

Research Report on Rare Earth Industry in China, 2017-2021

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Abstracts

China has abundant and diversified RE resources. Rare earth elements can be divided into the light RE, medium RE and heavy RE by their atomic weight, physical and chemical properties. Light RE are mainly found in Baotou of Inner Mongolia and Liangshan of Sichuan while the other two categories of RE are found in Ganzhou of Jiangxi and Longyan of Fujian.

According to CRI, driven by low costs of RE mining, such as low labor costs, and less environmental protection cost, Chinese enterprises started large-scale RE mining and export in the 1990s. Exploitation of RE in other countries was ceased as a result. During the recent decade or so, China's RE deposits are quickly diminishing. China once owned as much as over 70% of RE deposits in the world, but by the end of 2016, the proportion had fallen to 37%.

China implemented the license system of RE export quota from 1998 to 2015. On March 26, 2014, the WTO ruled that China's export limits on RE violated WTO rules. The Chinese government cancelled export tariffs on RE on May 1, 2015 and the RE export quota system came to an end on January 1, 2016. Before then, smuggling had become the major means of export of quite a few Chinese RE enterprises since they had no access to export quotas. In spite of a number of rectifications, it is difficult to eradicate smuggling.

However, China still sets indicators for the total mining volume of rare earth ores (rare earth oxide – REO). RE mining indicators are published by the State Council for enterprises, targeted at the mining of strategic metals such as rare earth, tungsten and molybdenum. The aim is to ensure the sustainable supply of resources and maintain the supply-demand balance. In 2015, the indicated mining volume of RE ores (rare earth

oxide – REO) amounted to a total 105,000 tons and remained unchanged in 2016-2017.

According to CRI, mining and refining of RE are monopolized by six major state-owned enterprises (SOE). Non-SOEs only have access to downstream industries, such as the production and application of RE materials. At present, the annual production capacity of China's RE extraction enterprises is over 300,000 tons. However, annual global demand is less than 200,000 tons, including 50,000 tons to 60,000 tons on the international market and 100,000 tons on the domestic market. China still dominates the global RE market. In 2016, the actual production of RE in China was more than 150,000 tons. This is higher than the quota because of illegal mining and smuggling, which cannot be stamped out because they are free from taxes.

CRI market research shows that in 2016, the prices of rare earth oxides and metals were lower than that in 2015. The average prices of neodymium oxide, dysprosium oxide and terbium oxide fell by 4% to 15% YOY and that of lanthanum oxide, cerium oxide and yttrium oxide fell by 5% to 30%. With the Chinese government boosting crackdown on illegal RE mining and the adoption of national RE reserves, the prices of RE are expected to pick up.

In terms of demand, downstream RE demand is divided into five major parts: permanent magnet materials, catalytic materials, luminescent materials, polishing materials and hydrogen storage materials. With the rapid development of global high-tech industries, RE will be more extensively used in high-tech fields and consumption of RE new materials will grow rapidly. Wind power, new-energy vehicles, smart phones and wearable electronics and other industries related to RE all have a promising future, promoting the development of the RE industry. For example, in 2016, the global production volume of new-energy vehicles was over 1 million, among which 517,000 were produced in China, up by 51.8% YOY. Rare earth hydrogen storage alloy is mainly used in nickel hydrogen batteries. China and Japan supplies 95% of rare earth hydrogen storage alloy in the world and China produces over 70% of hydrogen storage alloy in the world. A hybrid vehicle consumes 10 kg hydrogen storage alloy. Generally, mixed RE metals account for 30% of hydrogen storage alloy, which means a vehicle consumes 3 kg RE. The electric motor of a hybrid vehicle consumes 1-3 kg NdFeB magnetic materials and an electric vehicle consumes 5-10 kg.

According to the plan of the Chinese government, China would have produced 2 million new-energy vehicles by 2020. If this target is achieved, new-energy vehicles would consume 10,000 tons or even more RE, significantly promoting the development of the

RE industry.

Readers can obtain the following or more through this report:

Supply and Demand of Rare Earth

Global Trade of Rare Earth

Government Policies in Rare Earth Industry in China

Production of Rare Earth in China

Domestic Demand for Rare Earth in China

Export of Rare Earth in China

Illegal Mining and Smuggling of Rare Earth in China

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