

Research Report on China's Rare Earth Industry, 2019-2023

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Abstracts

Rare earth elements and metals are widely used in the industry. Rare earth elements are essential to aircraft engines, mobile phones and drill bits for oil and natural gas mining. As new energy vehicles are expected to replace traditional fuel vehicles, both military and civilian industries have robust demand for rare earths.

According to CRI, in 2017, China produced more than 80% of rare earth metals and compounds in the world. China's rare earth exports to the United States accounted for 78% of U.S. rare earth imports while the rare earths from Estonia, France and Japan only accounted for 14% in total. In 2017, the United States imported more than 17,000 tons of rare earth compounds, of which 10,000 tons of lanthanum compounds and 3,600 tons of cerium compounds were from China.

According to CRI, driven by low mining costs (including low labor costs) and low environmental protection costs, in the 1990s, Chinese enterprises started mining and exporting rare earths on a large scale. Consequently, most other countries stopped mining rare earths. In the past decade, China's rare earth reserves fell sharply. Its proportion in the global rare earth reserves once exceeded 70% while at the end of 2016, the proportion was only 37%. From 1998 to 2015, the Chinese government introduced export quota licensing system for rare earths. On Mar. 26, 2014, the WTO ruled that China's administrative measures for rare earth exports breached WTO rules. On May 1, 2015, the Chinese government canceled its tariffs on rare earth exports. On Jan. 1, 2016, it abolished the export quota licensing system.

To regulate rare earth mining, in the second half of 2018, the Chinese government began to shut down illegal mining enterprises and cut rare earth production quota to 45,000 tons, down 36% from 70,000 tons in the first half of the year. To upgrade its rare

earth industry, China shifts from exporting crude ores to exporting oxide products, which greatly impacts the global rare earth market.

After China Minmetals Rare Earth (Ganzhou) Co., Ltd. and CHALCO Guangxi Branch stopped producing rare earth ores because they failed to meet environmental protection standards, ionic rare earth ores fell short of demand in southern China. Subsequently, Chinese mining investors mined ionic rare earth ores in Myanmar and Vietnam and exported the mined crude ores to China for refining. However, in early Nov. 2018, all levels of government in Myanmar prohibited the rare earth mining activities of Chinese enterprises because of uneven distribution of benefits. In response, China's Yunnan Customs announced that it would ban all mineral imports from Myanmar. If the policy is strictly implemented, the prices of heavy rare earths such as dysprosium and terbium will increase on the global market. But it is uncertain that how long the import restriction will last and how it will affect the volume of China's heavy rare earth imports.

China has been the world's largest exporter of rare earths for years. In 2018, China's rare earth exports increased to 53,031 tons by 3.60% YOY, making China the world's largest importer of rare earths.

In 2018, China's rare earth oxide imports reached about 41,400 tons, increasing by over 100% YOY. Meanwhile, the domestic production of rare earth oxides shrank as China combated illegal rare earth production. China's rare earth imports are mainly minerals and chemical concentrates from Myanmar and the United States. In 2018, China imported about 26,000 tons of rare earth carbonates from Myanmar, which accounted for about 25% domestic demand. The heavy rare earths from Myanmar accounted for nearly one third of domestic consumption.

U.S. enterprises ship lanthanum-rich ores to China and then buy oxides and chemical products from China. The United States is the major buyer of China's rare earths, and lanthanum is used to refine oil. Last year, Myanmar became a key supplier of the dysprosium, terbium and gadolinium to Chinese producers of magnets and alloys. In 2018, the United States announced import tariffs on China's rare earths in its trade frictions with China but later it withdrew this decision. In the long term, China's rare earth imports will continue to grow. In addition to the United States and Myanmar, Australia is also exporting rare earths to China.

In 2018, the production volume of neodymium-iron-boron permanent magnets in China increased by 5% and the consumption increased by about 6%. The supply and demand on domestic market were close to balance. The export volume and export value

increased by 11% and 14% respectively.

In 2018, China only approved 115,000 tons of rare earth production quota, giving priority to meeting domestic demand. As a result, the global production of primary rare earth oxides grew by 20.80%. The growth was mainly attributable to the United States and Myanmar. On the other hand, since China started combating illegal rare earth mining in Sept. 2018, illegal rare earth production decreased by 50%. The consequent market gap is filled by other countries. The concentrate imports from Myanmar have become an important source of the dysprosium, terbium and gadolinium for China's magnet and alloy manufacturing industries.

According to CRI, in China, the mining and refining of rare earths are monopolized by six major state-owned enterprises (SOEs). Non-SOEs only have access to downstream industries such as the production and application of rare earth materials, namely, permanent magnet materials, catalytic materials, luminescent materials, polishing materials and hydrogen storage materials. With the rapid development of global high-tech industries, rare earths are being applied to more high-tech fields and the consumption of rare earth new materials are growing rapidly. The new energy vehicle industry, the wind power industry and other consumers of rare earths all have a promising future, which promotes the development of the rare earth industry. For example, in 2018, the global production of new energy vehicles exceeded 2 million units, among which 1.27 million units were produced in China, up by about 60% YOY. Rare earth hydrogen storage alloys are mainly used in NiMH power batteries. A hybrid electric vehicle needs about 10 kg of hydrogen storage alloy. In general, a hydrogen storage alloy contains 30% mischmetal, which means that a hybrid electric vehicle consumes about 3 kg of rare earths. The drive motor of a hybrid electric vehicle consumes about 1 kg to 3 kg of neodymium-iron-boron magnetic materials; the drive motor of a battery electric vehicle consumes about 5 kg to 10 kg.

According to the plan of the Chinese government, the annual production of new energy vehicles in China will reach 6 million units in 2023. If this goal can be achieved, new energy vehicles will consume 30,000 tons of rare earths or more, which will boost the development of China's rare earth industry.

According to CRI, the Sino-U.S. trade war has little impact on China's rare earth industry. For example, in May 2019, the United States again decided not to impose import tariffs on China's rare earths and other key minerals. It shows that United States still relies heavily on China's minerals to produce consumer electronics, military equipment and many other products.

Topics Covered:

Global supply of and demand for rare earths

Global trade of rare earths

Chinese government's policies on rare earths

Rare earth production in China

Demand for rare earths in China

China's rare earth imports and exports

Price trends of rare earth and rare earth materials in China

Major rare earth mining and refining enterprises in China

Major producers of rare earth materials in China

Driving forces and market opportunities for China's rare earth industry from 2019 to 2023

Forecast on supply of and demand for rare earth in China from 2019 to 2023

Impact of the Sino-U.S. Trade War on China's rare earth industry

Contents

1 CONCEPTS OF THE RARE EARTH INDUSTRY

- 1.1 Definition and Classification of Rare Earths
 - 1.1.1 Definition of Rare Earths
 - 1.1.2 Classification of Rare Earths
 - 1.1.3 Applications of Rare Earths
- 1.2 Global Distribution of Rare Earth Ores and Production Volume of Rare Earths
 - 1.2.1 Global Distribution of Rare Earth Ores
 - 1.2.2 Global Production Capacity of Rare Earths per Year
 - 1.2.3 Global Production Volume of Rare Earths
- 1.3 Major Rare Earth Producing Countries
 - 1.3.1 China
 - 1.3.2 Australia
 - 1.3.3 Myanmar
 - 1.3.4 Russia
 - 1.3.5 India
 - 1.3.6 Brazil
- 1.4 Methodology
 - 1.4.1 Data Sources
 - 1.4.2 Parameters and Assumptions
 - 1.4.3 About CRI

2 SUPPLY OF AND DEMAND FOR RARE EARTHS IN CHINA, 2014-2018

- 2.1 Development of China's Rare Earth Industry
 - 2.1.1 History of Rare Earth Production in China
 - 2.1.2 Distribution of Rare Earth Ores in China
 - 2.1.3 Production Volume of Legal Rare Earths in China, 2006-2018
 - 2.1.4 Actual Production Volume of Rare Earths in China
 - 2.1.5 Consumption of Rare Earths in China
 - 2.1.6 Price Trend of Rare Earths in China
- 2.2 Development Environment for China's Rare Earth Industry
 - 2.2.1 Chinese Government's Policies on the Rare Earth Industry
 - 2.2.2 Economic Environment for China's Rare Earth Industry
- 2.3 Global Consumption of Rare Earths, 2014-2018
 - 2.3.1 Overview of Global Consumption
 - 2.3.2 Consumption of Rare Earths in China

- 2.3.3 Consumption of Rare Earths in the U.S.
- 2.3.4 Consumption of Rare Earths in Japan
- 2.4 China's Rare Earth Exports
 - 2.4.1 Legal Exports
 - 2.4.2 Illegal Mining and Smuggling
- 2.5 China's Rare Earth Imports
 - 2.5.1 Overview of China's Rare Earth Imports
 - 2.5.2 China's Rare Earth Imports from Myanmar

3 ANALYSIS ON DOWNSTREAM APPLICATIONS OF RARE EARTHS IN CHINA, 2014-2018

- 3.1 Rare-earth Magnets
 - 3.1.1 Production
 - 3.1.2 Application
- 3.2 Rare Earth Luminescent Materials
 - 3.2.1 Production
 - 3.2.2 Application
- 3.3 Rare Earth Hydrogen Storage Materials
- 3.4 Rare Earth Polishing Materials
- 3.5 Rare Earth Catalytic Materials

4 ANALYSIS ON MAJOR RARE EARTH MINING AND REFINING ENTERPRISES IN CHINA, 2016-2019

- 4.1 China Minmetals Corporation
 - 4.1.1 Profile of China Minmetals Corporation
 - 4.1.2 Operation Performance of China Minmetals Corporation
 - 4.1.3 Development Strategies of China Minmetals Corporation
- 4.2 Aluminum Corporation of China Limited (CHALCO)
- 4.3 China Northern Rare Earth (Group) High-tech Co., Ltd.
- 4.4 Fujian Rare Earth (Group) Co., Ltd.
- 4.5 China Southern Rare Earth Group Co., Ltd.
- 4.6 Guangdong Rare Earths Industry Group Co., Ltd.

5 MAJOR PRODUCERS OF RARE EARTH MATERIALS IN CHINA, 2016-2019

- 5.1 Major Producers of Rare-earth Magnets in China
 - 5.1.1 JL MAG Rare Earth Co., Ltd.

- 5.1.2 Hengdian Group DMEGC Magnetics Co., Ltd.
- 5.1.3 Beijing Zhong Ke San Huan Hi-Tech Co., Ltd.
- 5.1.4 Ningbo Yunsheng Co., Ltd.
- 5.1.5 Yantai Zhenghai Magnetic Material Co., Ltd.
- 5.1.6 Innuovo Technology Co., Ltd.
- 5.1.7 Chengdu Galaxy Magnets Co., Ltd.
- 5.1.8 Advanced Technology & Materials Co., Ltd.
- 5.1.9 Pengqi Technology Development Co., Ltd.
- 5.1.10 Guangdong Weihua Corporation
- 5.2 Major Producers of Rare Earth Catalytic Materials in China
 - 5.2.1 Sinopec Catalyst Co., Ltd.
 - 5.2.2 Rezel Catalysts Corporation
 - 5.2.3 Hongda Xingye Co., Ltd.
 - 5.2.4 Beijing Jingyuntong Technology Co., Ltd.
 - 5.2.5 Jilin Jiafu Chemical Industry Co., Ltd.
 - 5.2.6 Ganzhou Qiandong Rare Earth Group Co., Ltd.
 - 5.2.7 Shandong Gemsky Environmental Technology Co., Ltd.
 - 5.2.8 Sino-Platinum Metals Co., Ltd.
 - 5.2.9 Hebei Hwat Automobile Components Co., Ltd.
 - 5.2.10 Qingdao Huicheng Environmental Technology Co., Ltd.
- 5.3 Major Producers of Rare Earth Hydrogen Storage Materials in China
 - 5.3.1 Whole Win (Beijing) Materials Sci. & Tech. Co., Ltd.
 - 5.3.2 Jiangxi JXTC Haoyun High-Tech Co., Ltd.
 - 5.3.3 Xiamen Tungsten Co., Ltd.
 - 5.3.4 Inner Mongolia Xi'aoke Hydrogen Storage Alloy Co., Ltd.
 - 5.3.5 Sihui City Double Win Industry Co., Ltd.
 - 5.3.6 Zhongshan Tianjiao Rare Earth Materials Co., Ltd.
 - 5.3.7 Gansu Rare Earth New Materials Co., Ltd.
 - 5.3.8 Baotou Santoku Battery Materials Co., Ltd.
 - 5.3.9 Anshan Kingpowers Advanced Materials Co., Ltd.
 - 5.3.10 Ganzhou Huajing Rare Earth New Materials Co., Ltd.
- 5.4 Major Producers of Rare Earth Polishing Materials in China
 - 5.4.1 Baotou Tianjiao Seimi Polishing Powder Co., Ltd.
 - 5.4.2 Baotou Xinyuan Rare Earth Hi-tech & New Materials Co., Ltd.
 - 5.4.3 Gansu Rare Earth New Materials Co., Ltd.
 - 5.4.4 Baotou New Century Rare Earth Co., Ltd.
 - 5.4.5 Gansu Debao New Materials Co., Ltd.
 - 5.4.6 Baotou Qitong Rare Earth Co., Ltd.
 - 5.4.7 Inner Mongolia Weineng Metal Chemical Co., Ltd.

5.4.8 Gansu Jinyang High-tech Materials Co., Ltd.

5.4.9 Shanghai Huaming Gona Rare Earth New Materials Co., Ltd.

5.4.10 Shanghai Yuelong Non-ferrous Metals Co., Ltd.

5.5 Major Producers of Rare Earth Luminescent Materials in China

5.5.1 IRICO Display Devices Co., Ltd.

5.5.2 Jiangmen Kanhoo Industry Co., Ltd.

5.5.3 Grinm Advanced Materials Co., Ltd.

5.5.4 Hangzhou Daming Fluorescent Materials Co., Ltd.

5.5.5 Jiangsu Bree Optronics Co., Ltd.

6 PROSPECT OF CHINA'S RARE EARTH INDUSTRY, 2019-2023

6.1 Factors Influencing Development of China's Rare Earth Industry, 2019-2023

6.1.1 Driving Forces and Market Opportunities

6.1.2 Threats and Challenges

6.1.3 Impact of the Sino-U.S. Trade War on China's Rare Earth Industry

6.2 Forecast on Supply of Rare Earths in China, 2019-2023

6.2.1 Forecast on Production Capacity of Rare Earths in China

6.2.2 Forecast on Production Volume of Rare Earths in China, 2019-2023

6.2.3 Forecast on Demand for Rare Earth in China, 2019-2023

6.2.4 Forecast on China's Rare Earth Imports and Exports, 2019-2023

6.3 Forecast on Investment Opportunities in China's Rare Earth Industry, 2019-2023

Selected Charts

SELECTED CHARTS

Chart China's Rare Earth Reserves, 2006-2019

Chart Production Volume of Rare Earths in China, 2012-2018

Chart Average Spot Price of Rare Earths in China, 2016-2019: Neodymium Oxide (Nd₂O₃/TREO 99.00%-99.90%)

Chart Average Spot Price of Rare Earths in China, 2016-2019: Lanthanum Oxide (La₂O₃/TREO 99.50%-99.90%)

Chart Average Spot Price of Rare Earths in China, 2016-2019: Cerium Oxide (CeO₂/TREO 99.50%-99.90%)

Chart Average Spot Price of Rare Earths in China, 2016-2019: Praseodymium Oxide (Pr₆O₁₁/TREO 99.00%-99.90%)

Chart Average Spot Price of Rare Earths in China, 2016-2019: Lanthanum (La/TREM 99.00%)

Chart Average Spot Price of Rare Earths in China, 2016-2019: Praseodymium (Pr/TREM 96.00%-99.00%)

Chart Average Spot Price of Rare Earths in China, 2016-2019: Neodymium (Nd/TREM 99.00%-99.90%)

Chart Average Spot Price of Rare Earths in China, 2016- 2019: Battery-grade Mischmetal (TREM 99.00% Nd/TREM 15%)

Chart Average Spot Price of Rare Earths in China, 2016-2019: Praseodymium-neodymium-dysprosium Alloy (TREM 99.00%)

Chart Average Spot Price of Rare Earths in China, 2016-2019: Dysprosium-iron Alloy (Dy 80%)

Chart Average Spot Price of Rare Earths in China, 2016-2019: Sintered Neodymium Iron Boron

Chart Major Policies on China's Rare Earth Industry, 2008-2019

Chart Volume of China's Legal Rare Earth Exports, 2008-2019

Chart Production Volume of New Energy Vehicles in China, 2012-2018

Chart Rare Earth Ores of China's Six Major Rare Earth Groups, 2019

Chart Operation Performance of JL MAG Rare Earth Co., Ltd., 2016-2019

Chart Operation Performance of China Minmetals Rare Earth Co., Ltd., 2016-2019

Chart Forecast on Legal and Actual Production Volumes of Rare Earths in China, 2019-2023

Chart Forecast on Production Volume of New Energy Vehicles in China, 2019-2023

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