

STRATEGIC METALS

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

Earthquake's Effects Felt Round The World



Radioactive fallout flows from Fukushima Daiichi nuclear power plant

Besides the massive human toll, Japan's catastrophic earthquake and tsunami has destroyed the region's civil and industrial infrastructure. Water and electricity supply have been adversely impacted forcing several businesses to slow down or stop operations completely and the chance of radiation from the nuclear reactors at the Fukushima Daiichi power station has increased people's fears.

The natural disaster has disrupted supplies to manufacturers of products as wide ranging as ships to semiconductors. CLSA analysts said, "Japan remains critical to the global tech food chain. Beyond damage to facilities, supply chain disruptions driven by road, port, power outages are key factors to watch." They estimated that Japan manufactures about 20% of the world's technology products and a disruption in supply from

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Japan would create one of the biggest threats to the global technology supply chain.

Japan is one of the largest users of rare earths and the slowdown in business has translated to a slowdown in the global demand for rare earths as well. The disaster is expected to temporarily stem the rise in rare earth prices but the long-term forecast still stands – demand will outstrip supply.

Furkhat Faizulla, marketing manager at Advanced Material Japan Corp. said, "So if 50 percent of the consumption of the world is in Japan and this 50 percent stops for a couple of weeks, or a couple of months, this will be a huge impact on the consumption side or the demand site".

Along with providing humanitarian relief, Japan's government is naturally keen to restore the power grid in the affected areas and bring the nation's economy back on track. However, until that time, Japan's rare earth processing capacity will be seriously affected since the processes are highly energy intensive. Under such circumstances, analysts expect rare earth deliveries to Japan to slow down significantly over the next few months. That would mean an increase in the market supply of rare earth metals, which could mean a short-term fall in the prices.

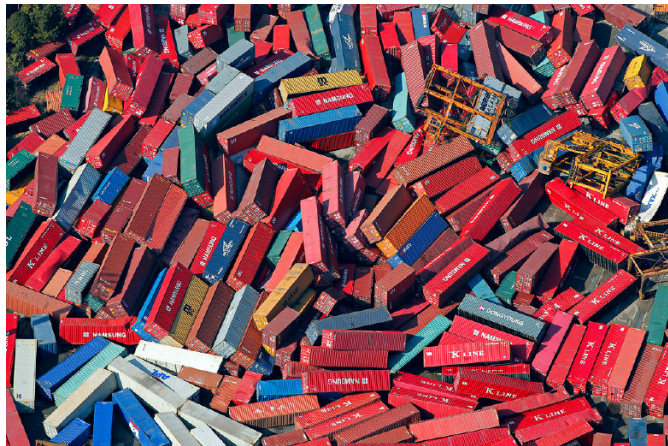
The disruption to port operations also means a delay in shipments of rare earth metals from Japan. On the other hand, the unpredictability of China's restrictive export policies is likely to make Japanese traders receive all the previously ordered materials that are delivered.

The earthquake and tsunami will also have a significant impact on the global steel market. The tsunami reportedly flooded steel plants of leading steel makers such as Nippon Steel Corporation, Sumitomo Corporation and JFE, among others. Operations had to be stopped since the scrap and raw material storage yards, and the finishing lines of many plants along the Pacific coast lay in the path of the tsunami. Nippon Steel has since resumed shipments from all but its Kaimishi plant in northern Japan.

Analyst Kim Hyun tae at Hyundai Securities said, "The earthquake has reportedly affected around 20% of the Japanese steel production capacity. It will disrupt production in Japan, one of the major steel producers exporting 40% of its output.

In contrast, steel demand will rise for damage restoration."

The inactive ports have brought Japan's coke, iron ore and scrap import shipments to a halt as well. Japan is a major importer of all three and the fall in demand is likely to result in a price drop. China's reduction in iron ore demand has already impacted prices and with a concurrent drop in Japan's demand, the prices are likely to see a further fall.



The finished steel market will see the opposite effect. Japan is a major supplier to the Far East and other South East Asian nations and with outbound shipments stopped, demand will suddenly rise. Of course, there would be no shortage of supply, as China, the CIS and South Korea would gladly fill in the gap. The move will be immediately reflected in the higher prices of long and flat products.

The failure and explosion in two of Japan's nuclear power plants has caused a 10% loss in Japan's power supply. The situation shows the risks of depending on only one source of energy, especially one that can cause so much contamination. In the wake of the crisis, Germany was the first European nation to temporarily shut down seven of its old nuclear power plants. Experts will now analyze the security features of the reactors. Switzerland and Finland are some of the other European nations that are reassessing their nuclear safety and rethinking their nuclear power policies.

The secondary effect of the nuclear strategizing is that more traders are focusing on renewable energy sources, especially solar power. In fact, Germany's Solarworld AG saw a 30% jump in its stock after the government announced its nuclear power plans. Nuclear energy currently contributes 23% of Germany's total energy supply and renewable energy about 16%. By 2020, renewable energy is expected to meet 47% of Germany's energy demand.

Japan's unfolding nuclear incident has already cast doubts about the nuclear power strategy of the US. Even before the incident, investors have been wary about committing money to nuclear projects and with Japan's current situation, enthusiasm is sure to dip even further. While some are arguing that Japan's Fukushima Daiichi power station is over 40 years old, others are of the opinion that the public is unlikely to be convinced about the invincibility of new nuclear power projects.

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Waking Up Washington to Critical Metals

On March 11, 2011, The Environmental and Energy Study Institute (EESI) held a congressional briefing on critical metals, which includes strategic metals and rare earth elements (REEs). The briefing – entitled “Securing America’s Supply of Critical Materials and Rare Earth Elements: Implications for Renewable Energy” – focused on the global supply of critical materials, developments in China, and how US policy could be framed such that the nation’s expertise in the occurrence, detection, extraction, processing, and recycling of these commodities could be strengthened.

Speakers at the event included Mark Johnson of the U.S. Department of Energy (DOE), Kate Johnson of the U.S. Geological Survey (USGS) Mineral Resources Program, Dudley Kingsnorth of the Industrial Minerals Company of Australia (IMCOA), and Andy Davis of Molycorp Minerals.

Speakers at the event pointed out that REEs occur quite abundantly on the earth’s crust and are not as rare as their name implies. They touched upon the importance of the 17 REEs in advanced technological applications such as airplanes, batteries, electric and hybrid vehicles, cell phones, computers, electronics, lighting systems, renewable energy systems and weapons systems – all of which are important for the nation’s economy and security. The materials are especially important in technologies that require magnets. They added that while some of the elements are essential for current applications, others are likely to be used in future technologies.

REEs help in enhancing efficiency and performance of several technologies besides making it possible to manufacture applications in very small sizes. All the REEs have different significance to clean energy technologies. Dysprosium, neodymium, terbium, europium and yttrium are the REEs of primary interest. Lithium is a non-REE critical material used for batteries and other applications.

China contributes over 97% of the global REE supply and

consumes over 60% of it. However, China’s restrictive and unpredictable rare earth export policies have forced nations worldwide to explore non-Chinese sources of these materials. On the positive side, China’s policies have opened the doors to many non-Chinese REE projects. The US too is primarily dependent on China for these materials. In an effort to break the Chinese monopoly, the US based Molycorp has announced plans to reopen its Mountain Pass mine in California. Outside of China, Molycorp owns the world’s largest deposit of REEs.

The demand and supply equation for many of the materials is unbalanced. Undersupplied materials have naturally driven prices upward while others are oversupplied. One of the main tasks for the industry now is to identify new sources, and diversify along the complete supply chain – mining to processing. The briefing also pointed out that the US would have to develop capable workforce to locate and produce REEs from new sources. Outside China, expertise in the REE industry is still limited.

The USGS publishes both technical and non-technical data about global sources of critical materials. It has revised its estimates of REE reserves in China from 36 million metric tonnes to 55 million metric tonnes.

The DOE has been working in association with industry and other governmental agencies on the best ways to tackle the various issues. The ideal solution would of course be to develop and utilize technologies that use the most common materials – a solution that cannot be achieved easily. Other methods suggested by the DOE are developing technologies that can reduce the quantity of REE required in a product; better processes for separating and recovering critical materials from waste streams and ores; and aggressive recycling. However, it is not economically feasible to recycle small quantities of REEs like those found in cell phones.

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Big Plans Outside China

Australia's rare earth company Lynas Corporation Limited is in a hurry to complete its \$230 million rare earth processing plant – the Lynas Advanced Materials Plant (LAMP) – on the northern outskirts of Kuantan in Pahang, Malaysia. Slightly radioactive ore, mined from Australia's Mount Weld mine, will be transported by ship to Kuantan and refined.

Once operational, Lynas expects the refinery to meet over 30% of the global demand for rare earth materials outside of China. The refinery will be the world's largest rare earth refinery and the first to be set up outside China in almost 30 years.

Rare earth refineries usually generate huge amounts of low-level radioactive waste, which is why most countries are wary about hosting rare earth processing refineries even if they have rich deposits. China has taken advantage of this and is today the world's largest supplier and consumer of rare earth materials.

Malaysia's last rare earth refinery at Bukit Merah was operated by Japan's Mitsubishi Chemicals but was closed in 1992 after years of protests by citizens. Today, the plant is one of Asia's largest radioactive waste cleanup sites. Mitsubishi is currently carrying out a \$100 million cleanup operation at the refinery. By agreeing to host the Lynas plant, Malaysia has agreed to take certain environmental risks. Now, Malaysia and the rest of the world hope that the risks will be worth the promised rewards.

Another non-Chinese rare earth company, US based Molycorp Minerals, plans to reopen its old abandoned mine in Mountain Pass, California but to meet the stringent environmental regulations, the company must rebuild its processing refinery. Undoubtedly it is an expensive endeavor.

In spite of the risks, Malaysia had agreed to host the plant

because of the projected economic benefits. If prices remain as they are, the refinery will generate \$1.7 billion in exports annually – an amount that is equivalent to almost 1% of the Malaysian economy. The government also offered Lynas a 12-year tax holiday.



Workers work around the clock to finish Lynas' Kuantan Refinery.

Critics however, are not convinced about the low-level radioactivity that the refinery will generate. Dr. Jayabalan A. Thambyappa, a general practitioner physician and toxicologist said, "The word 'low' here is just a matter of perception — it's a carcinogen." Over the last two decades, Dr. Thambyappa has treated leukemia patients, whose illnesses he and many others believe were caused by the Bukit Merah plant.

Meanwhile Fuziah Salleh, the Kuantan MP, has sworn to stop construction of the Lynas plant. She said, "If they are so desperate to process rare earth, they can do so in their own country." She has also encouraged the Malaysian Atomic Energy Licensing Board (AELB) not to award a license to Lynas for operating the plant. She pointed out that Lynas has still not framed a satisfactory plan on how to get rid of the radioactive waste.

Mathew James, Lynas corporate and business development vice-president, has denied that the plant would cause widespread radioactive damage. He said radiation would be very low and could not be compared to the Bukit Merah case, which had processed material with almost 98% more thorium.

Despite all the risks involved, the global rare earth industry is waiting for the refinery to begin operations and break the Chinese monopoly on the business.

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