Common Nonsense about Rare Earth Permanent Magnets

written by Jack Lifton | July 18, 2023

The common wisdom among the elites in Western capitols and among the "captains" of the Western industry is that the critical minerals supply issue is one that can be always solved by an increased allocation of capital, better known as "raising the offering price to increase the supply." This is nonsense, for critical technology minerals, but a person can realize this only if he has studied and gained a basic, general, understanding of geology, mining, and economics and has the ability to reach logical conclusions based on reproducible, independently verified data. The absolute quantity of natural resources available to humanity is limited, first and foremost, by geology and then by technology and, finally, economics. It's not how much money it would cost, but rather how much of our productive economy we are willing to give over for the extraction, refining, processing, and fabrication of products based on lithium, or cobalt, or the rare earths, or all three and even more of these uncommon technology metals.

Recently, it has come to light, that one nation, China, beginning decades ago, recognized the need to locate, obtain control over, marshal, and develop the chemical and metallurgical infrastructure to support the domestic production and/or refining of secure, sufficient, sources both of critical technology metals' minerals and of structural metals' minerals. The success of China's "industrial policy" has now been made apparent and is manifested by the impact of this policy's success on geopolitics and global industrial supply chains.

The natural resources of non-fuel minerals accessible by known

technology are limited to “deposits” defined as being those that are above a certain concentration (called the “grade,” which differs for each mineral from which chemical elements are extracted), and are at an economically significant extent. Deposits must also be in a location where they are accessible by road, sea, or rail, have sufficient fresh water available, and have the necessary supply of electricity. Junior mining ventures almost always tout “discoveries” of potential “deposits, “but purposely confuse the two to entice investors.

The choices of which ones of the chemical elements are critical for a particular nation differ according to a nation’s needs and its (that nation’s) importance to other nations’ security and trade.

The United States’ concession of the title, The World’s leading manufacturing nation, to China has radically changed the need for and the dimensions of its critical minerals needs. Many of my colleagues and the journalists who are covering this story always note the growing list of America’s total reliance on imports of critical minerals published annually by the United States Geological Survey (USGS), but they never mention the adjective that comes to the mind of any of us with a legal education when they hear the word, reliance. It is a ***detrimental*** reliance!

To emphasize where China is now, July 2023, with regard to self sufficiency in the rare earth metals needed to manufacture the rare earth permanent magnets needed by the global battery electric vehicle industry, and where China is going from here, I note that I received, earlier this week, a copy of a report entitled, “China Rare Earth Information,” published by the Chinese Society of Rare Earths. This report was described as a review of China’s rare earth industry for the 2nd quarter of 2023. It is an eye-opening account of the size of the Chinese

rare earth permanent magnet industry, which acts as a giant vertically integrated whole in many regards.

In the United States, in sharp contrast, industrial subsidies take the place of industrial policy as the politically correct choice. Washington's bureaucrats only caucus with each other, or with academic grantees, and in this way obtain almost no practical knowledge of the supply chains for manufacturing industries. Grants are handed out almost solely on financial, not sector competency, considerations and thus fail to go far enough upstream to where innovation resides.

Just one project jumped out at me from the report. A Chinese company is building a 15,000 year (!) rare earth permanent magnet factory to serve the OEM automotive industry. This new plant will begin operation this coming December. In its history, the North American rare earth permanent magnet industry has not produced anywhere near the volume output in all the years of its existence as this one new Chinese plant will produce. And note that China's current installed capacity to manufacture rare earth permanent magnets is now over 200,000 t/year.

As of this writing (July 18, 2023) North American companies produce only a few hundred tons per year of rare earth permanent magnets, and that is based on imported Chinese magnet alloy.

Ford Motor Company (NYSE: F) and General Motors Company (NYSE: GM) have both stated that they plan to produce 2,000,000 battery powered electric vehicles annually by 2026. If just these 4,000,000 vehicles each had one rare earth permanent magnet motor this would require 10,000 tons of rare earth permanent magnets.

To the best of my knowledge no where near any such amount, 10,000 t/year is planned to be produced domestically by 2026, and no significant part of the necessary supply chain for such

an amount is under construction or even planned at that level of output for 2026.

To qualify for the tax credit under the IRA, the value of the raw materials and finished goods in a car must have been majority added in the United States or a country with which the United States has a free trade agreement. Under no circumstance can that country be China.

Subsidies are a tax, and even in War, they are at best a short term solution.

The United States needs to develop a secure domestic rare earth permanent magnet vertically integrated manufacturing industry.

So far, all we've heard about this is nonsense. It's time for common sense to prevail.