

## **China Limits Exports of Rare Earth Metals**

Rare earth metals are a set of 17 chemical elements in the periodic table and include scandium, yttrium, cerium, and lanthanum. Small concentrations of these metals are a crucial ingredient in the manufacture of a wide range of high-technology products, including wind turbines, iPhones, industrial magnets, and the batteries used in hybrid cars. Extracting rare earth metals can be a dirty process due to the toxic acids that are used during the refining process. As a consequence, strict environmental regulations have made it extremely expensive to extract and refine rare earth metals in many countries.

Environmental restrictions in countries such as Australia, Canada, and the United States have opened the way for China to become the world's leading producer and exporter of rare earth metals. In 1990, China accounted for 27 percent of global rare earth production. By 2010, this figure had surged to 97 percent. In 2010, China sent shock waves through the high-tech manufacturing community when it imposed tight quotas on the exports of rare earths. In 2009, it exported around 50,000 tons of rare earths. The 2010 quota limited exports to 30,000 tons. The quota remained in effect for 2011 and was increased marginally to around 31,000 tons in 2012 and 2013.

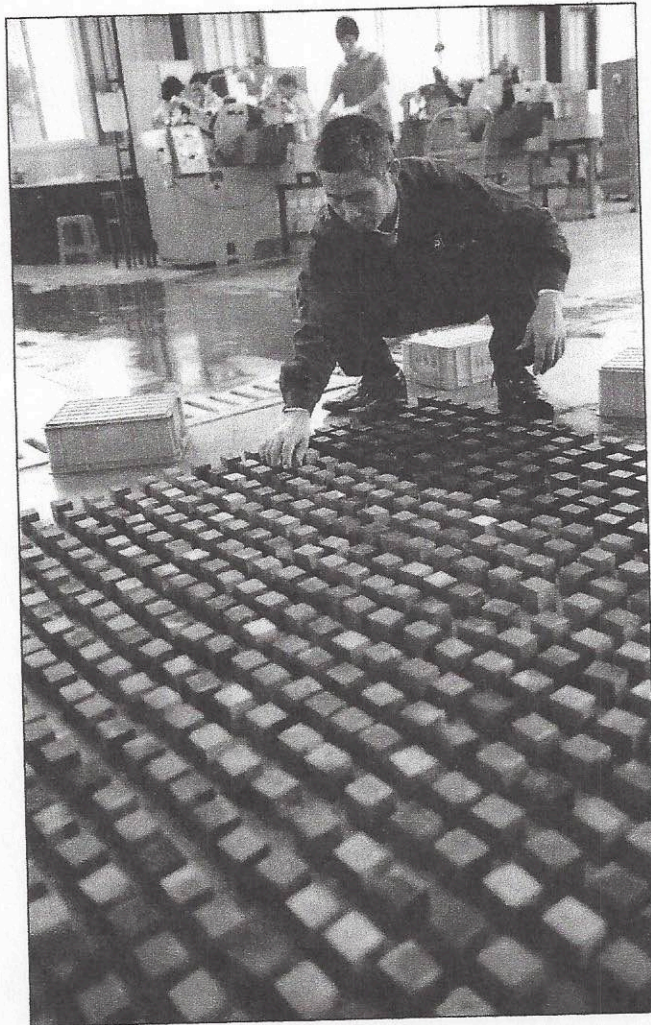
The reason offered by China for imposing the export quota is that several of its own mining companies didn't meet environmental standards and had to be shut down. The effect, however, was to dramatically increase prices for rare earth metals outside China, putting foreign manufacturers at a cost disadvantage. Many observers quickly concluded that the imposition of export quotas was an attempt by China to give its domestic manufacturers a cost advantage and to encourage foreign manufacturers to move more production to China so that they could get access to lower cost supplies of rare earths. As news magazine *The Economist* concluded, "Slashing their exports of rare earth metals has little to do with dwindling supplies or environmental concerns. It's all about moving Chinese manufacturers up the supply chain, so they can sell valuable finished goods to the world rather than lowly raw materials." In other words, China may have been using trade policy to support its industrial policy.

Developed countries cried foul, claiming that the export quotas violate China's obligations under World Trade Organization rules. In July 2012 the WTO responded by launching its own investigation. Commenting on the investigation, a U.S. administration official said that the export quotas were part of a "deeply rooted industrial policy aimed at providing substantial competitive advantages for Chinese manufacturers at the expense of non-Chinese manufacturers."

In the meantime, the world is not sitting still. In response to the high prices for rare earth metals, many companies have been redesigning their products to use substitute materials. Toyota, Renault, and Tesla, for example—all major automotive consumers of rare earth products—have stated that they plan to stop using parts that have rare earth elements in their cars. Governments have also tried to encourage private mining companies to expand their production of rare earth metals. By 2012, there were some 350 rare earth mine projects under development outside China and India. An example, Moly-corp, a U.S. mining company, is quickly boosting its rare earth production at a California mine. As a consequence of such actions, by early 2014 China's share of rare earth output had slipped to 80 percent. This did not stop China from announcing quota limits in 2014 that seemed to be in line with those of 2013.

### Sources

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A worker in China dries products containing rare earth elements.

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### Case Discussion Questions

1. Which groups benefited most from imposing an export quota on rare earth metals? Did it give the Chinese domestic manufacturers a significant cost advantage? Did it result in dramatically increased quality and environmental standards?
2. Given that 97 percent of rare earth metal production is now done in China, an increase from 27 to 97 percent between 1990 and 2010, do you think countries such as Australia, Canada, and the United States should reconsider their environmental restrictions on product of such metals?
3. The restrictions imposed by China on rare earth metals has resulted in some companies (e.g., Toyota, Renault, Tesla) starting to look for alternatives. They plan to use parts that do not include rare earth metals. Is this a good solution?