

## **Rare Earth Metals**

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**eResearch Corporation** is pleased to provide a **PINNACLEDIGEST** article entitled:  
**Rare Earth Metals**

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## Rare Earth Metals

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There is a small group of relatively unknown metals on the verge of becoming white hot. A very quiet, but important battle for control and access to these metals is already underway. The situation could turn scary and desperate very fast if our only true source of supply is disrupted. Demand is constant and continuing to increase, but supply is the x-factor which could send these metals sky-high very quickly.

We are talking about **rare earth metals**.

These metals are in high demand right now because:

- (1) Close to 100% of supply is located in China;
- (2) They are a group of very strategic metals being used for thousands of different technological products; and
- (3) Any green revolution or technological advancement in numerous fields relies solely on the availability of these **rare earth metals**.

Let's start with the basics as even those familiar with these metals have limited knowledge of their uses and the potential of a global supply crisis.

The **United States Geological Survey** (USGS) has identified 17 metals on the periodic table of the elements which are known as rare earth metals. Below are the more common ones that you need to know about.

**Cerium:** It is the most abundant of the 'rare earths.' It's found in automobile catalytic converters and other pollution control equipment. Cerium helps to reduce sulphur oxide emissions. It is also added to diesel fuel to help it burn more efficiently. Cerium has traditionally been, and continues to be used as a glass polisher.

**Lanthanum:** Its most important use is in rechargeable batteries, such as the nickel-metal-hydrate batteries used in the Toyota Prius hybrid (a typical hybrid car uses about 20 kilograms of **rare earth metals**). This is extremely important as Toyota continues to adjust its sales goals for the ever popular Prius into 2010. Even amidst Toyota's latest recall debacle, the shift towards electric cars is evident, attributing to more of the market share year over year.

**Neodymium:** It is used in magnets to make the magnetic field incredibly strong. Cell phones, computers and audio speakers wouldn't exist without neodymium magnets. And the creation of miniature motors wouldn't be possible without it. As our world becomes more reliant than ever on mobile communication, it is hard to imagine a world without cell phones and computers. Hybrid cars also use neodymium in their motors and generators.

**Holmium:** It has the greatest magnetic strength of any element, and is used in medical and dental lasers and nuclear control rods. It's also a colourant for glass.

**Dysprosium:** Its magnetic strength properties make it a useful material for certain lasers, fuel injectors for diesel engines, compact discs, and other various data storage applications.

**Thulium:** One of the rarest and most expensive of the 'rare earth' elements. It has unique properties that make it ideal for laser-based surgical tools.

**Yttrium:** Primarily used to make red phosphors for use in red LEDs and superconductors.

**Erbium:** A silvery-white metal created for use in photographic filters and as a colouring agent in sunglasses and jewellery. It's also a key element in optical amplifiers widely used in fibre-optic communications systems.

REM's (**rare earth metals**) great magnetic capacity and resistance to high temperatures is fundamental to their use in the outlined technologies above. REMs are used in thousands of technological products from cell phones, to flat screen tv's and automobile catalytic converters - products found in all areas of our society.



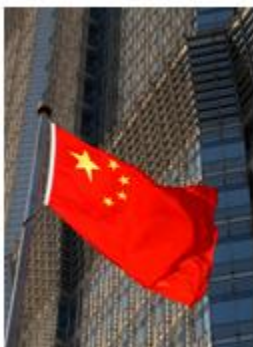
We believe the time is coming when the vast majority of investors will be forced to enter this up and coming sector. As the green movement increases and our demand for technology based products continues to skyrocket, the need to increase our level of supply of **rare earth metals** will come.

**Key Fact:** In early 2009, US Congress ordered the US Government Accountability Office to undertake a comprehensive review of US dependence on **rare earth metals** for their use in military applications, i.e. (night vision goggles, range finders, precision guided munitions and cruise missiles are a few examples).

This is the tip of the iceberg as China, which is responsible for over 95% of the world's production, has begun hoarding rare earth metals as a way to increase prices and ensure its own ability to sustain technological advances for years to come.

Wikipedia explains a shift occurring globally that, if not reversed soon, could leave every nation in search of rare earth metals in a deficit.

Wikipedia cited that:



"Chinese export quotas have also resulted in a dramatic shift in the world's rare earth knowledge base. For example, the division of General Motors which deals with miniaturized magnet research shut down its US office and moved all of its staff to China in 2006."

"On Sept. 1, 2009, China announced plans to reduce its quota to 35,000 tons per year in 2010-2015, supposedly to conserve scarce resources and protect the environment. Other sources of rare earth have been searched to avoid shortages and China's monopoly, mainly in South Africa, Brazil and the United States."

There is no doubt that the Chinese have begun stockpiling rare earth metals for their own consumption.

A report from Bangalore, published by Reuters in late 2009 made some interesting points:

"China may lose its near-monopoly on producing so-called rare-earth metals used in hybrid cars and computer hard disks as a host of smaller Canadian companies develop fresh sources of supply over the coming years."

This has us excited at Pinnacle and it should do the same for you. China put the few North American rare earth metal mines out of business years ago. Their cheap cost of labour combined with zero environmental red tape gave them an unprecedented global advantage. That is now changing as the rest of the world looks to stockpile for the future...

Frederic Bastien, an analyst at Raymond James, stated that, "There has been increased interest to look into ways to mine rare earth out of China, specially given the protectionism China is applying to its resources."

The threat China will cut off the west from rare earth metals is real. The most shocking commentary came in late 2009 when China's Ministry of Industry and Information Technology submitted a report on its rare earth industry which included proposals for further restrictions on exports and an outright ban on foreign shipments of a few key rare earth metals.

Jack Lifton, an independent rare earth metals expert, (and an outspoken one) commented that, "China had reduced exports of the metals since 2004. If that policy continues, the world could face a huge shortfall. At end of 2015, China will no longer be exporting rare earth metals. If the West has not found its own manufacturing, then the West will be no longer making rare-earth-based end products."

Remember that rare earth metals are used in basically everything technological and advanced.

As stated, rare earth metals are heavily used in optical-fiber communication systems, flat screen televisions, computers, cell phones and in building refined catalysts and hybrid car components (primarily batteries and magnets). There are thousands of in-demand applications which use rare earth metals, and this equates to a massive social and economic dependence.

Don't hit the panic button just yet.

Rare earth metals companies based in Canada, Australia and the United States are expected to bring on projects in the coming 3 to 5 years. Exploration in this sector is increasing and with the expectance of continued massive demand surges across the technological and green sectors, it's no surprise that the race to production has already started.

As companies position themselves for a potential rare earth metals rush, it is safe to say that it isn't just a speculators sector anymore. The US government is already panicking. As China tightens its grip on supply you can bet millions and eventually billions of dollars will flow into this sector to ensure a steady stream of supply. Canadian companies have been leading the way in this scope and will continue to do so. Expect the rare earth metals arena to only grow in the coming months and years as this situation reaches higher levels of awareness.

All the best with your investments,

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