

CHROMIUM

By Ian Robinson

After a sharp fall in 2001, world stainless steel production recovered during 2002 to nearly regain the 2000 level. According to preliminary estimates, stainless steel production rose to a level of 18.8 Mt in 2002, an increase of 5.3% over 2001 when production fell by 5.8% to 17.9 Mt from 19.0 Mt in 2000. The recovery in stainless steel production led to a recovery in demand and prices for ferrochrome, and some closed capacity was brought back on stream in South Africa before the end of the year.

The year opened on a dismal note with prices of ferrochrome at historic lows. Prices of charge chrome remained static during the first half of the year in the range US\$0.27-0.29/lb contained chromium – the lowest level for 30 years. In a presentation compiled for investors at mid-year, Switzerland-based Xstrata, one of the two major ferrochrome producers in South Africa, estimated that a total of 1.3 Mt of ferrochrome production capacity had been closed worldwide and about half of this capacity would remain permanently closed. The two giant South African producers, Xstrata and BHP Billiton's Samancor Chrome, had both reduced production by about a quarter during 2001 to levels of 860,000 t and 799,000 t through furnace closures.

Cost pressures on South African producers were further intensified by domestic factors – the appreciation of the rand against the dollar and a 50% increase in coke prices. South African ferrochrome producers obtain coke from both domestic and overseas sources but domestic producers follow international price trends because they set their prices in dollars.

However, rising demand for ferrochrome in response to the recovery in stainless steel production and the cost pressures on South African producers forced prices to rise in the second half of the year and producers started to look at restarting closed furnaces. Prices rose by US\$0.03/lb in the third quarter, which represented a reversal of the price decline which had persisted since the beginning of 2001. The upward momentum continued into the fourth quarter when prices rose by a further US\$0.03/lb to the range US\$0.32-0.34/lb.

Xstrata announced in September that it was looking at the possibility of restarting idle furnace capacity as demand increased and in early 2003 marketing manager of Xstrata South Africa, Jeff McLaughlan said South African ferrochrome producers would probably operate plants at more than 90% of design capacity in 2003 compared with 75% in 2002. Samancor raised production in the final quarter of 2002 by a margin of 12% relative to the final quarter of 2001 through the restart of idle furnaces.

However, marketing manager of South African ferrochrome producer Heric Ferrochrome, Paddy Probert, warned that the increase in prices during the

second half of the year was insufficient as the appreciation in the rand had more than offset the rise in dollar prices. At these levels, South African ferrochrome producers would have “little incentive” to expand production.

A forecast by Metal Bulletin Research (MBR) at Metal Bulletin’s 18th International Ferro-Alloys Conference in Monte Carlo in November that the price of charge chrome could rise to a level of US\$0.37/lb during 2003 could prove conservative as South African producers were demanding a rise of 20% in the second quarter to a price of US\$0.40/lb. MBR estimated that annual global consumption of ferrochrome increased by 16.5% in 2002 to 4.3 Mt and over the period of 2002 to 2006, demand for ferrochrome would increase at an average annual rate of 4.7% rising to 5.2 Mt.

New producers

Two major new production facilities were commissioned in South Africa during the year.

In January, Assmang commissioned a new ferrochrome furnace and pelletising plant at its Machadodorp smelter. The new facilities comprised a closed 54 MVA furnace and pre-heater as well as a 350,000 t/y pelletising and sintering plant.

This expansion raised annual production capacity to 320,000 t. Prior to the commencement of the expansion projects at Machadodorp in 2000 (including both the upgrade of the existing furnaces and the new facilities) the smelter had an annual production capacity of 150,000 t (125,000 t from three furnaces and 25,000 t from a metal-in-slag recovery plant).

Feed for the smelter is derived from the Dwarsrivier mine which is situated about 140 km to the north. The mine supplies a 50/50 mixture of lump and concentrates. Lump ore is defined as ore within the size range of +6 to -100 mm and fines are minus 1 mm. Most of the lump ore is used as feed for the three small open furnaces. The ore has a chromium:iron (Cr:Fe) ratio of 1.55 to 1.60.

During 2002, the new facilities experienced some technical problems, which delayed the attainment of sustained planned production levels. Assmang expected to resolve these problems and reach full production during the first quarter of 2003.

In September, SA Chrome and Alloys opened its 235,000 t/y capacity smelter at Boshhoek, about 30 km north-west of Rustenburg. The smelter comprises two 54 MVA closed submerged arc furnaces with charge pre-heating and a 520,000 t/y pelletising and sintering plant.

SA Chrome has an offtake agreement with ThyssenKrupp Metallurgie (TK Met) which is part of the ThyssenKrupp group in Germany. Its steel division is one of the world’s leading flat-rolled carbon steel manufacturers as well as the world’s largest producer of flat stainless steel.

The ore feed is a 40/60 mix from the LG6 seam at SA Chrome's recommissioned Horizon mine and chromite tailings from the UG2 at from Impala Platinum's mine. SA Chrome has a twenty-year supply agreement with Impala Platinum for the purchase of the tailings.

After the start of construction in mid-2001, the first furnace (S3) produced its first metal on June 1. The second furnace (S2) produced its first metal on September 4. A space has been left for a third furnace (S1) and construction will proceed with this furnace when market conditions are favourable.

In addition to the commissioning of the new production capacity in South Africa this year, there was also a significant change in ownership. At the end of July 2002, Mitsubishi Corp. of Japan secured a controlling interest in Hernic Ferrochrome, South Africa's fourth largest ferrochrome producer, by raising its holding in the company from 9.4% to 53.5%. As a result, Mitsubishi became the first Japanese company to acquire control of a South African ferrochrome producer - or any other South African resource company.

Previously, Japanese companies have focused on investments in specific production facilities, usually furnaces, in order to secure supplies for themselves or their customers.

Mitsubishi originally acquired its 9.4% interest in Hernic from Nippon Steel in early 2000 in order to secure supplies of ferrochrome for its customers in Japan and South East Asia.

Future South African production

Two new potential producers emerged during the year. A consortium of Australian companies investigated a project to produce ferrochrome from the Buffelsfontein mine in the Marikana area some 25 km west of Brits. The property is situated between operations controlled by Samancor and Xstrata. The property has a proven resource of 24 Mt of chromite ore, which would be sufficient for an annual production of 250,000 t of ferrochrome for a period of more than 25 years.

In early 2003, a spokesman for the project, known as Transvaal Ferrochrome (TFC) said that there were plans to raise A\$75 million by listing on the Australian Stock Exchange in May 2003.

Another foreign company, Tata Iron and Steel of India, proceeded with plans to build a ferrochrome smelter at Richards Bay, north of Durban. The project would have an annual production of 100,000 t of high-carbon (HC) ferrochrome, based on imports of high-grade ore from India.

Richards Bay was chosen as the preferred site for an overseas smelter because of the competitive power costs plus tax incentives. It is planned to build a single 56/58 MVA closed furnace based on Outokumpu technology with pre-heating of the charge. Local sources reported that Tata had stated that it wanted to commence construction before the end of 2003.

Tata's drive to establish a smelter offshore to smelt high-grade ore imported from India was sparked by the closure of a 50,000 t/y smelter at Jamshedpur in India as a result of high power costs. Tata had investigated the feasibility of establishing a smelter at Gladstone in Queensland, Australia before choosing Richards Bay as its preferred site.

Chinese-owned ASA Metals, the smallest ferrochrome producer in South Africa, decided to expand production and awarded the contract to build a second furnace at its smelter in Steelpoort in early 2003. The new furnace will have an annual production capacity of about 70,000 t, about 30% higher than the existing furnace.

Hernic Ferrochrome is also studying a project to expand production through the construction of a fourth furnace. The fourth furnace would be a second closed furnace with a pre-heater which would operate on a feed of lump ore and sintered pellets produced by the existing Outokumpu pelletising and sintering line. The original Outokumpu plant and the 54 MVA closed furnace were commissioned in mid-1999.

Developments outside South Africa

India exported a record level of 400,000 t of chrome ore and concentrate during the period April 2001 – March 2002. Most of the chrome exports are sold to Chinese producers of ferrochrome via trading group MMTC.

The high level of ore and concentrates contrasts with the declining level of exports of HC ferrochrome and charge chrome which were projected to fall below 100,000 t during the period April 2002 – March 2003. The decline in exports of ferrochrome in 2002 which was well below levels of over 150,000 t/y in recent years resulted from strong domestic demand and the continued closure of capacity in the state of Andhra Pradesh. Indian stainless steel producers were near full capacity and consumed the bulk of production by the domestic ferrochrome producers, leaving reduced tonnages available for export.

The plants in Andhra Pradesh which had closed in April following a hike in electricity tariffs remained closed because of the continuing power shortage in the state. It was hoped to start up more furnaces in West Bengal which has become India's largest ferro-alloy producing state.

In Australia, Consolidated Mining, which revived the Woodie Woodie manganese operations in the Pilbara region of Western Australia, has now restarted a chromite operation. Consolidated bought the Coobina chromite mine in Pilbara from private interests in late 2001. Coobina was discovered in 1925 and production since then has totalled about 240,000 t with the bulk of this production exported to China since 1998.

Coobina is situated some 400 m by road from Woodie Woodie and Consolidated's managing director, Michael Kiernan explained that Consolidated acquired Coobina because of the potential synergy between the

two mines. Mobile equipment can be moved between the two mines, and the two operations mined in campaigns.

The first shipment of chromite ore to China from Port Hedland was made during the second quarter and a trial shipment of 5,000 t of chromite was despatched to a European customer in October. Kiernan believes that the operation is on track to achieve its planned initial annual production capacity of 250,000 of 42% Cr ore. The company is also starting to work on a second heavy minerals plant which will double output to 500,000 t/y in 2004 with the objective of securing a sustainable share of 5% of the world market.