

Welcome to the Future, Critical Metals' Ventures Discover Reality

written by Jack Lifton | December 31, 2021

Way back in 2011 there were nearly 250 rare earth themed junior mining ventures looking at 400 “deposits” mainly in Canada and Australia. Today, just two of them are producing, [Lynas Rare Earths Limited](#) (ASX: LYC) and [MP Materials Corp.](#) (NYSE: MP) (the successor in interest to the bankrupt Molycorp of yore). These two ventures, even then, stood out from the pack by their common purpose of delivering a value-added product, individual separated (or blended) rare earth chemical forms, in the case of Lynas, and “magnets,” in the case of Molycorp. All of the others, without exception, stated that their saleable product would be a “mixed con.” This was the great “con” of the rare earths’ boom and bust of 2010-2013.

A concentrate of a mixture of all of the rare earths, from which the chemical elements that interfere with the separation of those rare earths into individual, or purposely blended combinations, of individual rare earth salts, is what is targeted to be produced at a mining operation where the ore is “mined,” concentrated, cracked and leached, and then is chemically processed to remove elements that interfere with the next step, selective separation of the individual elements in a form required for the next step in the supply chain that ultimately results in a finished product for sale to consumers.

For the rare earths this concentrate is, for practical purposes of safety and economics, a mix of rare earth carbonate solids. This should have been the initial target of 2011’s 250 rare earth juniors. It wasn’t. They overwhelmingly (other than Lynas

and Molycorp) did nothing to advance towards this target. That turned out to be a good thing, because the only non-Chinese customers for this “mixed con” before 2017 were Solvay in France (9,000 tpa capacity to produce individual rare earth salts), Silmet in Estonia (2,500 tpa), and assorted small operations in Asia, outside of China, with a combined capacity of perhaps 3,000 tpa. All of these bought their feedstock from China or (a tiny amount) from Russia at the time.

No 2011 junior sold a single gram of mixed con to the marketplace prior to 2017 (Lynas)

Why was the first 21st century, rare earth boom, such a bust?

Because none of them had the knowledge, education, experience or skill in processing or mineral economics to see that integration into a total rare earths supply chain targeted to a final product is necessary for **profitable operation**. Almost without exception the profitable part of the rare earth supply chain is concentrated in the metals, alloys, and magnet making end, and the only way to make a mine and separation system profitable is to distribute costs along a total supply chain. (America's [Energy Fuels Inc.](#) (NYSE American: UUUU | TSX: EFR), which is operating on a total supply chain model through magnet alloys, is an exception, because it is able to make a profit selling a mixed carbonate due to the skill of its administrative and operation management and a unique, for North America, existing processing infrastructure).

If there is to be a domestic American, or European, total rare earth permanent magnet supply chain then there will have to be in place operating commercial rare earth separation systems, rare earth metals and alloys production, and rare earth permanent magnet production capability and capacity to support it.

In fact, if there are to be total domestic supply chains for any critical metals, then, not just a mine, but also all of the downstream elements of the supply chain have to be in place before that can happen.

I note that for the cobalt chemicals necessary for the production of lithium-ion battery cathodes, the Canadian integrated cobalt processing junior, Electra Battery Materials Corporation (TSXV: ELBM | OTCQX: FTSSF), has entered into a supply agreement for cobalt concentrates from the world's largest non-Chinese producer, Glencore, to process that concentrate into fine cobalt chemicals for the battery manufacturing industry in its existing Canadian facility. When and if Electra can produce cobalt concentrates from its company-owned deposits there will already be in place the downstream operations to support that. In the meantime, it will buy feedstocks from others, and/or also toll them for others. Electra's management looks also to have given considerable thought to pricing, so as to ensure profitability.

This business model, to have in-house as much of the total final product supply chain as is necessary to be profitable, is the only practical business model for the production of critical metals and materials.

As of December 31, 2021, America's Energy Fuels (rare earths) and Canada's Electra (cobalt) are setting the pace for the future development of a North American critical metals' industry by commencing operations.

Happy New Year!