Strategic Issues in the Ferroalloy Industries

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Introduction

All properly run businesses require medium and long term plans, based on strategies designed to achieve the objectives set by their owners. Plans require forecasts, and forecasts require assumptions to be made. I do not need to remind managers from the ferroalloy industry that forecasts of commodity markets are frequently wrong; and when they prove to be wrong, the reason is generally that they were based on assumptions that proved to be incorrect. The developments that forecasters fail to predict may not be totally unexpected, but the timing and the speed or scale of events may well be a surprise.

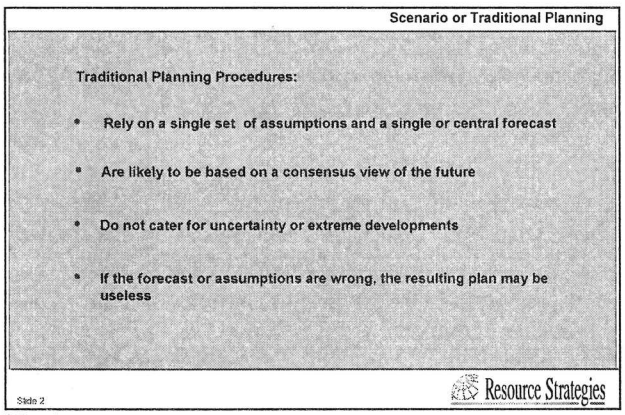

Fig.1.

For example, how many forecasters correctly foresaw the sharp contractions that we have seen in South-East Asian economies in the past nine months? How many foresaw the collapse of the Former Soviet Union, and all the economic repercussions that flowed from that event? How often have earlier forecasts been proved wrong because the analysts in question made the wrong assumptions about economic growth rates, energy prices or exchange rate movements?

These examples show how very difficult it is to make accurate forecasts of a commodity market. Nevertheless it is essential to have a view of likely future developments, as a basis for a corporate strategy and a medium or long term business plan. In Resource Strategies, we frequently assist companies with their planning exercises, but we find it unrealistic and unsatisfactory to base a business plan or a corporate strategy upon a single forecast of supply, demand and price for the product in question. If the forecast turns out to be wrong, the plan or strategy is also likely to be mistaken.

A solution sometimes used is to provide a high and low variant in addition to the central forecast. However, this does not eliminate the problem. It only means that the range of uncertainty increases as the forecast extends into the future. High and low forecasts will also be useless or misleading if the fundamental assumptions underlying the central forecast prove to be completely wrong.

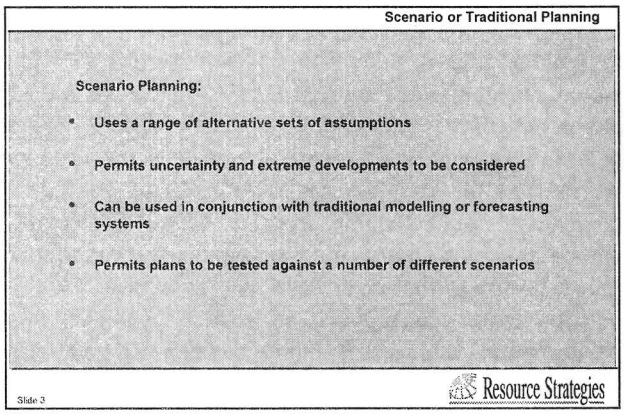

Fig.2.

The way to escape from this dilemma, in my opinion, is to use scenario planning. The concept is simple. Instead of using a single set of assumptions as a basis for a forecast or a business strategy, we develop a number of scenarios covering a number of different economic, political or technical developments. These can be used to generate a range of forecasts. More importantly, the company's business strategy can be tested to see how well it can accommodate each of the scenarios. The strategy can then be adapted or improved to ensure that is robust enough to stand up to the range of different scenarios that are considered likely.

Of course, the scenario planner may also fail to foresee the trends that actually develop, and the conditions in which his company must operate. However, he has a

much better chance of foreseeing developments correctly because he can develop as many scenarios as he likes, or at least as many as he can practically handle. He can include apparently extreme developments, such as the collapse of the Soviet Union or sudden economic declines across South-East Asia, without necessarily selecting them as the basis for a single or central forecast. In other words, scenario planning allows and even encourages the company formulating its strategy to consider a wide range of possibilities, including extreme or even unthinkable developments. The company can then ensure that its plan or strategy is strong enough to stand up to extreme or unlikely possibilities, and is not based only on the apparently safe consensus forecasts that the majority of his competitors will be using.

So much for the theory. In this paper I want to propose some scenarios that may affect the development of the ferroalloy business over the next five years or so, and examine potential strategies that companies in the industry might adopt, to see which ones appear the most secure or robust. Obviously, in a paper addressed to the industry as a whole, it is not possible or desirable to consider the strategies and the strengths and weaknesses of individual companies; that is an exercise that we would conduct only in confidence with an individual client company. However, we can consider some generic strategies and, I hope, produce some insights which may be of value in showing how individual companies could benefit from a scenario planning approach. First, however, we have to understand the recent history of the major ferroalloy industries, and the position from which they start today. To keep this paper within manageable limits, I have confined my attention to the manganese alloys and ferrochrome.

Recent Features of the Ferroalloy Industry

Manganese Alloys

Since well over 90% of manganese alloy consumption is accounted for by the production of steel, the market for ferromanganese and silicomanganese is determined by the rate of growth in steel production and the amount of manganese units used on average per tonne of crude steel produced.

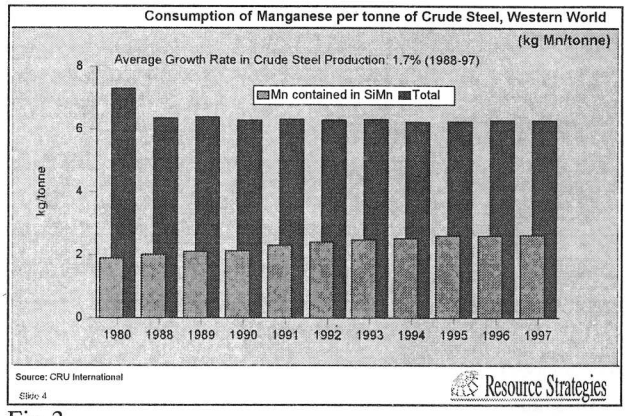

Fig.3.

In the Western world, crude steel production has grown at an average rate of 1.7% in the past decade, though with peaks of close to 7% in 1997 and troughs of -1.4% in the recession of the early 1990s. The unit consumption of manganese fell dramatically in the 1970s, when open hearth furnaces were being phased out in the Western world. In 1980 the average figure was 7.3kg per tonne. In the late 1980s it had fallen to around 6.4kg and has remained at or just below that figure ever since. In China and the CIS, we believe that the average figure is higher but it should gradually approach the Western average level. In the Western world little change is expected in the future.

The one noticeable trend is the steady increase in the consumption of manganese in the form of silicomanganese. This has been caused by the growth in electric arc steel-making and also by a trend towards the production of steels with low carbon contents.

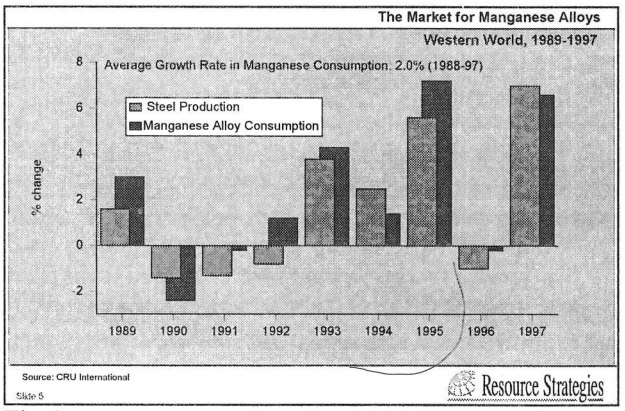

Fig.4.

The growth in demand for manganese alloys in the Western world has followed the changes in crude steel production quite faithfully, and since 1989 has averaged 2.0% per year. There have been years when the market has grown by as much as 6-7%, but over the medium term this is a market which is not likely to generate major surprises, at least on the demand side.

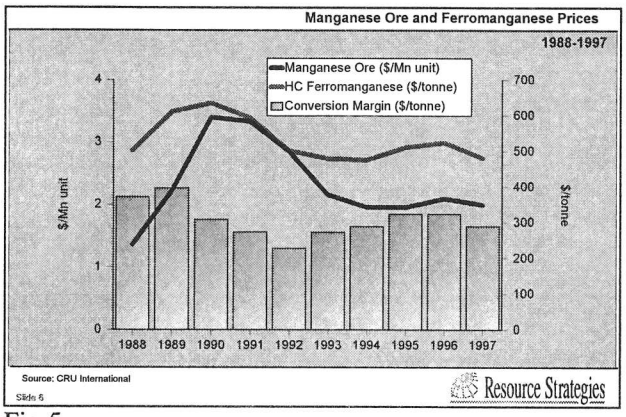

Fig.5.

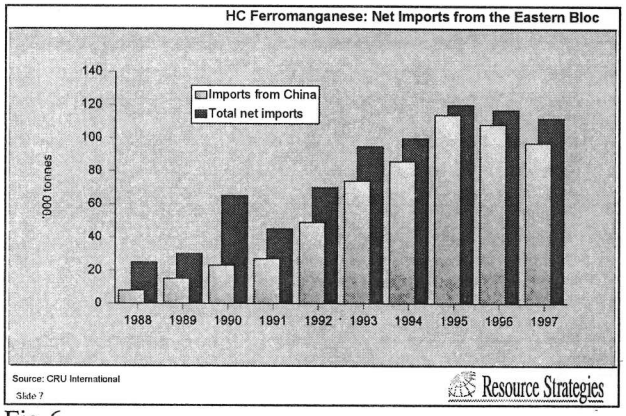

Fig.6.

Market prices, on the other hand, have shown more variation than the slow rate of growth in demand might initially suggest. One of the main driving forces is the price of manganese ore, which in 1989-90 was in tight supply. However, since 1994 both ore and high carbon ferromanganese prices have on average been quite stable.

The bars at the foot of the chart give an indication of the average conversion margins available in the industry as a whole, defined as the difference between the average annual contract price of ore and the average selling price of HC ferromanganese. This margin is the amount available to cover all production costs, depreciation, interest charges and profits. Clearly the conversion margin for any individual producer may be different because it will be determined by his ore purchase contracts and his own selling prices. However, the trend is a good guide to the health of the industry.

There was a steady recovery in conversion margins in the mid 1990s, as ore prices fell faster than alloy prices, but this trend was reversed in 1997. However, the conversion margin in 1997 was considerably below the levels of 1988-89, even in nominal terms. If inflation is taken into account, the real reduction in conversion margins between 1988 and 1997 was of the order of 40%. This implies a constant need to reduce costs in order to preserve profitability among producers of ferromanganese.

Pressure on Western producers of ferromanganese has been exacerbated in the 1990s by increasing imports from the Eastern bloc, and principally from China, which have grown to about 120,000 tonnes per year since 1995. This has been driven largely by imports of high grade ore from the West, much which has been converted on a toll basis by Chinese enterprises and re-exported. These imports, however, do appear to have passed their peak.

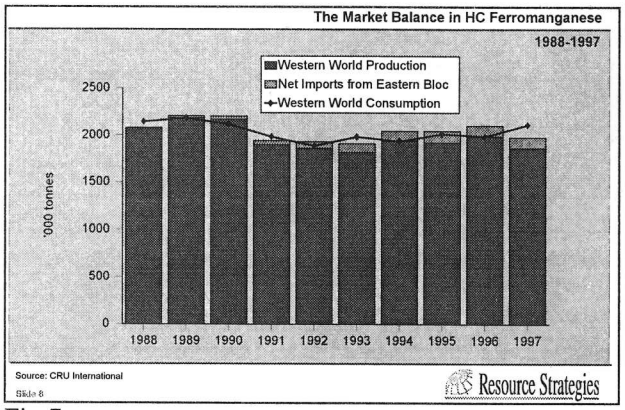

Fig.7.

If we combine the demand and supply figures for high carbon ferromanganese, we find a rather depressing picture for Western producers. There has been no net growth in Western world consumption since 1988; net imports from the Eastern bloc have increased during that period and the production from Western world plants has fallen by about 200,000 tonnes between 1988 and 1997. Ferromanganese producers have therefore had to contend with a falling market for their own production, combined with falling conversion margins.

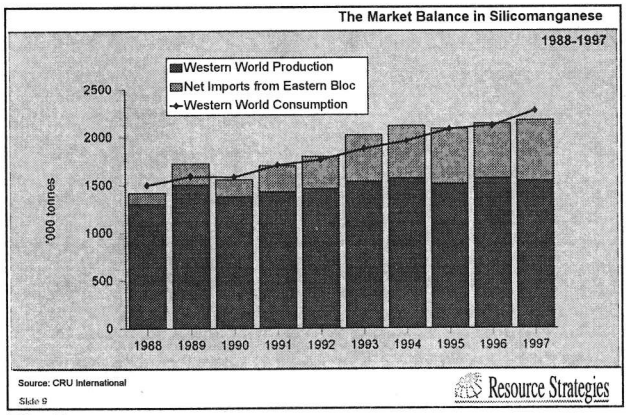

Fig.8.

The position for producers of silicomanganese has been almost as frustrating. Because of the increasing usage of manganese in this form by the steel industry, total consumption in the Western world has grown by almost 5% per year in the last decade. However, two-thirds of the growth in Western consumption has been met by exports from the Eastern bloc, of which more than half come from China and the remainder has come principally from the CIS. It is not surprising that silicomanganese exports from China have been the subject of anti-dumping duties.

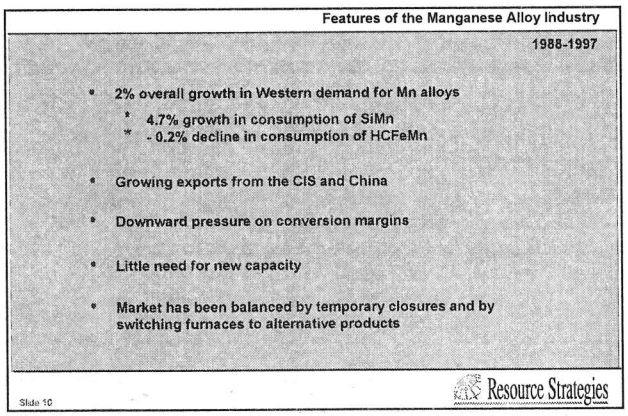

Fig.9.

We can therefore summarise the recent situation in the manganese alloys industry as follows:

1. Growth in demand for ferromanganese and silicomanganese in Western markets has been largely met by increasing exports from China and the CIS.

2. There has been consistent downward pressure on conversion margins

3. There has been little requirement for new capacity in the Western world

4. The market for alloys can be readily brought into balance by the temporary or permanent closure of furnaces, or by switching furnaces to the production of other ferroalloys

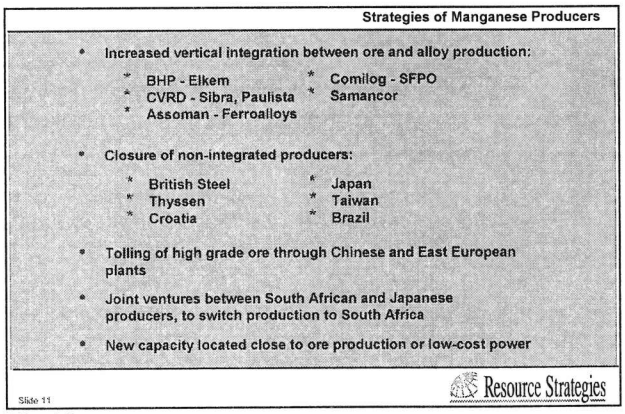

Fig.10.

Faced with this situation, producers of manganese alloys have pursued a variety of strategies:

1. Several have chosen to integrate ore and alloy production. Non-integrated alloy producers have felt to need to secure access to high grade ore, to ensure their survival, and ore producers have wanted to secure long term outlets for their ore, and also add more value to their production.

2. Another form of integration has been practised by ore producers, particularly in South Africa, who have tolled ore through plants in China and Eastern Europe, in order to maintain or increase market share without increasing their own capacity.

3. Several non-integrated producers have closed in recent years. Generally, the closures have occurred among companies that have no cost advantages, either in access to ore, access to cheap electric power or access to low cost labour.

4. In South Africa, some joint ventures have been established with Japanese partners, which are designed to create low-cost capacity in South Africa and allow high cost capacity in Japan to close down.

5. Elsewhere, the small number of projects to create new capacity are driven by the need to be close to ore production or by access to low cost electric power.

Ferrochrome

I want to review the same trends and issues in the ferrochrome industry, before looking at some scenarios for the future development of the two industries.

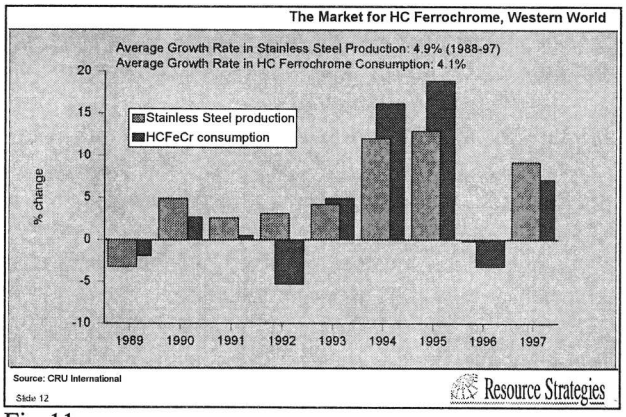

Fig.11.

The growth in the market for ferrochrome has been much faster than that for ferromanganese. Markets for stainless steel have expanded dramatically in the past decade. The production of stainless steel in the Western world has grown by 4.9% on average since 1989, and in three of the last four years the Western world market has grown at rates ranging from 9 to 13% per year.

The consumption of ferrochrome has grown by just over 4% since 1989. It does not exactly match the rate of growth in stainless steel production because of the use of stainless scrap. However, there are indications that the proportion of primary ferrochrome relative to scrap is increasing in the production of stainless steel, so the trend rate of growth in ferrochrome demand may be increasing.

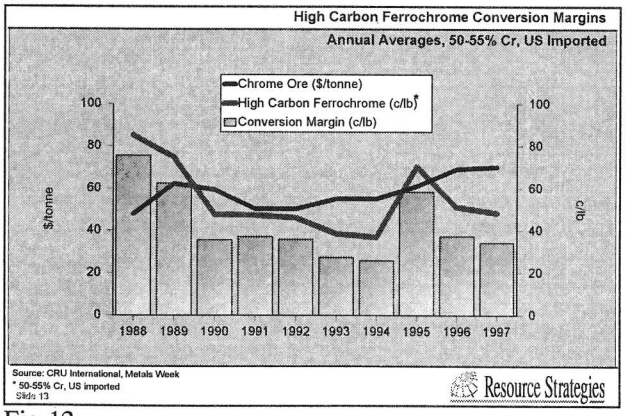

Fig.12.

Despite the strong rate of growth in the ferrochrome market, prices have seldom been very favourable to the producers in the past decade. Very high prices in 1988-89 were followed by three years of rather stable prices and two years of depressed prices. There was then a short, sharp rise in 1995, followed by further declines.

Chrome ore prices have been much more stable, reflecting the small number of major players in this market. The result has been that average conversion margins for the industry as a whole have been below 40c/lb since 1990, and in two years below 30c/lb, with the single exception of 1995. In real terms, of course, recent conversion margins have been well below those of the early 1990s.

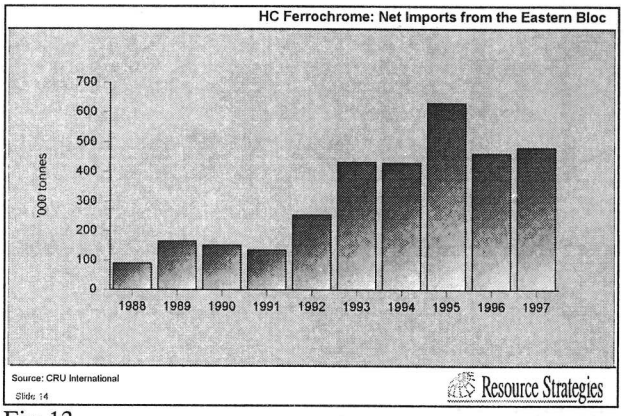

Fig.13.

One of the major reasons why strongly rising demand has not translated into profitable prices for producers is the fact that net imports from the Eastern bloc, and specifically from Kazakstan and China, have soared from 90,000 tonnes in 1988 to 600,000 tonnes in 1995 and close to 500,000 tonnes in 1997. Chinese exports have dwindled sharply since 1995, and Kazak exports have also been considerably reduced this year, as a result of disputes about the ownership and control of the Kazak mines and conversion plants, so the pattern of Eastern bloc exports could change dramatically in 1998.

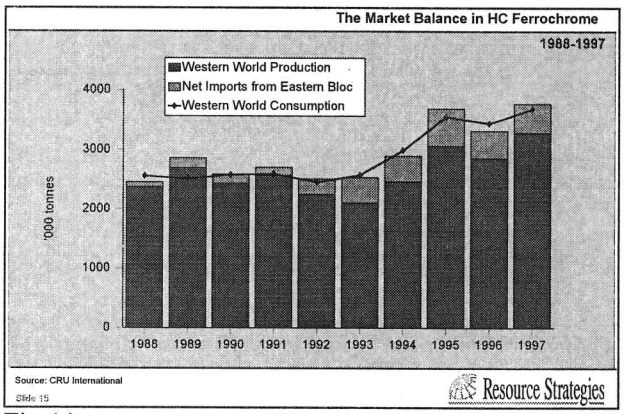

Fig.14.

The market balance over the last decade falls into two very distinct phases: from 1988 to 1993, there was very little overall change in Western world production or consumption, while Eastern bloc imports tended to push the market into surplus. From 1994 onwards, demand has grown very strongly, and imports from the Eastern bloc have been needed to supply the market in full. Indeed, a large part of the Chinese supply has been based on ore imported from Western sources and re-exported as alloy.

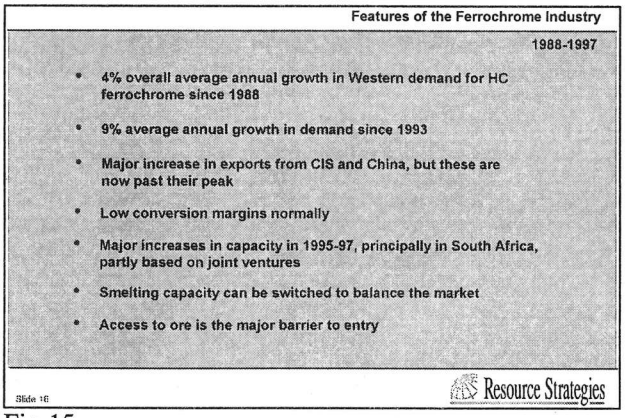

Fig.15.

The major features of the ferrochrome industry have thus been the following:

1. Over a ten year period, growth in Western world consumption has averaged 4% a year, but in the past five years, it has been as high as 9%

2. The flood of exports from the CIS and China has passed its peak

3. Conversion margins have been kept low in most years because there has seldom been a shortage for any length of time

4. Smelting capacity can be switched from manganese alloys to correct a market imbalance, and the growth in demand has encouraged the addition of new capacity close to sources of ore, principally in South Africa

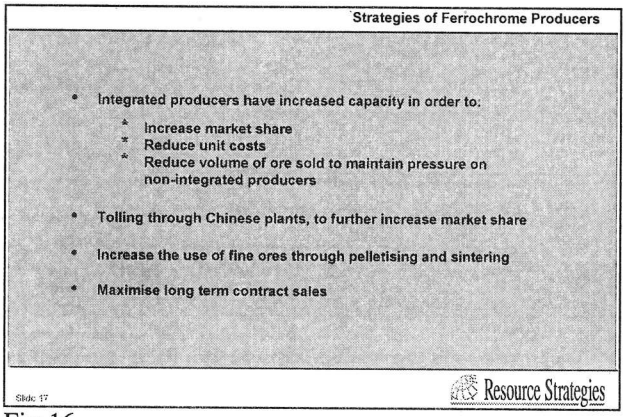

Fig.16.

Faced by these conditions, the strategies of the ferrochrome producers have included the following:

1. Integrated producers have tried to maximise their market share by increasing capacity, and reduce their unit costs by achieving economies of scale

2. Some have used tolling to increase their share of the alloy market even further

3. Maximising the use of fine ores by pelletising and sintering

4. Integrated producers have kept ore prices firm and reduced the proportion of ore sold to non-integrated producers.

5. Major producers have sought to maximise long term contract sales through strategic alliances.

Scenarios for the Future of the Industry

The scenario planning process requires an analysis of the current position of a company, or an industrial sector, and then the creation of a number of scenarios covering potential developments (which could be economic, political or technical) that would affect the future of the industry. Some simple scenarios are set out in the following slides. They are intended to illustrate the process, and generate some thought or comment; they are definitely not intended to constitute an exhaustive list of all the scenarios that we might develop if we were working for an individual company. Each scenario would also be worked out in more detail than is feasible here. The outlook period can, of course, be selected according to the planning needs of the company using the process. For the sake of illustration, I have selected a five year period, from 1999 to 2003.

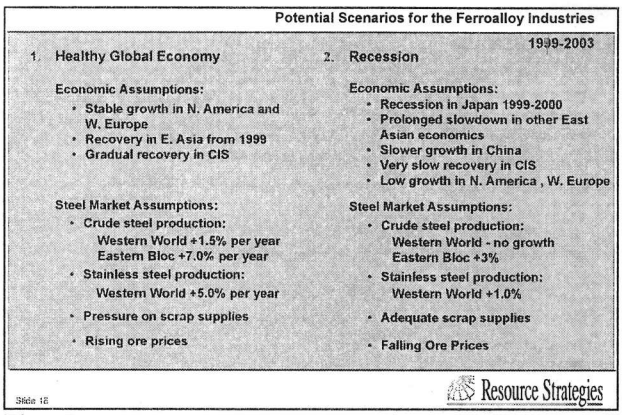

Fig.17.

The first scenario assumes an optimistic view of the global economy: Japan and the major Asian economies would revert to growth from 1999 onwards, after the necessary structural and policy reforms. Growth would continue in North America and Western Europe without interruption; and the CIS economies would recover slowly. The resulting growth in global steel production might be about 2.1% per year (made up of 1.5% in the Western world and 7% in the Eastern bloc). Stainless steel production might be expected to grow at 5% a year. Supplies of scrap for carbon and stainless grades might well become tight under these circumstances, and ore prices are likely to increase.

An alternative scenario could assume that the problems of the Japanese economy result in a recession in that country in the next two years. The other East Asian countries (notably South Korea, Taiwan, Thailand, Malaysia and Indonesia) could suffer a prolonged downturn, before starting to recover; the Chinese economy could not escape from these recessionary forces, and would suffer at least some reduction in its rate of growth; the CIS would recover only very slowly; and the major industrialised countries would also suffer from weak Asian markets and imports of cheap Asian products.

Under this scenario, crude steel production might remain unchanged for the next five years; scrap supplies would probably be plentiful and ore prices would fall.

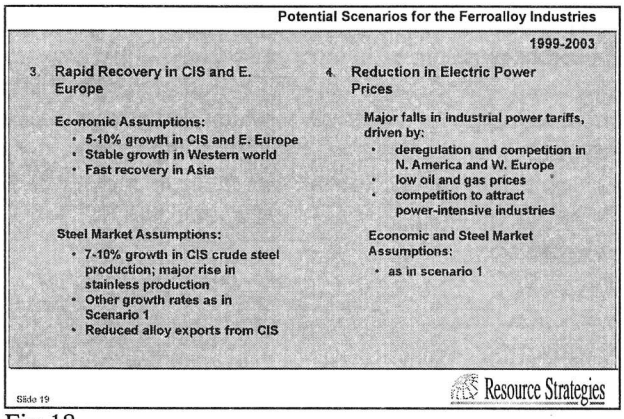

Fig.18.

Further alternative scenarios could focus on regional or institutional developments that may be influential in the ferroalloy markets. Scenario Three assumes that the economies of Eastern Europe and the CIS move into a phase of rapid recovery. Economic growth of 5-10% per year in these areas, plus stable growth in the Western world and quick recovery in Asia could result in a rapid rate of increase in steel production in the CIS (in both carbon and stainless grades). Provided liquidity returns to the economies of the CIS, the obvious implications would be that consumption of ferroalloys in the CIS and Eastern Europe would increase fast, and the volume of exports would fall. Western producers would have to increase their rates of production, and invest in additional capacity. Chinese exports would probably also fall, at least for ferrochrome, because of reduced ore supplies.

Another potential development that could have profound implications concerns the price of electric power. We are already seeing in North America and in parts of Western Europe that privatisation and deregulation of the electric power utilities is leading to intense competition between suppliers of electric power. Tariffs for industrial users have fallen and could fall further; low oil and gas prices are assisting this process; and competition to attract or sustain power-intensive industries such as ferroalloy production could also help to reduce the power component of their operating costs.

This scenario could be combined with any of the earlier assumptions about economic growth and steel market conditions, though I have chosen to combine it with the optimistic growth scenario. The major implication would be that currently marginal producers in Europe or Japan would find it easier to survive, since an important cost disadvantage would be reduced or even removed. In China, on the other hand, power prices could continue to increase, despite the opposite tendency in other countries, and Chinese ferroalloy producers could find themselves becoming less and less competitive in international alloy markets.

I emphasise that none of these scenarios is put forward as the central or most likely forecast. They are all possible and the purpose of the exercise is to determine how well companies can stand up to any of them. All these scenarios, and others as well, can be developed more fully and combined with forecasting models, to produce estimates of future demand, alloy prices and investment requirements. I do not intend to follow this procedure here, but I would like to illustrate the way in which strategies can be devised, or tested, to determine how well they can withstand the diversity of developments that could flow from each of the scenarios considered.

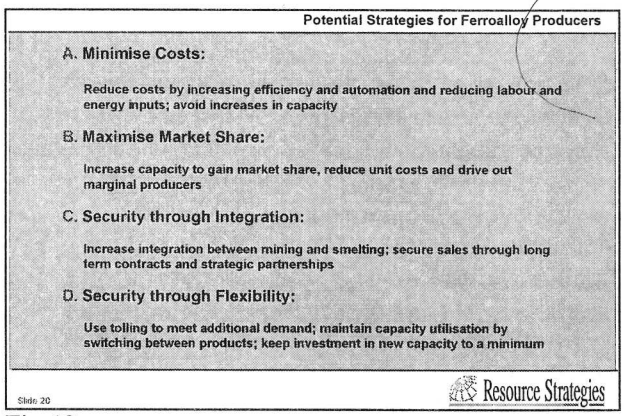

Fig.19.

First, for illustration, let us image a range of strategies that ferroalloy producers might follow in the years ahead. This is only a selection of the potential strategies, and none of them is intended to reflect exactly the strategy of any existing company. Here, for simplicity, I am considering the strategies of manganese and chrome producers together.

A. Minimise Costs: this strategy focuses solely on cost reduction, through increasing efficiencies and recoveries, and reducing the inputs of labour and power. Increases in capacity are avoided altogether.

B. Maximising Market Share: this strategy aims to increase capacity in order to gain market share and simultaneously reduce unit costs through economies of scale; it is designed to drive out marginal producers when the market is static or growing slowly.

C. Security Through Integration: this strategy aims to preserve margins by integrating mines and smelters; and also to seek security of sales by establishing long term sales contracts and strategic alliances with consumers.

D. Security Through Flexibility: this strategy (which is open only to producers with their own sources of ore) aims to minimise investment in new capacity and instead use tolling contracts to meet marginal demand; it also aims to keep capacity utilisation high by switching furnaces between alloys.

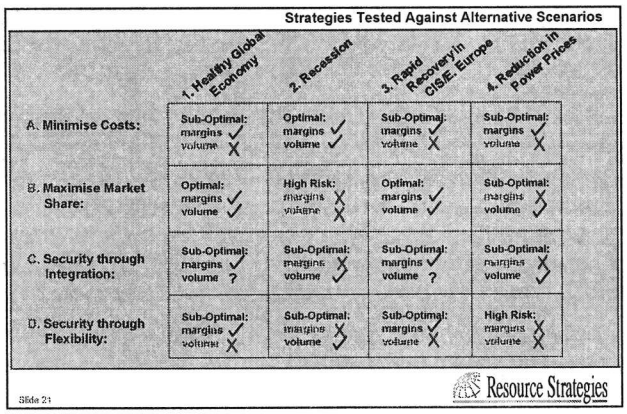

Fig.20.

The final stage in the process is to match the strategies against the scenarios, in order to determine how well a selected strategy can stand up to the conditions likely to flow from each scenario. This can be displayed in a matrix format, provided the matrix is not uncomfortably large. Alternatively, a company with a well-established strategy can test that strategy alone against any number of scenarios.

In the matrix shown here, Strategy A is obviously best in the recession scenario, but may fail to maximise sales volumes in stronger economic conditions. Strategy B is clearly best when demand is growing strongly, but potentially disastrous in recession. Strategy C is sound in all scenarios but never likely to produce the best possible results. Strategy D relies on the availability of capacity to undertake toll conversion, and may fail to take best advantage of strong growth in demand.

Two final points need to be made. First, when working with an individual company, is it obviously possible and indeed necessary to define in much greater detail the competitive position and potential strategy of the company. My examples are intended to be no more than illustrations of the way in which the process can be applied.

Secondly, it is desirable to add to each scenario a probability ranking, so that the risks attached to a strategy can be assessed in a structured manner. This exercise is also beyond the scope of the present paper, but it is a vital step in the determination of a corporate strategy. Monte Carlo analysis is a very useful tool for this purpose.

Summary

This paper demonstrates, I hope, that planning and strategy formation is a complex process. It must cope with uncertainty; it must be based on a clear understanding of the present situation and an imaginative approach to what may happen in the future; and it must be capable of constant revision and reappraisal as the future unfolds. The scenario approach permits these objectives to be met far better than any approach based on a single, or central forecast of market conditions, and is therefore the approach that I would recommend to this industry and indeed to the minerals sector in general for the vital task of strategy formation.