

Global sulfuric acid market – a twenty year retrospective

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1994: Low prices in sulfuric acid and related markets

The first issue of *Sulfuric Acid Today* appeared at a time of low prices worldwide for sulfuric acid and in key related markets. The benchmark U.S. Gulf/Tampa import price for acid was around \$30/ton cost-in-freight (cfr), the U.S. benchmark molten sulfur price was \$60/long ton delivered at Tampa, the world price for solid sulfur was around \$60 metric ton freight-on-board (fob) Vancouver, diammonium phosphate (DAP) was trading at \$175/ton fob Tampa for exports and copper was trading at around \$0.85/lb. All were low by historical standards.

World trade in sulfuric acid was around 6.5 million tons/year, of which most was short-haul trade within Europe and Asia, and from Canada into the United States. Long-haul sea trade was confined to shipments to the U.S. and Latin America from Europe and Japan. Dominating world trade were three Swiss-based companies. The market leader was Interacid, then part European-owned and part owned by Sumitomo of Japan. Interacid held a strong supply position in Europe and held exclusive export rights from Japan to destinations outside Asia. Boliden Chemtrade (BCT) and Metallgesellschaft (MG) had strong supply positions in Europe because of their origin within base metal majors. All three traders were active in imports to the U.S. and Brazil, and Interacid and BCT were starting to invest in logistics to serve the emerging Chilean market.

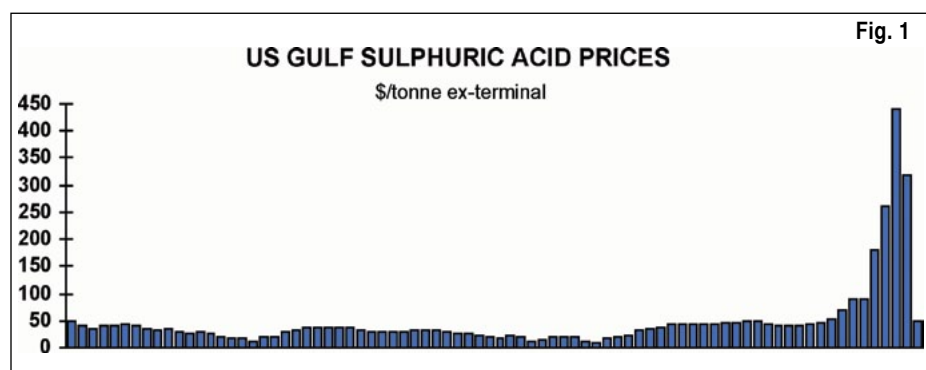
In North America, the phosphate fertilizer industry was diverse, with 10 companies in the Florida “Bone Valley” region alone producing phosphoric acid and finished products. IMC, Cargill, CF Industries and Agrico were the leading producers. Because of this diversity, Interacid subsidiary SATCO (a joint venture with Freeport McMoRan Copper & Gold) invested in sulfuric acid import tanks at Tampa in the late 1980s, with BCT following shortly thereafter. By 1994, acid imports into Tampa were about 650,000 tons/year, compared with up to 1 million tons/year earlier in the decade.

It was a notable year on the sulfur side. Freeport’s new Main Pass 299 Frasch mine offshore New Orleans had just reached full production of 5,000 long tons per day, and its Culberson mine in west Texas was also producing over 3,000 long tons per day.

Smelter acid production in the United States had been through a period of consolidation in the late 1980s and early 1990s because of low copper prices, leaving Phelps Dodge, Asarco and Magma in the Southwest and Rio Tinto’s Kennecott in Utah as the main producers. Elsewhere, alkylation acid majors DuPont, General Chemical and Rhone-Poulenc were major acid vendors, as was BCT’s Intertrade sulfur-based plant at Copperhill, Tennessee. In eastern Canada, Marsulex and Noranda made most of their combined 1.6 million tons per year export sales by rail into the U.S., Marsulex through its contract with Inco, and Noranda from its own smelters and from those of Falconbridge, in which Noranda was building an ownership position.

1995 – 2007: Prices stable; industry consolidating and restructuring

Fig. 1, taken from the Spring/Summer 2009 issue of *Sulfuric Acid Today*, shows sulfuric acid prices remained relatively steady all the way from 1994 until early 2007. Acid prices were around \$50/ton cfr Tampa for imports, Tampa sulfur was \$70/long ton delivered, Vancouver sulfur was \$65/ton fob, DAP was trading at \$250/ton fob Tampa for exports and copper had risen to about \$2.50/lb.



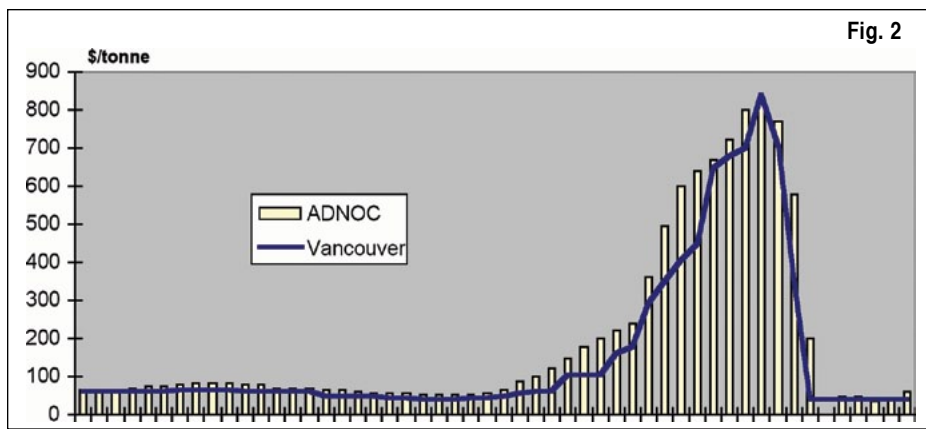
Seaborne trade in acid by 2007 was about 8 million tons, of which over 5 million tons was long-haul. In terms of sources, South Korea had become an important exporter with the opening of two large smelters by LS-Nikko Copper and Korea Zinc, both at Onsan in 1999. By 2007 Korean acid exports rivaled the Japanese. Together they were the largest source of sulfuric acid from smelting, followed by Europe. China had become a key importer of over 2 million tons per year from Japan/South Korea, handled directly by smelter acid producers. This played a significant role in stabilizing the global market. It also meant that the United States was no longer a prime target for acid imports. One key reason was the emergence of Chile as the leading importer of long-haul tonnage, importing about 1.4 million tons in 2007 to support copper ore leaching. The leading traders were now Interacid, BCT and a new player – Transammonia (now known as Trammo). With the advent of tonnage from South Korea, Interacid, now wholly-owned by Sumitomo, had been unable to hold on to its exclusive position with regard to exports outside Asia, allowing other traders to secure positions there. That is how Transammonia gained market entry. Meanwhile, since 1998 BCT had been owned out of Canada. German trader MG had virtually exited the international acid market. All three leading traders invested heavily in Chile. Major sulfur trader ICEC also began to be active in the sulfuric acid market as did smelting major Glencore.

Meanwhile, this period was one of consolidation and change in U.S. markets. In sulfur, Freeport closed its Culberson, Texas, mine in 1999 and surprisingly its flagship Main Pass 299 mine after less than 10 years of production. These closures were a result of the growth of sulfur produced involuntarily through oil refining and natural gas processing combined with the low prevailing prices. In phosphates, many years of low profitability came to a head in 2004, when Mosaic was formed as the vehicle by which Cargill acquired the assets of IMC including the former Agrico plants. This left Mosaic as the U.S. market leader, with a dominating position in Central Florida, where only CF Industries in Plant City remained outside its system. One of the consequences of the consolidation was that the need for sulfuric acid imports into Tampa virtually disappeared. The U.S. Gulf coast became the focus instead, with direct imports by Agrifos in Texas and Mississippi Phosphates, complemented by Martin Midstream Partner’s investment in a new import terminal at Beaumont, Texas, in 1999 giving access to industrial markets. Transammonia too became an active importer into the United States.

In terms of acid supply within the United States, low copper prices forced the closure of major smelters by Asarco (Texas), BHP Magma (Arizona) and Phelps Dodge (New Mexico), all in 1999. These closures were followed by Marsulex (Tennessee) in 2000 and Asarco (Montana) and Phelps Dodge (New Mexico) by 2002. In Canada, Noranda closed the Gaspé smelter in Quebec. This was also a tumultuous time for the ownership of smelters. In 2004-05, after competitive bidding, mining major Vale of Brazil acquired Inco, and soon Xstrata bought Falconbridge/Noranda, which by then was a single entity. Phelps Dodge had been a bidder in Canada, but was itself soon acquired by Freeport. The impact of all this on acid marketing was less than might have been expected. Chemtrade Logistics had spun off from Marsulex in 2000 and kept the Inco acid marketing contract following the Vale deal. Noranda had been handling all the Falconbridge and Noranda tonnage since the late 1990s. It then entered an ill-fated joint venture on acid marketing with DuPont that was dissolved in 2001, after three years. NorFalco was formed then to take on the acid marketing, and it retained the business after the sale to Xstrata. Total Canadian acid sales by rail to the United States now exceeded 2 million tons/year.

2008-2009: Unprecedented boom and bust

The sulfur price figure (Fig.2), taken from the Spring/Summer 2009 issue of *Sulfuric Acid Today*, shows the magnitude of the price boom and subsequent collapse that took place from the second half of 2007 until early 2009. The commodity boom driven by demand in China drove DAP prices in China up to a staggering \$1,200/ton cfr by mid-2008. This allowed sulfur prices to rise accordingly, reaching a peak



of \$800/ton fob Vancouver. The Tampa molten sulfur price reached \$600/long ton delivered in the third quarter 2008. The sulfuric acid import price into the U.S. peaked at \$440/ton cfr in the same quarter. All these price surges were driven by the need to make more DAP. Copper was trading at over \$4/lb. The collapse in an over-heated market was even faster, though. By the first quarter of 2009 Tampa sulfur was \$0/long ton delivered and sulfuric acid was landing in the U.S. at below \$15/ton cfr for most of 2009.

The consequences for the global sulfuric acid market were significant. During the boom, new sources of smelter acid like the west coast of India joined the market. Sulfur-based acid in Europe and even China also became exportable. Most of these new sources disappeared as quickly as they came, but new opportunities were thereby revealed.

The key change going forward was that the acid trading community became still more fragmented. ICEC took the opportunity to get involved in exports out of China and increased its acid trade volume. The opportunities in sulfuric were noted by a number of fertilizer traders; several jumped into the market; some of these, like Ameropa and Quantum, are still involved in the business.

In North America, the 2009 collapse renewed the push by the oil refining industry to invest in prilling to provide access to the international solid sulfur market as a safety valve at times of weak demand. Similarly in acid, early 2009 was the first time in history eastern Canadian marketers could not guarantee movement of acid from smelters. Due to containment issues, involuntary production cutbacks were imposed on smelters.

2010 and beyond: Market returns to normal

Demand for phosphate fertilizers and other commodities improved in the fourth quarter of 2009, which saw prices for products increase going into 2010. Since then the sulfur market has been in a supply deficit which has supported prices. This influenced price ideas in sulfuric acid markets where relative stability has been exhibited since 2010 until recent months. As our article in the Fall/Winter 2013 issue of *Sulfuric Acid Today* examined, some weakness in both the sulfur and sulfuric acid markets developed during the second half of 2013. Reduced demand for phosphate fertilizer related to India was a catalyst for reduced sulfur consumption. This also reduced demand for spot sulfuric acid to augment sulfur-based production to support phosphoric acid. In both markets, the dip in demand put downward pressure on prices. As 2014 began, sulfur prices were strengthening as phosphate fertilizer producers increased consumption at a time when tight supply prevailed. The sulfuric acid market lagged because of steady but not robust demand for industrial uses. For the balance of 2014, market performance will be dictated in part by fertilizer demand in India.

By 2013, global acid trade was stable with players remaining the same—major exporters included Europe, South Korea and Japan. Chile remains the main importer but its import needs are peaking and its requirement will be key moving forward.

Since 2010 there have been notable changes in the North American market structure. In 2011, ICEC was acquired by leading petroleum coke marketer Oxbow, and Chemtrade Logistics bought Marsulex, from which it had spun off in 2000. In 2013, Glencore acquired Xstrata, which put several Canadian smelters under new ownership, although

acid marketing via NorFalco was not affected. In 2014, Chemtrade Logistics acquired General Chemical and Mosaic agreed to buy CF Industries' phosphate business.

On the production and consumption side, there was a loss of supply in Canada with the closure of Xstrata's Kid Creek smelter in 2010. Freeport opened a new sulfur-based burner to support copper leaching in Arizona in 2011, increasing sulfur consumption as well as sulfuric acid production in the US. In Texas, Agrifos became a merchant sulfuric acid supplier as it consumed less internally when in 2011 it switched from producing DAP to ammonium sulphate (amsul).

Looking ahead, there are new sources of sulfur and sulfuric acid supply planned. New sulfuric acid production is expected from gasification projects in the U.S. Gulf coast region, such as a petcoke project in Louisiana and a lignite coal project in Mississippi. On the sulfur side, new supply will be felt from BP's Whiting, Indiana, refinery following an expansion there allowing it to run heavier crudes.

It remains to be seen, however, if new production of sulfur and sulfuric acid will be absorbed in the domestic market. In the case of sulfur, the increase in production will be met with a loss of demand with the closure of a PCS chemical plant in Florida. Meanwhile, length in the global market will be emerging toward the end of 2014 as new projects come on-stream. As a result, sulfur exports out of the U.S. Gulf Coast are expected to increase to balance the market. On the sulfuric acid side of the market, increased domestic production will either back out offshore imports and affect volumes delivered by rail from Mexico and Canada or see first significant volumes of acid exported from the U.S.

Argus Media publishes weekly global reports on sulfur and sulfuric acid as well as reports on fertilizer-related products including nitrogen, ammonia, potash and phosphate. In addition, a North American-focused sulfur and sulfuric acid publication that includes in-depth analysis of the domestic market was launched in September 2013. For more information on Argus and its portfolio of fertilizer publications, please visit www.argusmedia.com/fertilizer. □

