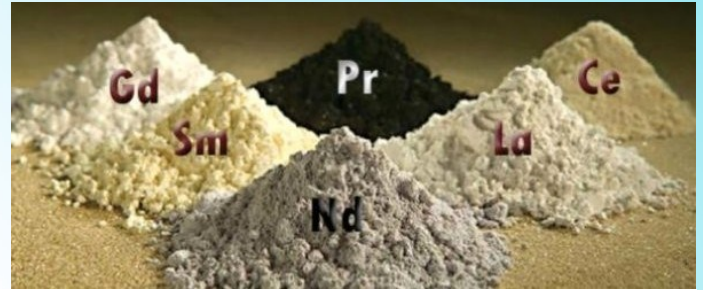


**Rare Earth Metals, Technology, Politics and the Perpetual Motion Machine:**

Believe it or not, there is a technology that manufactures a product that combines these seemingly unrelated business and political fields.

The product is manufactured from rare earth metals that are extracted from mining operations using an acid solution. The used waste acid stream which is the byproduct created by stripping the metals from the ore, is recycled for continuous reuse.

In other words “No Waste Stream”, only a product stream that is rich in rare earth metals and a recycled acid stream. The acid is sent back to be reused in the mining operation forming a continuous recycling for the extraction of the rare earth metals.



According to the Law of Conservation of Mass states “for any system matter or energy with mass, must remain constant over time.” Mining of rare earth metals can apply this law to the separation and production of the individual metal elements.

By creating recycled acid solutions helps these mining companies minimize chemical usage and waste streams which is an ongoing issue for this industry.

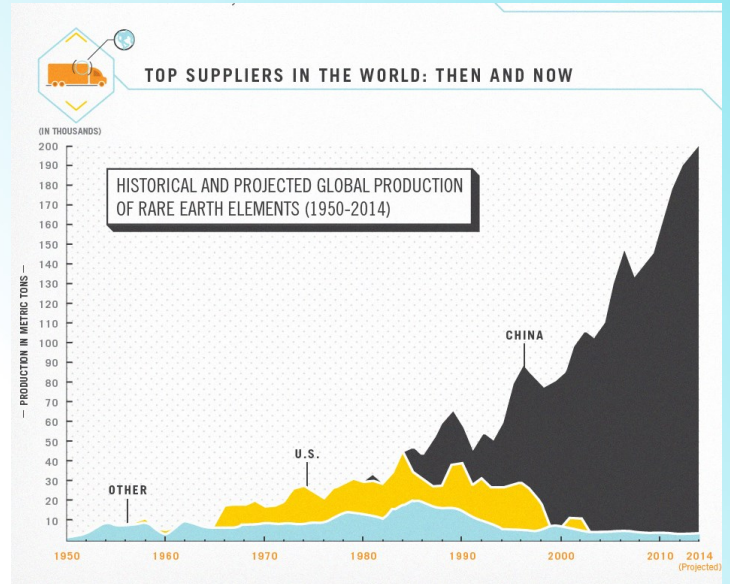
When you hear the words rare earth metals, commonly one might instantly think of silver and gold. One could easily overlook the other obvious metals such as Terbium (used in sonar equipment), Scandium, (manufactured into aerospace components) or even Thulium (portable X-Ray machines).

### Common Use of Rare Earth Metals:

Rare earth metals have a variety of use in the manufacturing industries. These metals range from high tech equipment, medical equipment, military weapons, and even in common everyday items such as cell phones.

In 2010 China cut their export quota for rare earth metals by 40% causing quite a bit of concern around the globe. As of 2013 China contained 80% of the 17 minerals and announced they were still not meeting their own demand.

However, due to the mobility of American mining industries, along with other companies and entrepreneurs the U.S. was able to re-open several mining operations. The increase production helped to meet the US requirements for these metals.



The irony of the term “rare earth metals” is the fact not that rare. To mine these elements is a combination of labor intensive, complex processes and environmentally hazardous by-products. This causes concerned companies to look for alternatives to the excessive use of chemistry and having to deal with the environmental impact of this type of mining operation.

Mech-Chem Associates, Inc. has a patented membrane technology called Diffusion Dialysis. This technology separates the metal bearing solution from the acid solution. One side of the membrane produces a metal rich solution that is used for the production of rare earth metals. The other side of the membrane produces the recovered acid solution that is recycled back into the ore leaching operation. This Diffusion Dialysis system keeps the acid solution in a perpetual and sustainable cycle.



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