

# America awaits alumina assembly



Refractory bauxite supply, new processing techniques and non-metallurgical alumina on the agenda at **IM's** 16th International Bauxite & Alumina Conference in Miami

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It has been a tough year for those sourcing bauxite outside of China. At first, non-metallurgical (non-met) demand crashed, then, when the industry appeared to be getting back on its feet six months later, China placed further restrictions on supplies, particularly refractory grade.

But the restrictions in China have given rise to some interesting new developments with First Bauxite Corp.'s refractory grade project in Guyana stealing most of the headlines.

Further downstream, non-met alumina demand fell to under 5m. tpa from over 6m. tpa a year before, according to TAK Industrial Minerals Consultancy. Global chemical alumina production also fell significantly by 35-40% as its end markets suffered.

Non-met supplies of bauxite and alumina are at the mercy of the refractories market – which in turn relies heavily on steel, consuming around 70% of refractory bricks.

When the steel industry stumbles, the refractory industry feels it and the knock on effect to bauxite and alumina suppliers is pronounced.

*Metal Bulletin* and **IM's** 16th International Bauxite & Alumina Conference in Miami, 29-31 March 2010, will explore the three key industry areas – mineral supply, alumina production and the impact of the recession, and new processing techniques for refractory bauxite that could offer material quality and cost benefits.

First Bauxite Corp.'s chief executive officer **Hilbert N. Shields** will speak on the company's Bonasika bauxite mine which is a timely and precious new source of refractory grade material not controlled by China.

TAK Industrial Mineral Consultancy's **Ted Dickson** will examine global production of non-met alumina in (what is hoped to be) the wake of the recession, and the impact this has

had on its end markets.

Dickson will look at what this will mean for alumina volumes being traded and the impact on spot prices and contracts.

## Emergence of a new source

China restrictions on refractory grade bauxite and its strategy to secure supplies outside of its borders over the last number of years has been well documented.

As its export doors began to close, China's activity overseas increased leaving a refractory grade sourcing crisis. The world's other significant source, other than the bauxite rich Shanxi and Guizhou provinces in China, was in Guyana, operated by Omai Bauxite Mining Inc. – this was not to last.

China seized control of the source when Bosai Minerals Group bought the operation at the back end of 2006. This was a classic case study, if ever the mining industry needed one,

demonstrating China's insatiable appetite for resources.

Future refractory grade supply appeared at risk and traders and consumers alike were looking at every possible alternative – including other alumino-silicate minerals such as andalusite, chamottes and mullite – as the world approached one of its most active industrial periods of modern times.

Traders of alternative minerals were beginning to eye significant opportunities.

"We have seen a strong increase in demand for andalusite," said the trader Cofermin, "For many applications in refractories, andalusite is simply a better raw material than bauxite."

When First Bauxite's aims to mine and calcine refractory bauxite became clear, the industry took great notice.

The company has three bauxite assets in Guyana under its control: the Bonasika, Essequibo, and Waratilla-Cartwright claims. The three deposits contain key non-met grades of bauxite including cement, chemical, and refractory.

First Bauxite announced in February that it will aim to produce 100,000 tpa of calcined bauxite using a pressurised vertical shaft kiln. The Bonasika claim is being targeted first with the process designed by ThyssenKrupp AG through subsidiary Polysius.

Through its subsidiary Polysius AG, ThyssenKrupp will design agglomeration and sinter plants aiming to produce 100,000 tpa of calcined bauxite using a pressurised vertical shaft kiln.

Christoph Beyer, senior manager, at

“It is no joke, refractory bauxite is as rare as rocking horse's waste”

A Chinese mineral processor on the scarcity of supply

Polysius will be discussing this project and a new process that the company has developed for refractory grade bauxite production.

The company expects its new process to increase the quality of the final product, minimising energy consumption while optimising yield. With restricted supply, interest in this is expected to be widespread.

First Bauxite has also employed consultant Met-Chem to carry out a feasibility study on the project, which is expected to be available for review during Q1 2010.

"Met-Chem is well advanced towards completion of the feasibility study and current activities include finalising the bauxite beneficiation process flow sheet and lay-outs as well as coordinating the work of its sub-contractor Roche," said the company.

Meanwhile, Finland's Outotec Oyj has been contracted to test process flow for silica removal and magnetic separation of iron minerals.

#### Even China is tight

"It is no joke, refractory bauxite is as rare as rocking horses [waste]," explained one processor of the mineral reacting to a question on supply.

Bauxite is tight in China at the moment

following the closure of a number of mines limiting the amount of raw material in the market. The knock on effect of the tight supply has meant that many rotary kilns have temporarily stopped.

Heavy tariffs imposed by the Chinese have restricted supply. Additional costs include: 17.5% VAT tax in addition to the RMB300 licence cost and the price of the raw material which has increased by about RMB200-300/tonne (\$29-34/tonne) in the last month.

In another blow to the supply of refractory grade, the long awaited return to production of the Shanxi province mines could be a matter of years instead of months despite strong local demand (*See p.23, Supply Situation Report: Refractory Bauxite*).

#### Non-met alumina

Dickson's paper will discuss the performance of the non-met alumina market over the last year.

The total use of non-met alumina was estimated at 6m. tpa in 2008, this fell to 4.5m. tpa in 2009. The drop in chemical grade alumina was quite pronounced falling from 1.4m. to just about 1m. tpa.

Chemical alumina, predominately produced in Western Europe, saw a notable production fall off in 2009 compared with the year before. Production fell from nearly 2m. tpa in 2008 to just over 1m. tpa in 2009.

North America and China, the second and third biggest producing regions, saw a far less severe drop. In Asia (not including China), output actually grew from 800,000 tpa to just shy of 1m. tpa.

For calcined alumina, used widely in abrasive, ceramic, and refractory applications, production has remained stable since the start of the year but prices are still significantly lower than last year, leading producers have told IM.

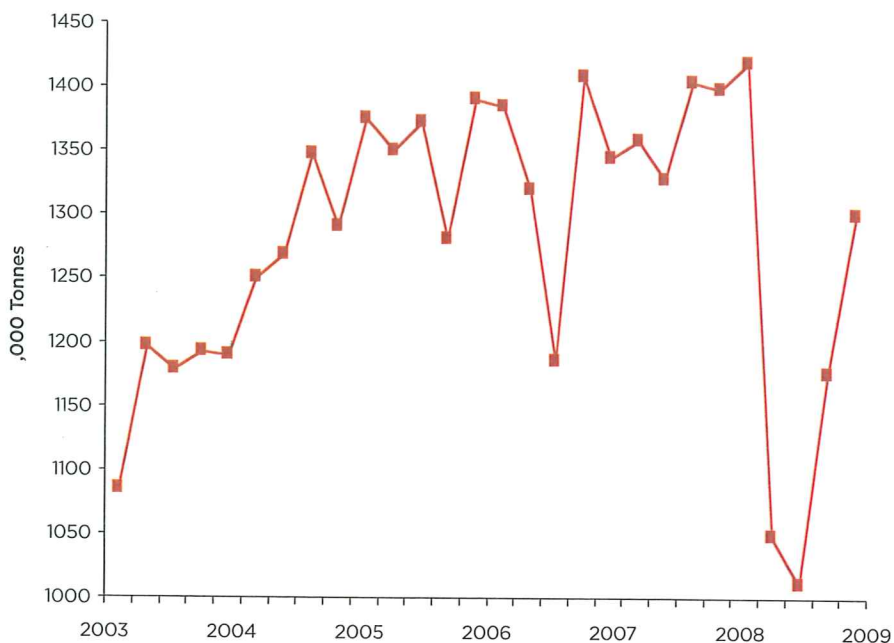
In the main, non-met alumina produced at Bayer alumina plants remained steady compared with mid-2009 levels.

For example, unground calcined alumina (98.5-99.5%  $Al_2O_3$  bulk FOB refinery) has been quoted at \$600/tonne which compares to a price of \$775/tonne.

While hydrated alumina grades were at \$200-300 (damp, 57-60%  $Al_2O_3$ , 5-8% moisture, bulk, FOB refinery).

Alumina is still suffering from the significant fall in steel refractory activity, but this has not stopped some producers from remaining optimistic.

#### Quarterly chemical grade alumina production



Source: TAK Industrial Minerals Consulting

On non-met alumina demand in general, producers said that they are seeing marginal increases in demand with a return to buying, notably, from the refractory industry. Still, the industry remains very cautious.

"No one is willing to commit to long term supply contracts anymore or say that the market has turned around. We are still just seeing small orders", said a source.

But producers are wary. Higher metallurgical alumina prices will result in higher feedstock costs for non-met alumina producers which outsource material from Bayer alumina plants.

The refractory market, however, remains central to industry recovery.

"The performance of the refractory market in Europe is still very far from levels seen in 2008 but we are seeing a return to high demand in Indian and China," said one European calcined alumina producer.

"There are niche markets for non-metallurgical alumina where activity is restarting such as flame retardants, or standard ceramics. It's very weak improvement but sales are better than this time last year," the company added.

Dickson's presentation in Miami will look at the factors driving alumina demand and the impact the recession has had.

It will discuss major end markets for alumina that have been hit hard by the recession.

The biggest consumer, refractories, has begun to show an improvement as the wheels on steel production start to turn again as old furnaces are relined. The ceramics sector is expected to start seeing more growth in the hi-tech applications after the traditional sector was one of the highest profile casualties of the recession.

The talk will also look at emerging markets in developing countries such as waste water treatment.

### Intrinsic link with metals

The conference is set to explore the intrinsic link with non-met bauxite and alumina and its metal counterparts which accounts for around 90% of the market.

Talks from Alcoa and BHP Billiton will look at the impact of the market slowed down in aluminium on both alumina production and bauxite mining. This coupled with a discussion on trends in primary aluminium, which is driving the whole industry, is set to have implications for non-met producers.

A panel session on alumina prices will explore whether there is a need for a reform of the way the industry evaluates prices and trades alumina. While this focus will be on metallurgical grades, it is central to metallurgical industry activity – which has a big say in the fortunes of non-met alumina.



Arcelor Mittal

Non-metallurgical alumina and its customers in the refractory industry await an upturn in steel activity.



Refractory bricks entering a tunnel kiln

RHI