

The heat is on

A refractory mineral supply squeeze in China impacts on the global steel refractory industry

A tilt furnace producing brown fused alumina in China; production in Henan province has been halted until 31 March 2018 creating shortages and price rises

If ever there was a time to acknowledge and try to understand the significant influence of Chinese policies on industrial mineral supply to western markets, that time is now.

The upshot is that 2017 will be remembered as the Year of the Perfect...or, perhaps, Imperfect Storm – depending on whether you are a western mineral producer or a western consumer of Chinese minerals, respectively.

Of the consumers, the steel refractory producers – such as RHI Magnesita, Vesuvius, Minteq, HarbisonWalker – are the ones perhaps suffering the most.

This is not a cyclical phase. The fall-out is unlikely to be temporary for many operations; this time it's serious

The cumulative effects of swift and robust central government policies in cracking down on pollution (plant closures), explosives provision (limited or no mine blasting), and unlicensed businesses, not to mention domestic market demand factors, have combined to create a storm of severe shortages and soaring prices for key refractory minerals exported from China.

The impact has been keenly felt by consumers of refractory raw materials, such as calcined bauxite, brown fused alumina, dead burned and fused magnesia, silicon carbide and graphite.

The shortage and soaring prices for graphite electrodes has directly impacted all fused refractory mineral producers (fused magnesia, fused alumina, silicon carbide).

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China in change

Underpinning these impacting factors on Chinese mineral supply is the much wider game of Chinese internal politics, highly profiled at the 19th National Congress of the Communist Party of China, which took place in mid-October.

The Congress saw President Xi Jinping consolidate his position at the helm of the world's second largest economic power, and determine economic policy for the next few years. Xi's tenure has been notable for a severe anti-corruption campaign at all levels of the party, as well kick-starting China's anti-pollution campaign. Each of these drives has had a direct impact on the mineral supply sector.

Any miners and mineral processors closed during 2017's inspections by the Ministry of Environmental Protection (MEP) which are subsequently unable to afford and install the required anti-pollution equipment, will fail MEP standards and remain closed.

Meanwhile, State Council Order 684 against "undocumented and unlicensed operating procedures", signed by Prime Minister Li Keqiang, is a policy to criminalise all business operations without business (and other) licences, effective from 1 October 2017.

For those falling foul of this order: operations are stopped; goods, equipment, raw materials, products seized; confiscation of illegal gains; and subject to a fine of RMB10,000 (US\$1500).

The policy is likely to hit many small-scale mineral operations, and investigations will perhaps temporarily halt operations.

Until things become clearer in 2018, the survivors will likely be the larger companies and state-owned enterprises.

Thus the resultant tight squeeze on refractory mineral supply for export is simply collateral damage in Beijing's grand scheme of things.

Bauxite supply impacted

As one supplier put it, "Bauxite has all but now stopped from Shanxi province".

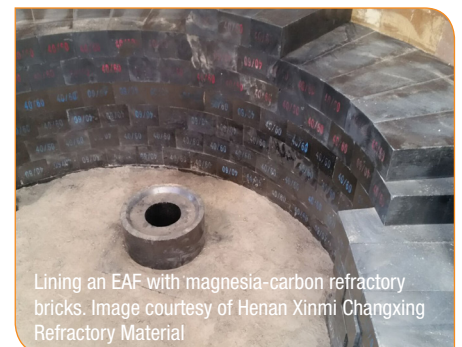
All Shanxi calcination plants have now stopped calcination, with similar happening in Henan province, prompting a shortage of rotary calcined bauxite to crush and size by the wider processing sector for export customers, as well as feedstock for BFA production.

Leading bauxite producing and processing centres in Shanxi, Guizhou, Henan, and Tianjin were subject to yet another round of plant closures by government environment inspectors during August/September 2017.

Reports indicate that many of the smaller plants in Shanxi and Tianjin which were active suppliers for calcined bauxite exports, have been closed and many will never re-open. This is owing to either unaffordable required environmental upgrades or inability to secure the necessary permits (environmental and business licenses) to continue operations, or both.

The strict control over explosives provision to miners during the year finally culminated in a complete ban on supply from 1 October, with security concerns over the impending 19th National Congress.

The ban was initially for a period of at least one month, although it appears it will continue



Lining an EAF with magnesia-carbon refractory bricks. Image courtesy of Henan Xinmi Changxing Refractory Material

into 2018. For many mining operations, especially in northern China, the November-March winter period is normally closed to drilling and blasting in any case (this has particularly affected the magnesite supply sector).

Many Chinese processing plants and traders have been caught out with little or no stocks, with only the larger players perhaps housing now rapidly depleting stocks.

The situation has enhanced the pressure on buyers: with no immediate payment, then no material is supplied. In many cases deals can only be made with cash, and a deposit is required in advance of production, plus the highest bidder wins.

Winter closures

With the onset of winter and in turn the almost instantaneous switch-on of country-wide energy supply for heating, fused mineral prices – consuming much electricity – are expected to rise further (affecting fused magnesia, BFA, and silicon carbide for refractories).

In an effort to conserve electrical energy as well as the environment, the government of Henan province has enforced large scale BFA plant closures from November 2017 to end-March 2018.

There are few stocks of BFA and bauxite in Europe. Some limited stocks of 4-5 month old material exists in Germany, but it is unknown how long these will last, probably not too long.

New supplies of BFA and bauxite are expected only at the end of December or in January 2018, and there remain concerns over the precise volumes and availability of these deliveries.

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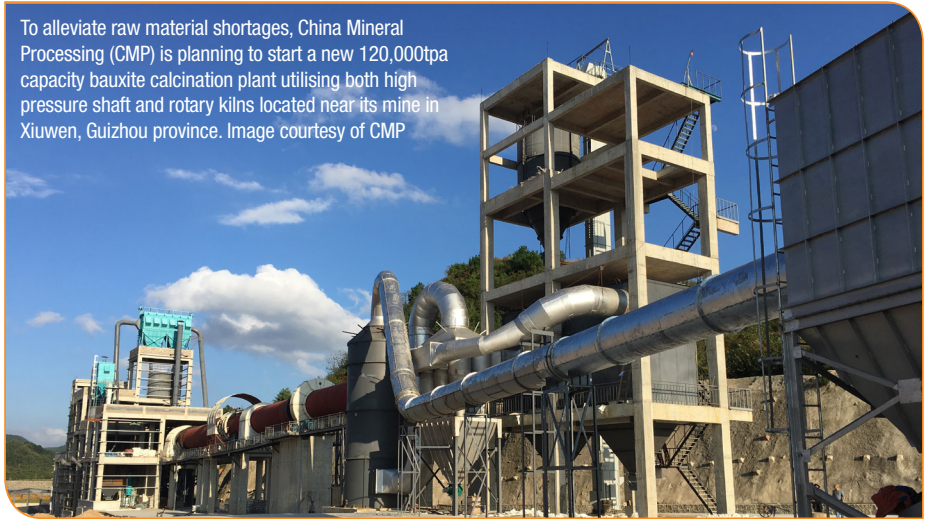
Certain European refractory mineral suppliers have increased prices by 10-15% and intend to 'ration' their supply to just a few key customers in 2018

In Shanxi province, the local government of Luliang City has set a 'peak hour restriction' on coal-fired industrial activities for the period 1 November 2017 to 31 March 2018.

Located in west central Shanxi province, the prefecture of Luliang is a major coal and bauxite producing district, incorporating the important refractory bauxite producing centres of Xiaoyi and Luliang counties.

Many bauxite kilns have been instructed to stop operating, with certain cement and refractory plants also included.

To alleviate raw material shortages, China Mineral Processing (CMP) is planning to start a new 120,000tpa capacity bauxite calcination plant utilising both high pressure shaft and rotary kilns located near its mine in Xiuwen, Guizhou province. Image courtesy of CMP



The upshot of this latest Shanxi government measure is that some 610,000tpa refractory grade calcined bauxite production capacity is to be closed for five months. Crucially, the local government has also stipulated that plants can only return to production if they switch to natural gas.

It is not yet clear how many plants will achieve this since the capital expenditure, not to mention technical effort, is significant. Moreover, the switch to natural gas is forecast to add between US\$50-70/tonne bauxite.

All this has resulted in rapidly rising prices: prices for BFA 95% Al_2O_3 , big bags are ranging around US\$750-770/t FOB, translating to around €770-790/t delivered Europe; prices for Chinese calcined bauxite, rotary 86% Al_2O_3 , lump 0-50 mm, FOB are in the order of US\$400-450/t, but expected to edge towards the US\$500/t mark by the year end.

So what next?

On the one hand it might be apparent that nothing is clear. There will be some that will assume this situation will pass and China's minerals industry will go back to 'business as usual'.

One of the issues is that there appears to be a perception among some mineral consumers in Europe that things are not quite so bad; either through a lack of knowledge or appreciation of the China situation; owing to some still being able to draw down on stock from old contracts in European warehouses of their suppliers; or still receiving limited bauxite from small Chinese traders.

But this time around, given the clear heavyweight implementation of recent central government-led measures, listening to the situation in China, it is surely unlikely that things will ever be the same again.

And mineral traders and consumers should prepare for this – as will, and are, mineral producers and project developers outside China (desperately wishing they had started investing and expanding earlier).

It seems that global mineral consumers are just starting to wake up to the reality that the whole refractory market might be short of raw material in 2018, which is why certain refractory companies for example, are now

trying to bring forward their 2018 negotiations and fix 2018 contracts as soon as possible.

There is a structural transformation in the country taking place, which will be forcefully pushed through by the government. This will result in the closure (and consolidation) of many small, possibly even medium-sized players together with consolidation of the remaining stronger, larger and more regulated players.

Already this is happening in the magnesite business, and one school of thought considers that if successful, this may become a template for successive such reforms in other mineral producing sectors.

Frankly, it is a process that China has been promising to undertake for more than a decade. Now it is finally happening.

Mineral supply shortages are set to continue, as are price rises. Even if the latter plateau, the sheer non-availability of physical material will remain an issue well into 2018, and perhaps 2019.

Suppliers and traders with mineral stocks will start to ration supply to favoured customers, if not already. The adopted practice of maintaining low inventories in response to the 2009/10 GFC where many were left with excess stocks is now turning against the industry.

The refractories industry will be obsessed with finding limited raw material sources and haggling prices, while existing mineral producers outside China ponder capacity expansions, and those developing bauxite (e.g. First Bauxite, Guyana) and magnesia projects (eg. Ma'aden, Saudi Arabia) will be upping their game.

Meanwhile, the refractory recycling sector, already evolving fast, will be given additional impetus as European refractory manufacturers turn to alternative sources of refractory raw materials.

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