

STEEL

By Tony Sweeney

The surge in steel demand/production that has been evident since 2000 continued in 2003 and world steel production reached 962 Mt, up 6.6% over production in 2002. The main reason for this increase was, once again, China, which produced 220 Mt, 21.2% higher than output in 2002. China produced 22.8% of world crude steel output, up from 20.2% in 2002.

The impact of Chinese steel demand and production was felt in the steel raw materials sectors, where prices for scrap, iron ore and coke were buoyant. Freight rates in the dry bulk market were also affected and rose strongly in the second half of 2003.

The Section 201 tariffs on steel imports imposed by the US were lifted in December 2003, thereby averting a potential trade conflict. The tariffs helped the US domestic steel industry, but the decline in the value of the US dollar over the past two years was probably of greater benefit.

The outlook for 2004 is optimistic, and a world crude steel production level of 1,000 Mt could be achieved for the first time.

Economic environment

World economic growth increased by 3.2% in 2003, continuing the recovery from the economic slowdown of 2001, but was still below the long-run growth trend. World trade grew by 2.9%, but is nowhere near the 7% average growth trend of 1970-2002. Thus, the world economy is recovering, but at a pace that mirrors the relatively mild slowdown.

The US, the world's biggest economy, continues its recovery; inflation remains under control, short-term interest rates are at historical lows, and the recent rate of productivity improvement continues. Unemployment remains a sticking point and the creation of new jobs is less than expected, although this will almost certainly change if the recovery continues as expected. Fiscal stimulus has helped the economy to grow, but the downside is the burgeoning government deficit, and this shows no signs of improving. The war in Iraq can only exacerbate the budget situation. The budget deficit is one of the twin deficits, the other being the trade deficit, which now runs at about 5% of GDP. The US dollar has declined sharply over the past two years and this will have an ameliorating effect on the trade imbalance. The upside of this trade deficit is that the rest of the world grows faster, but such imbalances cannot go on forever.

The Euro region grew by a miserly 0.5% in 2003, but the UK and the other European countries outside the Euro area did somewhat better. The Commonwealth of Independent States (CIS) grew by 5.8%, and Russia, the

biggest member of the CIS by far, improved by 6.0%. This strong performance, albeit it from a relatively low level, has been helped by rising oil prices and increasing energy exports. The CIS is still in a state of transition, but the worst is now behind it.

After years of a relatively stagnant economy, there are signs that Japan has turned the corner. Economic activity grew by an estimated 2.0% in 2003 and the threat of deflation appears to be receding. Government debt, at about 170% of GDP, is too high and tends to have a deadening effect on the economy.

China continues its industrialisation at what many consider to be an unsustainable pace. The IMF estimated that China would grow at a 7.5% pace in 2003, but later figures suggest that the growth in economic activity was over 9% for the year. Economic data from China leave something to be desired, and other economists have put growth as high as 10-11% for 2003. At some point the torrid pace will slow, but when this will happen is just a guess.

Growth in economic activity will slow when inflation in China begins to take hold and interest rates rise. Other bottlenecks may occur at ports and transport infrastructure, and at the current rate of growth environmental pollution could act as a brake on economic growth. At the moment, however, the carousel is spinning and the ride is too good to miss.

China is blamed for exporting deflation with its finished goods and causing inflation of commodity prices. Both are true to some extent, as is the claim that American jobs are lost to China; but it is China that is funding the two US deficits through its purchases of US Treasury bonds. Although China runs a substantial trade surplus with the US, its overall current account balance was only 1.3% of GDP; China runs a deficit with many Asian countries.

India, the second most populous country in the world, is also in a growth phase, and its economy was estimated to have grown by 5.6% in 2003. Economic activity in Asia as a whole is growing vigorously and this is supported by strong pan-Asian trade, with China as the locomotive.

Latin America continues to under-perform and its largest economy, Brazil, grew by only 1.5% in 2003. The failure in Latin America is systemic, a result of crony capitalism and political corruption, and the comparison with Asia is eye-opening.

Steel demand

Expected world steel demand in 2003 was 884 Mt of finished steel products, up 6.4% over 2002 demand of 831 Mt. If China is given its own bottom line, then steel consumption in the rest of the world increased from 620 Mt in 2002 to 627 Mt in 2003, an ambulatory-paced increase of 1.2%. In fact, all the growth in world steel demand in 2003 took place in Asia: steel demand in the rest of the world was 403 Mt in 2002 and 2003. Is this the Asian Century?

Economic growth is a major factor in steel consumption, although one that varies with the degree of industrialisation in an economy and its structure. When countries are in the industrialising phase of their development, steel consumption growth easily exceeds economic growth; highly developed countries with an advanced service sector do not usually exhibit strong growth in steel consumption. This phenomenon is known as declining steel intensity.

It comes as no surprise that growth in steel consumption is strong in China, but the 21.7% increase in 2003, to 257 Mt, up from 211 Mt in 2002, was probably beyond the top-end of most forecasts. Other Asia was up by about 3% to 224 Mt, with Japan weighing in with 74 Mt, South Korea 45 Mt, India 31 Mt and Taiwan 21 Mt. Total Asia now accounts for 54% of world steel demand, and China alone accounts for 29%. China's share is forecast to increase in the future.

The EU15 has a steel demand of 139 Mt, with Germany (34 Mt), Italy (32 Mt), France (16 Mt), Spain (19 Mt) and the UK (13 Mt) being the major countries. Comparisons between steel demand in France and Italy (roughly the same size and wealth) and Spain and the UK (the UK is bigger and wealthier) highlight that steel demand is only one measure of economic development. Other Europe had a steel demand of 71 Mt in 2003, of which Russia was the biggest contributor with 24 Mt, followed by Turkey with 13 Mt.

NAFTA was the only region to show a decline in steel consumption in 2003, falling to 129 Mt from 133 Mt in 2002. The decline was registered in the US, 99 Mt in 2003 down from 103 Mt in 2002, with Canada (16 Mt) and Mexico (14 Mt) holding fast.

South America had a steel demand of 28 Mt in 2003, with Brazil (16 Mt) being the largest consumer. Steel demand in the Middle East/Africa was essentially flat in 2003 at 36 Mt.

It is interesting to look at apparent steel consumption per capita, which is a computation derived from production-plus-imports-less-exports divided by population. These figures vary widely, but do give some indication of those regions where steel consumption is likely to grow in the future. Generally, industrialised countries have high and relatively constant steel consumption levels per capita, for example, EU15, US and Japan. Less developed countries have lower but growing levels of steel consumption per capita.

Blast furnace iron production

World blast furnace iron production in 2003 was 655 Mt, up 7.7% from the 608 Mt produced in 2002. Of the 47 Mt increase, China was responsible for 33 Mt. Asia as a region increased its output by 12.0% in 2003, and the other major producers were Japan with 82 Mt, South Korea with 27 Mt, India with 27 Mt, and Taiwan with 10 Mt. Asia produced 53.4% of the world total in 2003, and China alone was responsible for 30.8%.

Blast furnace iron production in the European Union was 92 Mt in 2003, up 1.9% over production in 2002. Germany was the biggest producer with 29 Mt, followed by France with 13 Mt, the UK with 10 Mt, and Italy with 10 Mt. The UK showed the biggest improvement in the region, up 19.5% over production in 2002. Blast furnace iron production in Other Europe increased by 7.3% in 2003 to 26 Mt, with Turkey 6 Mt, Poland 6 Mt, and the Czech Republic 5 Mt, being the major producers. Production in the CIS continued its upward trend and output increased 5.3% to 82 Mt, with Russia 48 Mt and Ukraine 30 Mt, being the major contributors.

South America produced 26 Mt of blast furnace iron in 2003, a 7.8% increase over 2002, and of this, Brazil produced 32 Mt, up 8.0%. Africa/Middle East increased its output by 3.9% to 11 Mt, with South Africa 6 Mt and Iran 2 Mt being the major producers.

The only region to register a decline in blast furnace iron production was North America, down 1.9%, the third straight year of decline. Mexican output was up by 4.7% to 4 Mt, but this was more than offset by the 2.7% decline to 39 Mt in the US. This decline at a time of a booming iron and steel market underlines the rationalisation of company structure and capacity that continues to take place in the US and, possibly, shortages of critical raw materials such as coke.

Direct reduction

Direct reduction (DR) processes are loosely defined as those processes in which iron ore is reduced to solid iron (generically known as sponge iron) without going through the liquid phase. The temperatures employed are much lower than those used in the blast furnace/oxygen blown converter (BF/OBC) system, the minimum economic scale is about one-tenth of the integrated system, and since DR plants are modular, capacity can be increased incrementally.

Generally, iron-ore pellets or lump are reduced by a carbon monoxide/hydrogen mix, which is obtained by cracking natural gas, or from coal. The sponge iron is pyrophoric and has to be charged directly to an electric arc furnace, or is pacified by briquetting to give hot briquetted iron (HBI), which is the form generally used when it is transported.

When DR processes were first developed, about 30 years ago, they were mooted as a competitor to the integrated steelmaking systems, whereas, in fact, they have become complementary to the integrated processes. Directly reduced iron (DRI) and HBI are generally charged to electric arc furnaces, but can also be charged to blast furnaces to increase their productivity, albeit at a significant cost.

Apart from scale advantages, DR processes are more environmentally friendly than classical integrated systems, because they do not need coke ovens or sinter plants – often considered to be the pollution ‘bad boys’ of the steel

industry. Drawbacks to DR include the need for an adequate supply of natural gas at a competitive price and, since there is no liquid separation enabling the removal of gauge elements, the iron ore used has to be of high quality, because those elements report to the final steel.

More recent developments in DR are attempting to use iron-ore fines instead of pellet and lump. Fines are sold at a considerable discount to pellets and lump and are more readily available. Performance has, so far, been patchy, with some plants not operating at all. The Finmet plant in Australia, a gas-based process that uses fines, has had more than its fair share of teething problems, but operated at about 80% of its capacity in 2003.

World DR production in 2003 was a record 49.5 Mt, an increase of about 10% over 2002. Gas-based processes accounted for almost 90% of world production, with Midrex systems producing nearly 65% and HyL systems producing almost 20%. The biggest gas-based producers are Venezuela, Mexico, Trinidad and Tobago, Iran and Saudi Arabia. In these countries, there are ample supplies of relatively cheap natural gas. The coal-based systems account for about 10% of world output and these systems are favoured in India and South Africa.

The growth in DR production in 2003 can be attributed to China's voracious appetite for raw materials. This has impacted the steel scrap market and pushed the price of scrap to unprecedented highs: the *American Metal Market* weekly scrap price composite ranged from US\$65-98/t in 2002; US\$98-162/t in 2003; and reached US\$252/t in March 2004. As more steel scrap is used in steelmaking, the level of unwanted residuals has been increasing and addition of DRI/HBI ameliorates this problem. The hefty price increases for steel scrap translates to DRI/HBI producers and the margins for these producers are now healthily profitable.

Crude steel production

Crude steel production closely follows blast furnace iron production, and output in 2003 was 6.8% higher than 2002 at 964 Mt. China was the biggest producer in 2003 with 220 Mt, a 21.2% increase over 2002 and 22.8% of the world's total. Of the 61 Mt increase in world crude steel production, China was responsible for 47 Mt of it, ie, over three quarters of the increase. Japan was the second-biggest producer in 2003 with 111 Mt, a 2.6% increase over 2002; South Korea with 46 Mt, India with 32 Mt and Taiwan with 19 Mt were the other major producers in Asia. In all, Asia produced 45.7% of the world's total steel output.

The European Union produced 160 Mt of crude steel, up 0.7% over 2002, and 16.6% of world output. Germany was the biggest producer with 45 Mt, followed by Italy with 27 Mt, France 20 Mt, Spain 16 Mt, the UK with 13 Mt, and Belgium with 11 Mt. Apart from the UK, whose output was 11.7% higher, 2003 was almost a carbon copy of 2002. Denmark ceased to produce steel in

2003 and joins Ireland as the non-steel producing members of the European Union.

Other Europe increased its steel production in 2003 to 52 Mt, up 7.6% over 2002. Turkey increased its steel production to 18 Mt, up 11.1%, and the other major producers in the region were Poland, 9 Mt up 8.8%, Czech Republic, 7 Mt up 4.3%, Romania, 6 Mt up 5.1%, and Slovakia, 5 Mt up 7.3%. Crude steel production in the CIS increased by 6.3% to 107 Mt, with Russia and Ukraine producing 63 Mt and 37 Mt respectively.

Crude steel production was essentially flat in North America in 2003, with a small gain in Mexico, 15 Mt, up 8.0%, being offset by a 1.3% decline to 90 Mt in the US. South American steel production was higher in 2003 by 5.4% at 43 Mt, primarily due to a 5.2% increase to 31 Mt in Brazil, which produced 72% of the region's output.

Steel production in Africa/Middle East in 2003 was 30 Mt, an increase of 5.0% over 2002. The major producers in the region were South Africa 9 Mt, Iran 8 Mt, Egypt 4 Mt and Saudi Arabia 4 Mt. Oceania's steel production in 2003 was 1.0% higher at 8 Mt.

Technology

Steel is produced essentially through two process routes; either oxygen blow converters (OBC) or electric arc furnaces (EAF). Liquid iron is produced in the blast furnace (BF) and this is charged to the OBC; the overall process is often referred to as the integrated BF/OBC system. The iron units are largely obtained from iron ore and are therefore classed as 'virgin' iron units. Some steel scrap is charged to the BF, and particularly to the OBC, where it is used to increase productivity in the furnace and help control the 'blow'.

The EAF steel production system is a steel scrap melting process and is a much simpler plant than the integrated BF/OBC plant. The solid metallics charged to the EAF are primarily scrap, but increasing amounts of DRI/HBI are now used, and even some small quantities of solid pig iron are sometimes added. Additions of DRI/HBI are increasing because of the need to dilute the 'residuals' that have built up in the scrap supply. The term 'integrated' could also be applied to the DRI/EAF plants where the sponge iron is fed directly to the EAF, and this accounts for about three-quarters of DRI/HBI production. The other quarter is 'merchant' material, which is transported and sold elsewhere.

The amount of crude steel produced by OBC is about 60% of the world total and this share has been relatively stable over the past decade. While the share has been stable on a world basis, there has been considerable change on a regional/country basis and wide variations between regions. Those regions where, because of historical steel consumption, there is a large scrap bank, have tended to use more steel scrap and the share of steel produced by OBC has declined. In the European Union, the share of crude steel output

produced via OBC has declined steadily from 67.5% in 1993 to 59.5% in 2003. At the same time, the share of EAF crude steelmaking has increased from 32.1% to 40.5%. Similarly, in the US, the share of OBC crude steel production declined from 60.6% in 1993 to 51.1% in 2003. At the same time, EAF crude steelmaking increased from 39.4% in 1993 to 48.9% in 2002.

The situation in Asia is somewhat different: OBC steel production has increased from 55.8% in 1993 to 66.8% in 2003, while EAF steelmaking over the same period has decreased from 30.7% in 1993 to 29.4% in 2003. Asia is now the primary steelmaking region in the world, and it is where the latest additions to steel production capacity have taken place, where the market requires the addition of large tranches of capacity, and where the supply of steel scrap is limited and production requirements exceed any potential supply of scrap. In China, OBC steelmaking grew from 46.1% in 1993 to 72.4% in 2003, whereas its EAF steel production declined from 23.2% in 1993 to 20.4% in 2003. This pattern is not consistent across Asia: South Korea, for example, has seen its OBC steelmaking decline from 66.8% in 1993 to 55.2% in 2003, with a concomitant increase in EAF steel production.

South America has had relatively static levels of OBC and EAF steel production since 1993, at two-thirds and one-third respectively. The CIS has increased its OBC production share to nearly 60% from 39% in 1993, largely because of the closure of inefficient open hearth (OH) steelmaking. The EAF steel production share has remained relatively constant at about 13% since 1993.

There is still some OH steelmaking, largely located in the CIS (Russia and Ukraine) and Asia (China and India). This is gradually being phased out, and in China's case, it only exists because of the ferocious demand for steel. Any slowdown in Chinese steel demand would see that capacity close first.

China

Napoleon is reputed to have said: "Let China sleep, for when she awakes, she will shake the world." More recently, General Curtis Lemay of the USAF, affectionately known as 'Bombs Away with Curtis Lemay', was a proponent of a pre-emptive nuclear strike on China, because he thought China had the potential to become a great power. Both men were prescient, Napoleon rather more kindly.

China is very definitely awake and is beginning to shake the world. Growth in real GDP from 1985 to 2003 has averaged about 9% per year. Generally, such rapid growth in a developing country, or a developed country for that matter, leads to bottlenecks and inflation, but not in this case. Inflation averaged 11.0% per year from 1985 to 1994 and 2.7% per year from 1995 to 2003; and since 1997, China's inflation rate has been close to zero or even tending to very slight deflation. There are now (Spring 2004) signs of incipient inflation. China's growing economy is not just a benefit to Chinese citizens, but it is also the locomotive for economic activity in Asia. Economic activity in

India has also grown strongly, around 5.5% per year from 1985 to 2004, and the two countries between them contain about one-third of the world's population.

Both China and India and the rest of developing Asia have gained from free trade and globalisation; job losses in North America and Europe are more than offset by job gains in Asia, and they are a net benefit to the world economy, notwithstanding the localised pain where the jobs are lost. It is not, however, an entirely one-sided picture. China does run a plus US\$100 million surplus in trade with the US, but it runs deficits with other countries, and its overall current account surplus is about 1% of GDP. Its imports are increasing faster than its exports, and it is not just countries that supply raw materials to China (Brazil, Australia) that benefit; about two-thirds of Japan's growth in exports in 2003 was directed at the Chinese market. Moreover, the subsidiary companies of foreign multinationals have been responsible for the bulk of China's export growth since 1994, and these exports (re-imports) have allowed these multinational companies to remain competitive. China also finances America's twin deficits by buying US Treasury bonds, albeit in an effort to prevent its currency rising. The undervaluation of the Chinese currency (renminbi) is a bone of contention; it is pegged to the US dollar, and as the latter has declined against world currencies, so has the renminbi.

China has been a factor in the declining inflation in the industrialised countries as its manufactured goods enter these markets. China's plentiful supply of labour, its low wage costs, and its competitive exchange rate means that its goods can be produced much more cheaply than they would be in the importing countries. But while it helps to hold down the price of finished goods, China's voracious appetite for raw materials is a large factor in booming commodity prices. China is the world's biggest consumer of copper, zinc, steel and iron ore, and is now the second-biggest consumer of oil after the US. All these commodities have seen sharp price increases in 2003. Some of the effects are indirect: the price of molybdenum is now over US\$10/lb in the North American and European markets because China has cut its molybdenum exports in order to feed its domestic market.

China is nominally a communistic centrally-planned economy, but it has a broad streak of raw capitalism. The central and cantonal governments seem to be in charge of infrastructural developments, but have much less control over the production of goods and services. It was still possible, as recently as 1999, for a government official to advise that steel production would top out at 130 Mt (it was 220 Mt in 2003). Canny Western economists at the time knew better and thought that steel production could reach 150 Mt by 2005 – the difference in error was only a matter of degree. About the same time, major molybdenum producers in China with state connections were complaining bitterly that they were being undercut by small, family molybdenum producers who ignored pollution and safety regulations. Data from China are often suspect, because central government data collection agencies are weaker than their counterparts in the West.

How long can this boom in China last? Until recently, most of the economic benefit of the economic boom has gone to the major cities. The development of transportation infrastructure is opening up the hinterland and expanding consumer markets. Chinese officials have estimated that, by 2020, some 300 million people will have migrated from rural poverty to the cities, which will increase consumer demand and push up the demand for housing. Economic activity is unlikely to shrink, but the rapid rate of growth could slow down. Bottlenecks in electricity production, temporary shortages of raw materials, insufficient port and rail capacity, or even a shortage of water, could act as a brake on the economy and stimulate inflation. Stricter environmental controls could also impede growth in economic activity. Inflation could provoke an increase in interest rates and an inevitable rise in the value of the renminbi, which would tend to constrain exports. Finally, as in all economic booms, debt levels have increased sharply and some of the bank loans are feeding speculation.

One of the criticisms aimed at China is that there has been excessive investment, specifically in industries such as steel. Current Chinese steel production capacity is about 220 Mt, and a further 80 Mt is to be added over the next three to four years. Steel consumption in China is, however, running ahead of production and it had net imports of nearly 35 Mt of semifinished and finished steel products in 2003. Thus, the over-investment criticism is perverse. There is some inefficient OH capacity still operating, but this is a function of the imbalance between domestic supply and demand, ie, should domestic supply catch up with demand, this inefficient capacity will be closed.

At the heart of the criticisms is the fear that steel demand in China could falter and be overtaken by production. If this does happen, Chinese steel exports could increase rapidly, to the detriment of steel producers elsewhere. It is a plausible risk, but it is difficult to see what else the Chinese should do. This is a good example of a pre-emptive trade complaint!

Market dynamics

The scrap industry is fragmented and highly competitive and is very close to the economists' 'perfect market'. The price of scrap is a sensitive and accurate indicator of the state of the steel market, and prices in 2003 indicate that it was a very good year. Steel scrap prices (the benchmark #1 HMS price) in 2002, rose from about US\$65/t at the beginning of the year to about US\$105/t by midyear and stayed at that level through to the end of the year. Prices were more volatile in 2003; starting the year at US\$105/t, they reached US\$160/t by year-end. Thus, in two years, scrap prices had risen by US\$100/t. By March 2004, the prices had reached US\$250/t, before dropping very sharply in April.

Steel scrap was not alone in this bullish trend; the prices for base metals increased sharply in 2003, with the top performers being nickel and lead, up 85% and 60% respectively.

The two main factors in these abnormal price increases were demand from China and the weakness of the US dollar. World economic activity increased in 2003 and demand for commodities was underpinned by the strength of Chinese demand. The general weakness of the US dollar (ironically, not against the Chinese currency) made dollar-denominated commodities relatively cheaper in non-dollar-denominated countries, eg, Japan, the EU and the UK. So sharp were the price increases in base metals and steel products from June 2003 to March 2004, that speculative funds were almost certainly involved and some pull-back in 2004 is inevitable.

The steep rises in steel scrap prices brought forth the inevitable calls for restrictions on scrap exports from North America and Western Europe, often from the same sources that tried to restrict steel imports. China was, and is, under attack in the US because of the huge trade imbalance in China's favour, and the US steel industry was trying to make the imbalance worse by hoping to restrict scrap exports to China. There is a certain consistency in the logic, but it does show that support for open markets is a matter of convenience rather than conviction.

The prices of the other major raw materials to the steel industry, coke and iron ore, also increased sharply. Coke was on offer from China at about US\$150/t fob China; the peak in the last cycle was about US\$100/t. Iron-ore prices increased about 18% for deliveries in 2004, an unusually large price increase for this commodity. Freight rates were also affected and prices increased sharply during the second half of 2003. Rising scrap prices meant that merchant DRI/HBI producers enjoyed similar increases and that most merchant producers were profitable.

The US Government imposed tariffs in 2002 on a wide range of steel imports. Ostensibly, these tariffs were imposed to give the domestic steel industry some respite from damagingly low steel prices and to give the industry time to restructure itself. One governmental eye was also looking at the Congressional elections coming up in November 2002. Steel prices did rebound, although they were probably going to do so anyway, the domestic steel industry did restructure and continues to do so, and the political calculations were accurate. The steel users in the US complained, the steel exporters outside the US threatened retaliation, and the US Government relented by granting exemptions. The tariffs were finally removed in December 2003, just in time to head off retaliation.

Trade in finished steel products was 317 Mt in 2002, 39.1% of production. Steel trade increased rapidly following the demise of the former Soviet Union, where steel demand dropped much further than production and the difference was exported to the world market. The former Soviet Union is the world's biggest steel exporter and this situation will continue for many years. Japan is the second-biggest net exporter and benefits from the close proximity to China. The US used to be the biggest net importer of steel but was overtaken by China in 2003. Imports of steel into the US dropped sharply in 2003, partly

because of the Section 201 tariffs, and also because of the depreciation of the US dollar. Now that the tariffs have been removed, it will be interesting to see what happens to steel imports in 2004.

Arcelor (European Union) is the world's biggest steel company and it produced 43 Mt in 2003, just 4.5% of total world steel production. Nippon Steel (Japan) was the second- biggest producer with 32 Mt, 3.3% of the world total; and LNM Group (International), JFE Steel (Japan) and POSCO (South Korea) all produced around 30 Mt. Thus, the top five steel-producing companies produce less than 18% of the world's total steel production. Consolidation among steel producers is happening: Arcelor, LNM Group and JFE Steel are all the result of consolidations. In the US, there are now only three major steel-producing entities, viz, US Steel, International Steel Group (ISG) and Nucor. This restructuring and consolidation has been forced upon the steel industry. Years of inadequate returns on investment have led to rationalisations of steel capacity and the steel industry will continue this process.

One of the burdens that the steel industry has had to bear has been government involvement and ownership of steel production capacity. Government ownership, *per se*, is not the problem; it is the market distortion arising from government subsidies, usually to maintain inefficient or obsolete capacity that is no longer economically viable. Another distortion arises when chronically unprofitable companies can declare bankruptcy, obtain protection from their creditors, and re-emerge from bankruptcy at a later date, both solvent and viable. In the US, this option, known as Chapter 11, allows failing companies a second or even a third chance to rehabilitate themselves and continue operating. This option prevents the market operating efficiently, and unfairly penalises healthy companies.

A multinational effort is under way at the OECD to draw up a steel subsidies agreement, which would seek to ban such subsidies. In this way, obsolete capacity would be closed, but the problem remains, "whose obsolete capacity?" A few years ago there was an estimated 300 Mt of obsolete capacity, and now there is less than 100 Mt. What happened to the rest? The obsolete capacity question has been partially overtaken by events. Steel demand in China has been so strong that capacity once considered obsolete is now operating profitably in order to meet Chinese demand. The steel business is of course cyclical, and this period of feast will at some point turn to famine. There is a much greater chance of getting an agreement during the famine than at the feast.

Steel outlook

Steel production in the first three months of 2004 was 248 Mt, some 8.7% more than the same period in 2003. The growth in steel production in China continues, and production in the first quarter was 61 Mt, 26.4% higher than the same period last year.

Since the US is enjoying an economic recovery, Japan is beginning to look stronger, Europe is stirring, and China and the rest of Asia show no signs (yet) of slowing down, it is a distinct possibility that the world will produce over 1,000 Mt of crude steel in 2004.

This forecast can, of course, be derailed by 'events' not yet visible on the radar screen. More prosaic indicators, such as the sharp fall in scrap prices in April 2004, and the build-up of iron-ore stocks at Chinese ports, suggest that the rapid growth in steel production may ease slightly.

Tables (7) on following pages.

Table 1: Steel trade: selected countries 2002/03 (Mt of semi-finished and finished steel products)

	2002	2003 (e)
Germany ¹		
Exports	24.5	24.9
Imports	17.6	16.7
Net	6.9	8.2
US		
Exports	5.5	7.6
Imports	30.2	21.5
Net	(24.7)	(13.9)
China		
Exports	6.9	8.5
Imports	29.2	43.2
Net	(22.3)	(34.7)
Japan		
Exports	35.4	34.0
Imports	3.3	3.4
Net	32.1	30.6
CIS		
Exports	58.6	
Imports	4.7	
Net	53.9	

Source: International Iron and Steel Institute. ¹ About two thirds of Germany's steel trade is intra-EU.

Table 2: Plant process used in 2003: percentages country/region

	BOF ¹	EAF ²	Other ³	CC ⁴	IC ⁵
European Union 15	59.5	40.5		96.6	2.9
Other Europe	59.8	40.1	0.1	88.7	10.7
CIS ⁶	57.1	13.1	29.8	41.3	56.4
North America ⁷	49.1	50.9		97.4	2.5
<i>US</i>	<i>51.1</i>	<i>48.9</i>		<i>97.0</i>	<i>3.0</i>
South America	66.8	33.2		92.6	7.3
Africa / Middle East	30.6	69.4		99.0	1.0
Asia	66.8	29.4	3.9	93.0	6.6
<i>China</i>	<i>72.4</i>	<i>20.4</i>	<i>6.9</i>	<i>92.5</i>	<i>7.0</i>
<i>Japan</i>	<i>73.6</i>	<i>26.4</i>		<i>97.7</i>	<i>1.9</i>
Oceania	81.3	18.7		99.4	0.6
World	60.9	34.0	5.2	88.3	11.1

Source: International Iron and Steel Institute. ¹ Basic oxygen furnace. ² Electric arc furnace. ³ Usually open hearth furnace. ⁴ Continuous casting. ⁵ Ingot casting. ⁶ Commonwealth of Independent States, ie, the former Soviet Union less the Baltic States. ⁷ Includes Mexico and Central America.

Table 3: World crude steel production (Mt) country/region

	2001	2002	2003
European Union 15	158	159	160
Other Europe	46	48	52
CIS ¹	100	101	107
North America ²	120	123	123
<i>US</i>	90	92	90
South America	37	41	43
Africa / Middle East	27	28	30
Asia	354	394	441
<i>China</i>	151	182	220
<i>Japan</i>	103	108	111
Oceania	8	8	8
World Total³	850	903	964
World ex. Asia	496	509	523

Source: International Iron and Steel Institute. ¹ Commonwealth of Independent States, ie, the former Soviet Union less the Baltic States. ² Includes Mexico and Central America. ³ Totals may not add due to rounding.

Table 4: World DR production (Mt) country/region

	2000	2001	2002	2003
Latin America	10.14	10.47	11.06	11.41
<i>Trinidad & Tobago</i>	1.53	2.31	2.32	2.28
<i>Venezuela</i>	6.69	6.38	6.89	6.90
Middle East / Africa	13.59	13.63	14.57	15.44
<i>Iran</i>	4.74	5.00	5.28	5.62
<i>Saudi Arabia</i>	3.09	2.88	3.29	3.29
Asia	8.61	8.34	9.43	10.85
<i>India</i>	5.44	5.59	6.59	7.67

Table 4 World DR production (Mt) country/region continued

North America	8.52	3.79	5.55	6.33
<i>Mexico</i>	5.83	3.67	4.90	5.62
Australia	0.56	1.37	1.02	1.95
Russia	1.92	2.51	2.91	2.91
Germany	0.46	0.21	0.54	0.59
World Total	43.8	40.32	45.08	49.48

Source: Midrex Technologies, Inc.

Table 5: World blast furnace iron production (Mt) country/region

	2001	2002	2003
European Union 15	91	90	92
Other Europe	25	24	26
CIS ¹	75	78	82
North America ²	55	53	52
<i>US</i>	42	40	39
South America	31	33	36
Africa / Middle East	11	11	11
Asia	285	313	350
<i>China</i>	147	169	202
<i>Japan</i>	79	81	82
Oceania	7	7	7
World Total³	579	608	655
World ex. Asia	294	295	305

Source: International Iron and Steel Institute. ¹ Commonwealth of Independent States, ie, the Former Soviet Union less the Baltic States. ² Includes Mexico and Central America. ³ Totals may not add due to rounding.

**Table 6: Apparent consumption per capita: selected countries
(kilograms finished steel) country/region**

	1994	1998	2002
European Union 15	311.6	374.3	357.7
Other Europe	131.2	176.1	181.5
CIS ¹	99.2	77.3	100.3
North America ²	293.0	332.2	288.8
<i>US</i>	395.5	443.3	369.2
South America	67.6	76.9	72.3
Africa	31.5	29.6	30.2
Middle East	109.4	121.6	167.6
Asia	92.1	86.8	123.5
<i>China</i>	87.3	90.9	163.1
<i>India</i>	20.6	23.9	28.1
<i>Japan</i>	598.1	556.1	562.4
Oceania	295.7	287.4	338.9
World	120.8	125.6	144.1

Source: International Iron and Steel Institute, October 2003. ¹ Commonwealth of Independent States, ie, the Former Soviet Union less the Baltic States. ² Includes Mexico and Central America.

Table 7: Apparent steel consumption (Mt of steel products) ¹
country/region

	2002	2003	2004
China	211	257	290
Other Asia ²	217	224	225
European Union 15	138	139	143
Other Europe ³	68	71	74
NAFTA	133	129	136
South America	28	28	30
Middle East / Africa	36	36	38
World	831	884	936
World ex. China	620	627	646

Source: International Iron and Steel Institute, October 2003. ¹ Note that these data are in finished steel product tonnes and are not directly comparable with crude steel data quoted elsewhere. ² Includes Australia and New Zealand. ³ Includes the Commonwealth of Independent States and Eastern Europe.