



**House Natural Resources Committee:  
Subcommittee on Energy and Mineral Resources -  
Oversight Hearing on "Strategic and Critical Minerals Policy:  
Domestic Minerals Supplies and Demands in a time of Foreign  
Supply Disruptions"**

**Testimony  
of  
Mr. Ed Richardson  
President, U.S. Magnetic Materials Association**

**May 24, 2011**

Chairman Lamborn, Ranking Member Holt, distinguished Members of the Subcommittee,

Thank you for the opportunity to testify today. I represent the United States Magnetic Materials Association, a trade association dedicated to the reestablishment of the entire supply-chain of materials used in magnet systems. These systems play a vital role in the health of the U.S. defense industrial base and in the future potential of renewable energy in our nation. Our Association represents all segments of the U.S. magnet industry and rare earth supply-chain, including miners, processors, metal and alloy producers and finished magnet manufacturers. My comments today will relate to strategic-level rare earth issues and the challenges we face in accessing reliable supplies of the critical materials needed to support our industry.

When you hear about the crumbling infrastructure in the United States, it's not just roads, bridges, and sewer pipes. It's advanced industrial technologies, as well as the supply chain of critical materials to support those technologies. Frankly, we've lost many of the key capabilities to produce these technologies domestically – losing our nation's technological edge in the global marketplace. This situation absolutely holds true when it comes to advanced applications – both energy and defense – that use rare earth oxides, alloys, metals, or magnets

### **The Rare Earth Value Chain**

It is common knowledge that rare earth materials play a critical role in the basic functionality of key green technologies such as hybrid cars, wind turbines, and compact fluorescent lights. They are essential to digitized and miniaturized electronic consumer goods such as flat screen televisions, mobile phones, and disc drives. Rare earth products are necessary in vital military technologies such as munitions, missiles, radar surveillance, and avionics. Discussion forums at think tanks, in academia, and in the media often raise these issues.

Less frequently discussed is the global market for rare earth materials and the value chain itself. This value chain consists of three distinct elements:

- The miners of rare earth oxides, such as Molycorp in California and Lynas in Australia, both of whom are in the process of starting new operations;
- The processors that turn the oxides into usable alloys, such as Great Western Technologies and Santoku America; and
- The magnet manufacturers such as Electron Energy Corporation that take those metals and alloys and produce finished products.

It is important to note that most assets that make up the rare earth value chain do not exist here in the United States. In fact, today's U.S. rare earth supply-chain consists of one company capable of mining and separating rare earth elements into oxides, no active rare earth metal makers, two companies that can make limited quantities of rare earth alloy, and one rare earth permanent magnet maker.

Thomas & Skinner, for instance, had made sintered neodymium iron boron permanent magnets – used in several missile systems – but like other producers, got out of this business years ago and do not have a plant to make these magnets today. Companies such as Thomas & Skinner and

Arnold Magnetic Technologies have publically stated their desire to reenter this market if and when market conditions support it.

### **Foreign Sources**

The United States is largely dependent on foreign sources for these critical materials. China firmly controls 97 percent of the world's rare earth oxide supply, nearly 100 percent of commercial sales of rare earth metal, and over 75 percent of neodymium iron boron magnet production.

This monopolistic power enables them to wield considerable influence. For instance, merely a rumor of an export ban on rare earths to Japan sent a chill through the industry last summer. China has linked access to its markets and resources with moving operations to China and providing them with key technologies. On May 19, the Wall Street Journal reported that China is once again expanding its export-quota systems and imposing higher taxes on rare earth materials. This further constricts an already tight supply. Moreover, this announcement contains a worrisome new requirement that export limits, which once only applied to concentrates and then expanded to oxides and metals, will now include ferroalloys. This demonstrates yet another move down the supply-chain from natural resources to value-added processes.

As they continue to reduce export quotas and expand the materials covered, manufacturers must make the hard choice of either relocating to China to access raw materials or risk severe uncertainty regarding long-term availability of supply.

Thankfully, there are companies in ally countries that can assist in this dilemma. For instance, Less Common Metals currently has a metal processing and alloying operation in the UK. Through its members, the USMMA has joined together existing global assets to provide non-Chinese rare earth elements, metals, alloy and magnets. The members of the USMMA could feasibly provide a secure, non-Chinese source of the supply to the United States in as little as 12 months, but policy and funding decisions will need to be made to do so. With little guaranteed domestic demand for many rare earth metals and alloys, and a lack of a single licensed producer of neodymium iron boron magnets, the future of the domestic rare earth industry remains uncertain.

### **Manufacturing First Approach**

To mitigate the impact of foreign supply disruptions, the USMMA is a strong proponent of a "Manufacturing First" strategy. By establishing the ability to manufacture rare earth end products, the "Manufacturing First" strategy creates downstream demand for rare earth elements. This provides incentives for commercial interests to fill in the domestic value chain for rare earth elements while leveraging oxides available from ally nations and domestic producers coming online. By supporting the "Manufacturing First" strategy, the U.S. government could signal to industry that it will not stand by as China attempts to dominate the global rare earth magnet industry. In addition, this approach provides U.S. manufacturers an alternative to Chinese suppliers. This would be the first critical step in decreasing U.S. industry's dependence on foreign suppliers.

Perhaps of greatest concern is the total lack of any current capability to make sintered neodymium iron boron magnets. As I noted, there are currently no U.S. producers of these magnets; this is due to the inability to obtain the necessary license from the current patent holder. This imperils U.S. national security in particular because this patent holder, as a matter of policy, will not produce defense-specific magnets. This leaves our defense supply-chain largely dependent on China for access to these key materials.

### **Moving Forward through Increased Understanding**

In sum, much of our most critical and strategic technologies are dependent on foreign suppliers to make them work. And this is a situation that should make anyone – whether in the U.S. government, military, industry, or general public – very uncomfortable.

Through our advocacy efforts, the USMMA has identified numerous misperceptions in the media, academia and sometimes on Capitol Hill. To counter these misperceptions, the USMMA released a Myth-Fact paper earlier this month. I'd like to share with you a few:

- First, it has been said “rare earths aren’t rare.” This is not totally accurate. While rare earths are abundant in the earth’s crust, the ability to locate concentrations that are economically viable for extraction and processing is rare.
- Second, some believe U.S. capabilities can come online rapidly to fill the supply-gap. However, mining and extraction is only a small part of the rare earth value-chain. Aside from the 10-year average permitting time for a rare earth mine, concentration and separation facilities are extremely complex and can cost upwards of \$500 million per location.
- Third, recent reports from Goldman Sachs and previous statements from the Department of Defense suggest that supply will soon equal or exceed demand for rare earths. While this is true for some of the more prevalent elements, a long-term global shortage for materials like the heavy rare earth dysprosium will not be mitigated in the foreseeable future.
- Fourth, some suggest that substituting, recycling or reusing rare earths is a viable alternative. While the USMMA supports efforts in all these areas, they are not a panacea. Currently, no viable alternatives are available for many materials and R&D, though promising, faces a development cycle of up to a decade for commercialization. Furthermore, many systems using rare earths, such as weapons, are legacy systems that will be in inventory for decades. This also applies to commercial technologies and refining capabilities that will both require increasing quantities of rare earths.
- Finally, some suggest that stockpiling, as proposed in H.R. 1388, the Coffman RESTART bill, will further restrict an already tight supply. This is a misinterpretation of what Mr. Coffman is proposing. The RESTART Act and the Rare Earth Inventory Plan included in the FY12 National Defense Authorization bill would require planning for a very limited vendor-managed inventory of rare earth

materials such as alloy and magnets that would be available to support our national security in the event of a crisis. This inventory would likely constitute a tiny fraction of global demand and be inconsequential in the market, but provide an “insurance policy” for the United States.

Rare earths are an example of the broader strategic and critical materials issues our nation faces. Solutions are possible. We hope this committee will address these challenges and help close the gap on other critical materials. The USMMA has suggested a six point plan to close those gaps, which can be applied to other strategic and critical materials. It includes:

1. Establish a baseline by thorough supply-demand analysis conducted by the U.S. Government
2. Team with ally nations to provide critical raw materials to ensure a reliable source of supply supplements existing and future domestic mining and separation capabilities
3. Ensure fair trade practices are enforced by the United States Trade Representative
4. Invest in domestic capability through programs such as the Defense Production Act to close critical supply-chain gaps
5. Establish domestic manufacturing capability through tools such as the Defense National Stockpile that both incentivize industry investment and address national security concerns; and
6. Invest in future innovation through research, development and education

Because this is the Natural Resources Committee, we would add a seventh item to that list: establish an interagency Task Force to address the often bureaucratic and unnecessarily lengthy permitting process. We do not support shortcuts that circumvent appropriate rules and regulations, but we do encourage expediting applications by focusing resources and finding efficiencies to support the process.

In closing, China will continue to leverage its global dominance in the strategic and critical material supply chain until the United States and its allies commit to action that will counterbalance this influence. The US needs to begin to take steps immediately to eliminate this current and growing threat to our economic and national security.