Situation and Policies of China's Rare Earth Industry

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Preface

Rare -earths are metals are an important, non-renewable natural resource with increasingly wider applications in the spheres of economic and social development.

China is among the countries with relatively rich rare earth reserves of rare-earth metals. Since the 1950s, remarkable progress has been witnessed made in China's the rare earth industrycountry's extraction and processing of these metals. After many years of effort, China has become the world's largest rare-earth metals producer, consumer and exporter of rare -earth productsmetals, with the highest rate of application.

While bringing In spite of its benefits to for mankind, the exploitation of rare -earth metals has brought about increasingly significant problems regarding this resource and the environment. In the exploitation and utilization of rare -earth metals, the rational utilization and effective protection of the environment pose common challenges for the world at large. In recent years, China has taken comprehensive measures in the links process of mining, production, and exporting of rare -earth goods metals and, to strengthened efforts for the protection of the resource and the environment, endeavoring to ensure a and to promote the sustainable and healthy development of this industry.

With the in-depth the deepening development of economic globalization, China is involved in more extensive international exchanges and cooperation in the field of rare -earth metals. Always honoring the

rules and living up to its committmentsfaithful to its pledges, China has provided the world with large quantities of rare -earth products. It will continue to follow the relevant regulations of the WTO rules, , strengthen the scientific management of of this industry and , supply rare -earth products to the global market, so as to and make its due contribution to the economic development and prosperity of the world economy.

For some time now, some countries have been particularly fretful concerned about the situation of China’s rare -earth metals industry and related policies, doing a lot of guesswork and conjuring up many storiesgiving rise to suggestions of various kinds. We hereby give a presentation to China’s rare -earth metals industry in order to further make the international community with have a better understanding of this issue.

I. Current Situation of China's Rare -Eearth Industry Metals

Rare -earths are a group of metals comprise 17 chemical elements in the periodic table of the elements, i.e., -- Lanthanum (La), Cerium (Ce), Praseodymium (Pr), Neodymium (Nd), Promethium (Pm), Samarium (Sm), Europium (Eu), Gadolinium (Gd), Terbium (Tb), Dysprosium (Dy), Holmium (Ho), Erbium (Er), Thulium (Tm), Ytterbium (Yb), and Lutecium (Lu), and their congeners Scandium (Sc) and Yttrium (Y). According to their atomic weights, and physicoal and chemical properties, they arerare-earth elements can be divided into light, middle, and heavy rare earth elements. The first five above-mentioned elements are light ones, and the rest are either middlemiddle or heavy ones. Because of their unique physicoal and chemical properties, rare earth elements are considered indispensable in modern industry as they are extensively used in areas such as new energy, new materials, energy conservation and environmental protection, aeronautics and astronauticsaviation and space science, and electronic information, to name but a few.

China is is relatively abundant in in rare -earth resourcess, and its rare -earth reserves accounting for approximately 23% of the world's total reserve. The main characteristics of China's rare -earth resources display the following characteristicsare as follows:

— Their The distribution of rare earth elements presents a "light north, heavy south" pattern. Light -rare -earth mines are mainly lo-

cated in Baotou of, the in the Inner Mongolia Autonomous Region, and other northern areas, as well as in Liangshan of , Sichuan Province, while ion-absorbed-type middle- and heavy -rare earth deposits are mainly found in Ganzhou of , Jiangxi Province, Longyan of , Fujian Province, and some other southern areas.

— There are various The types of rare -earth resources are rather diversified. China has a rich variety of rare -earth mineralsores,, including bastnaesite, monazite, ion-absorption minerals, xenotime, fergusonite, and others, with a relatively complete range reserve of rare -earth elements. Among them, the middleion-absorption middle and heavy rare earth deposits minerals occupy an important position in the world.

— The associated radioactive elements of light rare -earth minerals ores pose major problems for the environment. Most of China's light rare -earth deposits ores can be industrially mined for large-scale industrial exploitation, but as thorium (Th) and other radioactive elements are difficult to treat, and therefore great more attention must should be paid to its impact on people's health and the ecology when they are mineding, smelteding, and separatedseparating out rare-earth metals.

— Unfavorable occurrence conditions for iIon-absorption middle and heavy rare -earth ores have poor occurrence conditionsores. In ion-absorbed-type -rare -earth depositsmines, the rare -earth elements are absorbed in the soil in the form of ions, making it difficult for industrial exploitation difficult due to sparse distribution and low abundance rate.

Since the introduction of the reform and opening-up policies in the late 1970s, China's rare -earth industry has seen rapid development. Major progress has been made in the research and development of relevant mining, smelting and utilizing application technologies, and the increasing expansion of the industrial scale has basically satisfied the needs of the nation's economic growth and social development.

— A complete industrial system has been achieved. China has developed three major rare -earth production areas, i.e., the light -rare -earth production areas in Baotou of Inner Mongolia and Liangshan of Sichuan, and middleiddle weight- and heavy -rare earth production areas in the five southern provinces centering around represented by Ganzhou of in Jiangxi Province. With a With complete industrial system armed with technologies covering mining, dressingand selecting, smelting , and separating technologies and incorporating separating, as well as an industrial system incorporating equipment manufacturing, and material processing and end-product utilizationapplication, China can produce over 400 varieties of rare -earth products in more than 1,000 specifications. In 2011, China produced 96,900 tons of rare -earth smelting separation ing products, accounting for more than 90% of the world's total output.

— The market environment is gradually improving as China is constantly expediting reforming in the rare- earth metals industry, promoting the development of a market system featuring diversified investment bodies, independent decision-making by for businesses, and pricing according to supply and demand. In recent years, investment in China's rare -earth metals industry has experienced rapid growth, and the scale of the market has been constantly expanded, . sState-owned, privately -owned and foreign-invested economic sectors coexist, and the value of the rare -earth metals market is approaching is nearing 100 billion yuan. The market order in this sector is gradually improving, and progressive development is being made in the merger and reorganization of businesses. The old picture of a "small, scattered, and disorderly" rare -earth metals industry has vanished.

— Scientific and technological technical level has also improved further. After many years of development, China has established a relatively complete R&D system of research and development, pioneered numerous various technologies of international advanced levels in rare -earth mining and dressingselecting, smelting, separatingseparating,

etc.and other areas, and its unique mining and selectingdressing processes and advanced separating techniques have laid a solid foundation for the efficient exploitation and utilization of rare -earth resources. The rare -earth new materials industry has experienced steady development, and industrialization has been achieved realized in using rare earths metals to produce permanent-magnet, luminescent, hydrogen-storage, and catalytic materials, and other new materials, providing support for the restructuring and upgrading of traditional industries, and the development of emerging industries of strategic importance.

The rapid development of China's rare -earth metals industry has not only satisfied domestic demand for economic and social development, but also made important contributions to the world's rare -earth metals supply. For many years, China has been faithfully fulfilling its pledges upon its accession entry into the WTO, honoring the WTO rulesregulations, and promoting fair trade in rare -earthes commerce. Currently, China supplies over 90% of the global market rare -earth needsmarket with 23% of the world's total reserves, its output of . China produces more than 70% of the world's permanent-magnet, luminescent, hydrogen-storage and polishing materials, which use rare earthrare earthses as raw materials, , and other materials accounts for more than 70% of the world's total, and using rare-earth metals. In addition, the China-produced country's rare -earth materials, parts and components, as well as rare -earth end products, such as energy-saving lamps, special and small and specialized electric motors and Nal machines, niMH ckel-metal hydride batteries, and other end products satisfied the development needs of high-tech industries of other countries, especially those of the developed countries.

Despite its rapid development, China's rare -earth metals industry also faces many problems, for which China has paid a big price. The following are some of the problems:

— Excessive exploitation of rare -earth resources. After more than 50 years of excessive mining, China's rare -earth reserves have kept

declining and the years of guaranteed rare -earth supply have been reducingshortened. The decline of rare -earth resources in major mining areas is accelerating, as most of the original resources are depleted. In Baotou, only one-third of the original volume of rare -earth resources is available in the main mining areas, and the reserve-extraction ratio of ion-absorption -rare -earth mines in China's southern provinces has declined from 50 two decades ago to the present 15. Most of the southern ion-absorption -rare -earth deposits mines are located in remote mountainous areas. There are so many mines scattering over a large area that , it is difficult and costly to monitor their operation. As a result, illegal mining has severely depleted local resources, and mines rich in reserves and easy to exploit are were favored over the others, resulting in a low . Also, the recovery rate of the rare -earth resources is relatively low. Less that 50 percent of such resources are recovered in ion-absorption rare -earth mines in sSouthern China, and only ten percent of the Baotou reserves are dressed ore is selected and utilized-for use.

— Severe damage to the ecological environment. Outdated production processes and techniques in the mining, selectingdressing, smelting and separating of rare -earth ores have severely damaged surface vegetation, caused water loss, soil erosion, , pollution,, and acidification, and reduced or even eliminated food crop output. In the past, the outmoded tank leaching and heap leaching techniques were employed at ion-absorption middle and heavy rare -earth mines, creating 2,000 tons of tailings for the production of every ton of REO (rare earth oxide). Although the more advanced in-situ leaching method has been widely adopted, large quantities of ammonium nitrogen, heavy metal and other pollutants are being produced, resulting in the destruction of vegetation and severe pollution of surface water, ground water and farmland. Light -rare -earth mines usually contain many associated metals, and large quantities of toxic and hazardous gases, waste water with high concentration of ammonium nitrogen and radioactive resi-

dues are generated during the processes of smelting and separating. In some places, the excessive rare earth mining exploitation of rare earth ores has resulted in landslides, clogged rivers, environmental pollution emergencies, and even major accidents and disasters, causing great damage to people's safety and health, and the ecological environment. At the same time, the restoration and improvement of the environment has also heavily burdened some rare -earth production areas.

— Irrational industrial structure. China's rare -earth metals industry has huge over-capacity in smelting and separating. On the other hand, the research and development of rare -earth materials and components is lagging behind, its level of rare -earth new materials development and end-product application technologies is significantly lower than the advanced international level, and the IPR ownership, and the production and processing technologies of new-type rare - earth materials and components are relatively small in number. As a result, low-end products overflow while high-end products are in short supply. China's rare -earth metals industry, relatively small in scale, features a low concentration rate with numerous businesses, but lacks large enterprises with core competitiveness. Self-discipline in the industry is also weak, and vicious competition exists to some extent.

— Severe divergence between price and value. Over quite a fairly long period of long time, the low price of rare -earth products has remained low and elements has failed to not reflected their real value, the scarcity of the resources has not been appropriately represented, and the damage to the ecological environment has not been properly compensated for. Since the second half of 2010, despite the gradual rise in the price of rare -earth products, the rise it has been much lower than that in the price rise of other raw materials like gold, copper and iron ore. From 2000 to 2010, the price of rare - earth products metals rose by 22.5-fold, while that of gold, copper and iron ore increased by 44.4-, 44.1-, and 44.8-fold during the same period, respectively.

Chart 1 Changes in the Price of China's Rare Earth Products 1986-2010

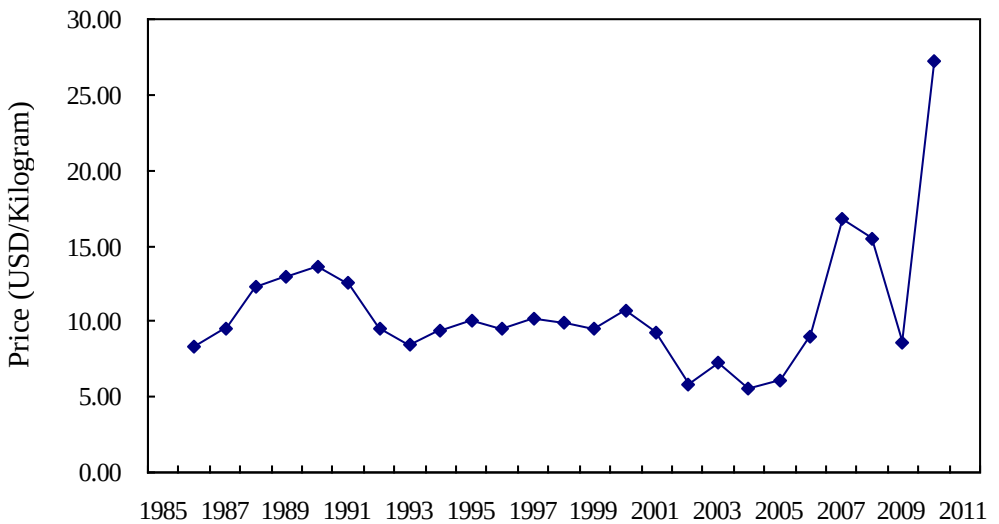


Chart 2 Price Rise of Rare Earth Products as Compared with That of Some Other Commodities, 2000-2010

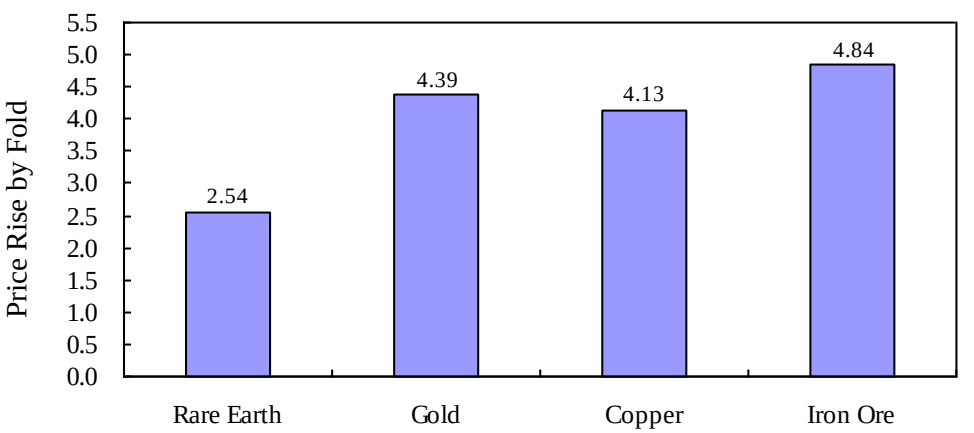
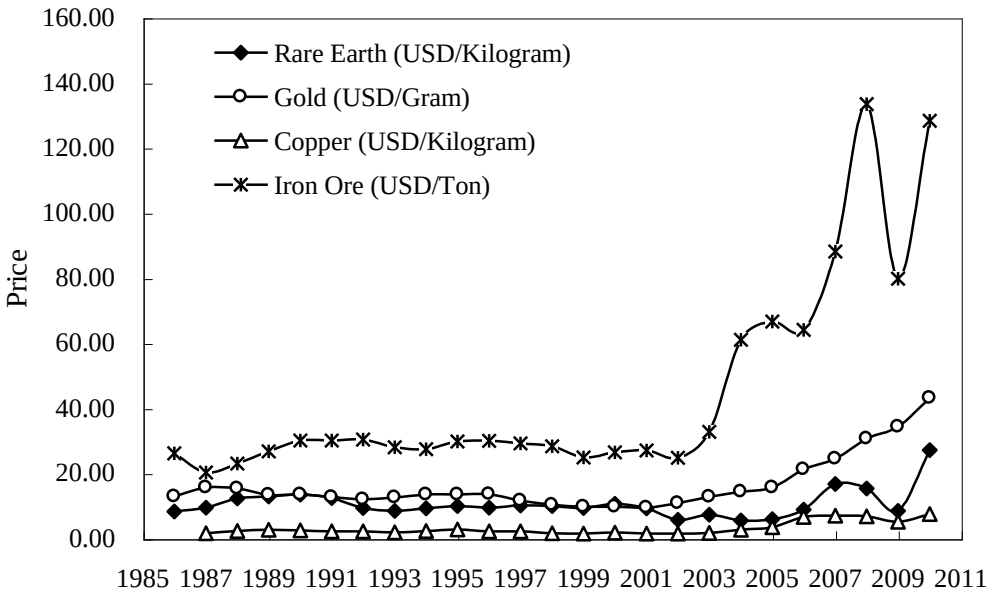


Chart 3 Price Changes of Rare Earth, Gold, Copper and Iron Ore 1986-2010



— Grave smuggling situation. Due to Affected by multiple factors, including domestic and international demand, the smuggling of rare -earth products to overseas markets continues to be a problem in spite of the efforts made by of China's customs listing to take it as a key criminal act to a priority to crack down on on this crime. From 2006 to 2008, the volumes of rare -earth products imported from China, according to statistics collected by from foreign customs, were 35%, 59% and 36% higher than the volumes exported, as the export statistics released by from the Chinese customs show, and the figure from foreign customs is 1.2-fold over the Chinese figure in 2011.

To address the salient problems in the development of China's rare earth metals industry, the Chinese government has tightened streng-

thened supervision over itof the industry. In May 2011, the State Council issued Guidelines on Promoting the Sustainable and Healthy Development of the Rare -Earth Metals Industry (hereinafter referred to as the “Guidelines”), attaching more importance to the protection of resources and the environment, and the realization of sustainable development. According to the “Guidelines,”, the government — in accordance with law — will strengthen control over of the mining, production, circulation, import and export, and other links of the rare -earth metals industry, and study and formulate as well as amend and improve related laws and regulations on regarding the administration of this industry. The Chinese government has established an inter-departmental departmental coordinating mechanism for regarding the rare metals industry to make overall plans and study of the national strategy, program, plan, policy, and other important issues concerning the development of the rare earth industry. The state has also set up a rare earth office to coordinate and propose plans on the mining, production, reserve, and import and export of rare -earth materials. The relevant departments of the State Council will perform their respective administrative functions accordingly. In April 2012, Association of China Rare Earth Industry was founded with official approval. It is expected to play an important role in promoting self-discipline in the industry, regulating the industrial order, and proactively positively carrying out international cooperation and exchanges, among other functions. A year or so has passed since the implementation of the “Guidelines,”, the transformation of the development pattern of China’s rare -earth metals industry has picked up speed, and significant improvement has been seen made in maintaining its development order.

II. Principles and Targets of Development

1. Fundamental Principles

— Adhering to environmental protection and resource conservation. The state will implement stricter standards for ecological protection and protective exploitation policies concerning rare -earth resources, improve relevant laws and regulations on the industry's administration, and crack down on all violations of laws and regulations according to law.

— Adhering to total-amount control of total volumes and optimizing reserves. The state will quicken its steps to implement the conglomerate strategy, promote structural adjustment of the industry, actively push forward technological innovation, strictly control the mining, smelting, and separating capacities, phase out outdated capacity, and further increase the concentration rate of the industry.

— Adhering to giving consideration to both the domestic and international markets and resources. The state will take synchronized administrative measures on rare -earth mining, production and export, and encourage international exchanges and cooperation.

— Adhering to coordinated development of local economy and society. The state will strive to correctly handle the relations between local and overall development and current and long-term development, and maintain a normal order of industrial development.

2. Main Targets

Within a short period of time, the state will strive to establish a regulated and orderly system of rare -earth resource exploitation, smelt-

ing and separating, and market circulation, and effectively control the disorderly exploitation of resource, deterioration of the ecological environment, blind expansion of production, and rampant smuggling; increase the recycling rate of rare -earth resources, the recycling rate of ore dressing recovery, and the rate of comprehensive utilization, enforce take effective control over of the intensity of resource exploitation, and restore the reserve-extraction ratio to a proper level. It will make sure the discharge of waste water and gas, and slag meet the established production standards, and effectively restore the ecological environment in key areas. It will push forward merger and reorganization in the rare -earth industry, and develop large-scale, highly -efficient, and clean production enterprises. New-product development and new technology application will be accelerated. On this basis, the state will further improve related policies and laws and regulations regarding the rare --earth industry, gradually establish a unified, standardized, and highly -efficient administrative system for the industry, and develop a sustainable and healthy development pattern featuring rational mining, orderly production, efficient utilization, advanced technology and intensive development.

III. Effectively Protecting and Rationally Utilizing Rare-earthRare Earth Resources

Rare-earthRare earths metals, as a non-renewable natural resources, need to be effectively protected and rationally utilized. As part of its drive to ensure the sustainable use of resources, China has been practicing protective exploitation of its rare-earthrare earth resources materials for many years.

According to China's the Mineral Resources Law promulgated in the 1980s, the state adopts a policy of planned exploitation with regard to mining areas that are embraced in state plans and are of great value to the national economy and specified minerals for which protective exploitation is prescribed by the state. In 1991, China prescribed the protective exploitation for of ion-absorption rare-earthrare earth minerals resources, exercising planned, unified control in administration of all related procedures, including mining, dressing, smelting, processing, selling and export. In 2006, China began to exercise total-amount control over the exploitation of put a limit on the total volume of rare-earthrare earths metals to be mined every year. In 2007, the state incorporated introduced a mandatory plan to administer the production of rare-earthrare earths metalsinto management by mandatory planning. In 2008, the state issued the National Plan for Mineral Resources Plan (2008-2015) to exercise planned regulation and control, restrictive exploitation, tightened access and comprehensive utilization for rare earths and some other specified mineral resourcesof rare-earth ,metals and other specified minerals, of which protective exploitation is prescribed by the state. In 2009, the state took back the power for regis-

tering, examining and approving the prospecting and mining of specified minerals, of which protective exploitation is prescribed by the state. In 2011, China adjusted the tax rates on mining of rare-earthrare earth ores. The adjusted new tax rate for light rare-earthrare earths minerals (including bastnaesite and monazite) is 60 yuan per ton, and for middle and heavy rare-earthrare earths minerals (including xenotime and ion-absorption rare earthsminerals) is 30 yuan per ton, much higher than the rates before the adjustment, which ranged from 0.4 yuan per ton to 2 yuan per ton. The state also established a strategic reserve a system and for kept the rare earth building up strategic reserves in of rare-earth the form of resources and products, designated the first 11 rare-earthrare earth mining areas to be embraced in state plans, and formulated a special plan for key rare-earthrare earth mining areas. China has tightened control on mining rights and enforced a system of mining rights allocation plans. In principle, the state has put a moratorium on accepting new registration applications for rare-earthrare earth prospecting and mining, and prohibits existing mines from expanding their production capacity. The state exercises strict control over of the total rare earth mining and production volumes of rare-earth metals to reduce resources development intensity, slow the depletion of resources, and advance sustainable development.

In recent years, China has launched special campaigns to regulate rare-earthrare earth mining and production, effectively protecting and rationally utilizing rare-earthrare earth resources in various many ways. The state has tightened control of the total volume of rare earth mining and mandatorily planned quotas for rare earth production by means of Through satellite photography, video monitoring, regular inspection, monthly report system, special invoice checking, and opening phone lines to receive reports concerning violations of related laws and regulations, the state has tightened control of the total mining volume of rare-earth metals and the mandatory planning quota of rare-earth pro-

duction. In pursuance of related laws concerning rare-earthrare earths metals, China has cracked down on illegal rare earth mining and mining activities that violated laws or exceeded the quotas prescribed set by the state, as well as on production activities of rare-earthrare earth smelting and separation enterprises that were unplanned or exceeded the state-set quotas. China also has strengthened joint supervision in of key rare-earthrare earth production areas, investigated and punished rare-earthrare earth enterprises that conducted mining and production in violation of laws and regulations, polluted the environment, caused wastes in wasted resources, or did not have the necessary conditions to ensure production safety production, and called to account those punished enterprises and individuals responsible for these violations in accordance with the law. The state has re-examined permits for rare-earthrare earth prospecting and mining, and publicized a list of legitimate mining enterprises. It has also accelerated the formation of a long-term mechanism for regulating the order and supervision of rare-earthrare earth mining and production, advancing the merger and reorganization of rare-earthrare earth enterprises, and phasing out outdated processes techniques and capacities to realize large-scale and intensive production. By way of In the course of special rectification regulation campaigns, more than 600 cases of illegal prospecting and mining were investigated and rectified, more than 100 cases were placed on file for further action, and 13 mines and 76 smelting and separation enterprises were ordered to cease production for rectification. In this way, the trend of illegal mining and production has been reversed.

The Chinese government has stressed the comprehensive utilization of rare-earthrare earth resources. Over the past few years, the state has reinforced research into the geological structure of ion-absorption rare-earthrare earth mines, advanced the building of “green” mines and comprehensive utilization demonstration bases, developed environmentally-friendly and efficient mining technologies to increase the re-

covery rates of rare-earthrare earths metals by a large margin, extended support to ed the development of new flotation reagents and ore-dressing equipment to raise the dressing recovery rates of rare-earthrare earths metals, and worked to recover recycle lean ores and tailings. China promotes the balanced utilization of rare-earthrare earth elements, encourages research into the application of light rare-earthrare earth elements, such as lanthanum and cerium,, whose reserves are relatively abundant, and expedites the development of technology for reducing or providing substitutes for the use of scarce heavy rare-earthrare earth elements, such as europium, terbium and dysprosium. The state also fosters the comprehensive recycling of paragenetic ores of scarce rare-earthrare earths metals that are difficult to recover recycle during the process of ore dressing and smelting, and encourages the recycling of rare earth associated ores of rare-earth metals, including niobium, tantalum, thorium, strontium, potassium and fluorite.

China gives great support to the development of the circular economy in this field, and works hard for the recovery and utilization use of secondary rare-earthrare earth resources. The state encourages the development of special processes, technologies technologies and equipment for the collection, processing, separation and refining of rare-earthrare earth wastes, supports the building of specialized bases for the recovery and utilization use of secondary rare-earthrare earth resources, including molten salts after pyrometallurgy, slag, waste permanent magnet materials and motors, waste NniMH ckel-metal hydride batteries, waste fluorescent lamps, dead catalysts, used polishing powder, and other waste electronic components containing rare-earthrare earth elements.

IV. Better Coordination ion of Rare-earthRare Earth Utilization with Environmental Protection

In recent years, out of the need of environmental to better protection the environment, China has been improving its control over high-energy consuming, highly polluting and resource-based of resource products and related industries that require high energy consumption and cause severe pollution. In the field of rare-earthrare earth industry metals in particular, the state has adopted a series of taken effective measures to better coordinate rare-earthrare earth development and utilization with environmental protection. China will never develop the rare-earthrare earth industry at the expense of its environment.

The state has strengthened control supervision of the rare-earthrare earth industry with regard to environmental protection and formulated relevant laws and regulations, which is essential to the better coordination of rare-earthrare earth utilization with environmental protection. Since the 1980s, China has enacted about a dozen laws related to on environmental protection, including the Environmental Protection Law and the Law on Water Pollution the Prevention and Control of Water Pollution, and established institutionalized the systems of environmental impact assessment, control of the total pollutant discharge, and ordered elimination or control of treatment of pollution within a time limitspecified period of time. The state promulgated and put into effect the Regulations on Land Reclamation to ensure the full fulfillment performance of all land reclamation obligations, demanding . The Regulation requires that mining, environmental protection and land

reclamation should be conducted concurrently, to timely restore the eco-environment that has been damaged by mining. Since the implementation of the 11th Five-Year Plan (2006-2010), the state has listed energy conservation and emission reduction as part of the objectives of national economic and social development, and mandated the targets of reducing the intensity of lowering energy consumption intensity, chemical oxygen demand (COD) and sulfur-dioxide emission. The 12th Five-Year Plan (2011-2015) has added reducing lowering the emission intensity of carbon-dioxide emission and the emission of ammonia nitrogen and nitrogen oxides to the list of mandatory targets. In 2011, to intensify environment protection efforts in the the rare-earthrare earth industry's efforts for protecting the environment, the state enforced the Pollutant Discharge Standards for the Rare-earthRare Earth Industry, which sets the limits of COD, and emission of such pollutants as ammonia nitrogen, phosphorus, fluorine, thorium, heavy metals, sulfur dioxide, chlorine gas, and particulates for rare-earthrare earth enterprises. At present, China has been making studies in the establishment of is preparing to establish an environmental risk assessment system for the rare-earthrare earth industry.

EarnestStrict enforcement of laws and regulations on environmental protection has been the key to maintaining a good environment while developing and utilizing rare-earthrare earth productsmetals. In recent years, the state has enforced implemented the environmental impact assessment system to the letter. An analysis, prediction and assessment report of the environmental impact that may be caused by a rare-earthrare earth construction, expansion or renovation project must be submitted in advance, along with countermeasures to prevent and mitigate the impact. No project shall be implemented before it passes the assessment. To intensify In supervising the environmental protection efforts in of the rare-earthrare earth industry, the state also strictly observes adheres to the stipulation in the Environmental Protection Law that installations for the prevention and control of pollution at a

construction project must be designed, built and commissioned together with the principal part of the project, and that a construction project should not be commissioned or used until such installations are examined and considered up-to-standard by environmental protection authorities in charge. China exercises a pollution discharge license system and implements the Discharge Standards of Pollutants for the Rare-earthRare Earth Industry. Rare-earthRare earth enterprises are forbidden to discharge pollutants before they obtain pollution discharge licenses from the environmental protection authorities, and should strictly observe the standards on the density, quantity and channels of pollutant discharge. The state adopts a system of compulsory elimination of obsolete processes technologies and equipment, and prohibits the use of tank and heap leaching methods for ion-absorption rare-earthrare earths ores and the mining of monazite deposits only. The government also bans the use of technologies that cause heavy pollution and severe damage to the environment, and acts to prevent ecological degradation and environmental pollution at the source. In recent years, China has been stricter in implementing the deposit system for protecting and restoring the geological environment of rare -earth mines, urging rare -earth enterprises to carry out their economic responsibilities for environmental protection and restoration, and gradually establishing a responsibility mechanism of environmental control and ecological restoration for the at mines.

The state carries out special environmental protection campaigns to regulate the activities of the rare -earth industry. In these campaigns, governments at all levels require rare -earth enterprises to accelerate the construction of environmental protection facilities, abide by the pollutant discharge standards, and implement clean production. Enterprises that do not meet these requirements shall be are ordered to cease production for pollution control in accordance with the law,, and shall will be closed down if they still fail to meet the standards after the deadline set for them after they are given time to correct their ways. An

overall environmental protection inspection has been conducted since started in 2011 on all rare earth minesenterprises engaged in rare-earth mining, smelting, and separation and , and metal production enterprises, investigating . The state and punishing investigated and punished rare -earth enterprises responsible for polluting the environment. So far, the state , and has published two lists of a total of 56 enterprises that meet environmental protection standards. As a result of the campaign, the rare -earth industry and its enterprises have been urged to put in has spent more than four billion yuan on pollution control and technology upgrading, markedly enhancing the environmental protection level of the industry. Regarding enterprises that generate heavy severe pollution, pose environmental hazards, cause strong complaints from the public, or violate laws and regulations on environmental protection, the state will publicize their cases, urge them to rectify their activities within a specified period of time, supervise their rectification process, and take other disciplinary actions measures necessary in accordance with the law. Governments at all levels will appropriate funds to address ecological damage and pollution caused by tailings and slag, which have been formed over a long period of time.

V. Promoting Technological Advancement and Industrial Upgrading

China makes it a priority to enhance the level of scientific development and utilization of rare -earth products metals. The state strives to create a favorable policy environment for expediting the technological advancement and upgrading of the rare -earth industry, overcoming resource and environmental bottlenecks and providing technological support for the sustainable development of rare -earth industrymetals.

The state encourages technological innovation in the rare -earth industry. The Outline of the National Program for Long- and Medium-term Scientific and Technological Development (2006-2020) lists rare -earth technologies as a key field of research and development to get state support. The state supports basic studies and studies on frontier technologies related to rare earths, as well as the research and development, application and spread of basic, frontier and critical industrial technologies, and promotes aims to propel the establishment of an enterprise-centered, market-oriented technological innovation system that which combines the efforts of enterprises, universities and research institutes. China actively develops environmentally-friendly, advanced and appropriate rare -earth exploitation technologies, highly efficient mining technologies suited to complex geological conditions, and comprecomprehensive ssive recovery technologies for paragenetic and associated mineral resources, in order to

raise the recovery rates and cyclical utilization levels of the resources. The country makes vigorous efforts in organizing research and development of advanced technologies for low-carbon and low-salt discharge, manufacturing of ultra-pure products, membrane separation, recovery and utilization of associated thorium resources, recovery and treatment of fluorine and sulfur in tail gas, recycling of chemical raw materials, and automatic production control, to realize the efficient and clean smelting and separation of rare -earth metals. The government guides rare -earth production and application enterprises, scientific research institutes and institutions of higher learning universities to develop deep processing and new material application technologies. It works hard to foster science and technology personnel, strengthen the protection of intellectual property rights, and establish technological standards, in order to create favorable conditions for the development of rare -earth technologies.

Over the past few years, China has accelerated the technological transformation of rare -earth enterprises, encouraged the use of efficient and green technologies for mining and ore dressing, such as in-situ leaching, and advanced equipment to renovate rare -earth mines, enhanced their performance in comprehensive resource utilization, ecological restoration, environmental protection and safe production. It has built and improved facilities for the storage and treatment of tailings to protect and make better use of tailing resources. The state government also encourages the transformation of existing the production lines of for rare -earth smelting and separation by using advanced equipment and technologies, such as separation without using ammonia, and fuzzy simultaneous linkage extraction technologyand separation, in order to reduce the consumption of chemical materials and discharge of the “three wastes,” namely, waste gas, waste water and waste residues. New technologies and equipment featuring low discharge and low energy consumption are adopted to for renovate ing enterprises engaged in rare -earth metal smelting enterprises, to in-

crease production efficiency, improve and product quality and also lower energy and material consumption. The state is also accelerating the elimination of ammonia saponification extraction, chloride electrolysis, hydrometallurgical synthesis of rare -earth fluoride, and other obsolete processes technologies and capacities. It encourages enterprises to combine technological transformation with merger and reorganization and elimination of outdated capacitiesobsolete technologies, in order to get backward rare -earth enterprises to close down, suspend operations, merge with others or change their lines of production.

Readjusting and optimizing industrial structure Structural adjustment and upgrading is a crucial step in promoting the sustained and healthy development of the rare -earth industry. The Chinese government exercises strict control over of the total volume of rare -earth smelting and separation, and will not approve any new rare -earth smelting and separation projects except for those state-sanctioned projects of merger and reorganization and for distribution optimum. Existing rare earth smelting and separation projects are prohibited from expanding their scale of production. The state resolutely halts the construction of projects that are undertaken in violation of violate relevant regulations, and will punish, in accordance with the law, departments and individuals responsible for giving approval beyond their authority and those responsible for building the projects in violation of relevant regulations. China adjusts the structure of processed rare -earth products, curtails the excessive consumption of rare -earth resources metals by low-end products, and reduces the output of low-grade processed products that require high rare -earth consumption. It aims to follow the international scientific and technological and overall industrial development trend and by encourage ing the growth of high-tech rare -earth application industries with high added value. In addition, the state expedites the development of high-performance rare -earth materials and devices, including magnetic, luminescent, hydrogen- storage, and catalytic materials, and encourages the application of

rare -earth materials in the fields of information, new energy, energy conservation, environmental protection and health care. The states government encourages enterprises to strengthen innovation in management innovation, establish the modern enterprise system, and accelerate industrial upgrading, in order to transform them into modern enterprises that save resources, protect the environment, follow the path of intensive development and actively fulfill their social responsibilities.

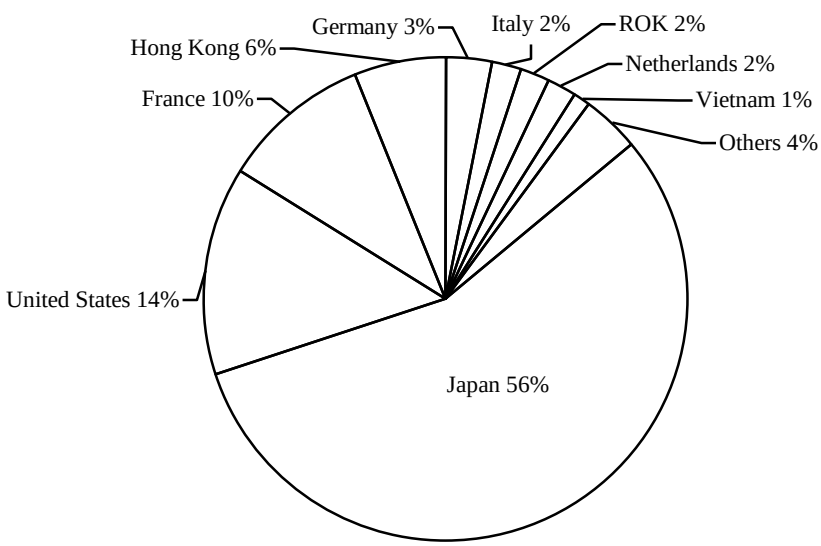
VI. Promoting Fair Trade and International Cooperation

Opening up is a basic state policy of China. In the field of rare -earths metals, China gives simultaneous consideration to both domestic and international resources and markets, and follows a win-win mutually beneficial strategy that both ensures of maintaining a reasonable rational supply of rare -earth products onmetals to the international market and while helps protecting the environment and resources. China will continue its It makes persistent efforts in to promoting e fair trade and international exchanges and cooperation in this field.

In view of the needs of protecting the environment and resources and developing in a sustainable way, and after giving overall considerations to the domestic and international markets, the carrying capacity of resources and environments, as well as domestic production conditions, China strictly controls the total volumes of rare -earth mining and production, and takes restrictive measures on the mining, production, consumption and export of rare -earth products metals simultaneously. The state sets a reasonable quota for annual rare -earth exports that basically satisfies the normal demand of the international market. Meanwhile, China tightens customs controlsupervision, regulates the management of declarations to be filed by enterprises, and orders rare -earth export enterprises to comply with the industrial policies, industry access and environmental standards. The state is reinforcing its supervision and control over of export enterprises and the self-discipline regulation of the industry. In accordance with the law, it investigates and punishes enterprises that export rare -earth

products clandestinely, export products procured purchased from illegal channels sources or commit other illegal acts disrupting the normal causing serious disorder of to the rare -earth export business. In 2011, the state carried out a special campaigns to crack down on rare -earth smuggling, during which it tracked down 769 tons of smuggled rare -earth products metals and 23 criminal suspects in eight cases. Meanwhile, the state China strictly bans the import of rare -earth products containing radioactive substances that exceed the prescribed limits.

Chart 45 Export Market of China's Rare -Eearth Export in 2011



Regarding rare earth trade, the Chinese government has reiterated on more than one many occasion that China will continue its rare -earth supply to the international market. The tightened control over rare earth export by the Chinese government The state exercises stricter control of rare-earth exports is carried out in concert with that over

the mining, production and other links of the rare earth industryand of rare-earth mining and production at the same time. This is in alignment with China's path of sustainable development and the interests of all countries in the world. China opposes politicizing the rare -earth issue, and is willing to strengthen promote dialogue and cooperation with other rare -earth producers and consumers in with a constructive and responsible manner, attitude. It hopes to work together hand in hand with them in to preventing excessive speculation in the rare -earth market and solvinge the resource and environmental problems in the development of the industry. It also hopes that countries and regions with abundant rare -earth reserves will make active efforts in developing their own resources to diversify the supply and expand rare -earth trade in the international market, together shouldering together the responsibility of global supplying the world with rare earth supply in order to meet the needs of the sustainable development of the world economy.

In recent years, China has been actively creating a fair and open environment for foreign investment, encouraging foreign investment in environment restoration, waste product recycling, and high-end application development and equipment manufacturing in the rare -earth industry. Enterprises from the The United States, Germany, France, Canada and Japan have invested a total of 6.1 billion yuan in China's rare -earth industry, establishing 38 sole-proprietorship foreign-venture and joint-venture enterprises. Their products are mainly made for export to meet the needs of the mother countries of these investors. China encourages domestic enterprises to follow international practice practice and market rules, to and participate actively in international technological and economic cooperation in the field of rare -earths metals.

China has actively participateds in international exchanges in the field of rare -earths metals. It has consecutively established the International Conference on Rare -Eearth Development and Application, International Rare E-earth Industry Summit, Baotou Rare -Eearth In-

dustry Forum, and other platforms for academic exchanges. China has takens an active part in activities held by the International Workshop on Rare -Earth Permanent Magnets, International Commission on Illumination and other related international organizations. It has conducted bilateral and multilateral exchanges and dialogues on a broad range of issues concerning rare -earth metals with the US, the EU, Russia and Japan, to share information, enhance mutual understanding, and work hand in hand to promote the sustainable development of rare -earth science and technology and the rare -earth industry as a whole.

The sustained, healthy development of the rare -earth industry is crucial to the sustainable use of rare -earth reserves metals as important natural resources of the world, as well as to the protection of Planet Earth, which is home to all mankind. Nowadays, as all countries depend on each other for existence and prosperity, they should strengthen cooperation and share responsibilities and achievements. In future, China will adhere to the Scientific Outlook on Development, improve its rare -earth policies, reinforce supervision over the industry, and work closely with the international community to safeguard a fair and rational order of the rare -earth market, better coordinate rare -earth development and utilization with the protection of the environment and resources, and make new contributions to the world’s economic growth and scientific and technological development.