battery recharge rates and energy density. These could lower production costs and increase the economic viability of electric cars and many other technologies. The new Chevy Volt is an example. It uses a version of a lithium-ion manganese rich battery.

Researchers at the University of Illinois are working on manganese-using batteries that can recharge in minutes instead of hours. For example, researchers have created a battery that could be 90% recharged in just two minutes. Short term costs are naturally expected to be high but replacing cobalt with manganese is expected to bring down costs. The mobile electronics market and energy storage market that uses lithium-ion batteries could take advantage of this promising technology and reap massive benefits in the long term. These batteries will have a longer shelf life as well.

President Obama has announced that at least 1 million electric vehicles will be sold in the US by 2015. China has a similar expectation of selling 1 million vehicles by 2020. The proposals

cannot succeed until new battery technology is developed and commercialized.

A green energy technology that holds promise is a battery system that could harness power from freshwater and salt water. The process involves filling a battery with fresh water and charging it with a small amount of electricity. The fresh water is then replaced by salt water and since it contains 60 to 100 times the amount of ions, the battery generates electricity.

Experiments have demonstrated an efficiency of about 74% while scientists think that can be increased to 85% with certain modifications. To increase efficiency, nanorods of manganese dioxide are used to make the positive electrode of the battery. Manganese dioxide is environmentally benign which is partly why it was selected for the

electrode. At current development levels, a plant could generate 100 MW of power using 50 cubic meters of water per second. Efforts are on to study the possibility of using sewage or grey water as a power source.

Mining consultant Ken Reser expects the price of electrolytic manganese to rise because of new technologies generating higher demand. Besides China is going to run out of ore in the near future leading to high demand and high prices. The prospects for manganese are promising in both the traditional steel industry as well as in the growing technology markets.

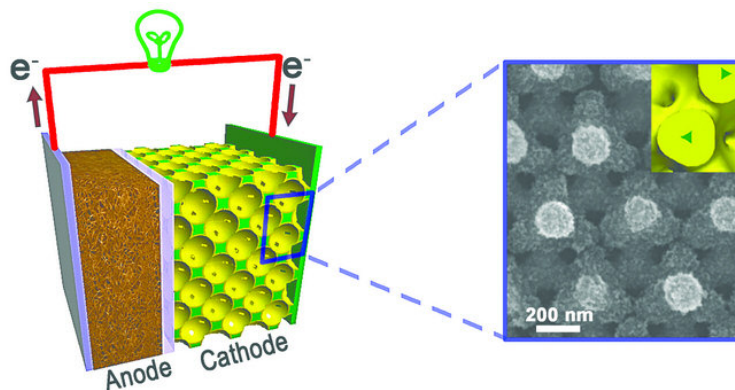


Diagram of a lithium-ion battery constructed using a nanostructured bicontinuous cathode. Right: scanning electron microscope image of the nanostructure, a three-dimensional metal foam current collector coated with a thin layer of active material. Image courtesy of Paul Braun, University of Illinois.

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