

Metal Mining Innovation and COVID-19

The lack of strategic innovation in the metal mining industry in the last 35 years is coming to an end. The decline in ROI is because the technology platforms in exploration, mine production and waste management, have not adjusted to market conditions – the only exception is mineral processing. Given the dual impetus of climate change and COVID-19, the focus has to be on the strategic transformation of mine production systems and mine waste management practices.

The effects of COVID-19 will not go away soon - social structures, health care and social welfare systems, and businesses will change because people's expectations will be different, and the economy will respond accordingly. In the 1300's the bubonic plague eliminated serfdom in Europe's agricultural economy. This virus will impact modern serfdom; companies will no longer be allowed to take **no** responsibility for the social welfare of the people that generate their revenue.

A few months ago, major economies were unable to finance the social and economic welfare of all their citizens - now they can. COVID-19 made people stay home, but it was not participating in the economy that changed things. It is now clear that that everyone in society is responsible for the health and welfare of everyone else, and social and political systems must adjust accordingly. Rescinding the new level of government support will be difficult. It will likely stay and be paid for with a new tax system where 'services' companies will be required to pay taxes in the countries in which they operate, just as companies with fixed assets, such as mining companies, have to do.

The system for producing the raw materials for the global economy has been faltering as measured by its overall decline in productivity. The risk-averse culture was created by assigning more career risk to unsuccessful attempts at process improvement than career benefit to those who were successful. The result was the 'strategic risk' to the entire business, of becoming less productive or less socially acceptable, continued. The first victims of this failure were shareholders who were robbed of the greater returns that would have been achieved by higher productivity. Next were the communities, not the shareholders, that had to bear the risk and pay the cost of inadequate waste management practices. The final victim is society that relied on companies to produce the materials the global economy needs **and** expected them to be able to increase production to drive the electrification of the economy to address climate change. Declining copper production is one measure of mining industry stagnation.

COVID-19 is forcing everyone to adjust expectations - a day in the park with friends versus dozens of deaths in nursing homes. The value choices are just as stark in mining; is mining just there to provide shareholder ROI, or is there a higher purpose? A higher purpose requires it to meet **all** the demands of the future; there will be no retreat on social license issues to get higher production, and all costs and risks must be assessed realistically and shared fairly. This is the lesson of Covid19.

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