

A.L. WATERS CAPITAL LLC

Special Report: Rare Earth Elements Forecast 2012

rare earth
elements

special report

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Little more than a year ago, few people outside of the mining industry knew much about rare earths and what they are used for. Despite their strategic and economic importance many people had never heard of these elements until recently.

Since then, skyrocketing prices, and a newfound awareness of the fact that China held a near monopoly in the industry, has practically made rare earths a household name.



In the past, rare earth prices didn't apparently warrant the attention of the US and other developed nations which allowed China to take a dominating role in the industry. Today, China accounts for as much as 97% of the world's output of these critical periods.

The prices of rare earth oxides have risen dramatically, however, in the past year or so. Manufacturers have driven prices as they accelerate production of hybrid vehicles, wind turbines, and the most high tech applications of which many sophisticated investors are unaware of the link to rare earth elements. Simply put, producers need the rare earth ore and are willing to pay for it on the world markets.

Several factors make the rare earth industry very unique and, sometimes, difficult to predict. First, there is no global rare earths market. There are only local and regional markets for individual rare earths and supply and demand can vary greatly. If a manufacturer of high tech magnets needs neodymium, they engage a supplier and enter into a long term contract.

Some called the exponential rise in rare earth prices a bubble, and felt vindicated by the recent pullback in the market prices. While it was always likely that we would see a market correction, several factors are likely to support a gradual rebound in the price of at least some rare earth elements. For one thing, there are several barriers that will keep some of the newest producers from making a significant impact on the supply side. One example would be that China strictly limits the imports of rare earths in any form. One might think that this is an obvious statement, as China produces enough rare earths to have no need for any imports. The problem is that China is also dominant in the refining of rare earths; particularly heavy rare earths. This means that rare earth mining companies elsewhere in the world will have to also find, or create, complex facilities to turn mined ore into finished products. Because of this, very few junior miners will be able to produce the particular heavy rare earths demanded by the current- and near-term market, or will ever get into actual production.

Some doubt as to whether Molycorp will be able to produce significant quantities of heavy rare earths, without significant investment in processing facilities. The company may have the capacity for refining light rare earths, but would require a more capable facility for the HREEs, and would need new capital to be able to build one. Another issue is the fact that uranium, thorium and other radioactive materials are a byproduct of mining for rare earths, which permitting process and greater costs for new

miners. Therefore, a solid discovery in the exploration phase does not necessarily translate to a profitable bottom line.

This should prove to be another advantage for Frontier Rare Earths, as the levels of uranium and thorium in the Zandkopsdrift are relatively low compared to other carbonatite deposits.

There has also been a lot of talk that US government is looking into developing a strategic stockpile, as the military also relies on substantial quantities of certain rare earth elements. Creating a strategic stockpile now would only worsen the shortage outside China.

The recent decline in market prices also poses a problem for new entries to the rare earth mining industry. Rare earth prices have declined by about 27% from their highest values this year, which means that new rare earth mine developers are likely to face problems while funding new operations.

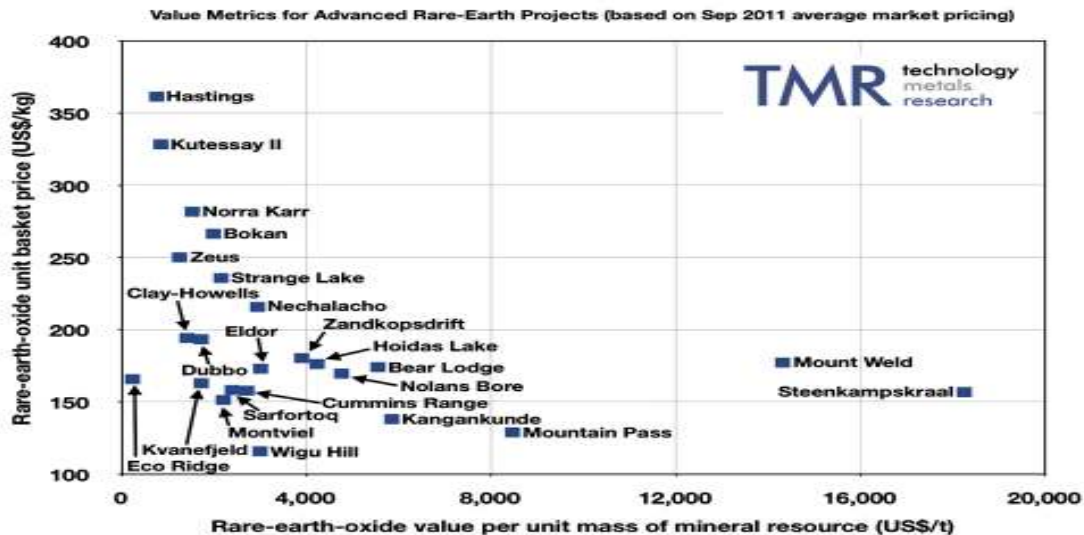


Lastly, there is the simple supply and demand issue. Demand has skyrocketed over the last decade from 40,000 tons to 120,000 tons. Meanwhile, China has been cutting its exports. Now, it only exports about 30,000 tons a year; only one-fourth of global demand.

Here is a review of the supply/demand scenario over the next 3 to 5 years.

- Supplies of Dysprosium (TV and LASERS) are not likely to meet global demand before 2017.
- Terbium (LASERS/FUEL CELLS/ALLOYS) and Yttrium (TV/GLASS/ALLOYS) likely to be in the same predicament until 2015-2016.
- Lanthanum and Cerium the two most important non-critical rare earths, are likely to go into permanent surplus by 2012-2013.
- Neodymium (MAGNETS)
 - Optimistic forecast supply = demand in 2014
 - Pessimistic forecast supply = demand after 2017
- Europium (TV SCREENS)
 - Supply = demand after 2015-2016
- Global rare earth production (total) not expected to increase much until at least 2015-2016
- Most optimistic assumptions have demand outpacing supply until at least 2015
- Projected 15% increase in demand by 2015

Here is a graphic illustration of several of the current, advanced, rare Earth projects around the globe. Source: Technology Metals Research



Watch for significant discoveries of heavy rare earths (HREEs)

Hastings Rare Metals is set to develop the Hastings Heavy Rare Earth Project following a successful scoping study which indicates a mine could run for 15 years based on an open cut, 36 million ton resource.

The project would rank it in the top heavy rare earth projects in the world with an extremely high proportion of HREO of total rare earth oxide ratio.

Based on these figures, earnings before interest, tax, depreciation and amortization have been placed at \$150 million per annum allowing for a short capital payback period of less than 5 years.

The project has a high proportion of heavy rare earth oxides, 85% of total rare earth oxide ratio and a relatively high heavy rare earth oxide content of 0.18% compared to other projects. Importantly, demand for heavy rare earths is strong, with more than 8% growth in demand over the past 3 years. Both yttrium and dysprosium are on the US Department of Energy's critical supply list in short and medium term.

The Hastings project, located in the Kimberley Region of Western Australia, is one of the richest heavy rare earth deposits in the world with a total heavy rare earth oxide Resource of 62,500 tonnes placing the project among the top 10 in the western world.

Following is a list of rare earth elements:

Heavy rare Earths

*=most important

Dysprosium*
Europium*
terbium*
Ytterbium*
Yttrium
Erbium
Gadolinium
Holmium
Thulium
Promethium

Lutetium

LREEs

*=most important

Neodymium*
Lanthanum *
Praseodymium*
Cerium*
Samarium
Scandium

Following is a list of some of the more commonly traded rare earths, their market highs, and current market prices.

Terbium

- Present: \$2800/KG
- High: \$4500/KG

Dysprosium

- Present: \$2000/KG
- High: \$2800/KG

Yttrium

- Present: \$170/KG
- High: \$210/KG

Neodymium

- Present: \$270/KG
- High: \$410/KG

Europium

- Present: \$3900/KG
- High: \$5900/KG

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