

5. RARE EARTH METALS (REES)

DEFINITION

REEs are a set of seventeen chemical elements in the periodic table, specifically the fifteen lanthanides plus scandium and yttrium. They are relatively plentiful in the Earth's crust. However, because of their geochemical properties, rare earth elements are typically exploitable ore deposits.

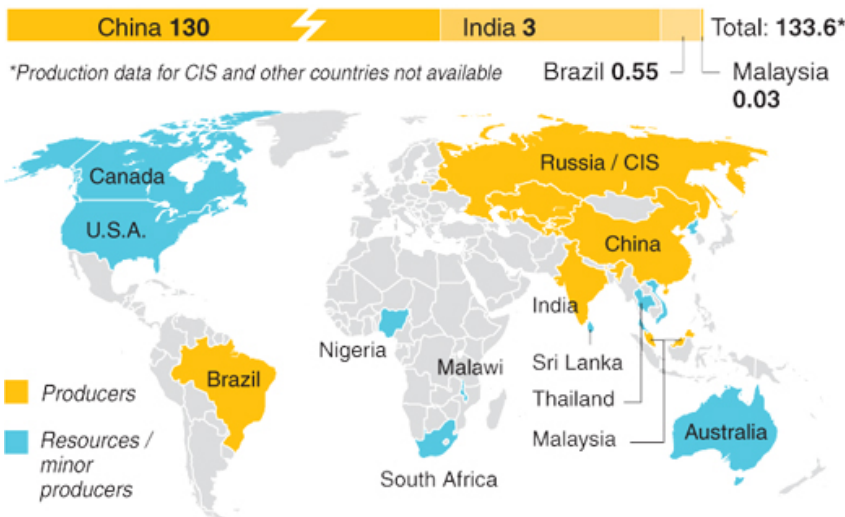
USE

Used in the production of many devices including LCD screens, computer chips, optical media, rechargeable batteries, mobile phones, magnets, and car components. They are important for defense equipments, such as jet fighter engines, missile guidance systems, antimissile defense, and space.

DEMAND AND SUPPLY

World demand for REEs is estimated at 136,000 tons per year and it is projected to rise to at least 185,000 tons annually by 2015... The major importers of REEs are Europe, USA and Japan. The leading supply countries were China, France, and Japan. These three countries accounted for 94% of the domestic imports.

2011 PRODUCTION in thousand metric tons



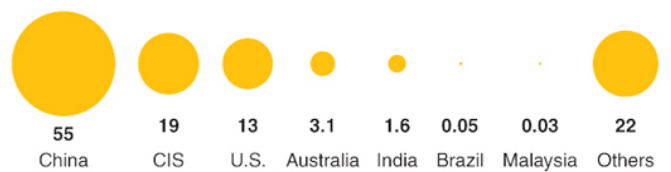
CIS= Commonwealth of Independent States (Former Soviet Union states)

From the 1960s to the 1980s, the **United States** was the leader in global production of rare earths. Since that time, processing and manufacturing of the world's supply of rare earths have shifted almost entirely to China, in part due to lower labor costs and lower environmental standards.

In July 2010, **China** announced cuts in its exports of REEs by about 72%. Because of China's decision to restrict exports, many countries have re-started explorations with varying success. No raw REE production is known in the EU, which is dependent on imported REEs raw materials from China.

China accounted for 97% of world production. State-run labs in China have consistently been involved in research and development of REEs for over fifty years. There are two State-Key labs: one affiliated with Peking University, and another one is associated with the Changchun Institute of Applied Chemistry. China sets their export quota for the first half of 2012 at 10,546 thousand metric tons.

WORLD RESERVES in million metric tons



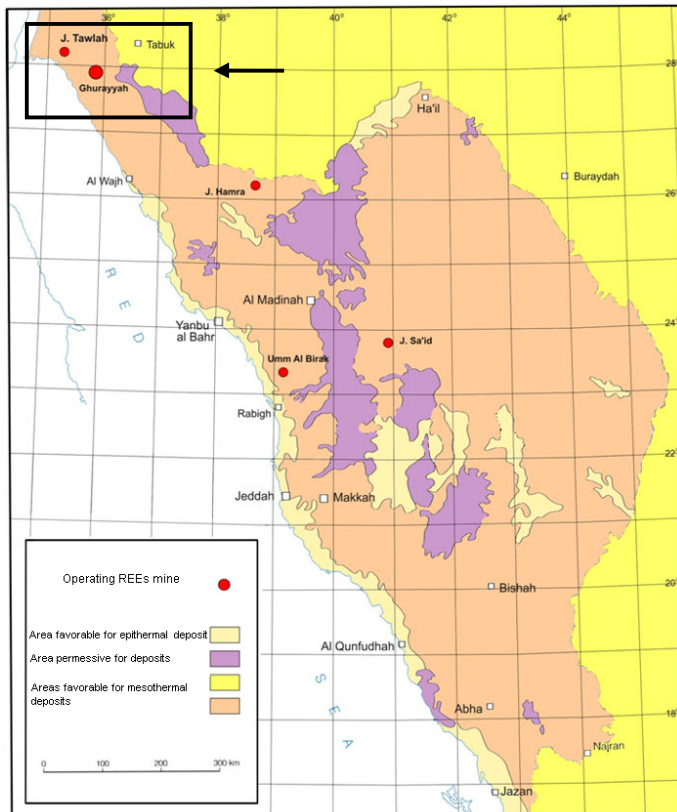
EU The European Commission has adopted a strategy targeted at better utilization of supplies in the EU (*"Effective raw materials strategy for Europe"*, 2011) partnership with new sources, and increased recycling and substitution. Among EU countries, Germany has passed its own strategy designed to ensure that it is able to secure enough rare earths to support manufacturing operations. 12 German companies have formed a collaboration to establish an alliance in order to secure the supply of industrial raw materials for German industry.

JAPAN has been supporting research on rare earth substitution for a number of years now under the *"The New Energy and Industrial Technology Development Organisation"* (NEDO).

SAUDI ARABIA FOCUS: RARE EARTH METALS (REES)

Saudi Arabia is geologically diverse and contains a wealth of resources, including some of the world's largest gold deposits. The Kingdom is a home for rare earths such as, **tantalum** and **niobium**.

The Kingdom is considering how to exploit the deposits, given that local industry does not yet make use of them. With this as a distinctly possible background, mineral exploitation would become the third pillar of the Saudi economy. Saudi Arabia is currently at an exploring stage and trying to evaluate the available deposits of minerals and REEs. After this step, the raw materials would be exploited and mining licenses would be given to foreign enterprises. The main purpose is to attract foreign investments in order to help to increase regional development in rural areas, and to create new jobs.



The mining explorations are focused on an area of nearly 600.000 km² called **The Arabian Shield**. This area was created during the late Proterozoic, had a particular geological evolution (accretion of volcanic island arcs) and contains huge deposits of minerals.

The most important deposits of REEs in Saudi Arabia are concentrated in the Western part of the Kingdom, not far from Jeddah and Medina.

Jabal Tawlah is one of the most known deposits of metal elements of high economic importance in Saudi Arabia. Reserves have been estimated to a depth of 65 m under the surface. This relatively little sludge has the highest concentrations of niobium, tin, yttrium. It is also rich in Baltantalm, thorium and heavy rare earth elements (REE).

Ghurayyah is a world-class deposit containing valuable tantalum, niobium, rare-earths, zirconium and yttrium.

MAIN CONTACTS

The Saudi Geological Survey (SGS)

It is the national geologic survey, established as an independent entity attached to the Ministry of Petroleum and Mineral Resources. The SGS will be able to provide a number of its services and consultation skills to the public and private sectors. SGS also has the flexibility to operate abroad and can form partnerships with private companies or with other earth science agencies.

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Website: <http://www.sgs.org.sa/>

Ma'aden (Saudi Arabian Mining Co.)

It is a diversified mining company, active in gold base metals mining and infrastructure industry. It is the largest mining company in Saudi Arabia. The Saudi government still owns 50% of its shares.

Website: <http://www.maaden.com.sa/>

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