

Rare earths, source of progress and conflicts

Part 2 - Importance and application



The rare earth (RE) metals constitute a key raw material for the production and development of a wide range of high-tech equipment. From smartphones and computer hard drives to lasers, radars, sonars, night vision systems, hybrid vehicles and military use.

They enable the construction of stronger magnets, and thus also the development of more efficient electronic devices. Gone are the days when we were using bulky and heavy PCs, whose performance was slower too.

To give more precise examples^[1]:

300 kg of Nd, Pr and Dy are needed for a 3.5 MW wind turbine.

1 kg of Nd, Pr and Dy are required for 1 hybrid car.

2.4 g of rare earth elements are present on average in your laptop.

Your laptop and phone became smaller and lighter mostly thanks to the use of rare earth elements in some of their components.

In the following post we are going to discuss about the process technologies and environmental impacts related to rare earth metals.

Application	RE elements	Products	Market share
Magnets	Nd, Pr, Sm, Tb, Dy	Motors and generators, HD drives, smartphones, microphones, speakers	27 %
Glass and ceramics	Ce, La, Nd, Er	Polishing powders, UV resistant glass, thermal glass, sensors, camera lens	23 %
Catalysts	Ce, La, Nd, Pr	Auto catalysts, fluid cracking catalysts (for the petroleum production)	18 %
Metal alloys	La, Ce, Pr, Nd, Y	NiMH batteries, superalloys for aeronautics and space	16 %
Phosphors	Eu, Y, Tb, La, Dy, Ce, Pr, Gd	LCDs, LEDs, fluorescent lamps, Xray imaging, optical sensors	5 %
Others	-	Pigments, nuclear sector, medical tracers	8 %

Table: Use of rare earths (2016) ^[2]

^[1] EURARE: Development of a sustainable exploitation scheme for Europe's REE ore deposits (2013)

^[2] Table 1: Alkane resources Ltd - Economics of Rare Earth Projects (2017)

