The Aluminium Sector - Magnium Australia

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Aluminium alloying is the single largest market for primary magnesium, followed by die casting, with steel desulphurisation a distant third. Die casting and desulphurisation both have substitutes, meaning both are sensitive to fluctuations in magnesium prices.

There is no substitute for magnesium as an alloying element in aluminium. There is no net zero aluminium without net zero magnesium.

The Pidgeon process cost variable can be extreme. Ferrosilicon (FeSi) is an integral cost to producing primary magnesium, a cost inextricably linked to China’s steel sector because the reductant used in the process, FeSi, is consumed in large quantities. FeSi prices are strongly influenced by its biggest market, the steel market. So, when steel prices rise, so too do FeSi prices, which are invariably passed through to primary magnesium production. This pricing variable today confounds potential long-term, off-take partners.

Environmental compliance—although the Pidgeon process is based on a simple reaction that produces a mostly inert waste product, it does consume direct heat energy and the subsequent remelting and casting of magnesium can produce dross and many other undesirable by-products. The summary is the Pidgeon process is a very toxic process to make metal and as environmental requirements continue to tighten in China and globally, so too will the costs of compliance, which is pushing prices higher. The price increase has not settled yet but appears exponential as carbon taxes or equivalents are placed by recipient countries or Unions.

As Chinese production is facing both internal pressures to close polluting factories, and price variable inputs swing, the future is bleak and exports will become constrained. Only one new greenfields primary magnesium plant built outside China over the past 15 years is still operating, this being the former ESAN owned plant in Turkey. Many of the world’s primary aluminium producers, therefore, remain critically exposed to a Chinese magnesium supply disruption, as do the thousands of downstream fabricators they supply.

Leaving aside costs it would take at least 30 months to establish a large, primary magnesium supply base to replace what is currently exported from China. If China were to experience a sizeable disruption to its primary magnesium exports, which prima facie appears a high probability, then many of the world’s largest primary aluminium producers would find themselves in a difficult situation.

Australia abounds with world-leading endowments of several minerals that have critical status in Australia and across the G7 economies. Australia also abounds with renewable energy potential, which can be further unlocked with synergy with energy-intensive processing of critical minerals into critical metals. Australia also has world-leading technology, involving the application of rocket nozzles for supersonic separation of metals. This CSIRO developed technology can unlock the potential of our endowments to become the world’s leading producer of green critical minerals.

The world is ready for green metals. There is no green aluminium without green magnesium.

Indigenous Engagement Strategy

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