A gravity-defying leap in the price of Chinese rare earth metals has triggered fears that the cost of components used in a range of goods from mobile phones to hybrid cars could soar.

The three to fivefold jump in prices since January comes after China, the world’s biggest producer of rare earths, has clamped down on domestic output.

The implications could be far-reaching. Although annual consumption of the metals is small relative to that of other commodities, rare earths are found in everything from fluorescent lights to wind turbines. They are very difficult, if not impossible, to substitute.

Industrial buyers are in shock after witnessing the price of rare earths such as cerium oxide jumping 475 per cent in just five months, amid falling supplies.

“I've never seen anything like it,” says one US-based purchaser of rare earths. “People are trying to wriggle out of using rare earths in any way they can, whether by developing new products or finding substitutes.”

Rare earths came under the spotlight after China, which produces more than 90 per cent of the world’s total output, started to reduce export quotas two years ago. Beijing’s influence aroused concern when exports of rare earths to Japan were temporarily suspended after a diplomatic dispute.

Following that de facto embargo, governments around the world, particularly Washington and Tokyo, have stepped up their efforts to develop other sources of supply. But those efforts will take years. In the meantime, Beijing has tightened regulations on its own polluting rare earths sector as part of a programme to clean up Chinese mines. Many expect China’s rare earth production to fall as a result.

As China cuts further export quotas – this year’s overseas sales licence is 4.5 per cent lower on an annualised basis than last year’s and more than 40 per cent below the 2009 quota – global demand for the metals has been growing.

Beijing has also clamped down on smuggling, which at one point accounted for about one-fifth of total sales, further squeezing the global market.

Statistics collected in Hong Kong show exports of rare earth metals have halved over the past year to reach just 1,819 tonnes last month. At the same time, the value of exports has soared to more than $121,000 per tonne, a 10-fold increase from a year ago.

Traders say that Chinese customs officials are policing exports and require that sales contracts match an internal price list, known by some as the “secret price”. They say sales of rare earths are quicker, but that offers are withdrawn more often because of rapid price moves.
Li Miaoling, general manager of China Metallurgical Import and Export Group, a Guangdong company, says: "Since the end of year, customs has been adjusting their price list every week. We’ve had to add a clause to our contract stating that if customs raises prices, we will have to adjust."

The cost of neodymium oxide, which is used in permanent magnets and wind turbines, has risen more than threefold this year, hitting Rmb850,000 per tonne, according to Antaike, the Beijing-based commodities consultancy.

Dysprosium oxide, used in lasers, has jumped 338 per cent since January to Rmb4,700 a kilogramme, an all-time record. Even prices for the most common rare earths, such as lanthanum, used in hybrid car batteries, have risen sharply.

Users have been scrambling to find alternatives. Hybrid carmakers are accelerating the development of lithium ion batteries. Toyota, for example, is developing an induction motor for electric cars that uses fewer rare earth magnets.

Chemical companies, also big consumers of rare earths, have been developing alternatives. Albemarle, the US-based chemical company, recently introduced a new line of low rare earth fuel catalysts, citing a 1,500 per cent increase in the cost of lanthanum in the last 12 months.

With China planning to reduce output, manufacturers are braced for a sustained period of high prices. In February, Premier Wen Jiabao outlined a “five-year plan” for rare earths that included increased state oversight, raising environmental standards, a crackdown on smuggling, the closure of illegal mines and consolidation of rare earth producers. A new environmental code for rare earths mines will come into effect in October and Beijing has halted issuing new licences for the mines.

“China has been rectifying the rare earth industry, taking environmental protection and other things into account,” Lin Donglu, secretary general of the Chinese Society of Rare Earths, says. “Rare earth output will definitely be reduced.”

Yin Jianhua, rare earth analyst at Antaike, says: “Over the next five years China will probably continue reducing exports.”

This shift in policy follows similar policy changes on other commodities. Beijing has launched an industry-wide “consolidation” process for coal over the last two years, which has dampened output and forced China, once an exporter, to import large amounts of coal, pushing up prices.

China has also purged illegal and environmentally damaging mining of antimony, a metal used in fireproofing goods. The crackdown on antimony has pushed the cost of the commodity to a record high.

In the face of concern from industry and from global capitals, China has insisted that it will continue to be a reliable supplier of rare earths. However, rising prices fit neatly with China’s ambition to end its role as supplier of cheap rare earths to the world. As Mr Lin of the Rare Earths Society says: "Prices of gold, oil and other commodities are all high. Why should the cost of rare earths not be high, too?"
First the good news. Manufacturers of LED light bulbs are getting better all the time at improving the bulb’s “warmth” - that glowing feeling that people get from the soft light of candles.

Regular readers of this blog know that interior designers have criticized LEDs for emitting a coldness compared to the 100+year-old incandescent bulb. Manufacturers like Philips are addressing that problem by coating their bulbs with phosphor - a process that explains the yellow color of Philips LED bulbs such as their new 75-watt model (pictured). That, in turn, should help the energy efficient LED bulb ultimately replace the electricity-hungry incandescent, which requires roughly 80% more power than its LED equivalent.

One problem: phosphor comes from rare earth minerals, and as a new report from Pike Research notes, China controls 97% of the world’s rare earth production.

“China’s new export quotas, introduced in July 2010, have seen prices for rare earths skyrocket,” the report notes.

That can’t help the industry’s acknowledged need to cut bulb prices, which range to over $40 in the U.S. and €20 in Europe - LED bulbs have a bill of material that include components that convert a home’s alternating current to direct current and that knock down the voltage. I have at least 30 light fixtures or lamps in my house in the UK (many of you will have more). If they all blew at once, I’d have to find $1200 to replace them, using American prices. That’s a capital cost in some books. The rare earth situation does not make that any better. What does soften the blow is the money I’d save on electricity over the years, and the money I’d save by possibly never having to buy light bulbs again. Remember, these things are supposed to last for anywhere from 15 to 25 years, which is, of course, unproven.

Of course the lighting industry is not the only renewable energy sector, or technology business for that matter, afflicted by the rare earth quandary. Manufacturers are using rare earths in everything from iPhones to wind turbines.

“Rare earth metals have been identified as a troubling area of potential risk for a number of prominent clean energy technologies including wind turbines, electric vehicles, fuel cells, and energy efficient lighting,” the Pike report notes.

I’ve said it before and I’ll say it again: I like the long-term prospects for LED bulbs. But unless prices decline, they have a rare chance of taking the consumer market by storm soon.
China expands export quotas of rare earth metals

19 May 2011

China has expanded export quotas for rare earth metals, further tightening its grip on the minerals used in a number of high-tech electronics.

From Friday, iron alloys containing more than 10% of rare earths will fall under the export quota, the commerce ministry said in a statement.

Rare earths are a collection of 17 chemical elements in the periodic table.

World manufacturers rely heavily on China for these minerals.

Rare earth metals are used in high tech goods such as mobile phone handsets, hybrid car batteries, wind turbines and weapons guidance systems.

China had already cut exports by about 35% in the first half of 2011 driving up prices to record levels. It produces around 97% of rare earth metal supply.

The Chinese government also wants to cut off what it calls illegal exports of the valuable metals.

‘Crack down’
A directive issued on a government website said it will "resolutely crack down on illegal exports and smuggling of rare earths".

China will cap its total output of rare earth oxides at 93,800 tonnes this year - up 5% from 2010.

Some industry experts suggest illegal rare earth exports have amounted to up to 10,000 tonnes of supply last year, more than 10% of this year’s cap.

The Chinese government says that it needs to limit rare earth exports to protect the environment and Chinese industry which is producing increasingly sophisticated products.

However the move has angered countries such as Japan which depend on the imports and have seen the cost of the goods they produce rise.

Mines in the United States and Australia have been re-opened in order to increase supply outside China, whilst Canada and Brazil are also looking to increase their production.

The world’s rare earths

- Found in high concentrations in the world's crust, but difficult and costly to extract
- Used for green technology, such as battery-charged cars and wind turbines; in laptops, flat-screen TVs and mobile phones; for lasers; and for medical equipment, such as MRI scans
- Demand has risen dramatically over recent years
- They include: Scandium; Yttrium; Lanthanum; Cerium; Praseodymium; Neodymium; Promethium; Samarium; Europium; Gadolinium; Terbium; Dysprosium; Holmium; Erbium; Thulium; Ytterbium; Lutetium
May 6, 2011

By DAVID FICKLING

SYDNEY—Demand for rare earth elements that has driven up prices more than tenfold since 2009 is likely to be met by a surplus of supply by 2013, as Western companies start up new mines to compete with the Chinese firms that now dominate the market, Goldman Sachs analysts predicted Thursday.

The forecast calls into question the sustainability of the current boom in rare earths, a suite of 17 elements used in products from high-powered magnets, and fuel refining to energy-efficient light bulbs and mobile phone screens, as well as the shares of companies seeking to produce them.

Prices of rare earths hovered between $5 a kilogram and $20 a kilo from the early 1990s until 2010. But a 40% cut in export quotas by China, which accounts for 90% of global rare earth production, sent prices soaring. The basket price of rare earths held in Lynas Corp. Ltd.’s Mount Weld deposit in western Australia—the largest non-Chinese mine, due to come to production in the next few years—has jumped to an average of $162.66 kilos from just $10.32 kilos in 2009.

Goldman’s view differs from that of miners. In a presentation last month, Lynas forecast that global demand for rare earths, which include neodymium, cerium and lanthanum, will outstrip supply by 35,000 tons this year and in 2012. Annual supply shortfalls of around 20,000 tons are expected in 2013 and 2014, it added. It predicted long-term prices in the $120/kg-to-$180/kg range.

Lynas Chief Executive Nicholas Curtis says China is on the verge of becoming a net importer of the elements, a transformation that would be similar to those that drove major shifts in global markets for coal in 2009 and oil in the mid-1990s, and could accentuate the current price spike.

"China will become a net importer because its consumption for its own domestic value-added industry is going to drive very high [demand] growth for these resources. They've explored every inch of China for what's available and if they had more rare earths deposits of any size, it would be being developed now," he said in a recent interview.

Lynas shares have risen fourfold since China announced the quota cuts in July 2010.

Goldman Sachs analyst Malcolm Southwood, however, said the price boom is nearing its peak. The supply deficit will peak at 18,734 tons this year, equivalent to 13.2% of a forecast 141,524 tons of demand, before the market slips into a slight surplus in 2013, he said in the report published Thursday. The surplus will rise to 5,860 tons or 3.2% of projected demand in the following year, the report said.

Initially, at least, prices will likely continue to rise, he said. The basket price for the Mount Weld rare earths should climb to $227 a kilogram next year, a gain of about 40%. Prices may eventually moderate to an average of $82 a kilogram, but that will happen only in 2015, the third consecutive year of a global surplus, the report said.

"We envisage a closely balanced market in 2013, and modest surpluses thereafter—at least, for some of the more abundant light rare earths—with some price softening in the 2013-2015 period," according to the report.
Goldman's view matches the outlook of many other market participants who believe the current boom is overdone. "For [the rare earths such as] cerium and lanthanum, there will certainly be some surplus," said a major European rare earths trader, who didn't want to be named because of the sensitivity of trading relationships.

"When you have these high prices, people immediately start to look for substitutes, and it takes one to two years, but people can switch out of rare earths."

He cited the glass industry, which has replaced its consumption of cerium with selenium over the past year as prices of the rare earth rose to $135 per kilo currently from just $3.88 per kilo in 2009.

Other analysts see prices falling much closer to historic averages as new projects come onstream, particularly if continued high prices encourage the development of major deposits such as Greenland Minerals & Energy Ltd.'s Kvanefjeld site, which is more than twice the size of Mountain Pass and Mount Weld combined, but located on an isolated mountainside just south of the Arctic circle.

"Lynas has said their production costs are $10 per kilogram. If they think they can sell their material at $150 a kilogram, a markup of 15 times, I don't know customers are going to be prepared to pay for it," said Dudley Kingsnorth, executive director of Industrial Minerals Company of Australia, a rare earths analysis house.

"Once these new mines come onstream, there will be a fall in price, and if miners insist on multiples of 15-20, they're going to face more competitors. They're going to have to face a little bit of reality."

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Read more: http://online.wsj.com/article/SB10001424052748703992704576304712512256774.html#ixzz1Nx3sHL5U
Supplies Squeezed, Rare Earth Prices Surge

By KEITH BRADSHER
Published: May 2, 2011

HONG KONG — Rare earth prices are reaching rarefied heights.

World prices have doubled in the last four months for rare earths — metallic elements needed for many of the most sophisticated civilian and military technologies, whether smartphones or smart bombs.

And this year’s increases come atop price gains of as much as fourfold during 2010.

The reason is basic economics: demand continues to outstrip efforts to expand supplies and break China’s chokehold on the market.

Neodymium, a rare earth necessary for a range of products including headphones and hybrid electric cars, now fetches more than $283 a kilogram ($129 a pound) on the spot market. A year ago it sold for about $42 a kilogram ($19 a pound).

Samarium, crucial to the manufacture of missiles, has climbed to more than $146 a kilogram, up from $18.50 a year earlier.

While the price inflation is a concern to manufacturers, consumers in many cases will barely notice the soaring cost of rare earths. Even though the materials are crucial to the performance of everyday equipment like automotive catalytic converters and laptop computer display screens, rare earths typically are used only in trace quantities.

One exception is the Toyota Prius hybrid car, whose manufacture uses a kilogram of neodymium.

Toyota has been raising prices for the Prius, but has cited demand for the car and economic conditions. While acknowledging that rising prices for raw materials in general have affected the company’s overall financial results, Toyota has declined to provide a breakdown of the role of rare earths. (Production problems stemming from the Japanese earthquake and tsunami have also crimped supplies of Prius cars, which are made only in Japan.)

The high prices for rare earths reflect turmoil in the global industry that mines and refines them. China, which controls more than 95 percent of the market, has further restricted exports so as to conserve supplies for its own high-tech and green energy industries. That is despite the World Trade Organization’s ban on most export restrictions.

Meanwhile, an ambitious effort to open the world’s largest rare earth refinery in Malaysia, which had seemed certain to begin operating by this autumn, is tied up over regulatory reviews of the disposal plans for thousands of tons of low-level radioactive waste the plant
would produce annually. Public opposition to the refinery is evident in the weekly protest demonstrations now being held.

At the same time, Japanese companies are finding it harder than originally hoped to recycle rare earths from electronics and to begin rare earth mining and refining in Vietnam.

Although rare earths are crucial to the supply chains of some of the world’s biggest manufacturers, the industry that mines and refines them has long been characterized by small, entrepreneurial companies. Lately, though, soaring prices have contributed to industry consolidation.

Last month, for example, Solvay, a big Belgian chemical-industrial corporation announced that it would pay $4.8 billion to acquire Rhodia of France, a technological leader in making complex chemicals based on rare earths.

That same day, April 4, Molycorp, the only American company currently producing rare earths, said it had paid $89 million for a more than 90 percent stake in Silmet of Estonia, a much smaller company that is Rhodia’s only European rival in rare earth processing.

In Malaysia, where the giant rare earth refinery is under construction near the eastern port of Kuantan, regulators are delaying approval for an operating permit amid public concern about naturally occurring low-level radioactive contamination of the rare earth ore, which will be mined in Australia.

Raja Dato Abdul Aziz bin Raja Adnan, the director general of the Malaysian Atomic Energy Licensing Board, said the board had asked the Lynas Corporation of Australia, which is building the refinery, to provide additional documentation before accepting its application for an initial operating permit. It will take up to six months to review the application, Raja Adnan said, and Lynas will not be allowed to bring any raw material to the plant until a permit is issued.

But Nicholas Curtis, Lynas’s executive chairman, said that he believed the company could obtain the necessary approvals before September and that his company was sticking to its plan to begin feeding Australian ore into the Malaysian refinery’s kilns by the end of that month.

The Malaysian government also announced last week that it would appoint a panel of international experts to review the safety of Lynas’s plans. The company said it welcomed the move.

But Fuziah Salleh, an opposition legislator who represents downtown Kuantan and has been leading weekly protests, is mistrustful.
“The people’s concerns are that the independent panel will be formed by the government to prove that they are right,” she wrote in an e-mail message.

Toyota Tsusho, a materials purchasing unit of the Toyota Group, has separately encountered complex local regulations as it seeks to open rare earth mining and processing operations in Vietnam. The project was announced last October during a Chinese embargo on rare earth shipments to Japan. Takeshi Mutsuura, a spokesman, said that Toyota Tsusho now hoped to reach a contract in Vietnam this summer and start production in early 2013.

As recently as last autumn, there were also ambitious hopes in Japan to recycle rare earths from electronics waste. Dowa Holdings tried then to come up with ways to separate rare earths at a recycling factory in northwest Japan but found the task significantly more difficult than recycling other, more widely available precious metals. The recycling factory is now recovering 19 other metals instead, including cobalt and lithium.

All of this has left the world even more dependent on China. The Chinese government last autumn showed a willingness to use that near monopoly as a trade weapon, halting shipments to Japan from late September to mid-November, during a territorial dispute over islands in the East China Sea.

Although Beijing has officially denied that it imposed a Japanese embargo last fall, China’s own trade data released since then show that its shipments to Japan suddenly fell to zero in October for rare earth metals, and to nearly zero for rare earth oxides — which are more processed chemical compounds. At the beginning of this year China reduced its rare earth export quotas to all countries, while raising export taxes on some rare earths to 25 percent, from 15 percent previously.

Since April 1, China has also raised taxes on rare earth mining companies to the equivalent of $8 for each kilogram of refined product; rare earths were previously taxed like many other nonferrous minerals in China, at less than 50 cents a kilogram.

One of the biggest questions hanging over the rare earths industry is whether the United States, the European Union and Japan will file a World Trade Organization case against China, challenging its export quotas and duties. James Bacchus, a former chairman of the W.T.O. appeals tribunal in Geneva, said that Chinese trade data shows a virtually complete halt in shipments to Japan last autumn could be cited to buttress any W.T.O. filing by rare earth-importing countries.

China denies violating the W.T.O. ban on export restrictions, saying that it qualified for an exception to the ban for environmental protection and conservation of natural resources. But China has done little to restrict its own industries’ consumption of rare earths, usually a prerequisite for invoking an environmental defense.