

# Will sulphuric acid oversupply in China affect base metal smelter operating rates?

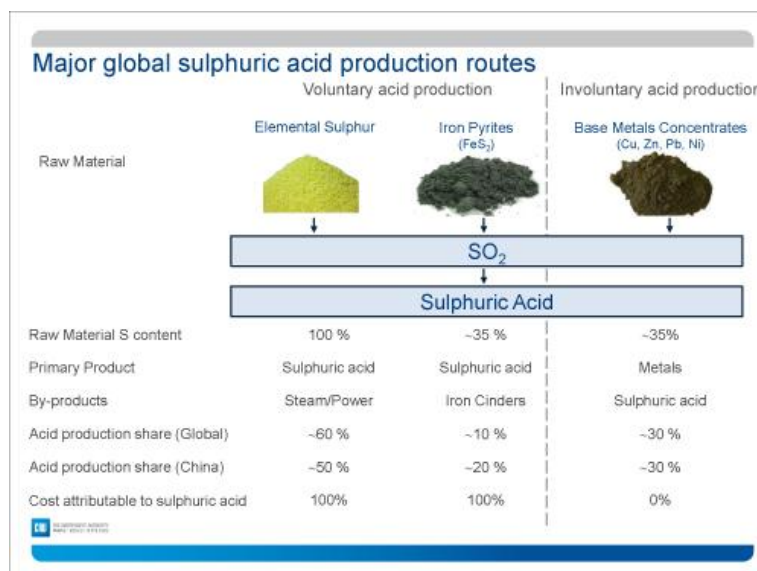
PETER HARRISSON - 23 OCTOBER 2013

News sources recently reported that Chinese base metal smelter operating rates could be placed under pressure by oversupply in the sulphuric acid market. CRU does not consider that there is a threat to metals production as a result of sulphuric acid supply. Flexibility in the Chinese sulphuric acid supply chain allows regional oversupply to be efficiently alleviated. The following CRU Insight will set out CRU's view of how the structure and key supply/demand dynamics within the Chinese sulphuric acid market are expected to prevent closures at smelting capacity. CRU uses its full-time sulphuric acid team to build its view of the global market and its analysts based in Beijing to provide an on-the-ground view of the Chinese market.

### Sulphuric acid production routes

There are three main ways to produce sulphuric acid, which differ by the raw material used to make the intermediate sulphur dioxide (SO<sub>2</sub>) gas. Once SO<sub>2</sub> is formed, the three production routes follow identical processes to form sulphuric acid. The primary production route for sulphuric acid is by burning sulphur, accounting for 60% of global supply. Base metal smelting makes up 30% of global production of sulphuric acid with the roasting of iron pyrites accounting for the remaining 10%. The three major methods can be split into two categories; voluntary and involuntary production.

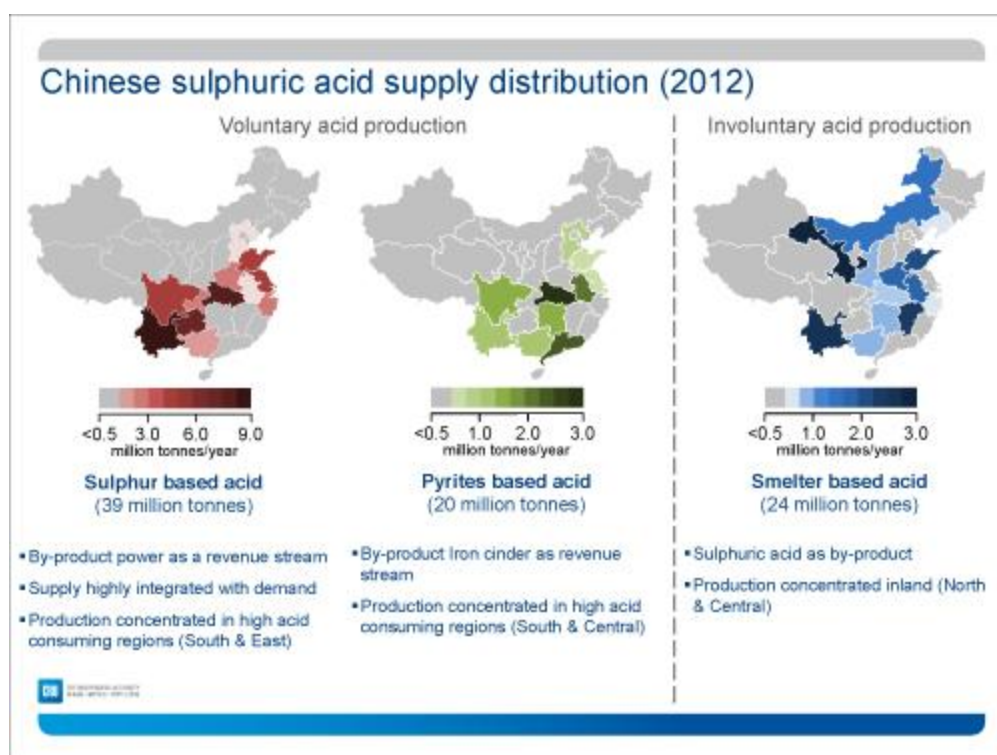
The sulphur and pyrites-based routes represent voluntary production because sales of sulphuric acid are the primary revenue stream. Base metals smelting is classified as involuntary production because metals represent the primary revenue stream with sulphuric acid treated as a zero cost by-product. The costs of voluntary production routes can be directly attributed to the production of sulphuric acid whereas costs at smelters are attributed to base metals output. Consequently, decisions around smelter investment and operation are not based on conditions in the sulphuric acid market.



## Chinese sulphuric acid market

The structure of the Chinese market in many ways mirrors the structure of the global market, and approximately 30% of supply originates from base metal smelters. The key difference in China is the presence of iron pyrites-route sulphuric acid, due to a large domestic ore resource, accounting for 20% of supply with sulphur-burning making up the remaining 50%. The dynamics which drive each of the supply routes can be quite distinct. These distinctions are primarily based around cost of production and integration with consuming industries. Smelter-based sulphuric acid has a zero cost of production but is also rarely tied directly to an acid consumption route.

Both sulphur and pyrites-based acid producers have a definable production cost and are also more frequently integrated with end-users. The lack of integration with consumers is not necessarily problematic for smelter acid producers when demand is strong but, as has been suggested recently, in times of weak demand regional oversupply can occur.



The sulphuric acid market must always balance on an annual basis as long-term stock-build is not a realistic option. Since sulphuric acid sales represent a minor proportion of smelter revenue, smelters can be expected to continue production regardless of price or demand with voluntary acid making up the remaining balance of demand. Imports also have a role to play in China with over 1.0 million tonnes entering the country every year. However, with certain parts of the market being integrated directly with consumption routes or benefiting from a significant energy credit (by recovering heat from sulphur burning), how efficiently does the involuntarily produced smelter acid trigger supply rationalisation from voluntary producers?

As a result of these additional factors, smelters can be faced with difficulty in selling surplus material to displace voluntary supply. Within the smelter-based acid sector the most remote producers are most likely to suffer from regional oversupply. The potential for oversupply can be of real concern for smelters given the apparent difficulty in

displacing voluntary production. Is it really that difficult to trigger voluntary producers to cut output? Which strategies can smelter acid producers employ to ensure that the market balances? Where in the chain of decision making do smelters currently find themselves?

### **Smelter acid supplier options in an over supplied market**

The point must be made that smelters must sell sulphuric acid output to ensure that metals output does not cease. This point is emphasised when the relative value to the smelter of a tonne of copper, lead, zinc or nickel is compared to a tonne of sulphuric acid. Some metals market commentators have suggested that not capturing the sulphur off-gas can be employed as an acid supply control measure; but this is not an option as Chinese smelters are being increasingly pushed towards lower emissions levels. Given that sulphuric acid output is directly tied to output of metal, the following section details the strategies which are currently being employed to alleviate oversupplied regions.

1. Cut prices to trigger supply rationalisation at local voluntary producers. Operating costs vary from zero at smelters, \$15-20/t at sulphur burners (after energy credit) and \$30-40/t for pyrites-based acid (after credit for iron cinders). Pushing prices to below the level required for voluntary production should trigger a supply response. Integrated sites with voluntary acid production have the option to purchase on the market in the gap between acid prices and sulphur/pyrites raw material prices are wide enough.
2. Cut prices and move material out of local market to areas of stronger consumption. For the more remote smelters, such as those in Gansu and Inner Mongolia, local demand is insufficient to absorb surplus material. Therefore smelters can rail excess material to regions of stronger consumption in the South and East of China to trigger supply rationalisation in those regions. With imports still being a supply component, pushing surplus acid into these regions can also displace import volumes.
3. Cut smelter operating rates and produce less metal. When acid cannot be sold and storage capacity is full the option does exist to cut smelter operating rates, but this would severely impair revenues. Moving forward planned maintenance can be another strategy which alleviates oversupply without impacting planned metals output.

### **What is the current market situation in China?**

CRU considers that China is suffering from weak demand growth in both the fertilizer and industrial sulphuric acid consumption sectors. However, demand has not declined and buyers of acid continue to buy. Delivered prices have certainly fallen over the last year from RMB 350-450/t (\$55-70/t) in early 2013 to current levels of RMB 150-200/t (\$25-40/t). However, the cut in price levels still represents a positive ex-factory price for smelter acid from all regions. The most remote major smelter acid suppliers in Inner Mongolia and Gansu are able to move surplus acid into the strong consumption regions of Sichuan and Shandong. Smelters are still receiving ex-factory prices of \$5-15/t. By delivering to stronger demand markets, smelters are concluding sales which is triggering voluntary production to cut-back.

Ex-factory prices in East and Central regions are estimated at \$25-40/t. Smelter acid is certainly harder to sell now than a year ago but it is still selling. One factor which is increasing the efficiency with which voluntary supply is being rationalised is the ownership of acid capacity in the central regions of Anhui and Jiangxi. Tongling NFM and Jiangxi Copper are two of the largest smelter acid producers in China. They are also two of the largest pyrites-based acid producers. In 2012, Tongling NFM produced 2.1 million tonnes of smelter acid and 0.7 million tonnes of pyrites-based acid; Jiangxi Copper similarly produced 2.1 million tonnes of smelter acid and 0.5 million tonnes of pyrites-based acid. In a situation where not all of this acid output can be sold these producers can cut back voluntary production (pyrites-based acid) before smelter output is affected.

For supply flowing into Eastern regions, imports are still a major supply component. Current import prices are in the region of \$20-25/t at Eastern China ports which equates to approximately \$30-35/t delivered to customers. In a heavily oversupplied market these imports would be put under far greater pressure than is currently being observed. Import volumes are still averaging 80,000 tonnes per month with prices indicative of demand for product remaining strong.

## **Conclusion**

Based on current evidence there continues to be significant flexibility in operating rates at voluntary sulphuric acid capacity to balance out regional smelter oversupply. Logistical routes remain open and buyers in stronger demand regions are accepting current volume and price levels. The environment in China is not one which shows any significant threat of cuts at smelters. Regional oversupply at the most isolated smelters is estimated to be 50,000-100,000 tonnes on an annualised basis. This level of surplus is against a background of over 84 million tonnes of consumption and 59 million tonnes of voluntary supply in China. With this being the case, CRU does not consider smelter cutbacks as a result of sulphuric acid oversupply to be likely in the current market.

CRU publishes a quarterly Market Outlook report forecasting Supply, Demand, Trade and Price in the Sulphuric Acid market. CRU's [Sulphuric Acid Market Outlook](#) covers short, medium and long term developments through the inclusion of an in-depth, project specific, five year view of the market along with a cost driven, 25 year outlook. The outlook for the Chinese market is built from CRU's Beijing office which about to celebrate its 10 year anniversary. For information on how CRU can help you understand the sulphuric acid market and its influence on fertilizer and base metals supply and demand, or to discuss the information put forward in this Insight please contact [peter.harrisson@crugroup.com](mailto:peter.harrisson@crugroup.com) (+44 2079032249).



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Peter Harrisson has worked on CRU's Sulphuric Acid analysis since joining the company in early 2011. He is currently Editor of the Sulphuric Acid Market Outlook report but also works across other nutrient areas including both market and cost analysis. Prior to joining CRU he completed a PhD in Industrial Chemistry.