Congressional Research Service
Informing the legislative debate since 1914

IN FOCUS

June 28, 2019

Trade Dispute with China and Rare Earth Elements

Background

Since 2018, the United States and China have been engaged in a trade dispute resulting from U.S. use of Section 301 provisions (which deals with foreign trade barriers). The dispute has led to several rounds of tariff hikes. The United States has imposed 25% tariff hikes on $250 billion worth of products from China while China has hiked tariffs on $110 billion worth of U.S. products.

On May 10, 2019, President Trump directed the U.S Trade Representative (USTR) to begin the processes of raising tariffs on essentially all remaining imports from China, which it valued at approximately $300 billion. A week later, the USTR published a list of Chinese products that could be subject to 25% *ad valorem* tariffs. The notice specified that certain products, including rare earth elements (REEs), would not be included on the list.

On May 20, Chinese President Xi Jinping made a publicized visit to a REE magnet facility in Jiangxi province. A May 29 editorial by Xinhua (the Chinese government's official state-run press agency) warned that by "waging a trade war against China, the United States risks losing the supply of materials that are vital to sustaining its technological strength."

The back and forth on REE have increased concerns among some U.S. policymakers over potential vulnerabilities to the U.S. economy from China's role as a major supplier of REE and other critical materials. For additional information, see CRS In Focus IF11226, *Defense Primer: Acquiring Specialty Metals, Rare Earth Magnets, and Tungsten*, by Heidi M. Peters; and CRS Report R41347, *Rare Earth Elements: The Global Supply Chain*, by Marc Humphries.

What are REEs?

REEs consist of 17 elements (metals) that have unique characteristics, such as magnetism, luminescence, and strength. They have a wide range of uses, including in many high technology industries and defense systems. Contrary to the name, rare earths are not "rare." Rather, they are relatively abundant in the earth's crust, but are highly scattered and usually found mixed together in other deposits. This makes it difficult to find REEs in a concentration high enough to be mined and separated economically. The United States was once a major producer of REEs from the mid-1960s until around the late 1980s when China became a major low-cost producer and exporter of REEs. This, among other factors, caused many U.S. REE miners and producers to withdraw from the market.

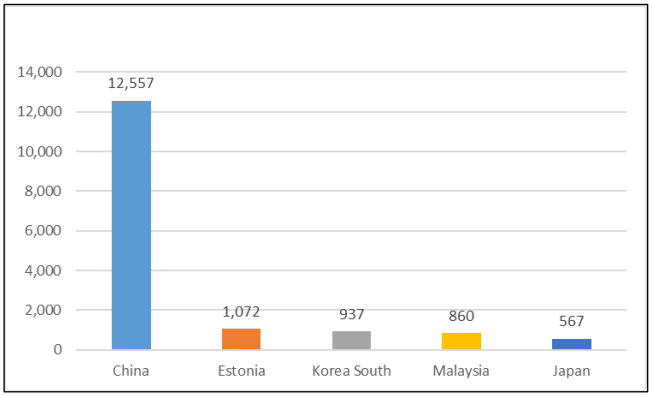
REE Dependency on China

According to the U.S. Geological Survey (USGS), in 2018, China accounted for 71% (and possibly higher due to illegal mining, production, and smuggling in China) of global REE production in terms of quantity. Chinese data indicate that its REE exports totaled 53,518 metric tons, with a value of $517 million. China's top three REE exports markets by value were Japan (54% of total), the United States (14%), and the Netherlands (8%). China also exported $1.7 billion worth of magnets containing REEs (including $201 million to the United States), an indicator of the significance of Chinese downstream industries that utilize REEs.

As indicated in **Figure 1**, China was the largest source of U.S. REE imports in terms of quantity at 12,557 metric tons (or 74% of total). China was also the largest U.S. REE supplier in terms of dollar value, at $82 million (or 56%) of the total. (Some U.S. REE imports from non-Chinese sources may have originated in China.) The consulting firm Adamas Intelligence estimates that in 2018 China became the world's largest REE importer (in terms of quantity), including $79 million worth of REE imports (largely REE ores and fluorides).

Figure 1. Top Suppliers of U.S. REE: 2018

Metric Tons



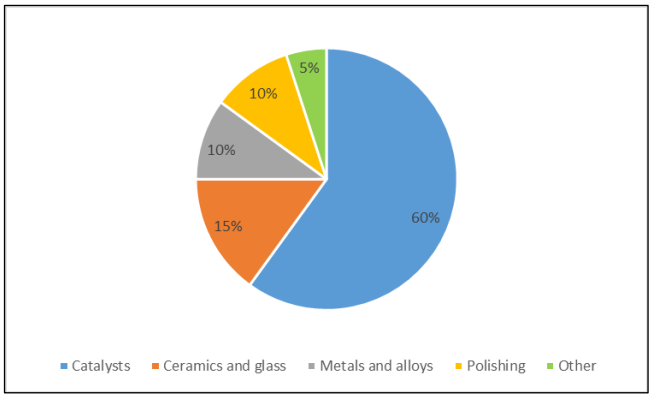
Source: USITC Dataweb.

Commercial Industrial and Military Uses of REEs

According to the USGS, the largest U.S. industrial uses of REEs in 2018 were for catalysts (at 60% of total); ceramics and glass (15%); metals and alloys (10%); and polishing (10%) (see **Figure 2**). Examples of industries that utilize REEs in production include advanced electronics (which involve magnets, batteries, phosphors, polishing, and metal alloys); medical equipment (magnets, batteries, phosphors, and polishing); hybrid and conventional vehicles (magnets, catalysts, and batteries); energy efficient lighting (phosphors); steel (metal alloys); wind turbines (magnets); and chemicals (catalysts). REEs have numerous military

applications as well. According to a June 11, 2019, article in *Foreign Policy*, "Every advanced weapon in the U.S. arsenal—from Tomahawk missiles to the F-35 fighter jet to Aegis-equipped destroyers and cruisers and everything in between—is absolutely reliant on components made using rare earth elements, including critical items such as permanent magnets and specialized alloys that are almost exclusively made in China."

Figure 2. U.S. Distributional Use of REEs: 2018



Source: USGS.

Past Chinese Restrictions on REEs

Concerns over China's dominant role as a global producer and supplier of REE stem in part from some of China's past practices. In September 2010, China reportedly sharply reduced REE exports to Japan on a temporary basis over a maritime incident between the two countries. At the time, Economist Paul Krugman wrote that this "shows a Chinese government that is dangerously trigger-happy, willing to wage economic warfare on the slightest provocation."

During the early 2000s, the Chinese government took a number of steps to consolidate control of REE industries in China. For example, it implemented a number of restrictions on REE exports, such as export quotas (which decreased from 65,580 metric tons in 2005 to 30,185 metric tons in 2011) and "temporary" export taxes (which ranged from 10% to 25% in 2012). Such restrictions appear to have been part of a broader government strategy to give downstream Chinese REE industries access to low-cost materials in order to support the growth of advanced technology firms (including green technology) in China, and thereby boosting innovation in China.

Further, China may have also sought to use the REE export restrictions to induce foreign firms that relied on these metals to move their production to China and share their technology with a Chinese partner in order to secure REE supplies. China's REE export restrictions and tax measures sharply raised prices for foreign importers. The overall average price of U.S. REE imports from China increased from $6,969 per metric ton in 2008 to $170,760 per metric ton in 2011, a 2,359% increase. This caused the quantity of U.S. REE imports to drop during this period from 546 metric tons to 323 metric tons (a 41% decline).

In March 2012, the United States, Japan, and the European Union jointly initiated a World Trade Organization (WTO) dispute settlement case against China's restrictive policies on REEs and two other minerals. Then-U.S. Trade Representative Ron Kirk stated, "America's workers and manufacturers are being hurt in both established and budding industrial sectors by these policies. China continues to make its export restraints more restrictive, resulting in massive distortions and harmful disruptions in supply chains for these materials throughout the global marketplace." In March 2014, a WTO dispute panel ruled that China's REE restrictions were inconsistent with its WTO obligations (the ruling was largely upheld by WTO Appellate Body in August 2014). In May 2015, China announced that it had removed the restrictions. In 2018, the average price of U.S. REE imports from China was $6,530 per metric ton.

Trump Administration Action on REEs

In July 2017, President Trump issued Executive Order (EO) 13806, directing the U.S. Secretary of Defense (in cooperation with other federal agencies) to issue a report *Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States*. The report, issued in September 2018, stated, "China's domination of the rare earth element market illustrates the potentially dangerous interaction between Chinese economic aggression guided by its strategic industrial policies and vulnerabilities and gaps in America's manufacturing and defense industrial base. China has strategically flooded the global market with rare earths at subsidized prices, driven out competitors, and deterred new market entrants." The report recommended that, among other things, the United States should seek to "create an industrial policy in support of national security efforts" and to "diversify away from complete dependency on sources of supply in politically unstable countries who may cut off U.S. access."

Possible Outcomes

The impact on the U.S. economy from possible Chinese punitive measures on REEs is hard to measure. REE export restrictions by China might cause the United States to seek alternative REE country sources, replacement metals, or greater use of recycling. Some analysts argue that the United States should seek public and private partnerships to develop its own domestic REE resources, including the development of downstream REE industries, in order to weaken China's near monopoly of REEs. However, it is unclear if such goals could be achieved relying on markets alone or whether they would rely on government support.

Should China attempt to restrict its REE exports to the United States, Congress might consider legislation to find alternative sources of REEs and products from downstream industries. In the 116th Congress, S. 1052 (Senator Manchin), would authorize the U.S. Department of Energy's Office of Fossil Energy to develop advanced separation technologies for the extraction and recovery of rare earth elements and minerals from coal and coal byproducts.

Wayne M. Morrison, Specialist in Asian Trade and Finance

IF11259

Disclaimer