



What are rare earths and what is their role in lighting?

Rare earths are a group of 17 metallic elements with very unique properties that are widely used in energy and lighting technologies. These elements are used in products such as hard drives, fuel cells, wind turbines, polishing powders and catalytic converters. In lighting, rare earth oxides are used for the creation of white light from the UV radiation generated within fluorescent lamps.

I've heard there is a rare earth "crisis" taking place because of increased costs. Is this true?

Rare earths are undergoing extreme cost increases due to unprecedented market forces. In less than 12 months, costs of some rare earth oxide materials used in lighting products have experienced increases ranging from 500 percent to more than 2,000 percent, and they continue to climb. For perspective, if the rate of inflation on the rare earth element europium oxide were applied to a \$2.00 cup of coffee, the new cost would be \$24.55.

Read more about rare earth cost inflation at

<http://www.bloomberg.com/news/2011-06-17/rare-earth-prices-double-on-china-industrial-minerals.html>.

Why are costs so rapidly changing?

A variety of factors continue to inflate the cost of these materials as realization of their intrinsic value increases. Demand for rare earths continues to grow in line with growth in green technologies. Supply, however, is declining as China, the main producer of rare earths, imposes quotas on its rare earth exports every year. Demand for some rare earths will outpace supply for some time.

Who is mining for rare earths?

Although rare earths are found throughout the world, approximately 97 percent of all rare earth production is concentrated in China.

For information about China's rare earth industry, see this joint report by the U.S. Geological Survey & U.S. Department of the Interior: http://files.eesi.org/usgs_china_030011.pdf.

With costs of rare earths skyrocketing, why aren't others outside of China eager to open mines?

Circumstances have raised the interest of speculators, and rare earth materials buyers are building inventories. However, costs to operate mining facilities are in the hundreds of millions of dollars, and the timeline to operationalize a new mine is seven to ten years. In addition, increasing environmental standards and growing labor wages have resulted in the development of fewer mines.

Are any new mines being developed to keep up with rare earth demand?

The Mountain Pass mine in California and the Mount Weld mine in Australia are expected to be operational in 2012. However, these mines will produce mainly a group of rare earths called "light" rare earths. Unfortunately, only half of the rare earths needed for fluorescent lighting products are considered "light" rare earths. The others are considered "heavy" and will not be produced in viable quantities outside of China for many years.



What is being done to try to curb rare earth inflation and meet supply needs?

Globally, many actions are underway. Governments are working with China to ensure balanced and fair trade policies. The U.S. government also has a marked focus on rare earths with a number of bills and actions aimed at securing a domestic materials supply chain. Researchers in private and public industries are pursuing the development of alternative solutions.

What is GE doing to combat the rare earth supply chain crisis?

GE technology teams are working closely with GE's Global Research Center to develop and procure lower rare earth content phosphor and qualify an expanded base of suppliers. The business continues to work to secure an ample supply of materials to help minimize cost impacts on customers.

Where can I learn more about rare earths?

For more information, go to www.gelighting.com/rareearths.