

# Sourcing Critical Minerals for the OEM Automotive Industry in 2023; a case of déjà vu all over again

written by Jack Lifton | October 26, 2023

The Western OEM automotive industry has begun to downshift its expectations of the speed at which it will be able to changeover its traditional powertrain from internal combustion engines to electric motors. This is primarily due to two factors, one is material, the sourcing of components the operation of which depends on critical metals and minerals being mined and processed by an unplanned total supply chain that in many cases does not (yet?) exist, and the other is the industry's reliance on customer demand coming from arbitrary government mandates requiring the EV transformation rather than on market forces.

It would seem that If the American Federal Government had good planning skills, its mandarins would, *prior to the attempted implementation of a policy*, look at the foreseeable consequences to the necessary critical materials' supply chains of that policy. In the same vein you would assume that the management of American manufacturing corporations, looking at a radical product change, in the case of mass produced consumer products, would try to coldly estimate the true costs of such a project. Alas, this is not the case for the vast majority of governmental oversight and private manufacturing organizations. They, thus, careen from one totally foreseeable crisis to another due, in both cases, to their ignorance of the time and capital allocation required for the design, engineering and the construction of the mineral and processed metal products' supply

chains critically necessary **and sufficient** for that radical product change.

Let's look at the need both for mined minerals and for the total industrial supply chains downstream of mining to convert those minerals into the end-user forms necessary for the manufacturing of OEM automotive components used directly on cars and trucks. We will focus only on the manufacturing of electrically powered vehicles, EVs.

It cannot be overemphasized, and it is painfully obvious after a few moments of reflection, that the OEM industrial world does not directly use the mined ores of the metals that constitute the structure of, or the appearance of, or enable the properties of the electrical or electronic components of its finished products. In the last generation or so, the number of steps in the widely variant supply chains that transform these ores into finished end-user ready components has been of little or no interest to the financializers who now dominate the management of Western manufacturing corporations. In fact, the legacy of managers, who are trained and have operated as engineers and scientists within the corporations and who understand these supply chains has all but vanished.

The America OEM automotive industry's move to electrification has placed its costs in intensive care [a/k/a margin collapse] The American Federal Government's only therapy is to offer to subsidize the costs of EVs to reduce the losses, *temporarily* while the OEMs figure out how to become competitive with their dual nemeses at home and abroad, America's Tesla and the growing Chinese EV behemoths led today by BYD, but we are assured that tomorrow the Chinese EV manufacturing industry will consolidate into just a few megacorporations making competition in the EV space in China all but impossible.

The Wall Street Journal recently wrote a review of the growth of BYD, which included the following paragraph:

“The investment bank, UBS, estimates BYD has a cost advantage of around 25% over traditional automakers in North America and Europe, **due in large part to its in-house manufacturing of parts[my emphasis]**. Analysts at UBS recently tore down a 2022 BYD model and found that around three-quarters of its parts were manufactured in-house.”

The American OEM automotive industry ignored the mining and processing industries after Henry Ford taught it to break the commodity based manufacturing “trusts” (a/k/a “monopolies”) of the 1910s, by vertically integrating his company upstream of his final products all the way to mining iron ore, shipping it, making steel, mining silicates, making glass, and even growing rubber for the making of tires. The surviving car makers, after the corporate bloodbaths of the teens and twenties of the twentieth century adopted this strategy of necessity in order to compete.

While I was a teenager, in the 1950s, car makers with names such as Hudson, Nash, Kaiser-Fraser, Studebaker and Packard vanished in bankruptcy leaving by the end of that decade just the Big Three, Ford, General Motors, and the Chrysler Corporation, and a small fourth called American Motors, the remainder of the last attempt by France’s Renault, to enter the American market.

The vertical integration of the American car makers continued until the final quarter of the twentieth century, and their production and service parts labeled as FoMoCo, Delco (GM), and Mopar (Chrysler) logos were familiar to the sourcing managers, and the manufacturing managers, not only of the OEM automotive assembly industry but also to those of the automotive maintenance and repair industry.

The biggest instance in one industry of financialization for profitability rather than innovation and productivity was the selling off by the Big Three of their internal parts and service organizations. The best example of this folly was the sale of GM's Delco to a private group that re-baptized it as Delphi and enriched itself even after filling GM's then emptying coffers with more than a billion dollars. NB: One of the miscellaneous parts of this sell-off was the by-then moribund Magnequench subsidiary of General Motors, the very entity that had been created to first produce rare earth permanent magnets for the OEM automotive industry-you see, by the late twentieth century the Chinese had mastered the technology for producing magnet rare earths from the short-sighted Molycorp executives that had gone to them to secure low cost skilled and unskilled labor in the early 1980s. Of course magnet making followed, and by the late 90s it was all over for both Molycorp and Magnequench.

For the record, a financializer first bought the Magnequench unit from GM and could not revive it. He sold it to a Canadian group headed by a CEO who was an experienced chemical engineer. The Canadians immediately moved the operations to China to cut costs and may have kick-started China's today dominance over Japan as the overwhelmingly largest manufacturer of rare earth permanent magnets for the OEM automotive industry (and for everything else, also).

The American rare earth processing industry shut down in 1998 when Molycorp shuttered its once pioneering and for some time, world's largest solvent extraction plant dedicated to rare earth separation. As of today, October 24, 2023, twenty five years later, there is no solvent extraction plant dedicated to rare earths separation operating in North America. There is no operation in the Americas today making rare earth metals and alloys for magnets from rare earth chemicals. There is no operation in the Americas making rare earth permanent magnets

for the OEM automotive, aerospace, or wind turbine industries.

I am now 83 and in pretty good health for my age-my mother lived to be 100. Why am I saying this to you? Because when I was asked at the Pentagon about 7 years ago how the USA could regain its footing in rare earth permanent magnets manufacturing I told them that they should scour the retiree communities and assisted care homes first to find the most experienced rare earth permanent magnet scientists and engineers and then provide oxygen, nursing care, and wheelchairs to those chosen to help.

Just since the closing of the original operations of Molycorp in 1998 and of Magnequench's move to China shortly thereafter, the Chinese have trained and utilized an entire generation of rare earth miners, processors, and end-use product fabricators. Simultaneously they have created the world's largest reservoir of specially educated rare earth scientists and manufacturing engineers(!). The total membership of these groups in China is believed to exceed 50,000 men and women. That means that while we, in the West, have been obsessed with financialization, the Chinese have already spent ONE MILLION MAN-YEARS on mining, refining, and producing and fabricating end user forms of rare earths for both the consumer and (their) military industries.

The sole driver today for the revival of a domestic American rare earth permanent magnet manufacturing industry is security of supply. But our institutional knowledge and inertia from excellence are extinct and have to be rebuilt.

If the United States actually were a free market economy then there would be no demand for domestic rare earth permanent magnets, since all potential domestically owned providers have openly said that they cannot match Chinese prices for such magnets. So, why are POSCO, Vakuumschmelze, and JLMAG coming to North America to manufacture here such magnets? Its entirely due

to the IRA, the Inflation Reduction Act, which grants subsidies, i.e., taxpayer giveaways, to those whose products have the majority of their value added domestically or in nations within which the USA has a “free trade” agreement, an FTA in Washington jargon.

The American OEM automotive industry has wisely embarked on a trajectory to become “involved” in a total domestic rare earth permanent magnet supply chain for its own needs. The U.S. Department of Defense has embarked on a similar mission. Neither group has much subject matter knowledge and may well waste quite a bit of time and effort on dead-ends, but both groups, the automakers and the military face an existential threat, the first being overwhelmed by Chinese made EVs and the second being overwhelmed by a Chinese military build up. Both would lead to restrictions on the sale of rare earth permanent magnets by China to the USA to give China a competitive advantage.

America is now robbing Europe of its remaining expertise in the manufacturing of rare earth permanent magnets. This is due to the subsidies to be provided to European manufacturers who relocate to the USA. Time will tell if this is going to be enough. I believe that we are entering a zero-sum game. Some companies and government departments will win and some will lose.

There is simply not enough expertise to go around, and there certainly is not enough of the critical minerals and their processing either.