

# China's Rare Earths Game Plan: Part 2 - The Issue of Pricing

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*Gareth Hatch*

# China's Rare Earths Game Plan: Part 2 - The Issue Of Pricing

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## Introduction

As reported in Part 1 of this series on "China's Rare Earth Game Plan", the first week of July 2010 saw an announcement from the authorities in China of a significant reduction in the total amount of rare earths that may be exported from China in the latter half of 2010.

In addition to that reduction, the authorities also announced that rare earth prices would be set and published by the central government on a monthly basis, through some form of unified pricing structure. There was also mention of a plan to eventually consolidate the numerous rare earth production companies in China, into 3-5 large conglomerates over a period of time, as well as discussion about a resource tax to funnel funds from the richer provinces to the poorer ones.

## Rare Earth Pricing

It has been widely reported that the Chinese authorities plan to implement a "fully unified pricing mechanism" [per the China Daily] in order to control the price of rare earths throughout the country. This change could apparently be implemented as early as this month, ostensibly an attempt to prevent "cut-throat competition" between material producers. On closer inspection, the proposed mechanism seems to apply only to the Fujian, Guangdong, Hunan and Jiangxi provinces, and the Guangxi autonomous region, at this time. These five jurisdictions are adjacent to one another in the southeast of China, an area whose elution-deposited / ion-absorbed clays are rich in the heavy rare earth elements. Inner Mongolia and other northern jurisdictions, which predominantly produce light rare earths, do not appear to be covered by the announcement. It would thus appear that the change is an attempt by the authorities to specifically control the prices of the more valuable heavy rare earths.

Some would argue that China is already well in control of rare earth pricing. Compared to news of the quota reductions, "I am less concerned with the

Chinese openly stating that they will set pricing," said **Jon Hykawy, a clean technologies and materials analyst with Byron Capital Markets**. "The fact of the matter is that world production of rare earths in 2009 was probably less than 100,000 tonnes of oxide," he said, "but well under 10,000 tonnes of that amount came from countries other than China. With that market share, Chinese firms already control price."

Are the Chinese looking to actively manipulate the price of rare earths? Dr. Hykawy doesn't think so. "To assume that 'the Chinese', in some unified conspiracy, are working to throttle back rare earth supply and raise prices would be incorrect, in our view," he said. "There are certainly some Chinese rare earth companies that recognize they will get the best pricing for material outside China, and would love to use their expertise to help establish operations outside China. This would allow these Chinese companies to more directly reap the benefit of worldwide demand." said Dr. Hykawy. "We are already seeing direct evidence of a price discrepancy between the domestic Chinese and Asian market for rare earths, for example."

**Jack Lifton, my colleague and co-founder of Technology Metals Research, LLC**, has also seen such price discrepancies. "As I have said before, a two-tiered pricing system - a China domestic price and a world price - has been a preferred solution in China up until now, to preserve jobs not only in the mining industry but in the value chain above it." he said. "The problem for China is that it now actually seems to want to participate in the WTO, which doesn't allow such a system." **Dudley Kingsnorth, Executive Director of IMCOA**, agrees. "At the same time as the reduction in quotas, it appears that China is attempting to exercise some control over rare earth prices in some provinces in the South of China." he said. "This could be contrary to WTO rules, which I believe to be a significant development. However, if there is adverse reaction, worldwide, the mechanism may be withdrawn or watered down to some form of guidance."

**Industry lobbyist Jeff Green, of J A Green and Company**, noted that recent rumors regarding a WTO action on rare earths appear to be false. "The USTR plans to complete a materials case already underway before turning to the rare earth issue," he said. He noted, however, that this unexpected and dramatic reduction in export quotas may result in them taking another look at the issue.

**John Kaiser, editor and publisher of Kaiser Bottom-Fish Online**, sees growing parallels between the rare earth industry in China, and the recent historical developments in the diamond industry. "China's announcement that it intends to set rare earth oxide and metal prices on a monthly basis," he said, "appears to be a step in the direction of establishing a cartel similar to the Central Selling Organization (CSO) operated by De Beers as a supply management system, before it lost control of the diamond market during the nineties. The CSO was effective," said Mr. Kaiser, "because producers were forced to sell to a single buyer which monitored demand and sold rough diamonds to an elite group of 'sightholders'."

Mr Kaiser noted that there are similarities between the "value-add" segments of the supply chains of both the rare earth and diamond industries. There are of course some key differences. "Diamonds are a luxury good that exist as an end-product, whereas rare earths provide functionality as an incremental input to end-products whose form bears no relationship to the inputs," said Mr Kaiser. "In addition, while diamond demand is largely a short term function of marketing and the business cycle, rare earth demand has a long term dimension, in that commercialization plans for products that require rare earth inputs have a long lead time. This constitutes a serious execution vulnerability, if 'just-in-time' procurement strategies are relied upon for critical inputs."

What would be the consequences of such a cartel? "It would be a disaster," said Mr. Kaiser, "reminiscent of the failed communist central planning systems which could never get demand and supply to match outside a free market price discovery system." There would also be significant logistical issues, too. "For a monthly rare earth price fix to be meaningful, China would need to force all suppliers to deliver to a central warehouse, from which the operator would allocate supply to the next stages in the supply chain," he said.

The critical question on everyone's mind is this: will prices for rare earths, centrally fixed or otherwise, go up? Jack Lifton thinks so. "In order for the Chinese rare earth industry to be able to survive the costs of environmental remediation and restructuring," he said, "and to take into account the realities of the unstoppable rise of costs in China of labor, energy, and water, it has been decided that prices must go up even within China. This means a consolidation of the industry, and the absolute elimination of rogue, unlicensed mining, because it is this wildcard that puts unfair competition onto the legal rare earth miners, to keep their prices down to their rare earth metal producers." Mr. Lifton suggests that the Chinese need to look inwards on this. "The trouble in the pricing of Chinese rare earths, lies not in their stars, but in themselves," he said.

China appears to have some work to do, in order to properly manage this situation. "China must 'discover' what it wants the long term price for rare earths to be," said John Kaiser, "which is likely to be significantly higher than current levels. If the Chinese rare earth cartel miscalculates demand, in the absence of allowing a free market pricing system to resolve the implied shortage, the cartel will need to allocate the limited supply at its 'fixed' price. This rationing of supply when there is a supply-demand imbalance will likely serve a strategic domestic agenda.

Clearly then, there are significant implications for a unified pricing mechanism. What about in the longer term? "Within a few years, such a cartel will have become completely dysfunctional and foreign end-users will be simply out of luck," said Mr. Kaiser. "The announcement that China will be adopting a monthly price fixing policy for rare earth oxides and metals will serve as a wakeup call to foreign end-users that they need to develop and secure their own rare earth inputs outside of China."

This of course is the next question on the minds of many: in addition to the quota restrictions, what do price changes - up or down - mean for non-Chinese rare earth mining and exploration projects? "While we remain concerned about the profitability of non-Chinese rare earth mines," said John Hykawy, "assuming we arrive at a point where the Chinese remove export restrictions on some elements such as lanthanum or cerium, we are less worried than in the past. Recent work we have done suggests that any

operating rare earth company would remain profitable," he said, "if only marginally, even if prices for lanthanum and cerium went to zero. It would take serious price cuts for all light rare earth elements to drive companies out of the market. Hypothetically, if the world is awash in light rare earths we probably don't care if a few suppliers shrivel up and die."

Dudley Kingsnorth notes that the time frame for future development, is critical. "I believe that collectively, the announcements [from China] give greater impetus to the development of rare earths outside China. There are only 2 projects," he said, "that have all the necessary approvals in place to take advantage of this opportunity in the next 2-3 years. The other potential projects have a timeline of at least 5 years to production; so we are in for some interesting times."

Jack Lifton has other concerns. "The serious problem for junior rare earth ventures outside of China," he said, "centers on the value of ore concentrates - the end product of any rare earth mine. For many companies, there is likely insufficient value in the ore concentrates alone, to make stand-alone mining profitable at that stage. Even going further up the supply chain in the case of the rare earths, for example, will add more cost than benefit until a stage is reached in the value chain where the product sells for more than its total accumulated cost of production." What might that stage be? "For the rare earths this is probably the 'refined metals' stage," said Mr. Lifton, "which is a good ways down the value chain from the mine face, and the production of which has never before been attempted by a non-Chinese mining operation in a vertical integration. It is at this point that China will now report monthly prices, i.e., the producer prices."

Mr. Lifton notes that price increases alone are not the only trigger required to kick start the production of rare earths in the West. "Settling on technologies to produce the metals, and then implementing them, is already under way in Japan," he said, "and has actually been accomplished there, although I do not know at what level of volume. Toyota, having seen the problem already, has invested in the development of a mine outside of China to feed an existing value chain it has in operation at some level in Japan."

Problems associated with future pricing of rare earths will affect different parts of the supply chain

differently. "The actual value of the contained rare earths in a finished consumer product is very small." said Mr. Lifton. "Therefore, even if rare earth prices doubled tomorrow, for one of the the largest end-user segments, the makers of rare earth permanent magnets, I doubt whether any increase in the price, for example, of the magnet for the vibrator function of a 'silenced' Blackberry, would cause the seller to raise the final retail price of the finished consumer device. Competition would intervene."

The benefits of such competition would not be limited to the entities furthest downstream in the technology supply chain. "More mining outside China will increase competition and help to stabilize rare earth material pricing." said **John Ebert, US business manager for Yunsheng Hi-Tech Magnetics**. "Currently, many motor companies are hesitant to embrace the conversion of ferrite magnets to neodymium-based magnets, because of the perceived volatility of rare earth raw material prices." Mr. Ebert is upbeat though, about the future prospects for the magnet industry outside of China, and in particular the USA. "With the opening of non-Chinese mines," he said, "we should see a return of magnet production and knowledge to the USA. A handful of specialist industries in plating, powder metallurgy, machining and injection moulding will find a new niche in refining, machining and assembling magnetic materials. This will revitalize a generation of magnetics specialists."

Language included in the National Defense Authorization Act which passed the US House of Representatives in May, aims to help with that process. Amendments were successfully added which would require that efforts be made to re-establish a neodymium-based magnet supply chain in the USA, in addition to assistance for the revival of the rare earths industry in the country. Regeneration of the production of magnet materials in the US could have additional benefits. "With the growth of magnetics specialists in the USA," said Mr. Ebert, "refining and machining the finished products outside of China will become economically viable. The big tradeoff will be between faster lead times and higher quality (from producers in the USA) and lower prices (from producers in China)."

Mr. Ebert believe that even more positive changes for the US magnet industry are possible. "Chinese policymakers may just live to regret a decision that swings the magnetic manufacturing pendulum back the other way." he said. "From being a leading

magnetics manufacturer, China will likely transform into a major magnetics consumer, giving up their competitive edge to the rest of the world." Whether such optimism is justified or not, remains to be seen.

Jeff Green believes that the US government is taking a close look at the speed with which the US magnetic material production capacity could be brought online. "By focusing on obtaining raw materials on the open market now," he said, "the government is examining stockpiling necessary materials while global rare earth production comes online. Concurrently, government investment in

downstream, value-added processing is being considered as a means of more cost-effectively and quickly closing the rare earth gap from the top down."

Industry participants at all stages of the technology supply chain remain watchful for signs of significant effects from the recent announcements from China, positive or negative. As various commentators have noted, the time frame in which critical decisions and initiatives need to be executed, in order to resolve the supply and demand requirements for rare earths outside of China, has long been upon us.

## About the Author

Gareth Hatch is a Founding Principal of Technology Metals Research, LLC. He is interested in helping people to understand the challenges associated with the growing demand for rare earth elements [REEs] and other critical and strategic materials, and how those challenges affect market sectors throughout the entire technology supply chain. He is based in the suburbs of Chicago, Illinois, USA.

For several years Gareth was Director of Technology at Dexter Magnetic Technologies, where he focused on the design & application of innovative magnetic materials, devices and systems, in order to solve real engineering problems. He led a stellar team of engineers who helped customers and clients in the aerospace, defense, medical, data storage, oil & gas, renewables and industrial sectors. He holds five US patents on a variety of magnetic devices.

A two-time graduate of the University of Birmingham in the UK, Gareth has a B.Eng. (Hons) in Materials Science & Technology and a Ph.D. in Metallurgy & Materials, focused on rare earth permanent magnet materials. He is a Fellow of the Institute of Materials, Minerals & Mining, a Chartered Engineer and a Senior Member of the IEEE. Gareth is also a Chartered Scientist and a Chartered Physicist through the Institute of Physics.

Gareth is the Founding Editor of Terra Magnetica, an Editor at RareMetalBlog and is Newsletter Editor and Chicago Chapter Chair of the IEEE Magnetics Society. He is Founder of the Magnetism & Electromagnetics Interest Group and Strategic Materials Network, both at LinkedIn.com. Gareth is also an Advisor to Energy Scienomic, a non-profit organization focused on best practices and standardization of global energy production data and information.

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