

Plight of Basic Materials Industries

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Introduction

The Japanese economy as a whole has been performing relatively well, but there are some industries which are in distress. Due to the skyrocketing of the cost of energy and raw materials consequent to two oil crises experienced since 1973, many basic materials industries, whose products have low added value, are in distress with no relief in sight.

The rise in the cost of electric power has dealt a nearly lethal blow to such power-intensive industries as aluminum smeltry, ferroalloy, and galvanizing open-hearth furnaces, while the soaring petroleum price has dealt a serious blow to the petrochemical and synthetic textile industries. These basic materials industries are rapidly losing their international competitive edge, with the result that imports of many basic materials have increased substantially.

In this article, two of the representative basic materials industries, namely, the aluminum refining and petrochemical industries, are taken up to study the problems plaguing them.

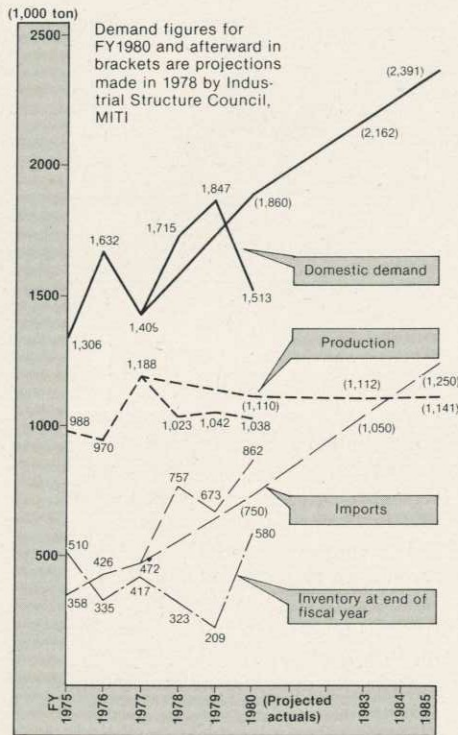
Aluminum Refining Industry

Between 1965 and 1973, the demand for aluminum refining registered a remarkable growth of slightly higher than 20% annually until the first oil crisis rocked the world in 1973. This was due to the expansion of demand for aluminum to make building materials, mainly sashes, and daily commodities such as cans as well as to increased demand from the transportation machinery and home electric appliance industries.

Domestic aluminum output capacity increased from 780,000 tons/year in 1970 to 1,640,000 tons/year in 1972.

However, as a result of the shrinkage in demand for aluminum after the first oil crisis of 1973, a big supply-demand gap appeared, and many production facilities became surplus. By 1980, the aluminum smeltry industry scrapped plants and facilities with an aggregate capacity of about

Fig. 1. Supply and Demand for Aluminum Ingots (Domestic)

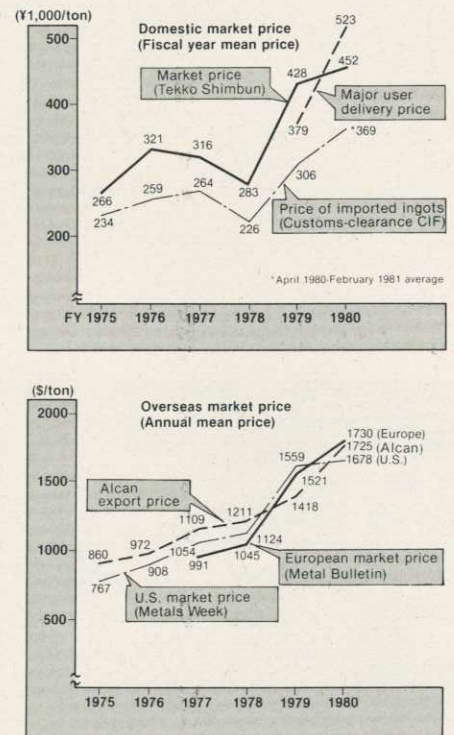


500,000 tons/year to trim down the industry's production capacity to 1,100,000 tons a year. However, as a result of a sharp rise in the cost of electric power consequent to the jump in oil prices resulting from the second oil crisis of 1978, the industry's international competitive power was further weakened.

More than 70% of the electric power which Japanese aluminum smelttries consume is generated by burning fuel oil. Because the price of fuel oil almost trebled during the period from 1978 through 1980, the cost of aluminum rose sharply from a little over ¥300,000 per ton in 1973 to about ¥500,000 per ton in 1980. The cost of electric power accounted for a big proportion of the total production cost of aluminum, rising from 33% in 1973 to 41% in 1980.

The domestic business recession starting in the second half of 1980 has resulted in a further marked shrinkage of domestic demand for aluminum ingots, as shown in Fig. 1. Moreover, as a result of the easing of the worldwide supply-demand situation for aluminum ingots, imports of aluminum ingots, primarily from the U.S., increased sharply. The cost of imported ingots was about ¥369,000 per ton (1980)

Fig. 2: Trend of Domestic and Overseas Prices of Aluminum Ingots



which was approximately 30% cheaper than the domestic price of about ¥523,000 per ton. This big price gap rendered normal competition impossible. The gap was due partly to the low spot price for aluminum ingots resulting from the temporary easing of demand-supply relations, and definitely to the difference in the cost of production resulting from the difference in the cost of electric power. Whereas the unit price of electric power in Japan is about ¥15/kwh, in the U.S. it is only about ¥5/kwh. Mirroring the inexpensive cost of electric power, the market price for aluminum ingots in the U.S., for example, is \$1,678 per ton (1980), which is extremely cheap when compared with the Japanese market price. (Fig. 2)

Dealt the dual blow of shrinkage in demand and sharply increased imports, the Japanese aluminum companies' financial position deteriorated drastically. They are expected to suffer from recurring losses amounting to tens of billion yen in 1981. Depending on their financial conditions, some aluminum smelters have had to close down, like Mitsubishi Light Metal Co. which was obliged to close down its Naoetsu smeltry.

But, the managements of aluminum

smelters are not idle. They have been vigorously engaged for the past few years in a search for inexpensive electric power and locating their production facilities overseas in cheap-power countries. Japanese aluminum companies have eight refining projects overseas, of which four have already gone into operation. The industry is also making painstaking efforts to coordinate the trimming down of domestic plant capacity below the current production level of 1,100,000 tons a year.

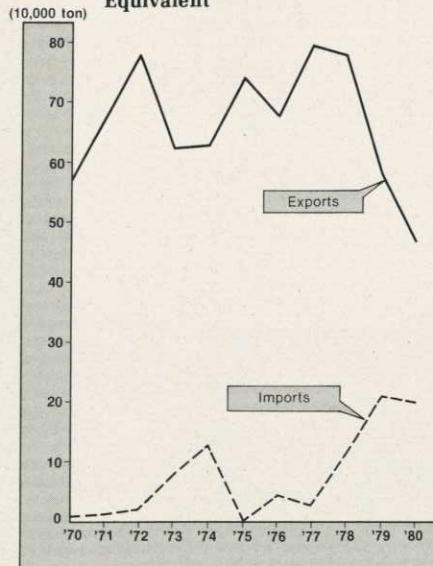
Petrochemical Industry

The petrochemical industry is an important key industry in Japan, occupying a nucleus position among chemical industries whose shipments account for about 8% of Japan's total shipment in value of manufactured goods.

The production of the petrochemical industry, in terms of ethylene, the basic product of the industry, rose sharply from 14,000 tons in 1958, the year of the industry's birth in Japan, to 1,790,000 tons 10 years later and further to 4,180,000 tons in 1974. However, due to the economic recession which followed the oil crisis of 1973, production dropped seriously in 1975. Although production recovered later, it diminished drastically again in 1980, and has not recovered yet.

Because of the recent intensification of the export drive of the American petrochemical industry which manufactures ethylene from low-cost natural gas, the stalemate in business activities overseas and the progress made by foreign countries in their efforts to become self-supporting in ethylene supplies, Japan's exports of petrochemical products have diminished

Fig. 3. Imports and Exports in Ethylene Equivalent



Notes 1. Statistics compiled by the industry.
2. Imports and exports compiled in ethylene equivalent by multiplying the quantity of some 10 principal ethylene derivatives (polyethylene, polystyrene, styrene monomer, ethylene glycol, vinyl chloride, EDC, etc.) by their respective basic units.

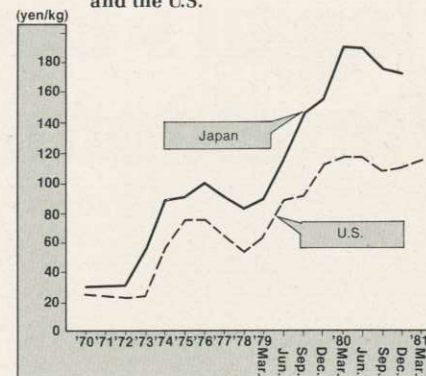
markedly. On the other hand, imports of petrochemical products have increased sharply as a result of an increase in low-cost American products. (Fig. 3)

An overwhelming proportion of the petrochemical raw materials produced in Japan are made from naphtha, most of which is used in producing ethylene. The price of naphtha remained stable at a level of ¥6,000-¥6,300 per kiloliter until 1973. However, after the oil crisis of 1973, the price of naphtha rose sharply consequent to the soaring of the oil prices. The price of naphtha rose as high as ¥25,000 per kiloliter at the end of 1974. Although it remained relatively stable subsequently, it rose again after the second oil crisis of 1978. It rose almost twice within one year and reached ¥51,000 per kiloliter at the end of 1979. It continued to climb upward and reached ¥56,400 per kiloliter in the second half of 1980.

West European countries depend on naphtha for as much as 88% of their raw material needs, while the U.S. uses ethane extracted from natural gas for about 50% of its raw material needs. The U.S. dependence on naphtha is a low 10-15%. Despite some difference in the prices of naphtha between Japan and European countries, the market price of naphtha fluctuates almost the same way in both Japan and Europe. Because the price of ethane is pegged at a low level by the U.S. Government by policy considerations, the price gap between the U.S. and Japan is widening. As a result, the ethylene price gap between Japan and the U.S. is widening as shown in Fig. 4. Whereas the price of ethylene in Japan is about ¥170 per kilogram, in the U.S. it is about ¥120 per kilogram.

Although much depends on future developments in the U.S. policy to decontrol the price of natural gas, the petrochemical industry in Japan will be plagued by sluggish domestic demand and increased imports for the time being.

Fig. 4: Trend of Ethylene Prices in Japan and the U.S.



Notes 1. Japanese prices surveyed by the industry.
2. U.S. prices based on ECN contract price.

Conclusion

As is evident from the cases of the two industries cited above, the problems faced by all basic materials industries are structural, having their origin in exogenous factors. Therefore, some of the basic materials industries mentioned at the outset will need to make coordination and adjustment efforts towards attaining equilibrium on a reduced scale. There are many cases in which industries, as was the case with the textile industry in the past, were compelled to carry out industrial realignment in the face of increasing competition from less-developed countries (LDC). Such industrial realignment by the distressed industries was not an easy undertaking. However, Japan was able to upgrade her industrial structure one step higher through adjustment efforts even though they were hard and difficult.

The realignment of basic materials industries is a problem which Japanese industry faces for the first time in the sense that they constitute one of the key industries in Japan and because the plight of the basic materials industries is caused mainly by soaring prices for energy. ●

One of Japan's major petrochemical complexes

