The Rare Earth Landscape 2025 Part II – Shifting Sands: From Engineering to Finance and the Erosion of Supply Chain Competence

written by Jack Lifton | January 1, 2025

The Original Equipment Manufacturer (OEM) American automotive industry's efforts to secure domestic supplies of the necessary critical technology mineral forms for their suppliers and themselves that satisfy the Federal government's political pressure to avoid using any production materials with Chinese "content " have reached the point where the OEMs have been pushed beyond their capability to perform technical due diligence and risk-benefit assessments.

I have determined why securing a supply of non-Chinese "content" rare earth permanent magnet motors for the OEM American domestic automotive assembly industry has been so slow and poorly executed. The OEMs' sourcing departments lack the core competency to do the job. A perfect paradigm example is General Motors' (NYSE: GM) "investments" in singular entities in the natural resource production or end-user product manufacturing supply chains for lithium-ion batteries and rare earth permanent magnet motors (REPMM). The OEMs have failed to notice that unless there is vertical integration so that costs can be distributed along the supply chain and result in a profitable end-use product, then subsidies become mandatory.

The short-sighted focus on mineral exploration and discovery has masked the deficit in downstream industrial operations necessary

to the production of the rare earth permanent magnet motors that form the overwhelming part of the demand for rare earths in the economy, both military and civilian. The military sector has recognized this, and since, internally, it acts as if it operates in a command economy where price only limits the quantity of purchases, it has organized a domestic American production part of the total supply chain for rare earth permanent magnet motors for its own benefit.

In addition to failure to understand the composition of the REPMM supply chain and its material and financial stress points, the financial managers who today dominate non-military OEM management believe that the government will always bail them out in the event of a catastrophic failure to be profitable and that they, the top managers, will face no personal consequences from any perceived or even revealed management incompetence. Thus they assume that subsidies and/or tariffs will be forthcoming.

The real problem, even in the command-based military sub-economy, is the lack of access to critical mineral supplies not originating under Chinese ownership or control. Such supplies are due to geological as well as geopolitical history and the market economics that control their profitable production.

Historically, the economics of producing the separated purified individual rare earth salts necessary to produce the rare earth permanent magnet motors that form the actual demand for rare earths moved not only the production and refining of the minerals but also the vast bulk of the supporting total supply chain for the motors to China more than a generation ago.

The American, European, and Japanese scientists and engineers who had created the knowledge, choices, chemical and metallurgical equipment, and organizational skills to mass-produce REPMs went to China to teach the locals how to do all

this and then returned home to mostly different employment or retirement as the domestic American and European industries dried up.

The fantasy among politicians and ignorant reporters who do not know or understand the manufacturing supply chains for critical technologies is that Americans' "can do" mentality along with unlimited capital can overcome "lost access to the critical minerals, the knowledge, specialized equipment, and manufacturing base."

The US military seems to have understood this, and other than the mistake it has made in leaving mineral sourcing mainly in the hands of the processing and finished goods contractors, it has a good chance of achieving its apparent goal of 1000 tons per annum of specialized rare earth permanent magnets for warfighting applications by 2027 (the current deadline for eliminating Chinese content).

As for the OEM automotive sector, expect a decline in product quality as unproven, inexperienced suppliers are chosen, first out of ignorance of the subject matter's supply chain details and then out of desperation.


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