

RARE EARTHS: EASING THE SCARCITY  
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In all honesty, I never gave much thought to “rare earths” until my trip to North Korea last fall. Unexpectedly, my partner, a real energy expert, and I concluded an agreement relating to the rehabilitation of the power supply in that poor, poor country. One obstacle to proceeding with the project obviously is political and diplomatic. The other is: how can we get paid? So, upon my return, I began gathering data on the DPRK’s capacity for engaging in legitimate and mutually beneficial international trade – if and when we get to that stage. Contacting the US Geological Survey, I discovered not too surprisingly that the USGS had scant information on rare earths in the North. Ever since, I have been on the look out for any information on the broader subject of US reliance on imported rare earths. Quite by coincidence, the more I looked, the higher the profile this obscure topic seems to have taken on. Learning of my quest, Judge Morris was kind enough to invite me to speak this morning.

I’m pleased to have this chance to discuss the rare earth issue. It’s a special case in some ways. In others, it’s a microcosm of the larger American industrial competitiveness issue and of the limitations of the American policy-making system – our goal-setting system for the nation. We need to address this critical problem, and we need to learn from that experience how best to address our other failings as a producing country.

First, what in the world is a “rare earth”? Think back to high school chem class. Remember those 15 elements on the periodic table, starting at Number 57, lanthanum, through Number 71, lutetium, plus just above them yttrium and scandium which have similar chemical properties? That’s what’s meant by “rare earths.” In fact, they are fairly ubiquitous in the Earth’s crust, but found in exploitable concentrations in relatively few places. Moreover, they are often found clumped together in mineral deposits, making the extraction process critically important. The ore must first be mined from mineral deposits and then separated into rare earth oxides. Next, the oxides are refined into metals, which are formed into rare earth alloys. The alloys are then manufactured into components such as magnets. Some of these steps in the supply chain are far from easy. For example, no single process exists to separate each rare earth from all the others. Thus, the refiner might have to focus on producing one at the expense of the others.

How can anything so obscure sounding be so important? This is what the US Government Accountability Office said in a recent report: “Rare earth materials ...are used in a variety of commercial and military applications, such as cell phones, computer hard drives, and Department of Defense (DOD) precision-guided munitions. Some of these applications rely on permanent rare earth magnets that have unique properties, such as the ability to withstand demagnetization at very high temperatures.”

The GAO could have gone farther to cite the use of rare earths for their magnetic and other properties in: radar and sonar systems, night-vision

equipment, lasers, fiber optics, wind turbines, solar panels, fluorescent light bulbs, rechargeable batteries for electric and hybrid autos, catalytic converters, petroleum refining, glass production, medical equipment, and a vast array of capital and consumer goods. In other words, our national defense and our use of a whole range of advanced technologies depend on reliable access to rare earths. Those applications are escalating exponentially. Supplies are scarce. Substitutes are lacking. We have a problem.

Not so long ago – as late as the 1990s, the US was the largest producer at every stage of the production process. Today, we are totally dependent on imports – 91 percent from China – to meet our growing needs, even though we hold 15 percent of the world’s reserves.

Rare earths in the United States are becoming scarce earths.

China, meanwhile, holds 40 percent of the global reserves and accounts more than 95 percent of world production of rare earth oxides. It limits domestic production and has reduced export quotas as well. By 2015, exports may be prohibited. It has also increased export taxes to a range of 15 – 25 percent. At the same time, China is promoting downstream industries, such as batteries and magnets. If recent history is any guide, China can be expected to support rapid and extensive vertical integration to achieve a dominant global position.

What could the United States do in response? We could ramp up mining, but that would take time and money. We could ramp up processing, but that would

take more time and more money. One estimate is that a new separation plant would cost \$500 million to \$1 billion and take a minimum of 8 years to come on line. The GAO estimated that rebuilding the entire rare earth supply chain would take as much as 15 years. We need substantial new investment in plant and equipment, in new processing technology, and in substitutes.

What it comes down to is this: China has a strategic vision that includes the development of a full-fledged rare earth supply chain; the United States does not. China has a plan to realize that vision; the United States does not. China acts with purpose to carry out its plan; the United States does not.

Fortunately, there are already some important stirrings in the United States as the implications of this situation have bubbled to the fore. The GAO has finished a useful preliminary report, "Rare Earth Materials in the Defense Supply Chain" (GAO-10-617R) in April. It contains extremely interesting examples of the vulnerability of our defense supply chain. In March, Rep. Mike Coffman, a Colorado Republican, joined by a bipartisan group of 16 House members, introduced H.R. 4866, The Rare Earth Supply-Chain Technology and Resource Transformation (RESTART) Act of 2010 in March. Sen. Lisa Murkowski is introducing a companion bill in the Senate. At least one hearing has been held, and more are planned.

These bills would form the beginning of a national rare earths policy for the United States. H.R. 4866 sets the following policy goal for the United States: "to take any and all actions necessary to ensure the reintroduction of a

competitive domestic rare earth supply chain, to include the reintroduction of the capacity to conduct mining, refining/processing, alloying and manufacturing operations using domestic suppliers to provide a secure source of rare earth materials as a vital component of national security and economic policy.”

The bills provide for:

- Studies by the executive branch agencies (Commerce, Defense, Energy, State, USTR and the EOP Office of Science and Technology) to establish critical needs for national defense and economic security (this is already being done by DOD at least
- and would bring us closer to the point that the European Union has already achieved);
- Establishment of a new national stockpile managed by DOD;
- Government support for R&D;
- Federal loan guarantees for domestic supply-chain development;
- Assessment (within 30 days) of the international trade practices of our trading partners and initiation of appropriate WTO proceedings.
- Support for innovation, training and workforce development by funding academic institutions, Government labs, corporate R&D, industry associations, and non-profit corporations.

This is a pretty good place to start. It’s pragmatic, non-ideological, and relatively ambitious in scope. The cost is not so clear, but if the cosponsors are

right about the critical importance of rare earths to our national defense and economic security, this seems like a sensible, balanced and fairly comprehensive approach. I do think that more attention should be paid to recycling which is now virtually non-existent and to the development of substitutes. We also need to promote an effective R&D effort by the private sector as well as the government through attractive and permanent tax credits. Finally, I think the measures in this bill need to be complemented by a much more aggressive tax reform that radically accelerates capital cost recovery (that is, expensing of investment, perhaps with a bonus), making the USA the best place in the world in which to invest.

In particular, I appreciate that the bill understands that foreign government practices are a problem – but just part of the overall competitive issue for the United States. It is high time that our country began to take a strategic approach to our economic challenges. At the center of the national problem – mounting debt, slow job growth -- is a long-term failure to invest in new plant and equipment. Over time, that reduces our ability to produce – to add value – in this country, to create secure employment, to innovate, to increase net exports and thus begin to reduce our foreign debt, regain our financial independence, restore value to the dollar, and secure the American Dream for future generations. We need to do this not just for rare earths but for a whole range of products in which we can and should be internationally competitive.

Thank you very much.