International Magnesium Association

China's Magnesium Sector Feels the COVID-19 Pain

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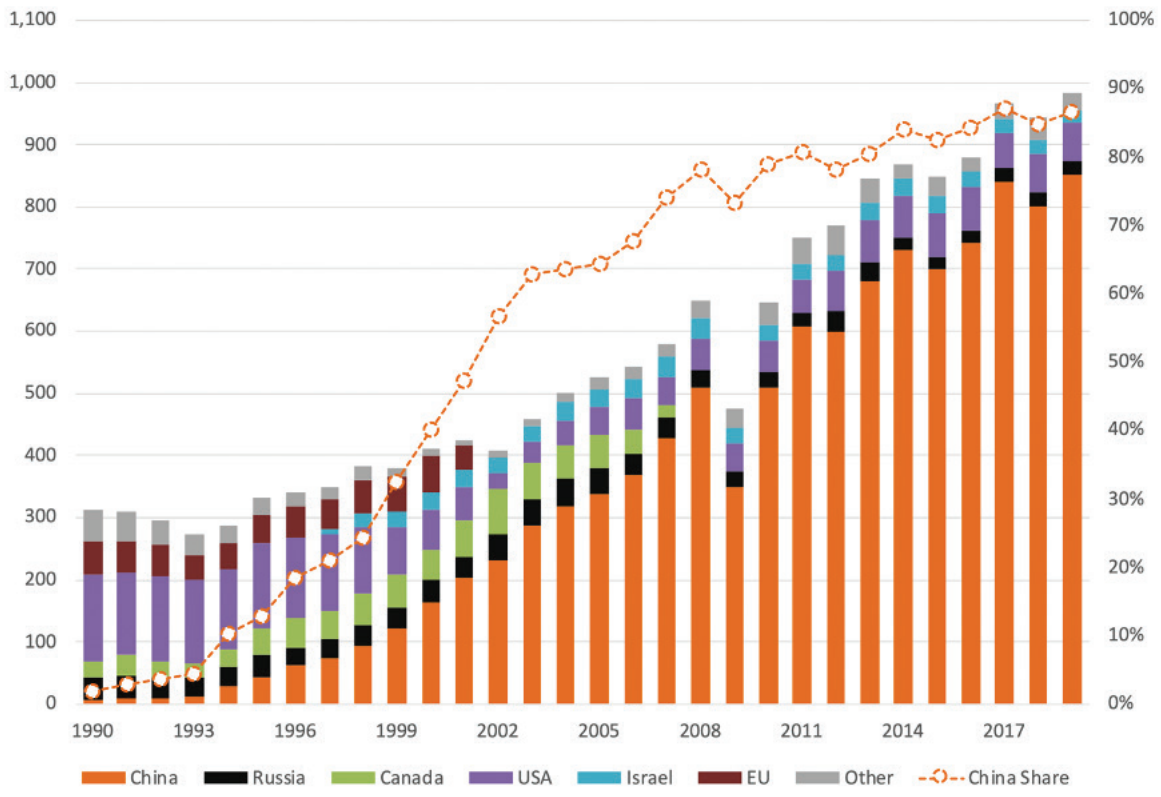
China's primary magnesium sector is heading for a significant production fall, the first in more than a decade, as the COVID-19 global pandemic impacts its biggest markets, both domestic and international. This article discusses the current state of China's primary magnesium sector, concentrating on the factors most likely to affect prices over the next six to twelve months.

In calendar 2019, China's massive magnesium supply base will once again account for over 80% of world primary magnesium production, with around 50% of this destined for export markets, mainly in Europe. Chinese-produced magnesium is largely excluded from the US market on account of anti-dumping duties on most suppliers, currently set at 141.49%.[1] China's long-term export markets have been seriously impacted this year by COVID-19, meaning exports are likely to fall in 2020.

Figure 1: Global Primary Magnesium Production by Country, 1990-2019 (kt)



In China, the COVID-19 pandemic has hit both supply and demand, although the impact has been felt more strongly on the demand side. In February and March, when the pandemic had its greatest

[1] https://www.federalregister.gov/documents/2019/02/01/2019-00756/magnesium-metal-from-the-peoples-republic-of-china-preliminary-results-of-antidumping-duty

impact in China, magnesium producers reacted quickly by cutting production. We estimate a decline of around 7% in production y-o-y during January and February alone.

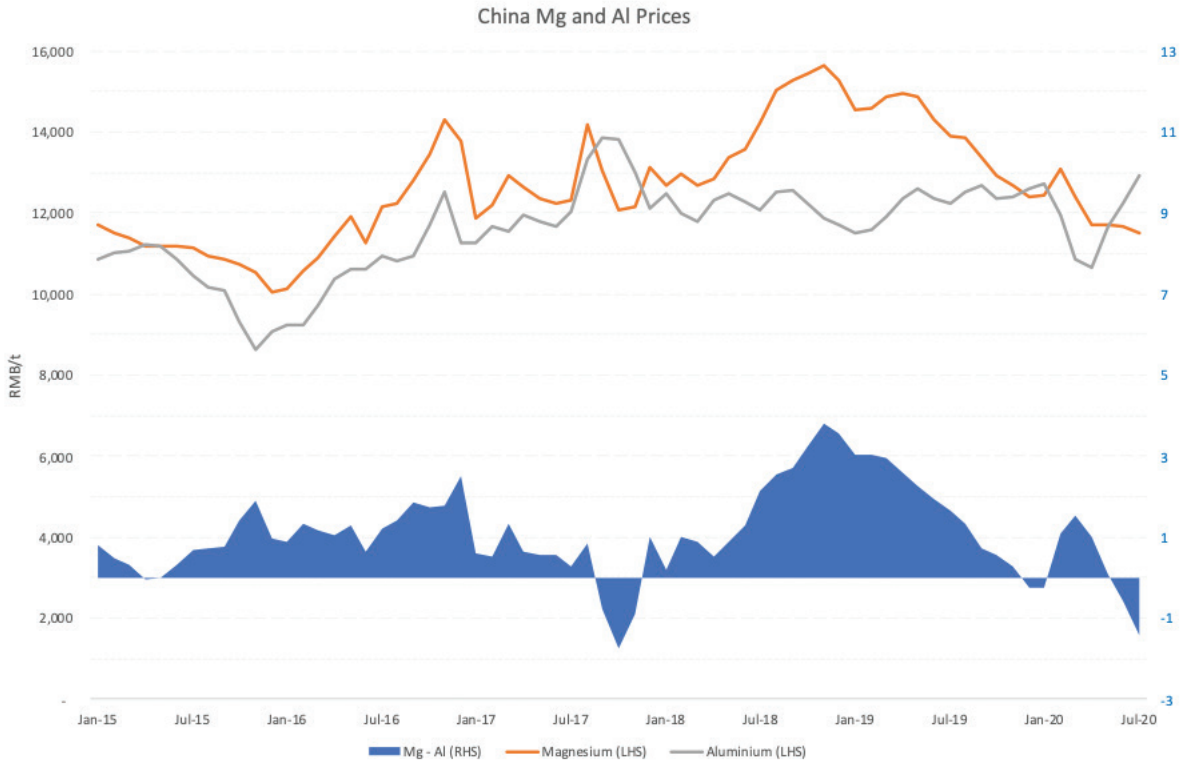
But by May, many producers had restarted, anticipating a rapid rebound in demand, both domestic and international. Domestic demand did rebound quickly, however what was not apparent at that point was the deteriorating global market conditions into which Chinese producers continued to push their products. As it became more apparent that global markets would not rebound as the domestic market had, producers were forced to dump product onto their own market, creating additional price headwinds.

It doesn't help that China's primary magnesium industry continues to operate at a utlisation rate we estimate at around 50%. That figure does include the huge electrolytic capacity at the Qinghai Salt Lake company, which appears less and less likely to produce any commercially meaningful tonnages of magnesium in the short term, given the current bankruptcy filing.

Deteriorating market conditions and considerable idled capacity overhanging the market therefore continue to create serious headwinds for prices over the short term.

In theory, lower prices should be good news for underlying magnesium demand, given the often-cited ratio between aluminium and magnesium prices (taking into consideration their relative densities) as a trigger for substitution between the two metals in die casting applications.

Figure 2:Primary Magnesium Prices vs Primary Aluminium Prices in China, Jan 2015 - YTD (RMB/t)



Aluminium prices have rebounded strongly in China post-COVID-19, meaning the gap in prices between the two metals has opened up. In practice, however, it is a much more difficult decision for die-casters to switch between the two metals than to base it purely on the ratio between their prices.

China's primary aluminuim production this year is forecast to top 36 million tonnes, compared with around 800kt for magnesium. Aluminium is widely available, well understood and well supported in

China, especially in the automotive sector. This provides a considerable barrier to substitution that stretches well beyond price.

There are a few factors that could push magnesium prices higher in China over the short to medium term, which would also make a shift away from aluminium more difficult to accept by die casters.

- **Ferro-silicon (FeSi)**—the costs to produce primary magnesium in China using the Pidgeon Process are 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 to do FeSi prices, which are invariably passed through to primary magnesium production.
- **Removal of Redundant Capacity**—the Chinese authorities have made no secret of their desire to permanently close redundant capacity. As they do so over the coming years, and industry utilisation begins to reflect levels more representative of a balanced supply demand scenario, prices would be more likely to rise with demand.
- **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 other undesirable by-products. As environemental requirements continue to tighten in China, so too will the costs of compliance, which are likely to push prices higher.

The Aluminium Sector

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.

So what might happen if Chinese costs were forced higher or for some reason exports were to become constrained? Only one new greenfields primary magnesium plants 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.

It would take at least 18 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, then many of the world's largest primary aluminium producers would find themselves in a difficult situation.

Perhaps it is time for the rest-of-world to reconsider investment in new primary magnesium capacity, despite the short-term price outlook.

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