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in Latin America*

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CONSIDERATION FOR PRODUCTION COMPLEMENTARITIES AND REGIONAL CO-OPERATION IN THE ALUMINIUM INDUSTRY IN LATIN AMERICA AND THE CARIBBEAN**

Discussion paper

Prepared by

the UNIDO Secretariat

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* Organized by UNIDO in co-operation with the Jamaica Bauxite Institute.
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1. Background

The First Consultation on the Non-ferrous Metals Industry was held at Budapest, Hungary, in 1987 to discuss alternative development strategies, technological possibilities and new forms of investment and finance in the non-ferrous metals industry with special emphasis on the problems of developing countries. The Consultation stressed in its recommendations the need to promote regional and interregional co-operation as well as to set up complementarity of production among regions.

In line with the recommendations, a follow-up meeting was organized by the United Nations Industrial Development Organization (UNIDO) in March 1989 in Cordoba, Argentina, to identify the potential opportunities for production complementarity in the non-ferrous metals industry in Latin America. The meeting examined the possible complementarities in the fields of raw materials, concentrates, refined and semi-finished products of the region's aluminium, copper, tin and nickel industries. In connection with the possible areas identified, the meeting determined some specific lines of action for increasing subregional and regional co-operation as well as for strengthening the connections within the different sectors of production.1/

The meeting also agreed that due to the large field of non-ferrous metals, the activity should focus in the future on the individual metals. Among the metals concerned, aluminium was chosen as the first metal to be thoroughly analysed together with an investigation of the viability of production complementarities between selected countries in the region.

In this connection, two background papers have been prepared, one dealing with the aluminium industries in Latin America, namely in Argentina, Brazil and Venezuela in which there are opportunities and great potential for a complementation programme,2/ and the other investigating the possibilities for such undertaking in connection with Mexico and the Caribbean area (Jamaica, the Dominican Republic and Trinidad and Tobago).3/ Both reports describe in detail production, capacity and trade relations as well as analyse the constraints facing the sector in relation to an effective programme of complementation.

On the basis of this background, the Meeting will concentrate its efforts mainly on arriving at feasible proposals in the field of complementarity and more specifically to propose measures and make recommendations necessary to promote the development of a coherent system of complementarity among the main producers in Latin America and the Caribbean and reinforce regional co-operation in the aluminium sector.

1/ The promotion of a coherent productive system in the field of non-ferrous metals in Latin America: possibilities for complementarity, ID/WG.481/5(SPEC.), 10 February 1989.

2/ Eva, A., Identification and viability of production complementarities of the main producers of aluminium in the South American region (Argentina, Brazil and Venezuela), ID/WG.501/1(SPEC.), 26 April 1990.

3/ Morrison, D.E., Investigation of the prospects for development of a specific complementation programme in the aluminium industry of Mexico and the Caribbean area, ID/WG.501/2(SPEC.), 17 May 1990.

2. The present situation and the expected development of the region's aluminium industries

2.1 The main features in sectoral breakdown

A general picture is presented of the aluminium industries underlining the main points with regard to the possible areas of complementarity and co-operation relating to the following countries under consideration. More detailed information can be obtained from the reports mentioned earlier as well as from studies prepared for the Cordoba meeting.4/ and 5/

Brazil

The Brazilian aluminium industry embraces the whole range of the vertical structure. The enormous bauxite deposits give the basis for its favourable position. In the past decade an ever increasing tendency of bauxite production was experienced and now the annual output is more than 8 million tons. This quantity is far beyond the demand of domestic alumina plants and, therefore, a great part of it is exported, mainly to Venezuela and Suriname. The main export market of Brazilian bauxite is in the United States of America. In 1988 the total exports grew by 65 per cent over 1987 and reached 4.5 million tons.

The weak point of the aluminium industry in Brazil is the alumina production. The total installed capacity is close to 1.6 million tons per year and the five alumina plants operate nearly at their maximum. The domestic alumina output does not cover the demand of Brazilian smelters and for that reason a considerable quantity has to be imported. At present the main suppliers are Venezuela and the Caribbean countries. In 1988 more than 370,000 tons of alumina were imported while ALCOA of Brazil exported 150,000 tons. In connection with the alumina production, large quantities of caustic soda are needed and in this regard the Brazilian aluminium industry is in a favourable position, since the domestic chemical sector is able to produce well above the demand of alumina plants. The caustic soda consumption of the alumina sector is 126,000 tons annually, while the total production approaches 1 million tons per year offering possibility for regional complementarity. The metallurgical sector can also be characterized by the maximum utilization of production capacity of 873,000 tons in 1988. Although the domestic consumption of primary aluminium is quite considerable as compared to other countries in the region, the majority of metal is exported in the form of ingots. In 1988, 515,000 tons of ingot were exported. The most important markets were Japan, the United States of America and Europe and to a smaller extent Latin America. The production of this sector is influenced by two inputs, namely electric energy and petroleum coke used for anodes and cathodes of electrolyzing pots. In Brazil the cost of electric energy is rather high which has an unfavourable effect on the competitiveness of this sector. The annual consumption from petroleum coke in 1988 was 350,000 tons. The domestic industry was able to provide this quantity;

4/ Grof, T. and Eva, A., Identification of specific projects for the production of semi-finished non-ferrous metals in Latin America, ID/WG.481/2(SPEC.), 3 January 1989.

5/ Morrison, D.E., Study on the identification of possibilities of production complementarities among the producers of aluminium and nickel in the Caribbean region, ID/WG.481/4(SPEC.), 11 January 1989.

however, 152,000 tons of petroleum coke had to be imported for other industrial purposes. The region's main supplier of petroleum coke is Argentina.

As for the downstream sector it can be stated that the production capacities are limited to a certain extent and the total quantity of semi-finished products (semis) produced was 414,000 tons in 1988. The installed production capacity including all manufacturing branches of the sector was 655,000 tons. This figure shows an increase of 6.4 per cent compared to 1987. The capacity is sufficient only for covering the domestic consumption. The exportable quantity of semis is rather limited. (In 1988 total exports were only 41,000 tons, while the exported primary aluminium ingots went up to 515,000 tons.) Analysing the data of production and consumption in comparison with the export and import figures, it can also be stated that foil rolling, extrusion and die-casting are among the bottlenecks in the downstream operations.

Venezuela

In Venezuela bauxite production only began in 1987. Although the mining capacity has been growing at an accelerated pace, the country is not yet able to eliminate the bauxite imports. In 1988 the actual production was about 1 million tons and approximately 2 million tons were imported mainly from neighbouring countries (Brazil, Guyana and Suriname). According to estimates, the domestic bauxite production will reach 3 million tons per year by the early 1990s.

In alumina production a continuous increase of capacity could be experienced; at present the output is over 1.3 million tons per year which is more than the actual demand of domestic smelters. The excess quantities of alumina of around 500,000 tons per year are exported. Major importers are the United States of America and Europe. In the Latin American region Brazil is the main importer. The domestic output of caustic soda for alumina extraction is rather low (around 40,000 tons per year); therefore the major part of the required quantity has to be imported.

The strongest and most profitable sector is the metallurgical one due to available natural resources. On the basis of comparative advantages this sector has been d veloping rapidly. While the production capacity of primary aluminium was 650,000 tons in 1988, actual output is 454,000 tons. The domestic aluminium consumption is rather low; therefore the majority of ingots is exported (in 1987 exports amounted to 302,800 tons). The main export markets were Japan, the United States of America and Europe. At present the anode and cathode materials made from petroleum coke are supplied by domestic sources.

In the downstream sector about 220,000 tons of metal were manufactured in 1988 to produce different kind of semis. The total installed capacity was 350,000 tons. 100,000 tons of semis were exported in 1987, 90 per cent of which went to the United States of America. The main export products are the drawn wires and cables, while a considerable quantity of rolled materials, especially can-stock products, is exported. The weak point of the sector is the manufacture of rolled semis, particularly foils and can-stock materials.

Argentina

In Argentina the main operating sector is the metallurgy. The installed capacity is now about 160,000 tons per year which demands 350,000 tons of alumina annually. The whole quantity is imported from Australia on the basis of a long-term contract which expires in 1993. The capacity utilization is at its maximum and nearly all the total output is used by the domestic manufacturing sector. In 1987 exports of primary aluminium were 35,000 tons, but in the following year it dropped to 11,000 tons in accordance with the aim of ensuring the supply of domestic manufacturers and only permitting exports of excess quantity. Argentina is self-sufficient in petroleum coke for anodes and cathodes and is even able to export a surplus.

In the downstream sector the total manufacturing capacity is about 210,000 tons per year and its utilization is rather low (71 per cent). Nearly half of the total output is exported. The main export markets are the Federal Republic of Germany, Japan, Chile and the United States of America. Up to now the main weak point of this sector is the powder and paste production. In this connection there have already been projects for establishing a powder/pigment plant.

Mexico

The county does not possess bauxite deposits and imports all of its metallurgical alumina demands from Australia. The total quantity is covered by a long-term supply contract which expires in the early 1990s.

The installed metallurgical capacity is about 70,000 tons per year, but at the same time there is a large facility recycling 28,000 tons per year. The capacity utilization has been consistently on the top; thus the total output of primary aluminium ingots is around 70,000 tons annually. Metal exports were 10,000 tons in 1987, while imports were double this figure. In the last three years domestic consumption varied between 70,000 and 80,000 tons annually.

In the downstream sector the manufacturing capacity is estimated at 170,000 tons per year. The total output of semis varied widely in the last few years reflecting the movement and uncertainty in the national economy. The maximum output was recorded in 1986 when it reached 123,000 tons. In the following year it fell to 97,000 tons. The weak point of the sector is the production of special quality rolled products. The major difficulties are encountered in the shortfall of raw materials and the great idle manufacturing capacities.

Jamaica

Contrary to the situation in the countries mentioned above, the strong sectors in Jamaica are those of bauxite and alumina. Bauxite production was 9.4 million tons in 1989 and further expansions are expected up to 1991. Nearly half of the quantity produced is exported to consumers outside the region. The remaining part is used by the domestic alumina production which amounted to 2.2 million tons in 1989. Considering the fact that there is no metallurgical sector in Jamaica, the whole alumina output must be exported. In connection with alumina extraction, the major problem is imported caustic soda. The whole demand has to be imported from outside the region which has an unfavourable effect on the cost-competitiveness of Jamaican alumina.

The downstream sector is very limited both in product-mix and in capacity which is only 5,500 tons per year. Its inputs (billets and slabs) are imported and the output is used mainly by the domestic processing sector.

Suriname

The bauxite reserves of Suriname are estimated at 530 million tons. In 1989 the bauxite production was 3.4 million tons, nearly all of which was consumed by the domestic alumina refineries. Only a small quantity of about 300,000 tons of bauxite was exported to Venezuela, while approximately the same quantity came from Brazil and the Dominican Republic for processing.

Until 1986 a metallurgical plant with limited capacity operated in the country, but in 1987 it was brought to a standstill. Later it was restarted with an output of about 10,000 tons per year.

Guyana

The bauxite reserves are estimated at 500 million tons. In 1989 production was 1.4 million tons. As the alumina refinery was stopped in 1983, the whole bauxite production had to be exported mainly to the United States of America, Europe and Asia. However, Venezuela also imports some 100,000 tons.

Dominican Republic

Production of bauxite started in 1959 but ceased in 1982 due to economic difficulties. It was resumed in 1987 with projected production figures of 324,000 tons per year. During the following years, however, the production did not grow and in 1989 the actual figure was 130,000 tons, 75 per cent of which was exported to Suriname and 25 per cent to the United States of America.

The country imports all of its needs for ingots and semis. A small extrusion plant with limited capacity is in operation and basically supplies the domestic market.

2.1.1 Production in the selected countries

Production figures are summarized in the following table for the selected countries according to sectoral breakdown. Figures embrace the 1986-1989 period in order to show the developments and expansions. Data on consumption and export-import activities can be found in detail in the reports listed in footnotes 4 and 5.

Production of bauxite, alumina, primary aluminium and semis in the selected countries of Latin America and the Caribbean, 1986-1989

	1986	1987	1988	1989
	Bauxite (million tons)			
Brazil	6.45	6.57	7.73	8.50*
Venezuela	-	0.22	0.55	0.55*
Jamaica	6.96	7.66	4.41	9.39
Suriname	3.73	2.58	3.43	3.43
Guyana	2.60	2.78	1.77	1.43
Dominican Republic	-	0.21	0.17	0.13
	Alumina (million tons)			
Brazil	1.26	1.40	1.42	1.70
Venezuela	1.27	1.36	1.28	1.30
Jamaica	1.58	1.61	1.51	2.22
Suriname	1.47	1.36	1.63	1.60
	Primary aluminium (thousand tons)			
Brazil	757	843	873	887
Venezuela	423	460	443	538
Argentina	150	155	157	162
Mexico	37	60	68	71
Suriname	29	2	10	13
	Semis (thousand tons)			
Brazil	463	430	424	393*
Venezuela	135	145	137	184*
Argentina	126	151	149	121*
Mexico	123	97	83	99*
Jamaica	3	3	5	n.a.
Domincan Republic	4	4	5	n.a.

* Provisional.

Source: World Metal Statistics 1989; ID/WG.501/1(SPEC); ID/WG.501/2(SPEC).

2.2 Trends in development and main obstacles in the region's aluminium industry

The main developments in the different countries under consideration in conjunction with possible areas of complementarities are summarized as follows:

Brazil

In the bauxite sector the production is expected to increase on a limited scale. The domestic bauxite consumption will not increase until new alumina capacities enter into production. Drastic changes will occur when the alumina project ALUNORTE enters into operation. Its projected capacity is 1.1 million tons per year and it is expected to operate by 1993 with an annual output of about 2.5 million tons of bauxite. This will cause a considerable modification in the export structure, but at the same time the decreasing exports would meet the decreasing import demand of Venezuela with a more or less similar rate of variation in quantity. In the near future Canada and the United States of America could become the main export markets for Brazilian bauxite. In the longer run, this situation will probably change due to a redeployment of upstream operations from developed to developing countries. After 1995 the bauxite exports may drop to an annual level of about 2 million tons.

As was mentioned earlier, the weak point of the aluminium industry in Brazil is the alumina production. Its output is much less than the actual demand of smelters. The only solution, therefore, may be to invest in a new alumina plant with a high capacity. Due to economic and financial difficulties the completion of the ALUNORTE project has been delayed. In the meantime Brazil needs alumina imports of about 300,000 tons per year. The region's main suppliers are Suriname and Venezuela. In the case of the latter, it is expected that the present quantity of 70,000 tons per year will probably decrease in the near future due to the country's own increasing demand. In the region Jamaica is the only country that could easily meet the deficit. The only problem is to find a mutual interest in the matter. However, this co-operation could not last long because the situation will probably have changed by 1995 and from this date Brazil will be self-sufficient in the alumina sector.

The biggest change in the production is expected in the metallurgical sector where a drastic increase is predicted. Until 1995 this sector intends to raise its output of primary aluminium from the present level by about 60 per cent. As the domestic aluminium consumption is expected to grow by only 5 per cent annually, the local demand in 1995 will presumably be no more than 600,000 tons. This also means that by the middle of the next decade 800,000 tons of excess metal will be available for export purposes; part of it could serve the process of regional complementation.

In the downstream sector the main aim for increasing capacities is to produce exportable semis. According to recent information, the following fields of aluminium application were expected to grow significantly in the near future: packaging, transportation and construction. These applications use aluminium in rolled and extruded forms; therefore, the emphasis is put on the development of can-stock and foil rolling, extrusion of profiles and die-casting. With regard to increasing the quantity of aluminium automotive parts and their manufacturing technologies, it can be stated that the press-forging capacity is insufficient to meet demands or to follow the

international tendencies in car and machinery production. The investment of a press-forging plant with an annual output of about 1,000 tons may strengthen the integrated nature of the downstream sector and at the same time offer an opportunity for further regional complementation.

Venezuela

According to earlier predictions, the domestic bauxite exploitation will probably reach 3 million tons in 1990. However, present indications are that several problems have developed with the Los Pijiguaos bauxite reserves which could cause the extension of bauxite delivery contracts with Guyana and Suriname in order to meet the demand of the INTERALUMINA refinery. Full self-sufficiency in bauxite is predicted around 1995.

The production of alumina amounted to 1.3 million tons in 1989 which exceeded the domestic demand of 1.08 million tons. Long-term development plans envisage the expansion of installed capacity to 3 million tons by 1995. The next stage will be investment in a new plant with 1 million tons of output to realize 4 million tons by the end of the century. Capacity developments were projected in accordance with the demand of smelters. In the two sectors the rates of development may differ and a temporary alumina deficit could come into being. By 1991 Venezuela's alumina demand of about 1.7 million tons will surpass its capacity and imports of approximately 400,000 tons per year will be necessary.6/ This problem can be solved by co-operation with Jamaica utilizing the possibility of complementation.

Comparing other producers world-wide, it can be stated that the Venezuelan aluminium metallurgy is in a favourable position due to its low production costs. Orientation of the main efforts should increase the output of primary metal in order to supply the growing domestic downstream sector and to enhance exports. Besides extension of existing smelters, seven new projects were identified for increasing capacity of production. However, there are only three that could possibly be implemented in a short term (ALDANCA, ALUSUR, ALUYANA). The expected production of aluminium ingots is 1.8 million tons by 1995 and 2 million tons by the end of the decade. Although these figures must be regarded critically, it is evident that in the longer run production will increase significantly. The advantageous position of this sector gives further possibilities for regional co-operation and complementation.

In the downstream sector development plans have two main purposes. The first is to substitute current imports (the majority of which is can-stock material), the second is to increase the quantity of exportable semis. At present production capacity of the sector is about 350,000 tons and it will be 375,000 tons by 1995. It is of particular interest that many projects deal with the die-casting of wheels for the automotive industry. These aluminium wheel plants were identified with a total output of about 2 million units per year. These products, together with other die-cast aluminium parts (cylinder heads, pistons etc.) will be directly transported to car makers in the United States of America. It is also interesting that the product-mix of this sector is very similar to that of the region's other countries having wide-scale manufacturing facilities like Brazil, Argentina and Mexico. Consequently, the

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6/ Morrison, D.E., op.cit.

possibilities are rather limited to identify areas among downstream sectors where the process of complementation could work better.

Argentina

In view of the fact that the whole alumina quantity is imported from outside the region, an opportunity is offered for regional production complementarities.

In the case of the metallurgical sector, different programmes of development are being implemented which will increase the capacity by another 30,000 tons per year in the 1990s. At present there are no plans for further investments, since the forecasts do not predict a drastic growth in the domestic consumption.

The downstream operations respond to metallurgical possibilities and the capacity of the manufacturing sector is 40,000 tons per year higher than that of the upstream. It also means that the manufacture of semis is capable of absorbing all the primary aluminium outputs even in the case of the projected increase in capacity of smelter. The structure of this sector is very similar to that of the other regional producers of semis. As was mentioned in the case of Venezuela, complementarities can hardly be found. Promising fields could be the production of master alloyed billets or slabs of good quality as the sector has long experience in these technologies.

Mexico

Similarly to Argentina, the alumina imports offer opportunity for enlarging regional production complementarities. There are, however, indications in the Mexican aluminium industry that serious thought is being given to the option of closing the smelter and procuring aluminium ingots on a long-term basis through co-operation with Venezuela. The low output based on the Soderberg technology of the smelter and the comparatively high energy costs in Mexico are the factors behind this proposal. For the time being the aluminium industry imports about 40,000 tons per year of primary metal and this quantity is expected to grow in the future.

In the downstream sector, idle capacities have been registered for some time. This situation could be rectified by improving the utilization of the plants. As a matter of fact, the structure of this sector is very close to that of the other aluminium industries in the region producing semis. Idle capacities could also be utilized.

Jamaica

According to present projections, bauxite production will be increased in the near future to 12 million tons per year.

In the alumina sector significant changes occurred between 1988 and 1990. The output was considerably increased by the reactivation of the closed ALPARI refinery (based on a new ownership arrangement) and by refurbishing and upgrading ongoing operations. The JAMALCO expansion will generate 250,000 tons per year surplus quantity of alumina and a feasibility study is presently being prepared for a new plant of 1 million tons capacity. As a consequence of expansion programmes, the output of JAMALCO can be increased to

2 million tons per year and later even to 3 million tons per year, and that of ALPARI to 2.4 million tons up to 2.6 million tons.

In the downstream sector the forecasts refer to the more effective capacity utilization of the extrusion plant and to the establishment of a cat-rolling facility in order to produce sheets and coiled strips of about 30,000 tons per year. This project has been considered over many years (1978-1989) but has been stalled due to lack of guaranteed ingot supplies and capital - especially foreign exchange for machinery and equipment.

Suriname, Guyana, Dominican Republic

Information is not yet available on the trends of development in the aluminium industry of these countries, but they can surely plan an active role in the future in supplying the neighbouring consumers with bauxite and alumina.

3. Main considerations regarding regional complementarities

3.1 Factors affecting complementarities

Before identifying possible areas of complementarities, it is important to consider briefly some factors which have been affecting the chances of strengthening regional co-operation in the aluminium industries.

Among promotion are the factors that result in comparative cost advantages for the different productive sectors in the selected countries. In bauxite mining: Brazil and Guyana; in alumina extraction: Jamaica, Brazil and Suriname; in the case of aluminium metallurgy Venezula, and in the downstream: Brazil and Venezula have cost-competitive positions which can effectively be utilized in production complementarites. Another factor connected with the foregoing to a certain extent is the relative abundancy of natural resources and the large idle capacities. The preferential trading arrangements and tolling agreements based on the off-take of products are also supporting co-operation by specific provisions and regulations on counter-trade that have been adopted by several countries of the region in order to minimize the use of hard currency. The increasing capacity of the larger regional economies like Brazil, Mexico, Argentina and Chile to produce capital goods required by the aluminium industry is also advantageous for further co-operation. In the case of Brazil, for example, 95 per cent of mining equipment and 90 per cent of machinery and equipment for refineries and smelters are produced by domestic industrial enterprises.

There are, however, factors that could adversely affect the progress of regional complementation. One of them is the aim of some countries in the region to achieve a complete vertical integration eliminating inputs from other aluminium industries. Another factor is the relatively low level of aluminium consumption in the region and a lack of institutions concerned with technology and product development. Otherwise the processing sector is more or less outside the aluminium industry in the selected countries. The unorganized nature of this sector and the lack of integration between the manufacturing and processing phases are also part of the problem. Another constraint in the progress of effective complementation is the very similar structure of downstream sectors in the countries having large manufacturing capacities. The lack of sufficient capital in the region and the increasing participation of foreign capital in new investments as well as increasing export activities towards hard currency markets are not favourable to the

process of complementation as it is also adversely affected by the lack of co-ordination in the tariff system, especially between ALADI and CARICOM countries and in pricing mechanisms.

3.2 Upstream and downstream sectors

Based on commercial trends, trade relations, structure, current and expected production capacities, the following areas of complementarities are to be identified in upstream and downstream sectoral breakdown.

3.2.1 Upstream sector

Bauxite

Venezuela, Suriname and Guyana

At present both Suriname and Guyana are supplying bauxite to the INTERALUMINA refinery of Venezuela. Considering the expansion of this plant up to 2 million tons per year and the difficulties of BAUXIVEN to increase its output, it appears essential for Venezuela to extend the co-operation with both countries to ensure appropriate bauxite supplies for the refinery. It seems to be favourable from many aspects. Suriname and Guyana enjoy a significant comparative advantage in bauxite production as compared to BAUXIVEN. The total cost of one ton of bauxite is around US$10 in these countries, while that of BAUXIVEN is about US$15. In addition it would allow Venezuela greater latitude to invest in higher value-added sectors such as metallurgy and downstream operations. At the same time this approach utilizes the region's potential at an optimum level and supports both expansions/diversification and integration processes. It should be pointed out, however, that investments will be required in both countries if they are to be sources of long-term bauxite supply.

Alumina

Jamaica and Argentina

Following the Cordoba meeting, contacts were initiated between ALUAR of Argentina and JBI of Jamaica to examine the possibilities of alumina supply. ALUAR's long-term contract with ALCOA of Australia is due to expire in 1993 and by that time the JAMALCO expansion with an additional quantity of 250,000 tons per year should be completed. The first alumina samples have already been analysed at ALUAR and now technical specifications are under debate. It appears that commercial contacts should be initiated to explore the possibility of Jamaica supplying at least a portion of ALUAR's alumina demand. Trade arrangements could be based on a barter system. In this case Jamaica needs a limited quantity of primary metal and a lot of agricultural products.

Jamaica and Brazil

Brazil will have to import alumina for years due to its limited production capacity and delays in completion of the ALUNORTE project. On the basis of projected developments of the metallurgical sector, the shortfall of alumina could escalate in the 1990-1992 period when an additional smelter of 345,000 tons is expected to come into operation. A considerable amount of imports comes from hard currency markets which is disadvantageous for Brazil.

Among its regional partners, Suriname and Venezuela were of greater importance, but at present difficulties are to be seen for Venezuelan imports. The third partner in the region is Jamaica with a limited supply of around 30,000 tons per year. Jamaica's alumina exports to Brazil are handled by ALCAN and ALCOA as intra-company transactions. Considering the projects for the development of the Jamaican alumina sector and the short- to medium-term shortfall in Brazil, it seems encouraging to extend the co-operation in this field.

Jamaica and Venezuela

As was analysed earlier in a short term (by 1991), Venezuela's alumina demand surpasses its production capacity and the country now faces imports of about 400,000 tons annually. Currently in the region there is no idle capacity; therefore the increased demand could only be met by expanded production of Caribbean producers or other sources. In the region the JAMALCO expansion could offer surplus alumina of about 125,000 tons per year. For the remaining part further negotiations are needed to determine a possible expansion of Jamaican alumina capacity and/or to divert alumina supplies now going to other markets to meet this demand. What is needed, however, is a co-ordination process between the respective enterprises to determine the conditions and terms of reference for a programme of co-operation.

Metallurgy

Venezuela, Mexico (and Jamaica)

As it was mentioned earlier, Mexico's long-term production of primary aluminium is considered marginal due to high cost of operation and out of date smelter technology. Its present imports are about 40,000 tons per year of ingots. On the other hand, there are large idle capacities on the dowstream side. In Venezuela the situation is just the opposite as the metallurgical sector has modern technology and high output, while in the downstream sector there are shortfalls. In view of this, discussions have been initiated by Grupo Aluminio (Mexico) with CVG of Venezuela to develop a co-operation programme, on the basis of which Venezuela supplies metals to Mexico to meet its import demand. The co-operation could be extended with a possible tolling arrangement under which Venezuela would supply additional quantities of ingots to allow the Mexican downstream sector to utilize its idle capacities; the increased output of semis would be geared to the regional and other markets.

Jamaica's participation in such complementarity would be through the supply of alumina to Venezuela on the basis of a tolling or metal exchange arrangement with the metal obtained in Mexico to manufacture semis for the Caribbean market.

3.2.2 Downstream sector

Brazil and Argentina

The automotive machinery sectors in both countries have well developed industrial structures and demand a wide variety of special qualities of press-forged aluminium products. In the region, Brazil and Argentina are the two countries where it appears worthwhile to introduce this technology to a greater extent. Of the two, Brazil is in the more favourable position because of the highly integrated nature of its aluminium industry and great

consumption capacity. The erection of a press-forging plant in Brazil would seem appropriate in order to supply the domestic industry with forged aluminium parts and to meet the demand of the regional market, especially that of Argentina.

Venezuela and Argentina

In both countries there have been projects for effective utilization of foil scraps. Powder and pigment production is the best solution for foil scrap processing as practised world-wide. The expected annual capacity of the powder pigment plant in Venezuela is 4,000 tons, while in Argentina it is about 2,500 tons. These capacities are high enough to produce substantial quantities of such types of product which could eventually replace current imports. In Argentina the imported powder pigment quantity is around 1,500 tons per year and that of Venezuela approximately 1,000 tons unless production could be exported either within the region or to other markets. It would be of great benefit for Argentina and Venezuela to co-ordinate their investment programmes as well as related technical aspects.

3.2.3 Other areas of complementarity

Caustic soda production

Venezuela and the Caribbean are facing problems in the supply of caustic soda. On the basis of its own petrochemical industry, Venezuela has already prepared plans for expanding the working production capacity up to 134,000 tons per year and for investing in a new plant in the form of a joint venture with countries of the region. The plant to be established at PEREVESA will have a capacity of 2 million tons per year which will cover the increasing domestic demand and permit the supply of caustic soda to the other countries of the region. At present financial aspects of this project are under study. According to forecasts, installation could begin in the early 1990s.

Equipment supply for mining, refining and smelting sectors

Brazil, Argentina, Mexico and Chile possess significant capacity for the manufacture of machinery and equipment. Despite this fact, however, such items are generally imported from countries outside the region. Future joint venture projects which involve significant equity participation by regional partners could provide opportunities for co-operation to establish stronger linkages between regional capital goods manufacturers and enterprises in these sectors.

Co-operation in research and development activities

With regard to profitability of the region's aluminium industry and the ability to produce products with higher value-added, it is expected that the emphasis will be shifting to the downstream and processing sectors, although there will also be upstream opportunities to realize better profits by producing special quality alumina and primary metal. Changes and modifications in both product quality and manufacturing technologies require intensive research and development activities to ensure the necessary background. A project for establishing a research and development centre in Venezuela is already under way. This centre, which will operate within CVG, could not only support the domestic developments but could generate opportunities for regional co-operation in research activities.

4. Considerations on economic and financial viability of complementarity

In Latin America and the Caribbean overall economic difficulties were experienced in the 1980s. The per capita GDP continuously decreased in almost all countries of the region and interregional trade as well as trade outside the region have moved downward in value. The ratio of interregional to total exports was 10.6 per cent in 1988, practically the same as in 1987 (10.7 per cent), but well below the 13 per cent achieved in 1981. There has, however, been a recovery in the volume of interregional trade since the mid-1980s, but the figures are still below those of 1981, the peak year for interregional trade.

Economic growth of the region is hampered by the outflow of capital to meet principal and interest payments due to massive external debts. As a consequence, the level of investment decreased and in 1988 it was only 81 per cent of that reached in 1980. The lowest point occurred in 1984 when the regional investment (expressed in per cent of GDP) was only 15.6 per cent. The peak was in 1980 when it reached 23.7 per cent. The slow recovery between 1984 and 1988 finally resulted in 17.4 per cent in 1988.

The expansion of production for both domestic and export markets is inevitable if the region is to emerge from the present situation. This expansion, however, needs a growing investment in productive sectors. Considering the extent of the external debt and the shortage of capital, the obvious solution is to utilize idle capacities in the region in order to increase production. This approach requires a higher level of co-operation between producing countries in planning production so as to benefit from complementarities. However, the expansion of regional production can be pursued by extending existing capacities rather than installing new ones which would be considerably more expensive. This approach would contribute to a more efficient use of capital resources and would allow enterprises to benefit from the comparative advantages of the regional aluminium industry.

Differences in the legal system of various countries, obstacles in trade, pricing and payment mechanisms, as well as difficulties in transportation and communication, are factors which should be looked into.

5. Considerations on supportive policies and institutional framework for promotion of regional co-operation in the aluminium industry

The process of complementation requires intensive support of the respective governments. Policy support is very important in cases of trading practice including tariff measures, import licences and payment mechanisms. The setting-up of an institutional framework for the development and operation of projects would also require policy and measures on the part of the governments.

With regard to the trading practice, the major obstacles to the development of regional trade are the payments and import procedures. In spite of difficulties experienced in the last 20 years, the trend of relative importance of the Latin American region as an importer moved in an upward direction and the trade of products marketed under various terms of preferential agreements nearly doubled. Nevertheless, these favourable changes also reflect the fact that during this period interregional trade was detrimental to products not covered by such agreements.

There have otherwise been signs in the region of a more liberal legal system of foreign investment by which foreign investors have been given special preference. It is to be wished that these solutions are applied to joint production schemes between all countries of the region.

The promotion of projected complementarities will involve either the broadening of ownership structures or the establishment of new ventures. It seems beneficial that in such cases promotion mechanisms be created to monitor and assist in the implementation process.

6. Possible area of complementarities and co-operation

As identified, there is great scope for a programme of complementarities in Latin America and the Caribbean region considering upstream and downstream production and supply of basic products. The opportunities for co-operation can be briefly listed as follows:

(a) Bauxite production and trade: Venezuela, Suriname, Guyana;

(b) Aluminium production and trade: Mexico/Jamaica, Argentina/Jamaica, Venezuela/Jamaica, Brazil/Jamaica;

(c) Aluminium production and trade: Trinidad and Tobago/Jamaica, Venezuela/Mexico/Jamaica;

(d) Caustic soda production: Trinidad and Tobago, Venezuela, Mexico, Jamaica;

(e) Anode production: Venezuela, Trinidad and Tobago/Jamaica;

(f) Equipment supply: Brazil, Mexico, Argentina, Chile.

7. Final considerations

In the light of the above and considering the major constraints hampering the development of the sector, among which are shortage of capital for investment, underutilization of installed production capacities, lack of institutional mechanisms, the Meeting is required to formulate concrete conclusions and recommendations for the promotion of a viable programme of complementarities in the region, placing emphasis on the following points of discussion.

7.1 Development strategies and institutional mechanisms

Strategies for developing the sector should be analysed in compliance with global tendencies within the aluminium industry as a whole. What would be the appropriate mechanisms at an institutional level that would monitor the trends in the sector at regional and global levels in addition to developing and co-ordinating action-oriented strategies and programmes of promotion within the region?

7.2 Supportive policies and trade measures

Supportive policies relating to trade, commercial relations, tariff and payment mechanisms should be formulated at the government level with key decision-makers and responsibles of public and private enterprises. How can one best promote and reinforce the appropriate policies and supportive trade

measures that are necessary to develop a programme of production complementarities on a coherent basis among selected countries in the region?

7.3 Financing mechanisms and investment opportunities

Co-ordinated efforts will be needed between countries, financial institutions and partners in the region to stimulate opportunities for investment. What would be the appropriate financial mechanisms for encouraging investment opportunities and stimulating joint ventures for the development of the aluminium industry in the region?

7.4 Research and development

Research and development play an important role in the development process of the industry. How can joint activities in the field of research and development and technological innovation be strengthened in order to promote production of semi-finished and finished products, make use of the underutilization of installed capacities, and widen production in the capital goods sector?

7.5 Import substitutions

In many cases, a significant amount of basic products is necessary for the production of aluminium, i.e. caustic soda, petroleum coke and alumina, which are imported from outside the region in addition to machinery and mining equipment, refining and smelting. In view of the high manufacturing potential and the experience of many countries in the non-ferrous metal sector in Latin America, how can the capabilities of the countries in the region be strengthened in order to make maximum use of the local resources and experience in the production of these inputs with the view to increase import substitutions?

8. Other considerations

In addition to the above, other considerations should focus on the following points:

(a) Establishment of a metal exchange for the region and promotional centres in selected countries;

(b) Identification of constraints and new possibilities for complementarities in order to harmonize co-operation for downstream production in the semi-finished and finished sectors;

(c) Identification of areas for technical co-operation in which international organizations could play a significant role in addition to co-ordinating the implementation process of promotional activities;

(d) The role of regional institutions as a focal point for co-operation in the development of complementarity programmes between the countries in the region; collection and dissemination of information relevant to the industry;

(e) The implication of sources and energy requirements for developing the industry.