

Industrial Minerals review 2020

by Mike O'Driscoll*

Responding to challenges and change

At this time last year, I commented on a “2020 Vision for Industrial Minerals” being shaped by the COVID-19 pandemic which was just hitting its stride in causing tragedy and mayhem around the globe. Industrial-mineral supply chains and markets were not immune from the fallout.

Fast-forward 12 months, and while we are not out of the woods yet, market recovery is underway. During 2020-2021 industry response to challenges and change wrought by the pandemic and other factors, although not without difficulty, has been refreshingly proactive.

In summarizing this activity, a “Rule of Six Influencing Factors” can be broadly ascertained as steering the outlook for industrial minerals:

1. Industrial-mineral “Criticality” + “Essentiality”
2. China in change.
3. Emergence of high-tech growth markets.
4. Accelerated recycling.
5. Environment.
6. Corporate and government readjustment.

1. Industrial-mineral “Criticality” + “Essentiality”

Perhaps of greatest long-term significance was the “favor” that the pandemic impact dealt the industrial-minerals business, in that it both educated and reinforced the vital role of industrial minerals in industrial manufacturing processes and everyday products and applications.

As mineral supply chains struggled to meet market demand for most of 2020, industrial minerals’ “essentiality” and “criticality” soon became apparent and has since informed consuming industries and governments worldwide of their vulnerable supply lines and overreliance on limited overseas sources.

This has naturally given a boost to the development of new and alternative sources of minerals in high demand worldwide, such as First Bauxite LLC’s new high-purity raw refractory bauxite mine in Bonasika, Guyana and Ares Strategic Mining Inc.’s Lost Sheep Fluorspar Project in Delta, UT.

Across the board, the impact of the pandemic on the ultra-important role of logistics in mineral supply was most evident, with ports congested and shipping disrupted, compounding material shortages and delivery delays.

As market recovery has stimulated demand for minerals, this issue has continued to plague the industry into 2021. It notably intensified in March with the Suez Canal blockage and further was strained by soaring freight rates adding to consumer woes as delivered mineral prices increased accordingly and shipping delays lengthened.

In early May 2021, Maersk, which handles about 20 percent of containers shipped, revealed that there

were not enough ships available worldwide to meet the surge in consumer demand (all products), resulting in record-high freight rates, some 25-50 percent higher than in early 2020. One barite trader quoted China to Europe at US\$6,000/20-ft container. This tight shipping situation is expected to last through 2021.

It is hoped that in the long term this recognition of industrial minerals’ importance will assist in prudent strategic-sourcing decisions and investment in mineral development projects worldwide.

2. China in change

China will always have a major influence over industrial-mineral supply, owing to its abundant resources. However, changes are afoot that are transforming the trend of this influence. The primary factor is the country’s fast-expanding domestic markets for industrial minerals, which is generating increasing mineral imports to China and thus consuming more domestic mineral production and reducing availability for export markets in the West.

Ongoing government environmental controls are causing certain mineral production centers (e.g., bauxite, magnesite, graphite) to close temporarily as they upgrade environmental anti-pollution equipment — particularly energy-intensive plants such as for mineral calcination and fusion — as well as overall mining restrictions.

Planned reforms to the structure of certain mineral production sectors will also change future supply scenarios, such as the rare earths sector and the magnesite sector in Liaoning, which is facing dramatic consolidation and streamlining — it is thought such actions will be rolled out to other mineral sectors.

A final note on China is to expect increasing activity by Chinese companies in overseas mineral projects, as has happened already with major rare earths projects in the United States, Vietnam, Greenland and Australia, and lately in fluorspar in the United States.

3. Emergence of high-tech growth markets

The emergence of high-tech growth markets is to become more mainstream, particularly in the “new energy” sector, e.g., lithium-ion batteries, electric vehicles, photovoltaic cells and wind turbines.

Demand for these markets’ respective critical minerals is to increase (e.g., for lithium, graphite, rare earths) and has recently influenced the strategies of many mining groups and governments.

Much has been written elsewhere in this journal about the race for critical minerals, where to find them, and how to secure their supply chains — suffice it to say it is an area which will remain busy for many years, but must be accompanied by recognition and understanding of the processing stage of these critical minerals and their integration into their end-product manufacture.

4. Accelerated recycling

Driven by environmental protection, development of the circular economy, primary resource pressures, limited sources and cost of waste removal and storage, there will be continued activity in developing mineral recycling and strengthening this fledgling mineral sector.

Mineral-recycling technology is becoming more established and economic, while opportunities in this sector are increasingly identified and sought after, such as in waste supply, waste source partnerships with traders and recyclers, process and sorting technology innovation and market application development.

There will be more supply-chain cooperation in modifying mineral end-product formulations to ease end-of-life recyclability, and in public-relations terms, it will provide mineral suppliers and mineral consumers with a green portfolio.

Again, this trend is influencing both mineral companies' and government strategies going forward in their mineral-sourcing plans.

More miners are becoming involved in recycling tailings and other waste sources. Recent examples announced in 2020 included: LKAB, Sweden, US\$1.2-2.4 billion over 15-20 years for rare earth elements (REE), fluorspar, gypsum, phosphorus from iron ore tailings; Rio Tinto, Canada, scandium oxide from ilmenite processing waste; Nutrien, USA, to supply 40 kt/a anhydrous hydrogen fluoride from phosphate rock processing fluorosilicic acid waste to Arkema (replacing U.S. fluorspar imports); Noranda Alumina, USA, to supply 60 kt/a bauxite residue to CemTech Materials.

5. Environment

The environment is clearly a common denominator for this Rule of Six Influencing Factors, but in addition to recycling and sustainable development of primary resources, there are two other key aspects affecting industrial minerals.

The first involves carbon dioxide (CO₂): whereby across the board the industry must reduce its carbon footprint, i.e., greatly reduce or eliminate CO₂ emissions. This is a huge challenge but one that is now occupying most mineral companies' future programs, whether it be switching energy source, installing CO₂ scrubbers or changing processing routes.

In Europe, for example, Carmeuse, Sibelco and Lhoist have all employed or plan to employ large solar-cell arrays, while European Commission (EC)-supported projects like low-emission-intensity lime and cement lead innovative solutions for carbon reduction.

In parallel to this, there is also an emerging market opportunity for certain minerals to be applied in carbon capture or sequestration technology. This is being looked at for magnesite, olivine and dunite, for example.

The second environmental strand for minerals is one that is already established but will certainly continue to grow: Minerals consumed in environmental

applications such as waste/water treatment and antipollution applications, e.g., hydrated lime and magnesium hydroxide in neutralization, bentonite and zeolites in absorption.

On Jan. 1, 2020, a new limit on the sulfur content in the fuel oil used on board ships came into force by the International Maritime Organization, prompting almost overnight a sudden demand for marine SO₂ scrubbers that utilize magnesium hydroxide.

6. Corporate and government readjustment

Finally, in essence necessitated and steered by factors 1-5, mineral producing and consuming companies and governments alike have been forced to readjust or reset their forward programs and thinking.

Overall, this centers on a rethink in mineral sourcing and supply-chain strategy: Consideration of alternative sources to say China and exploring for new sources of supply both domestically and overseas.

Regarding the corporate world, a refocusing of the mineral supply chain has taken companies in several directions: Securing alternative supply sources through switching suppliers, signing offtake agreements in new mineral projects, and/or investing in such developments; vertical integration, while not for everyone, continues as an option for large mineral consuming companies as well as mineral distributors (e.g., leading mineral trader Possehl Erzkontor acquired major processor Mineralmahlwerke Hamm last year to expand its capabilities).

There has also been recent corporate restructuring in stripping down to the core business while at the same time starting development of critical mineral and recycling business units, leading examples include LKAB with its REE (and other minerals) from recycling, Rio Tinto in primary lithium mineral development and lithium and scandium oxide recycling from waste, Iluka in REE development, Schlumberger and Volkswagen going upstream to develop lithium minerals supply.

At the same time, there will continue to be more government and regional (e.g., EC) input with actions, legislation and even investment to advance recycling, CO₂ emission reduction, and exploration and development of critical minerals and other minerals in short supply.

Last year saw several key action plans launched and some already updated in 2021, particularly by the EC, Australia, Brazil, Canada, India and the United States. More will surely follow.

All told, this Rule of Six Influencing Factors certainly heralds a new era of industrial mineral exploration, sourcing and development for the 2020s.

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Editor's note: Throughout this review, measurements are expressed as metric units unless the author provided conversions.