

SULPHUR

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The world sulphur market began to move into surplus in 2000, as demand growth faltered. The actual changes in the supply/demand balance were marginal, but the anticipation of a weaker market reversed the trend of the previous year and, after a firm start, prices slipped during the second half of the year, a trend that has accelerated in 2001.

Supply Developments

In analysing the sulphur market, it is necessary to look at sulphur in all forms, not just elemental sulphur (brimstone). All-forms sulphur includes, in addition to elemental sulphur, the exploited sulphur values of pyrite and off-gasses from non-ferrous metal smelters. Non elemental sulphur - generally utilised in the form of sulphuric acid - accounts for 30% of total all-forms supply.

Elemental sulphur is by far the most important sector of the market and is the sector that sees the market swings. Elemental sulphur is produced either from ores by conventional mining or the Frasch method (mined sulphur) or as a by-product of sour natural gas processing, sour crude refining, tar sands processing and stack gas clean-up (recovered sulphur). Recovered sulphur production accounts for over 90% of total world elemental sulphur production. Total elemental sulphur production in 2000 was 41.97 Mt, an increase of just 1% on 1999.

Frasch sulphur is produced by injecting super-heated water into sulphur-bearing deposits to melt the sulphur, which is then forced to the surface by compressed air. Frasch sulphur production on a commercial scale takes place in Poland and Iraq. Frasch sulphur production ceased in the US during 2000. Mined sulphur production in 2000 totalled 2.24 Mt, compared with 3.17 Mt in

1999. The reduction was due to market-driven production cutbacks in the US, where Freeport Sulphur closed the country's last remaining Frasch mine, Main Pass. The mine, located offshore Louisiana, was closed in August after producing 900,000 t in 2000. Freeport is selling the physical assets of the mine and it is highly unlikely ever to re-open.

Polish Frasch sulphur production was 1.12 Mt in 2000, compared with 1.09 Mt in 1999. Production is under threat from low international prices and is being cut back in the second half of 2001. Mined sulphur production in Iraq is estimated at around 200,000 t, although there is the potential to produce between 1 and 2 Mt/y. Production is currently at a low level because UN sanctions forbid exports, and production is being run at a level sufficient to meet domestic demand. Towards the end of 2000, an agreement was reached to supply Jordan with sulphur, and production will probably be increased to around 750,000 t/y once inventories are reduced.

World production of recovered sulphur increased from 38.32 Mt in 1999 to 39.73 Mt in 2000, the growth coming from increased sulphur recovery from both sour gas processing plants and from the refining of sour crude oil. Sulphur recovery at oil refineries increased from 15.35 Mt to 16.10 Mt, with increases throughout the world. The US is by far the largest producer of oil

World Sulphur Mt				
	Supply		Demand	
	1999	2000	1999	2000
Elemental	41.50	41.97	39.48	39.97
Pyrite	5.25	4.63	5.25	4.63
Other-forms	13.10	13.52	13.10	13.52
TOTAL	59.85	60.12	57.83	58.12

recovered sulphur, with output of 6.83 Mt, an increase of 180,000 t on 1999. Sulphur recovered from sour gas production totalled 22.49 Mt in 2000, compared with 21.84 Mt in 1999. Canada is the largest producer at 7.56 Mt, followed by Russia at 4.72 Mt and the US with 1.97 Mt. Other significant producers are Saudi Arabia (1.95 Mt), United Arab Emirates, France, Germany, Kazakhstan, Uzbekistan, Kuwait, Iran, Iraq, Qatar and Mexico. Production is growing rapidly in the Middle East.

World recovered sulphur production from other sources - oil sands, stack gases, etc. - totalled 1.13 Mt, around two-thirds of which was from oil sands operations in Canada.

Non-elemental sulphur production totalled 18.15 Mt sulphur equivalent in 2000, compared with 18.35 Mt in 1999. However, the fortunes of the two main components of this category, pyrite and other-forms, were different. Pyrite sulphur output fell due to reductions in China, southern Africa, Europe and the former Soviet Union. China is by far the largest exploiter of the sulphur values of pyrite, accounting for over three quarters of total pyrite use. Pyrite use in China is expected to continue to fall as sulphuric acid plants are converted to elemental sulphur use, particularly at coastal locations. Other-forms sulphur production, essentially sulphur recovered in the form of sulphuric acid at non-ferrous metal smelters, increased from 13.10 Mt sulphur equivalent in 1999 to 13.52 Mt in 2000.

Demand Developments

All-forms sulphur consumption increased from 57.83 Mt in 1999 to 58.12 Mt in 2000, with higher consumption in the former Soviet Union, Africa, the Middle East and Asia. The fortunes of the sulphur market depend primarily on the phosphate fertiliser industry. Consumption in the fertiliser sector (responsible for around two thirds of total demand) was stagnant, and decreased marginally. In the non-fertiliser sector, demand increased by around 5%. Elemental

sulphur consumption increased by around 1%. Sulphur demand increased marginally in most regions, but fell in the US.

Market Balance

The sulphur market has been operating in surplus for the past few years with the market balance being achieved through increases in inventory in Canada, Russia and Kazakhstan. Most other suppliers do not hold long-term inventory. Canadian suppliers have been increasing inventory this year due to the loss of the US market this year.

Price Developments

Sulphur prices began a downward trend at the beginning of 2000. Vancouver levels started the year in the mid-high US\$30s per tonne fob, but slipped during the year to the high US\$20s and settlements for first half 2001 have been in the high teens-low US\$20s fob. Middle East prices have also fallen, from the high US\$30s to around US\$20 fob, with spot sales lower than this.

The US domestic market has had an eventful year. Weaker demand and growing recovered sulphur production affected the market. Prices started 2000 at US\$56-58/t delivered central Florida, a reduction of US\$6/t of fourth quarter 1999. Prices remained at this level until the fourth quarter, when supply fears resulting from the closure of Main Pass resulted in a US\$6/t increase. Plans were made to increase imports from Canada, and two solid sulphur cargoes were imported and remelted at Galveston to help meet US demand.

Further price increases were threatened for the first quarter, but a sharp downturn in demand from the phosphate industry essentially cancelled out the impact of the closure of Main Pass and first quarter 2001 prices fell back to US\$55-57/t. Further weakening in demand has led US recovered sulphur producers to reduce prices further in the second quarter, in order to discourage imports. Second quarter prices were US\$40-42/t delivered central Florida, which (in real

terms) represents an all-time low. In an unprecedented move, prices were further reduced mid-quarter to around US\$26/t delivered Central Florida. This essentially backed out most Canadian sulphur from the US market.

Outlook

In the short term, the key to sulphur demand will be a recovery in the phosphate sector, particularly in the US. This is not likely to come until late in 2001.

In the medium term, a key factor in sulphur demand growth will be the development of laterite ore leach programmes in the metals industry, particularly for nickel. The first major project, Anaconda's Murrin Murrin operation in Australia, has had some teething problems, but the use of sulphuric acid for metals leaching looks like developing into a major end use of sulphur. There are a number of projects around the world which will lead to a major growth of sulphur usage, although in

recent months, several of these projects have begun to look uncertain.

In the medium to longer term, a key supply factor could be the availability of sulphur from the Middle East. Supply from the region is increasing steadily. The key question is how much Iraqi tonnage will re-enter the market. If Iraq again becomes a major exporter, it will exacerbate the current imbalance in the market. Canadian suppliers have become reluctant to pour to block, preferring instead to take negative netbacks, financed by strong oil and gas revenues. However, Canadian suppliers are being forced to put tonnage into long-term inventory because of containment problems due to the loss of the US market.

Astrakhangazprom, the main Russian producer, is also pouring to block (putting into long-term storage), a result of its unwillingness to accept negative setbacks, although there are signs that this is beginning to change.