

## Rare earth supply and demand

*George Werniuk*

According to Ian London of Avalon Ventures, rare earth elements (REEs) are becoming more important in a technologically advancing world. New applications are being found for them in hybrid vehicles, LED lights, lasers, superconductors and PET scans, to name only a few. Most of this sounds exotic but their importance in our everyday lives is growing.

The first rare earth element was found in Sweden in 1794. Today there are 15 elements classified as rare earths. By 1953, total demand for them was about 1,000 tonnes per year. In 1985, China started producing REEs, the same year that neodymium magnets were developed. These are used in energy efficient motors and wind turbines. Today REEs are found in items such as cell phones and flat screen televisions. As a consequence, demand for these little known but amazing elements has skyrocketed. Demand five years ago was 108,000 tonnes, and it is estimated that demand in 2008 was 124,000 tonnes.

Rare earths are not that rare but they are found grouped together in different proportions. If one or two types of rare earths are required, the rare earth ore has to be mined and the required elements have to be stripped out. This makes for complex and expensive processing and requires a lot of capital. Rare earths are not treated as a commodity because they are traded on private markets and through contracts.

Where do rare earths come from? Most supplies come from China, a country that is not only a producer but the world's largest consumer. As a result, China controls the rare earth market.

Looking forward over five years, it is expected that 180,000 tonnes of REEs will be produced annually, and the overall supply-demand situation should be maintained if China does not pull back. The challenge will be to produce the right types of rare earths.

The forecasts do not take into account new uses for rare earths. There are potentially new uses that will require a supply. Another conundrum is the application of rare earths in wind turbines, a growing source of clean energy. Rare earth magnets would be used more often, but the uncertainty of supply for a particular rare earth is impeding its universal application.

To meet the growing demand in the world outside China, the rest of the world will have to develop deposits and start producing the rare earths – it is not about how much resource is in the ground, it is about how much product is available.

Projects have long lead times. It can take 10 to 20 years to develop a grassroots discovery into a producing mine and these projects are capital intensive. There are some projects reaching the production stage outside China, which helps the supply situation somewhat and loosens China's grip on supplies.

London predicts that supply is not in a critical state; alternate innovations will come into play if a shortage of a particular rare earth develops; China will continue to seek out supplies

through foreign investments as the country looks for alternative sources to meet demand; the major miners have not entered into the rare earth business, leaving it to individual small companies. As new technologies are developed, new uses for rare earths will be found.