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LONG-TERM ASSOCIATIONS OF DEVELOPING COUNTRIES WITH CONSUMERS OF BAUXITE, ALUMINA AND ALUMINUM*

by

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Background of writer

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Introduction

This paper is concerned with the kinds of long-term arrangements and agreements that developing countries may make to supply bauxite or alumina or primary aluminum to consumers of these materials. The purpose is to help define the guidelines to terms and conditions to such arrangements that developing countries may consider in the international climate for new investments.

Some problems today to shape guidelines are quite different from those when bauxite-alumina-aluminum projects were undertaken in the 1940's and 1950's. In those years undeveloped countries were frequently colonies of West European Governments. Agreements were made under laws controlled by the home governments. Agreements were made in the expectation that they would be honored during the years they were to operate. There usually were no demands for participation by the colonial governments in the investment or management of the projects.

Today, the older forms of political colonialism are gone. The dominating political influence of major industrialized countries has decreased. New investment relationships have been influenced by the United Nations, the international lending agencies such as the World Bank and regional banks, and by government-to-government bi-lateral arrangements. The climate for international investments in projects to produce basic materials for export has changed. A number of producing

countries have felt free to break agreements for minerals and other materials, such as petroleum, copper, bauxite, and aluminum. This trend has not been confined to developing countries shaking off conditions left by colonialism or the restraints of agreements or laws affecting multinational corporations. Agreements or laws also have been broken or changed unilaterally by some developed countries.

To both groups of countries, the purposes have been similar. Both developed countries and undeveloped countries want greater revenues, higher taxes and higher prices for their exports. They want preference for employment of their own citizens over expatriates. They want their raw materials to be processed to more advanced stages for export as well as for home consumption. Some want participating or complete ownership of enterprises.

For these objectives they have used various methods to change agreements and relationships. Some have expropriated outright or indirectly by confiscatory taxation. Some have compelled the sale of all or part of enterprises at prices far less than replacement costs of new facilities, sometimes giving promises to pay that may never be met by those governments having chronic deficits in their balances of payments.

The breaking or forced revision of contracts has not been confined to undeveloped countries and former colonies. Nor has it been directed always against multinational corporations on the argument that they have imposed unfair terms in taking the resources of poor countries. Contract breaking or forced revision has also been engaged by governments in Latin America, by the State of Queensland in Australia, and by the Government of New Zealand. Nationalization of mineral enterprises and high taxation has been directed against enterprises in provinces of Canada.

New agreements imposed by governments have often been followed by demands from enterprises that buy raw materials that their contracts also be revised by the sellers. This situation has especially followed two powerful influences: the great increase in the costs of energy following the increased price of oil by the OPEC countries since 1974, and the international spread of inflation resulting partly from that cause and partly from deficit financing of many governments who are spending more than they collect in revenues. Thus, even some contractual relations between private enterprises have become unstable. Adding to concern over the stability of agreements has been the frequent changes in military control of many governments in the less developed economies, often accompanied by violence and danger to investments.

In the case of the aluminum industry, such conditions have contributed to a slow-down of investment in new primary aluminum capacity in the face of general expectation that shortages of metal are likely among the market economies by the early 1980's. Security of investment and adequate return on investment have become too uncertain to restore the former willingness to expand investment that prevailed in the 1950's and 1960's in the western economies.

It is therefore desirable to seek for guidelines to help overcome reluctant investment while evaluating older agreements that are still honored, and agreements that have recently been adopted.

Guidelines are affected by some questions from a global, world-wide perspective:

(1) What volume of markets is most likely to be served by new projects?

(2) What regions or countries may enjoy the largest growth of markets?

(3) What volume of investment capital will be required?

(4) What are the possible sources of capital?

After these questions, the next subjects are

(5) The current market supply channels for bauxite, alumina and aluminum.

(6) The principal corporate and financial ties in the marketing channels between producing countries and consumers.

(7) The types and characteristics of agreements between governments and consumers of bauxite, alumina and aluminum.

(8) What guidelines should developing countries consider to encourage investment in new bauxite, alumina or aluminum projects.

1. The volume of future markets for new projects

The market opportunities for 20 or more years may be impossible to estimate with high accuracy, but the nature of the aluminum industry will give the most favorable competing position to those developing countries that shape their policies and guidelines within at least a 20 year vision. It make take 5 to 10 years to discover, appraise and develop a new major bauxite resource in some regions where infrastructure is lacking. It may take only 2 to 4 years more to build new alumina plants and smelters based on new bauxite projects, but it can take up to 10 years to build hydroelectric projects on which some new smelters will depend. These facilities are very capital intensive, have an initial service life of 20 to 30 years and over 50 years for some power projects. Investors, whether governments or private corporations, need assurance that the facilities will operate during such long service lives and pay back the heavy investments. Furthermore, where such facilities are linked to a wide variety of consuming industries in other countries, these consuming channels depend for their economic survival upon a dependable supply of the primary metal and the supporting supplies of bauxite and alumina.

Therefore, conditions of dependable supply and long service life for the basic bauxite, alumina and aluminum projects are desirable for both the industrialized

market economies and for the centrally planned economies (CPE's), for both private corporate investors and for governments as investors.

Developing countries cannot justify for export markets small bauxite projects, small alumina plants and small smelters requiring small investment and having high unit costs of output. The most economical investment scale has become so large and the competition for capital funds so great, that the developing countries should expect to have to meet the conditions needed for large investments. Among these conditions are policies and commitments that promise to work for 20 years or more.

Accordingly, it is helpful to consider a rough estimate of the increase in world demand for primary aluminum by the year 2000. Including demand of the CPE's, the U.S. Bureau of Mines suggests by 1985 an increased demand of 14 million metric tons over 1973, and by 2000, another 27 million metric tons.[1/] The world demand would thus increase from 14 million metric tons in 1973 to about 54 million tons in the year 2000.

In meeting the increase in demand until 1985, the staff of the World Bank suggests one set of estimates for the future shares of the developing market economies in serving the developed market economies, excluding the CPE's. The Bank staff sees the developing economies between 1975 and 1985 more than doubling the production of bauxite, and alumina, and multiplying by nearly five times the production of aluminum. These are faster rates of growth than the World Bank staff foresees for the developed economies. These rates would be even higher to the extent that the developing economies increase their exports to any of the CPE's, especially to the Soviet Union and People's Republic of China. The Bank staff's classification of countries and regions is shown in Appendix A.

1/ U.S. Bureau of Mines, Mineral Facts and Problems, 1975 edition, p. 60.

Projections by World Bank Staff of Production, 1985
(Thousand metric tons)

Commodity	Economic region	Actual 1975 production	Projected production, 1985 Tons	% increase from 1975
Bauxite	World	68,973	155,000	125
	Developed	31,558	62,000	96
	Developing	37,415	93,000	149
Alumina	World	21,489	47,000	119
	Developed	16,533	35,500	115
	Developing	4,957	11,500	132
Aluminum	World	9,903	23,000	132
	Developed	9,060	19,000	110
	Developing	842	4,000	375

Source: Compiled from World Bank Reprint Series, No. 46, Investment Requirements in the Non-fuel Mineral Sector in the Developing Countries, April, 1977, p. 266.

One can expect this relationship to continue to favor the developing economies to the year 2000 if satisfactory economic conditions are maintained. Only if fear of political unreliability becomes more important than economic advantages in the developing countries would this outlook change to the detriment of those economies. In other words, developed countries may be willing to pay a higher price for political security and adopt alternate minerals or processes to substitute for the best bauxites now held by the developing countries. The developed countries may then build alumina plants near those less economical deposits, and in home countries build the smelters and power projects/regardless of lower cost possibilities in some developing countries. The World Bank projections and any extension of them to the year 2000 are, therefore, only targets for developing countries to consider.

2. The regions or countries of largest market growth.

The developing countries may be expected to have the largest rates of growth of demand for aluminum because of the low level of present consumption. But the

developed economies that now are the largest markets will continue to have the largest growth in total tons of demand. Consequently, the developing countries will have to continue to negotiate most of the agreements on bauxite, alumina or aluminum with representatives of the developed countries. These include among the central planned economies the Soviet Union, and among the developed market economies, the United States, Western Europe and Japan. The People's Republic of China may be a special case for the importation of large quantities of aluminum for an indefinite period, but may ultimately become a substantial producer and possibly a significant importer of bauxite or alumina.

As of 1976, of the total estimated world consumption of primary aluminum of 13.9 million metric tons, the Soviet Union may have absorbed 12 percent (1.7 million), the United States and Canada, 35 percent (4.8 million), Western Europe, 25 percent (3.5 million tons), Japan, 11 percent (1.5 million). These largest consumers took 83% of world consumption (11.4 million tons).[2/] Approximately the same percentages were consumed of the world production of bauxite and alumina.

To share in the growth of these largest markets, the developing countries will face competition from the developed economies in supplying bauxite as well as supplying alumina and aluminum. The projections of production by the World Bank staff to 1985 assume that the developed economies will still supply 40 percent of the bauxite, 76 percent of the alumina, and 83 percent of the aluminum. If the substitution of non-bauxitic minerals were forced upon the developed economies by high taxes or price policies or political instability of developing countries, then the growth of bauxite and alumina production would be sharply curtailed in the developing countries, and also primary aluminum production.

2/ Metallgesellschaft, Metal Statistics, 1966-1976, pp. 12-13.

3. What volume of investment capital will be required?

The investment requirements of the developing economies to produce bauxite, alumina and aluminum for the World Bank staff's projected output by 1985 is a total of $25 billion (U.S. dollars, 1975 price level) between 1976 and 1985. Funds from foreign sources would total about $17 billion, and the domestic financing by these economies would total about $7.4 billion.[3/] Therefore, the developing economies must look for most of these funds to the developed countries and the international financial institutions to which the developed economies contribute.

But these demands for bauxite-alumina-aluminum projects from the developing countries must compete with other demands for capital they will make upon the developed economies. This competition for funds will cover the entire range of programs of the developing economies including non-industrial projects and borrowings for general governmental purposes. Solely for other mineral based investments, the developing countries may require $71 billion between 1976 and 1985 according to the World Bank staff. These will include copper, lead, zinc, iron ore, phosphate rock, tin, nickel and manganese.

Alumina and aluminum projects are among the most capital intensive industries. For individual projects in 1975 dollars, the capital cost of capacity, as estimated by the Bank staff, is $85 per ton of bauxite excluding infrastructure, $750 per ton of alumina in an unintegrated plant, and $2,800 per ton of aluminum in an unintegrated plant.

The scale of investment for important projects planned for the next 5 to 10 years may be illustrated by a few examples:

Bauxite, Brazil, Trombetas project, Alcan consortium, 3.6 million tons, U.S. $300 million.

Alumina, Ireland, Alcan consortium, 800,000 tons, U.S.$500 million.

Alumina and bauxite, Western Australia, Reynolds consortium, 1 million tons, U.S.$800 million.

3/ World Bank staff report, cited above, p. 270.

Alumina, Indonesia government, 600,000 tons, U.S.$450 million.

Primary aluminum and electric power, Indonesia (Asahan project), 225,000 tons and 513,000 kilowatts, $1.9 billion.

Aluminum and electric power, Costa Rica, 280,000 tons and 700,000 kilowatts, $1.3 billion.

4. Possible sources of capital

The very large capital requirements for individual projects as compared with 20 years ago have stimulated the use of joint ventures or consortia to share the investment and the risk. These consortia may include not only private corporations but also enterprises owned or controlled by governments of the market economies. This pooling of interests creates strong financial entities and improves their ability to borrow funds and to raise equity capital.

Those who provide most of the long term loans and capital will determine the conditions of the loans and the kinds of agreements they will accept from the developing countries. For bauxite and alumina projects, the principal sources today are the leading private aluminum corporations, the Soviet Union, and some of the Mid-East oil producing countries. For supporting infrastructure such as railroads, townships and ports, the sources include the private aluminum corporations, the governments, the Soviet Union, and the international lending agencies such as the World Bank, International Finance Corporation, the Inter-American Development Bank, the Asian Development Bank, OPEC Fund, and Arab development funds. For the power projects to support the aluminum smelters, the funds may come from the international lending agencies, from Mid-East oil producing countries, from some governments such as the Soviet Union and Japan in bi-lateral agreements, and from private investors and lending institutions. Such loans usually require guaranteed contracts for the sale of power to the associated smelters. The finances for the smelters come from the aluminum companies, both integrated major producers and smaller consumers including aluminum fabricators, and from some governments, including the Mid-East, Japan and the Soviet Union.

5. The current market supply channels for bauxite, alumina and aluminum.

Two market groups are usually considered separately, the open market economies and the closed or centrally planned economies (CPE's). The open market economies include mixed economies of both government and private ownership of enterprises. The CPE's include the socialist economies. Some developing countries belong in either group. From the viewpoint of sharing in the growth of markets in these two groups, the developing countries may consider each group separately.

The centrally planned economies (CPE's)

The CPE's of Eastern Europe and the Soviet Union engage in considerable trade among themselves in bauxite, alumina and aluminum. The Soviet Union, however, is a major importer of bauxite and alumina from the open market economies and the developing countries, and in addition exports aluminum to Western Europe and Japan. In 1975 when the Soviet Union may have produced at least 2 million metric tons of primary aluminum, imports of 3.5 million tons of bauxite and 1 million tons of alumina were the equivalent of about 1.4 million tons of metal.

The bauxite and alumina imports moved through the following channels:

Countries	1975 Metric tons (000)	Suppliers
Bauxite		
Republic of Guinea.....	1,844	Guinea government enterprise, built with Soviet help.
Yugoslavia.....	947	State controlled bauxite companies.
Greece.....	611	Private companies.
Turkey.....	75	State controlled mine.
Alumina		
Hungary.....	405	State enterprise.
Jamaica.....	169	Private companies.
Guyana.....	121	State enterprise.
U.S.A.	114	Private companies.
Italy.....	76	
India.....	47	
Turkey.....	36	State controlled company.

Source: Aluminium (Dusseldorf), April, 1977.

The Soviet Union has provided technical and financial assistance in bauxite developments in Guinea and Turkey, for alumina projects in Yugoslavia and India (technical aid only), and for aluminum smelters in Turkey, Egypt and India (technical aid only). Much of this help has been for repayment in bauxite and alumina. On the other hand, the Soviet Union has arranged to purchase financial and technical assistance from the French company, Pechiney Ugine Kuhlmann, for construction of a one million ton alumina plant and 500,000 ton smelter.

The long-range expansion plans for more aluminum and alumina capacity in the Soviet Union will support additional imports of bauxite or alumina to supplement the inadequate or unsatisfactory domestic resources of bauxite, alunite and nepheline. Therefore, developing countries will continue to find the U.S.S.R. interested in providing technical help and mining and other equipment in exchange for bauxite or alumina.

On the other hand, the developing countries may expect some growing competition among the market economies in additional aluminum exports from Hungary and the Soviet Union. Very significant to Hungary could be further technical assistance to developing countries in the studies of bauxite resources and design and help in construction of alumina plants. As the leading producer of bauxite in Eastern Europe and a major producer and exporter of alumina, Hungary has developed a special technical proficiency. Hungary has provided such help in bauxite investigations to Guinea, Jamaica and Guyana, and has helped in the construction and supply of equipment for alumina plants in Rumania, India, and Yugoslavia.

With regard to the People's Republic of China, that government is presently an importer of primary aluminum. Domestic production is probably at the level of 200,000 tons per year while imports are rising above 150,000 tons per year. Supplying countries have included Canada, Japan, France, U.S.A., and Norway. China

will require much more aluminum to support its expanding economy. Developing countries may find markets in China for some time until the country can become more self-sufficient. A promising opportunity may be in the trade of aluminum for petroleum if China's expectations are met for large petroleum developments.

The open market economies

The principal exporters of bauxite or alumina outside of the CPE's are Australia, Jamaica, Guinea, Surinam, Guyana, Greece, Yugoslavia, the Dominican Republic, Haiti, Malaysia and Indonesia. Of these, all but Australia, Greece and Yugoslavia are mong the less developed economies.

The principal importers of bauxite or alumina are the United States, Canada, West Germany, the Netherlands, Norway, the United Kingdom, and Japan, all among the leading developed countries. These produced in 1974 77% of the primary aluminum output of the open market economies (8.5 million metric tons out of 11.1 million). All of these countries except the United States lack bauxite and are wholly dependent upon imported bauxite or alumina, but even the U.S.A. relies for 90% of its aluminum production upon imported bauxite or alumina.

Most of the rest of the trade in bauxite is into Italy, and of alumina into the widely distributed aluminum smelters of Mexico, Venezuela, Argentina, Austria, Iceland, Spain, Sweden, Switzerland, Egypt, Ghana, the Republic of South Africa, Bahrain, Iran, South Korea, Taiwan, and New Zealand.

For convenient reference, Appendix B gives recent production figures for bauxite, alumina and aluminum for all countries, as compiled by the U.S. Bureau of Mines.

Six multinational corporations

Six multinational aluminum corporations and their subsidiaries are the channels for marketing most of the bauxite and alumina output of the developing countries and also of Australia. This predominant position follows from a number of influences. First, they control their own supplies of bauxite and alumina in order to protect their heavy investment in 54% of the primary aluminum capacity of the open market economies (7.2 million metric tons out of 13.3 million). They do not want to expose such investments to the uncertainties of depending exclusively upon third parties for most of their bauxite, but they do buy some bauxite at times from each other and from third parties. Second, they must have a steady supply of metal to support the large fabricating investments they have created through their promotion of markets for aluminum. Third, they are obligated to provide dependable supplies of metal to the other extensive markets they have stimulated through their technology, product design, and engineering help to customers. These markets spread into a vast superstructure of industries now relying upon aluminum--automotive; commercial land, sea and air transport; containers for packaging and shipping; building and construction; electrical industry products; household appliances and equipment; and industrial equipment. Fourth, they have long term obligations to supply bauxite or alumina to other aluminum companies. They have assumed these obligations to supply other aluminum companies by sharing financial risks in joint ventures and consortiums because of the rising costs and requirements for large scale bauxite and alumina projects. Fifth, they are required by lenders to have assured bauxite and alumina resources in order to be able to borrow and repay the large funds needed to serve expanding aluminum markets.

From the viewpoint of the developing countries, arrangements with these six multinational corporations have had greater advantages than if their bauxite and alumina resources could be divided among smaller or unintegrated enterprises. The smaller enterprises would have had higher production costs, less ability to finance infrastructure of railroads, ports and townsites and social services to workers, less profitability and less revenues for government to share.

The six corporations and countries supplying their bauxite or alumina are as follows:[4/]

Alcan Aluminium Limited (Alcan), Canada, world-wide equity in primary aluminum capacity, 1977, 1,483,000 metric tons. Approximate own bauxite requirements, 6 million tons per year plus for substantial sales of alumina to others.

Sources of bauxite: Jamaica, alumina, 100% subsidiary.
Brazil, alumina, 100% subsidiary.
Guinea, bauxite, 13% of consortium.
India, alumina, 55% of joint venture.
Malaysia, bauxite, 87.5% ownership.
Australia, alumina, 21% of consortium.
France, bauxite sold to others.
Brazil, bauxite, 10% of consortium. Under construction.
Ireland, alumina with bauxite from Guinea, 40% of consortium. To be built.
Guyana, Surinam, Sierra Leone, purchases from other parties.

Aluminum Company of America (Alcoa), U.S.A., world-wide equity in primary aluminum capacity, 1977, 1,766,000 metric tons. Approximate own bauxite requirements, 7 million tons per year, plus substantial sales of alumina to others.

Sources of bauxite: Jamaica, bauxite and alumina, 94% subsidiary.
Surinam, bauxite and alumina, 100% subsidiary.
Dominican Republic, bauxite, 100% subsidiary.
Brazil, alumina, 50% subsidiary.
Guinea, bauxite, 13% of consortium.
United States, bauxite, alumina, 100% subsidiary.
Australia, alumina, 51% subsidiary.

4/ World-wide equity in primary aluminum capacity as calculated by Stewart R. Spector, The Spector Report, Oppenheimer & Co., Inc., New York, February 17, 1978.

Kaiser Aluminum & Chemical Corporation (Kaiser), U.S.A., world-wide equity in primary aluminum capacity, 1,058,000 metric tons. Approximate bauxite requirements, 4 million tons per year plus substantial sales of alumina to others.

Sources of bauxite: Jamaica, bauxite, 49% subsidiary.
Jamaica, alumina, 36.5% joint venture.
Australia, bauxite and alumina, 45% joint venture.

Reynolds Metals Company (Reynolds), U.S.A., world-wide equity in primary aluminum capacity, 1,206,000 metric tons. Approximate bauxite requirements, 5 million tons per year.

Sources of bauxite: Jamaica, bauxite, 49% subsidiary.
Jamaica, alumina, 36.5% joint venture.
Haiti, bauxite, 100% subsidiary.
U.S.A., bauxite and alumina, 100%.
Brazil, bauxite, 5% of consortium.
Ghana, bauxite, 46% subsidiary.
France, bauxite, 46% subsidiary.
Australia, bauxite, purchase option, 50 million long dry tons.
Australia, bauxite-alumina, 35% of joint venture in formation.

Pechiney Ugine Kuhlmann (Pechiney), France, world-wide equity in primary aluminum capacity, 987,000 metric tons. Approximate bauxite requirements, 4 million tons per year plus substantial sales of alumina to others.

Sources of bauxite: Australia, alumina, consortium.
Guinea, bauxite, 10% of consortium.
Guinea, alumina, consortium.
France, bauxite, alumina, 100%.
Greece, bauxite, alumina, 77% subsidiary.

Swiss Aluminium Ltd. (Alusuisse), Switzerland, world-wide equity in primary aluminum capacity, 660,000 metric tons. Approximate bauxite requirements, 2.7 million metric tons per year, plus bauxite and alumina sales to others.

Sources of bauxite: Sierra Leone bauxite, 100% subsidiary.
Australia, bauxite, alumina, 50% subsidiary.
France, bauxite, 99.98% subsidiary.
Guinea, alumina, 5% of consortium.
Guinea, bauxite, 50% of project in formation.

Other channels of bauxite-alumina trade

In addition to the direct uses of bauxite and alumina produced by the six major multinational corporations for their own use in world-wide smelters, they and other producers of bauxite and alumina sell within the open market economies. The leading

other sellers are state controlled bauxite and alumina companies in Yugoslavia; five privately owned bauxite companies in Greece; the state owned bauxite-alumina company in Guyana; and the state owned bauxite company in Indonesia. The principal buyers of alumina are aluminum smelters owned by governmen s and private investors in Norway, West Germany, Spain, Sweden, Mexico, Argentina, Venezuela, Egypt, Republic of South Africa, Bahrain, Japan, South Korea, and New Zealand.

Aluminum market channels

New aluminum smelters already committed to be built and some under consideration by others besides the six leading companies will open wider market channels for bauxite and alumina projects in the developing countries. Consequently, more bauxite-alumina projects are planned by the governments of Guinea, Indonesia, Brazil, Venezuela, Jamaica, Surinam and India. In addition, government participation in smelters for the first time is projected in Guinea, Brazil, Mexico, Surinam and Guyana, based on hydro projects. The Jamaica Government proposed to participate in the Mexican smelter, but the Mexican Government cancelled this project in 1978. The Government of Iraq may build a smelter.

Some of these projects may not materialize, but they are in accord with the trend toward the growing share in world aluminum markets of new entrants competing with the six leading companies.

Smelters have been established in the past 10 years in Iran and Bahrain in the Middle East. Construction has begun for a smelter in Dubai. Expansions of capacity are underway or expected in Yugoslavia, Spain, Norway, and Venezuela. In the two major market economies, the United States and Japan, a few producers will extend their primary capacity. But further expansion in these countries has run into the obstacles of extremely high cost power and environmental restrictions on new plant sites. Due mainly to high costs of oil for power, the Japanese aluminum industry

has become uneconomic and unprofitable. It is operating presently at less than three-fourths of capacity. It is looking for new smelter capacity outside of Japan, particularly under recent agreements with Indonesia, Venezuela and Brazil where hydroelectric power will be available at moderate cost.

The U.S. aluminum industry, operating at 90% of capacity, is still economic and profitable, but faces a doubling or even greater increase in costs of power for new smelter capacity in the 1980's. Expansion plans today are very limited, and it is expected that the U.S.A. will have to rely increasingly on imported aluminum by the early 1980's. This situation could become even more difficult by the late 1980's because nearly one-third of the U.S. primary aluminum capacity in the Pacific Northwest, 1.5 million metric tons, may lose its present low-cost firm hydroelectric power when the contracts expire with the Federal Government. Unless new legislation is adopted to continue to share this power with the smelters, some of them may become uneconomic and shut-down. Elsewhere in Texas, Alcoa is closing at least temporarily an 160,000 ton smelter because of the high cost of power generated from natural gas. It is conceivable that more U.S. capacity will be faced with the same situation that has forced the closing of over one-fourth of Japanese capacity.

The prospects, accordingly, do favor more smelter capacity in countries that have undeveloped hydro power or surplus gas that can not be put into more valuable petrochemicals or exported as frozen liquid gas. These countries include the Mid-East oil and gas producers and Algeria. For smelters based on hydroelectric power, Guinea, Mexico, Guyana, Surinam, Brazil and Costa Rica are leading candidates today.

6. Principal corporate, financial and cooperative ties between producing countries and consumers

Bauxite and alumina ties

Among the developing countries, governments own the bauxite deposits, and enter contracts, leases, or concessions with others for development, or develop the bauxite themselves.

Australia

Although not a developing country, Australia's arrangements and ties with companies must be considered because of its leading position in bauxite reserves, and the powerful competition Australia offers and will continue to offer developing countries in serving the same markets. Private corporations produce bauxite and alumina without governmental participation. They obtain bauxite leases from the individual Australian states (Queensland and Western Australia), and from the national Commonwealth government in the territory of Northern Australia. The companies are free to sell bauxite and alumina for domestic use and to export without price control by the states although the national government can influence prices under the power to grant or refuse export licenses. The recently displaced Labor Government planned to restrict export licenses unless export prices were high enough to suit it, but the succeeding Liberal Government has not yet imposed such a policy. While prices under existing contracts are honored, the national government is pressing for revision of low priced contracts and for higher price levels in new bauxite contracts. In the event of export license control over prices, the benefits would go directly to the companies, and only indirectly to the government through the taxation of profits.

The Australian states collect only royalties. The national government collects income taxes, currently at the rate of 45% of taxable profits, and royalty only in the Northern Territory. The various royalties presently are between U.S. $0.17 and $1.14 per metric ton in Western Australia and Queensland, respectively, and when combined with the income tax, constitute a much lower financial burden than is placed upon bauxite producers in the other leading bauxite exporting countries of Guinea, Surinam, and Jamaica.

Both the Australian government and the individual states have granted bauxite leases conditional upon participation of private Australian capital in the enterprises. Bauxite and alumina are produced in Western Australia by a company in which Australian capital provided 49% of the equity and Alcoa (U.S.A.), 51%. In the Northern Territory, a combined bauxite-alumina project at Gove was initiated and is technically serviced by Alusuisse. It was financed 30% by Australian capital and 70% by Alusuisse and is operated by Nabalco Pty. Ltd., a 50-50 joint venture of Alusuisse and the Australian interests. In Queensland, a third bauxite producer, Comalco, is a joint venture of Australian capital with Kaiser (U.S.A.). A related alumina plant is a joint venture of Australian capital, Kaiser, Pechiney and Alcan.

In the case of alumina prices used by Alusuisse, Kaiser and Pechiney for transfer of alumina to their parent or affiliated companies outside of Australia, the Australian Commissioner of Inland Revenue is investigating with the view of requiring higher prices and income tax payments.

The policies of the Australian government, the states, and the freedom of the private companies, strengthen the marketing of Australian bauxite and alumina throughout the world, and especially with Japan. The national government is a member of the International Bauxite Association but is following only to a limited degree the leadership of Jamaica toward taxing bauxite to produce large revenues, or toward price control. As a result, Alcoa of Australia, the lowest cost producer of alumina in the world, has been able to gain world-wide markets by selling at lowest prices to unintegrated smelters such as in Bahrain and Argentina, as well as to the U.S.A. Bauxite and alumina from Gove and Queensland also move into world-wide markets, especially to Japan, but also to Europe. Two new alumina projects will increase the competition of Australia with developing countries in export markets.

Republic of Guinea

Guinea is the second largest bauxite producer after Australia, having passed Jamaica in 1976. Possessing the largest high quality bauxite reserves and rivaling

Australia in total reserves, Guinea equals Australia as a competitor against other developing countries. The Government also has substantial programs to increase production from the current level of 11 million metric tons per year to about 30 million. Therefore, other developing countries should give careful consideration in their policies to those of Guinea.

Bauxite is converted into alumina for export by the Friguia private consortium in which Government in 1973 acquired a 49% interest. Bauxite is produced for export by another private consortium, Compagnie Des Bauxites de Guinee (CBG), a U.S. corporation, in which Government obtained a 49% interest in exchange for a 75 year bauxite concession when CBG was established in 1963. A third bauxite producer is entirely owned by Government, Office de Bauxites de Kindia, and produces bauxite for export primarily to the Soviet Union.

The Friguia consortium originated in 1958 under the former colonial government and sponsorship of Pechiney. It now includes not only Pechiney but Noranda (U.S.A.), British Alumirium (U.K.), Alusuisse, and Vereinigte Aluminium Werke (West Germany). It was compelled to sell a 49% interest to Government in 1973, evidently to be paid for over a period of time. The project includes bauxite mine, alumina plant (700,000 metric tons), townsite and port facilities, all financed by the private companies. Management is controlled by the companies, and they take all the output. The Government broke the 1958 agreement by enacting a bauxite levy in 1975 applicable to all producers of bauxite, alumina, alumina and iron ore. This followed the precedent set by Jamaica in 1974. The levy, however, is very moderate, 1% of the price of a ton of aluminum ingot per ton of alumina exported. Currently, this is about U.S.$11 per ton of alumina as compared with the Jamaica bauxite levy applied to Alcan of $42 per metric ton of alumina, almost four times greater.

The Government also is entitled to a 65% tax on profits of Friguia, but at least until recently, there have been very little or no taxable profits. For this tax the Government gave up any claim to dividends on its 49% share of equity.

The CBG consortium includes Alcoa, Alcan, Martin Marietta Aluminum (U.S.A), Pechiney, Vereinigte Aluminium Werke, and Alumetal (Italy). Exports are to reach 9 million tons per year. As of 1975, the committed investment in mine, railroad, port and townsite was $316 million. Government financed the infrastructure, railroad, port and townsite by borrowing most of the $108 million cost from the World Bank and U.S. Government's Agency for International Development. These borrowings, however, were guaranteed by the private companies. In addition, they directly invested the balance of over $200 million. The Board of Directors of CBG is equally divided between Government and the companies, but the companies manage CBG and have majority control. They have contracted to buy the output at prices subject to cost escalation. From these purchases, CBG will pay off the Government's debt, and in effect, the companies are giving the Government ownership of railroad, port and townsite in exchange for the bauxite.

The original agreement provided that Government would obtain revenues from CBG for repayment of debt for infrastructure, taken out of a tax of 65% of profits. No other taxes or royalties were to be paid. For the 65% tax on profits the Government gave up any claim to dividends on its 49% share of equity. Production began in 1973, and there were no taxable profits after debt service by the end of 1974 when Government unilaterally broke the agreement in 1975 by imposing a bauxite export tax, following the precedent of Jamaica. However, the tax is about half the Jamaica levy. In 1978 it is about $8.43 per metric ton as compared with somewhat over $16 per metric ton for Jamaica bauxite. The Guinea bauxite has higher ocean freight to markets than Jamaica bauxite, but has offsetting advantages from the lower bauxite levy, the much higher quality of ore, and the lesser costs of using it to produce alumina.

The Government bauxite enterprise at Kindia produces about 2.5 million tons of bauxite per year, nearly all for export to the Soviet Union under a 30 year contract. Up to 250,000 tons per year can be sold to other buyers. The U.S.S.R. in 1970 agreed to help this project and committed a loan of about U.S.$113 million for mine, railroad, port and infrastructure, including for Soviet equipment and services. Guinean personnel now run the operation with help from Soviet personnel, and Soviet personnel run the railroad. The bauxite exports will repay the loan. Shipments above those to repay the loan are reported to be sold to the U.S.S.R. under a separate price arrangement, but may also be used to repay other debts to the Soviet Union including $150 million for commercial obligations and $40 million for military supplies. Since the ore is lower in grade than the CBG bauxite, the price is lower. The U.S.S.R. also pays a bauxite levy on the exports but at a lower rate than the CBG bauxite due to lower grade.

The Friguia, CBG, and Government bauxite operations are in different regions of Guinea. But other regions have large and promising deposits of bauxite. To develop one of these, the Government has entered a 50-50 joint venture with Alusuisse for an 8 million ton project. The time schedule is uncertain because the mine will be linked with a $555 million railroad to be built across Guinea. It also may be linked with an alumina plant in which the Yugoslav firm, Energoproject, may participate. This firm in 1971 entered a separate joint venture, 51% owned by the Government, to develop bauxite (5 million tons per year), alumina (300,000 tons) and aluminum (150,000 tons).

A third program was formed in 1976 through a 50% interest of the Government in the Guinean-Arab Alumina and Aluminium Company. The other 50% will be held by Libya, Egypt, Kuwait, Saudi Arabia and the United Arab Emirates. The targets are 9 million tons of bauxite per year, 2 million tons of alumina, and a possible

smelter. More than one billion dollars will be needed for this program. Alusuisse is to explore the bauxite deposits and make feasibility studies.

In these proposed projects, Government obtains at least a 50% equity and in addition the right to receive 65% of profits. Additional revenues will come from the levies on bauxite, alumina and aluminum as provided by the law of 1975. The Government clearly recognizes that to induce the vast sums of outside investment, it will have to be moderate in its policies so that the total tax burdens leave the outside investors with sufficient profit to compete with alternative ways of investing that capital. President Touré is relying upon outside capital and technology, and has publicly recognized the poor performance of industrial companies wholly owned and manaced by the Government. His policies toward the bauxite-alumina-aluminum investors are influenced by ambitions for other major developments, including a hydroelectric project for which the Saudi Development Fund has commited a loan of $400 million; a $700 million iron ore project; and uranium, diamond, gold mining, and petroleum in which European, U.S. and Japanese companies are variously interested. In the framework of achieving the overall ambitions of the Guinea Government, the policies toward bauxite, alumina and aluminum may be expected to be harmonious, and act as a competing influence upon policies of other developing countries.

Jamaica

The changes since 1974 in the corporate, financial and other relationships between the Government of Jamaica and bauxite-alumina producers are extremely important to the United States, and very significant to developing countries that compete with Jamaica in the sale of bauxite and alumina. That year, under pressure from the increased price of oil, adverse balance of payments, and growing internal

deficit, the Government unilaterally broke its agreements with the six North American producers. The Government imposed on them the highest bauxite taxes in the world, and refused to arbitrate the matter under its agreement with the World Bank Center for the Settlement of Investment Disputes. The Government then moved to buy back all of the bauxite lands of the companies, to acquire a 51% interest in the bauxite mining facilities, additional interests in the alumina producers, to set up its own alumina and bauxite business, including a Government owned alumina plant, and to invest jointly in a smelter with Trinidad and Guyana. The Government also became a primary sponsor in 1974 of the International Bauxite Association to obtain support from other bauxite producing countries for similar tax and pricing policies. These policies also were part of a larger program of socialism and restrictions on private enterprise, changing the economic climate in Jamaica for new privately financed ventures. Complicating the change in economic climate was the continued large unemployment of youth, growing crime rate, violence against Jamaicans of all races, and the declaration of a national emergency.

To meet the needs of the United States aluminum industry, Jamaica supplied in 1974 55% of the requirements of the smelters. This supply was 900,000 short tons of alumina, and enough bauxite to produce 3.6 million short tons of alumina by using half of the alumina capacity of the U.S.A. The unique dependency of the U.S. alumina plants upon Jamaica bauxite came from the original design and operations of those plants to deal with the special characteristics of the Jamaica ore. A change to other bauxite would require adjustments and changes in production costs.

The U.S. producers of bauxite for export were Alcoa, Kaiser and Reynolds. Alumina was also produced by Alcoa, by Alcan in two alumina plants, by Revere Copper and Brass, and by the consortium, Alpart (Anaconda, Kaiser and Reynolds).

The five alumina plants had an annual capacity of 3 million metric tons. The bauxite export capacity was about 8 million tons and only to serve U.S. alumina plants.

Until 1974, the U.S. Jamaica producers had separate agreements with the Government to determine the pricing or taxing of alumina and bauxite. The general Jamaica income tax applied to all companies, then at the level of 45% of profits. In addition, there was a special law to determine the amount of taxable profits on bauxite. As a result, until 1974 the bauxite producers were paying in royalty and income tax somewhat less than U.S.$3.00 per long dry ton exported. The tax payment to Jamaica was limited to the amount that the U.S. companies could claim as an offsetting credit against double taxation by the U.S. Government. Compared with the values between $10 and $16 per long ton that the companies used for tax purposes in the United States, the tax and royalty paid to Jamaica was between 17% and 25%. The bauxite had no outside market value because it was not sold commercially to others. It was only used in alumina plants designed for that kind of ore by Alcan and the U.S. companies. The tax values and the amount of tax were considerably higher than in most other countries producing metallurgical bauxite. Consequently, there was no discrimination against Jamaica in the tax arrangements.

However, the U.S. Treasury Department had been negotiating for a few years with the Jamaica Government to have lower values used for the bauxite in order to increase the Treasury's revenues from taxing the profits on aluminum while reducing the tax revenues to Jamaica. The impasse in negotiations ended when the OPEC increase in the price of oil and the poor financial position of Jamaica gave the occasion for the new bauxite levy and higher royalty. These increased by about four times the revenues on bauxite to U.S.$11.71 per long dry ton. The new arrangement also

credited the income tax against the bauxite levy, so that the levy and royalty fixed the return to Government, and the income tax became only a bookkeeping matter. To protect total revenues, the new bauxite levy law allowed the Government to require minimum annual payments on a tonnage equal to about 90% of production capacity of each company, even if that amount was not produced.

The same payments were required on bauxite converted to alumina. The result was that the alumina producers also sharply increased payments. Until then, taxes on Alcan, the largest producer, had been falling off due to rising costs, and the taxes on the other alumina producers had produced little revenue per ton of alumina due to recent start-up of production and high initial costs.

The final result was that the Government increased its revenues from the producers from about U.S.$26 million in 1973 to about $180 million in 1974. This put the industry in the position of contributing 40% more than all other current revenues the Government had received in 1973. Yet four years later, by 1978, the Government's total economic and financial position had continued to deteriorate. The internal and external financial deficits had increased, and the Jamaica dollar had been devalued by 40%. The bauxite-alumina industry could not solve the problems of Jamaica.

It is important to note that there has been no general criticism of the bauxite-alumina companies and their social responsibilities. For years they have paid much higher wages than other Jamaican industries. They had provided intensive technical training of Jamaican workers, schooling, and had improved agriculture on their lands and helped house tenant farmers. Since the 1940's they had acquired substantial agricultural lands because that was the only way they could get the bauxite. The Government had no bauxite on its small lands. Yet, by law during World War II

the bauxite on private lands had been made the property of the Government. This was a very different situation from some other developing countries where the bauxite is on government land. As a poor country, Jamaica never had the resources to establish bauxite and alumina plants nor to participate in partnership with the $800 million investment that the private companies had made over the years. The Government could not buy a share in the investments by offering bauxite as Guinea now does, because the bauxite was on private lands that had first to be purchased with funds the Government could not supply.

In negotiations leading up to the bauxite levy, the companies had offered to assure Jamaica $80 million per year, or more than three times the payments of 1973. This offer was rejected by the Government. The passage of the bauxite levy violated the agreements with the individual companies that no other taxes would be imposed. Alcoa, Kaiser and Reynolds appealed for arbitration to the World Bank International Center for the Settlement of Investment Disputes (ICSID) on the ground that Jamaica, a participating country, had breached agreements subject to arbitration through the Center. Jamaica refused to arbitrate and unilaterally withdrew bauxite from the matters subject to arbitration under the participating agreement with the Center. The ICSID arbitration tribunal held a hearing and decided that Jamaica did not have the right to withdraw. But the Center never had to carry out its obligations because the companies withdrew their requests by 1977 after they entered new agreements with the Government.

These agreements provided for Government partnerships of 51% each in the bauxite mining operations of Kaiser and Reynolds, and a 6% interest in the combined bauxite-alumina operations of Alcoa. The Government had not moved to acquire an interest in Alpart but is negotiating for an interest in the Alcoa alumina plants. Under the agreements, the Government will purchase all of the bauxite lands and 51% of the operating business of Kaiser and Reynolds, not at current value, but at original

cost less depreciation. Since the current values were far greater than the book cost, the forced sales represented a substantial expropriation with nominal compensation.

Under the new agreements the companies obtain rights to mine enough bauxite for a 40 years supply at their current levels of production. Each company will take the bauxite at production cost plus the royalty and bauxite levy. The companies will pay rent on the leased bauxite lands and an annual return to Government for its share of the operating properties. The Government will pay interest on the debts to purchase the lands and share of the mining properties. The Government agreed to pay 10% down on the principal of the purchases and the balance over 9 years. Kaiser and Reynolds will continue to manage the operations of each partnership for 7 years and under the direction of an executive committee with equal votes for each partner. The debt to Kaiser is U.S.$20 million and to Reynolds $17.5 million. The debt to Alcoa has not been reported but is estimated at under $10 million. The ability of the Government to pay off these debts is not clear in view of its weak financial position and expanding obligations in other enterprises.

The Government obtained the right to increase its investment in the Alcoa alumina plant in order to secure alumina for its own purposes. Alcoa also kept the right to expand the capacity and to obtain an additional 40 year supply of bauxite for that operation.

In the Kaiser and Reynolds bauxite operations, the Government has the right to increase its investment in order to obtain bauxite for its own markets, and to supply additional bauxite leases for that purpose. Kaiser agreed conditionally that it will participate in the investment for 200,000 short tons of alumina capacity in a 600,000 ton alumina plant that the Government and the Government of Mexico proposed to build in Jamaica, provided the project is economically feasible and

competitive with other sources of alumina. However, the recent policy of Jamaica does not favor the private investment.

Whether the new agreements will be followed by further expansion for Alcoa in Jamaica and in bauxite production by Kaiser and Reynolds for Jamaica is uncertain under the present economic climate in Jamaica and the effect of the high bauxite levy in weakening the competitive position of Jamaica bauxite and alumina. Labor problems and violence over which the Government has not had control have seriously interfered at times with bauxite and alumina production. Attacks on Alcoa alumina plant personnel forced the temporary shutdown of operations in 1976.

One cause for future uncertainty is that rights of Kaiser and Reynolds to manage the bauxite operations need not be renewed after 7 years. The level of the bauxite levy is another deterrent to the companies. The possibility exists of a further increase after 7 or 8 years. Having made substantial investments in Jamaica, the companies had acceded to the levy rather than shut down because it would have taken time and considerable investment to develop alternative sources of bauxite and alumina. But other actions they are taking show that for additional sources of bauxite and alumina they will by-pass Jamaica.

Alcan since the 1950's had considered building a third alumina plant in Jamaica. However, the company decided late in 1977 to go ahead in Ireland with an 800,000 metric ton plant in a joint venture with Anaconda and Billiton of the Royal Dutch/Shell group. This plant will be expandable to 2.4 million tons. The Irish Government is to contribute grants of approximately $32 million out of an overall cost of some $560 million. Alcan has publicly stated that the Jamaica bauxite levy imposes a production cost disadvantage of U.S.$28 per short ton compared to other sources of alumina. The decision of Anaconda to invest in this high cost alumina plant was made against the alternative right Anaconda had to invest in an expansion in the Alpart plant in Jamaica.

Revere Copper and Brass in 1975 shut down its uneconomical 220,000 short ton alumina plant in Jamaica. The company had hoped to interest Japanese companies in participating in an expansion of capacity to make the facility economical, but the Japanese companie lost interest after Ja ica enacted th l uxite levy. Revere considers its plant an expropriated investment due to the levy, and has asked the U.S. Government's investment insurance agency, Overseas Private Investment Corporation, for compensation of up to $69 million due to expropriation by Jamaica of an investment of $95 million.

Alcoa and Reynolds are to build two new bauxite-alumina projects in Australia. Both companies will also be obtaining bauxite from new developments in the Amazon River basin of Brazil. The Alcoa project may include another alumina plant. Alcoa and Alcan will also be obtaining increased amounts of bauxite from Guinea. The disincentives in Jamaica to the bauxite producers are reflected in the decline of bauxite production from 1974 to 1977 of 25%, a drop from 15.3 million metric tons to 11.4 million.

Despite the shifting interest of the Jamaica producers to other countries, the Jamaica Government hopes to build up its own business in alumina and possibly bauxite. A provisional agreement was entered in 1975 for the Government of Venezuela to take a 10% equity in an alumina plant Jamaica proposed to build with the Government of Mexico. Venezuela was interested in buying each year 200,000 tons of alumina and 400,000 tons of bauxite. However, since then Venezuela announced a major discovery of bauxite which it may use for a million ton alumina plant it will build jointly with Alusuisse This plant can provide all of the needs of the two smelters in which that Government has a controlling position, and in addition will have alumina for export markets.

The proposed Jamaica-Mexican alumina plant of 600,000 tons capacity was to provide alumina to Algeria and Mexico, but would need additional markets in order to be

feasible. In April, the Mexican Government withdrew from the project. The loss of this market was a serious blow to the feasibility of the alumina plant. But the size of the bauxite levy alone would be a handicap to competiveness and feasibility.

This is evident from a comparison of present cost differences of producing alumina with bauxite from other sources as compared with Jamaica ore, and a comparison of delivered prices of alumina from Jamaica and from other sources. The advantage of Australian bauxite over Jamaica bauxite is reflected in Alcoa's reported prices in 1977 of alumina shipped f.o.b. Australia to the U.S.A at U.S.$116 to $132 per metric ton compared with Alcoa's alumina shipped to the U.S.A., f.o.b. Jamaica, at $176 per ton, or about 50% more. Alcoa also produces alumina in Surinam, and in 1977 shipped alumina to the U.S.A. at prices f.o.b. Surinam, about $30 less per metric ton than from Jamaica, or a 20% higher cost for Jamaica alumina.

Alcoa also ships bauxite both from Guinea and from Jamaica to the U.S.A. for conversion into alumina. The delivered prices of both bauxites were reported by Alcoa in 1977 at the level of $30 to $33 per metric ton, but after adjustment for higher quality of Guinea bauxite and lesser free moisture, the extra delivered cost of the Jamaica bauxite over the Guinea bauxite was about $26 to $29 per metric ton of alumina. Reynolds ships bauxite to the U.S.A. from Jamaica and will also shortly be receiving bauxite from Brazil. The estimated delivered price from Brazil will be about one-third less than the price from Jamaica, $20 instead of $30 per ton, and the cost of converting into alumina will give the Brazilian bauxite a greater advantage due to the lesser quantity and higher grade of Brazilian ore per ton of alumina.

Even Guyana bauxite is less costly than Jamaica bauxite for conversion to alumina. This is a very significant comparison because both Guyana and Jamaica are members of the International Bauxite Association, and Guyana now owns the former

bauxite-alumina operations of Alcan and the bauxite operations of Reynolds. Both of these were nationalized at extremely low purchase prices based on book value. On the sale of the government's Guyana bauxite no tax or levy is imposed. Some delivered prices of ore to U.S. destinations in 1976 and 197 were about the same as for Jamaica ore, but the Guyana ore is of superior quality and requires less to produce a ton of alumina. Furthermore, Guyana alumina delivered in 1977 to U.S. customers was priced at about $125 per metric ton compared with a delivered price level from Jamaica around $175. Jamaica alumina was at least 40% more costly than Guyana alumina.

In theory at least, Jamaica can improve its relations with the present producers and its attractiveness for expanded partnership operations by them, and for its own alumina or bauxite sales to consumers in other countries. The Government has shown some flexibility when it reduced the minimum tonnage on which the companies pay the bauxite levy in order to accommodate to the sharp decline in bauxite production in 1975 and 1976 due to labor troubles and to a general cut-back in aluminum markets. The Government also has slightly reduced the bauxite levy for at least one of the producers. The commercial bauxite reserves, formerly estimated at 800 million tons, are now estimated at 1.5 billion tons, enough for 110 years, and may be revised to 2 billion tons, according to the director of the Jamaica Bauxite Institute, Dr. Carlton Davis. Development of that volume is a long-term incentive if Jamaica wishes to improve its competitive position. But there still are deep-seated economic and labor conditions in Jamaica that cause uncertainty of stable costs and supply of bauxite and alumina. These conditions favor competitive opportunities to any other countries that can promise greater assurance of dependable supply at more controllable cost levels.

Surinam

In Surinam, the fourth largest producer of bauxite in the world, Alcoa and Billiton, a subsidiary of the Royal Dutch/Shell group, have had many years of association with the Government, long before that Government became independent from the Netherlands in 1975. In 1958, Alcoa entered an agreement for 25 years with the colonial government to finance and build an alumina plant, smelter, and a hydroelectric project. That basic agreement which also extended Alcoa's bauxite rights has been continued to the present with only one change. Following Jamaica's example, Surinam imposed a bauxite levy in 1974 in violation of the basic agreement. That levy was accepted in two interim agreements by Alcoa, the last one running through the year 1978. After deducting income tax, following the pattern of the Jamaica arrangement, Alcoa in 1978 may be paying the Surinam Government in combined levy and royalty about $17 per metric ton, the same level Jamaica gets. But the quality of Surinam ore is higher than Jamaica ore and the costs of producing alumina in Surinam is less than in Jamaica.

In the case of Billiton which produces only bauxite, a similar levy was imposed. Previously the company had agreed in 1973 to sell a 25% interest to the Government. It also agreed to establish a 50-50 joint venture for development of bauxite deposits in western Surinam and for production of alumina, and also aluminum if a hydro project were to be built. Billiton has been now evaluating the bauxite deposits in that area.

In 1974 Alcoa and Billiton agreed to a joint venture to build a bauxite calcining plant, 150,000 tons capacity, with the Government to have an option to purchase a one-third interest. Construction started but was suspended by 1976 to await improvement in economic conditions and in the attitude of the Government following political independence.

The Government has not yet purchased the 25% interest in Billiton and has a limited financial capability for the joint venture. It is building a 45 mile railroad connection from the bauxite deposits to a river port at a reported cost of $60 million. It must rely upon outside capital and ability to compete in bauxite and alumina markets.

The size of the bauxite levy is pressing against the producers' incentives in Surinam, particularly against Alcoa with its expanding bauxite interests in Guinea, Brazil and Australia. Total bauxite production in Surinam has fallen from a peak in 1974 of 6.9 million metric tons to 4.6 million in 1976, a drop of one-third, while Alcoa's bauxite output has risen in that period in Guinea and also its bauxite-alumina output in Australia.

Guyana

The Guyanese experience raises at least one fundamental question that Surinam and other developing countries should consider: how can a bauxite-alumina project succeed without arranging in advance for assured market outlets? Guyana did not protect itself on metallurgical bauxite when in 1971 it nationalized the bauxite-alumina operations of Alcan, nor in 1975 when it took over the bauxite operations of Reynolds. The production and sales record illustrates the problem. In 1970, the year before nationalization of Alcan's subsidiary, total Guyana bauxite production was 4.4 million metric tons. By 1977, output had apparently fallen by one-third to 3 million tons. Yet, production of primary aluminum in the market economies of which Guyana has been a part, advanced 50%, and bauxite production kept pace with that growth.

Both the Alcan and Reynolds operations were purchased at very low prices based on depreciated book values, giving Guyana a great advantage over costs of new production since 1970 in other countries, such as Guinea and the Northern Territory of

Australia. The Alcan properties were bought with promises to pay U.S. $54 million over a 20 year period at 6% interest, subject to withholding tax. The payments were deferrable if profits were not sufficient. The replacement value of the properties at the time was three to four times greater than the purchase price. Today, the replacement value is even higher.

The properties included alumina capacity of 340,000 metric tons, bauxite mining capacity over 3 million tons, and bauxite calcining capacity for refractory and abrasive markets of 740,000 long tons. The Reynolds properties were also acquired at depreciated book value less a deduction of nearly $7 million as a bauxite levy that Guyana had enacted in 1974 in violation of the previous agreement with Reynolds. The net payment was to be U.S.$10 million over 13 years at 8½% interest, free of tax, for mining properties with a capacity of at least 1.3 million tons. This was less than $10 per ton of capacity and compares with the Brazilian costs today in the Amazon Basin above $80 per ton. This was, of course, a form of economic force when the government imposed a heavy tax on the business, and then bought it at a price greatly reduced by the amount of tax.

The greatest profitability of Alcan's Guyana business had been in calcined bauxite, especially for refractories, in which Guyana had nearly a world monopoly due to the special grade of ore. This business has continued successfully, as well as a profitable volume of chemical grade ore, although competition from Guinea is likely to increase. But the largest tonnage was in metallurgical ore. Guyana did not have assurance of markets for this ore when it nationalized the Alcan and Reynolds business. This made it necessary for Guyana to employ an international minerals sales agent and pay a commission. Both Alcan and Reynolds took short-term contracts and at prices far below what Jamaica bauxite values had become under the bauxite levy.

The Government's bauxite prices did not include the bauxite levy which the Government had imposed on Reynolds just before the nationalization. The new Guyana manager admitted that in order to get business, he had to give price concessions.

Guyana hopes to integrate into aluminum production based on hydroelectric power. The plan includes a smelter of 150,000 to 220,000 metric tons capacity and a hydroelectric project of 600,000 to 1 million kilowatts. Investment would evidently be at least $1 billion. Customarily such financing requires guaranteed long-term contracts to purchase aluminum and to pay for the power. That means finding the assured markets in advance. This is the same problem that also faces neighboring Surinam.

If the smelter-hydro projects do materialize, they can provide an outlet for a considerable part of Guyana's metallurgical bauxite. But meanwhile, Guyana has not improved long-term relations with western corporate market outlets.

Indonesia

Indonesia also nationalized its bauxite industry. This was done in 1959 as part of the national program to displace most of the Dutch economic interests. Due to access to the rapidly expanding Japanese aluminum industry, the Government's bauxite enterprise, Aneka Tambang, was able to build up production from less than 400,000 metric tons in 1960 to three times higher in 1971 at 1.3 million tons. By 1976, however, because of production and transportation difficulties and recession in the Japanese aluminum industry, bauxite output had declined to about 900,000 tons. Sales are made to Japanese companies under contracts that run as long as 10 years, and for 1.2 million tons per year.

The Indonesian bauxite has to compete in Japanese markets with Australian bauxite and alumina, and Malaysian bauxite. The present price level for competing bauxites in that region is between U.S.$9.50 and $10.00 per metric tons for grades considerably higher than Jamaica ore. These prices are half to two-thirds the bauxite levy on Jamaica bauxite.

The Government since 1966 has tried to encourage foreign private investment in various minerals but under the principle that mining rights remained with the Government and the companies should operate on behalf of the Government. Some incentives and income tax reductions have been adopted, and an objective of at least 51% participation of Indonesian capital.

Alcoa has appraised very large deposits of lower grade bauxite in Kalimantan, looking toward a 1.6 million ton alumina plant, but in 1975 withdrew from this program. Three Japanese companies appraised on Bintan Island some 78 million tons of bauxite of adequate grade for alumina production but not for export, and had proposed a 400,000 ton alumina plant under conditions the Government did not accept. This project is to supply alumina for the 225,000 ton smelter that the Japanese companies are building on Sumatra, along with the Asahan hydroelectric project. Discussions for the Bintan alumina plant were not successful for Soviet financing and technical assistance. In March this year the Government entered an agreement with a joint venture of Alcoa and Kloeckner (West Germany) to build the plant.

This agreement depends on an acceptable alumina price to the Japanese, and on raising up to $450 million for the alumina project, now proposed to be 600,000 tons of capacity. A loan of $50 million may be supplied by the Government of Saudi Arabia to support a supply of 150,000 tons of alumina, presumably for a Saudi aluminum smelter. The balance of the funds would have to be borrowed, presumably against the guarantee of the Asahan aluminum project to pay for the debt service. The aluminum project is a joint venture between the Government and 12 Japanese companies, P. T. Indonesia Asahan Aluminium Company (INALUM), and may have new financial problems not expected when the joint venture was established in 1976. The Indonesian Government's equity was to be 10% and the Japanese 90%. The joint power-smelter project was then estimated to cost about U.S.$843 million, but the latest estimate is

as high as $1.9 billion. Therefore, the financial feasibility of the project is not certain unless much higher prices for aluminum are acceptable to the Japanese consumers, or the project is otherwise additionally subsidized by Japan. The basic financing plans call for nearly all of the loans to be made by three different financial agencies of the Japanese Government, including a loan to the Indonesian Government for most of its 25% share of all costs of the project. The interest rates vary between 0.75% and 5.5% on repayment terms between 15 and 30 years.

Therefore, the alumina project is tied into the construction of the power-smelter project, to the willingness of the Japanese Government to finance the greatly increased investment cost, and to the arrangements by which the Japanese aluminum industry absorbs the very high cost aluminum that will result. The Saudi Arabian interest in the alumina plant can only finance less than 10%.

Brazil

The development now beginning of some 2 billion tons of bauxite reserves in the Amazon Basin of Brazil is establishing ties of direct participation between the Government of Brazil and private companies to serve export markets for bauxite, alumina and aluminum. Up to the present, the industry from bauxite through aluminum has been serving domestic markets through three companies, including subsidiaries of Alcan and Alcoa, and a Brazilian controlled company in which the Government has a 20% interest. But the Government's role is now increasing as part of an active industrial development program, especially in the Amazon region. The Government is granting various incentives in order to encourage foreign capital, and is also providing substantial investment.

The first project is to produce bauxite, mainly for export. This is near the Trombetas River where some $300 million are being invested by a consortium, Mineracao Rio do Norte S.A., consisting of the Government's Cia. Vale do Rio Doce (CVRD) 46 %;

Alcan, 19%; a Brazilian company, 10 %; Reynolds 5%; two companies controlled by the Government of Norway, 5% each; and two other European companies, 10 %. Bauxite exports are to begin by 1979 at a level of 3.6 million tons, and may ultimately be increased to 9 million tons. This project consists of mines, a 30 kilometer railroad, ore treatment and shipping facilities, and a townsite for 2600 persons, created in a remote and largely unhinhabited area. The financing is through $100 million in equity by the consortium companies, loans of $150 million by three different banking consortiums including the Export-Import Bank of the U.S. Government, and the balance by loans from the World Bank's International Finance Corporation, and suppliers of materials, equipment, and services.

The incentives given to this project are very significant to its competitive position against other developing regions and countries. The consortium will be exempt from income taxes for 10 years and pay only a mining tax of U.S.$1.00 per ton. The export price will be fixed so as to return 13% per year on the investor's equity. That price as of 1977 is estimated at $10 per metric ton, f.o.b. Trombetas river port. This means that the delivered cost to U.S. or Canadian ports will be about $19 per ton, or about one-third less than Jamaican bauxite to U.S. ports. The Trombetas bauxite is also superior to the Jamaica bauxite and less costly to convert in alumina.

In the same Amazon region, other bauxite deposits are planned for development and linkage with an alumina plant and for export. The Government's CVRD holds major deposits as do number of private companies including Alcoa, Reynolds, and D. K. Ludwig (National Bulk Carriers). The Ludwig holdings are in the Trombetas River basin, in an area of more than 5000 square miles, privately owned and acquired for a vast agricultural and forestry enterprise of Mr. Ludwig.

Another major bauxite project is a joint venture of CVRD and the British company Rio Tinto-Zinc with a majority holding by the Government's company. This project is to produce for export but mainly to supply an 800,000 ton alumina plant at Belem (Alunorte). The alumina plant will be a joint venture between CVRD and 32 Japanese companies. It will supply alumina to an aluminum smelter of 320,000 ton capacity (Albras), a similar joint venture with the same Japanese interests. A hydroelectric project is to provide power for the smelter.

Other ties between bauxite producers and consumers

Private companies without government participation produce bauxite under concessions from the governments of Haiti, Dominican Republic, Sierra Leone and Malaysia. In Haiti where Reynolds operates, and in the Dominican Republic where Alcoa is the producer, the bauxite reserves do not offer prospects for expansion or alumina production. The bauxite is exported to the companies' alumina plants in the U.S.A. The interests of the governments seem to be to get as large revenues as possible from the companies. Consequently, both governments broke their agreements with the companies and, with the advice of Jamaicans, have imposed bauxite levies and royalties very similar in size to the Jamaican levies and with the same credit for income tax. Also, there are obligations for minimum annual exports or payments. The Haitian minimum export volume is currently 650,000 long dry tons per year, but may be reduced if Reynolds has to reduce its world wide bauxite consumption because of business conditions, or if uncontrollable interruptions of production occur. The Dominican minimum payment is for 625,000 tons of bauxite per year. Otherwise, in both Haiti and the Dominican Republic, the long-term mining concessions continue without interest of the governments in joint ventures.

In Sierra Leone, Alusuisse has been the only producer since 1963. The Government is not seeking control or investment in the operation but is interested in encouraging the company to expand from a present level of 700,000 tons per year to 3 million tons, including an alumina plant. In 1969 the Government had adopted a new policy to purchase at fair value a majority interest in mining companies. This intention was carried out with diamond mining but not with the bauxite producer, evidently because of limited financial ability. Instead, in 1976 the concession agreement was amended to give the Government increased revenues from rents, royalty, income tax, and surtax, and to give the Government representation of 2 members out of 6 on the board of directors of the bauxite mining company. The request for increased revenues followed the example of Jamaica but was far more limited, apparently not over U.S.$5 per metric ton in 1977, or less than one-third of the Jamaica levies and for a better grade of ore. The company has discovered new commercial deposits of about 100 million tons, and is interested in setting up a joint venture with other companies and the Government for production of bauxite and alumina. The Government hopes to obtain financing from the World Bank for a hydroelectric project that would supply power to the proposed alumina plant.

Malaysia has two privately owned bauxite companies, one a subsidiary of Alcan. Both sell mainly to the Japanese aluminum industry. Exports in the early 1970's had reached the level of one million metric tons per year but had declined by 1976 to less than 700,000 tons. In 1976 the Government had its bauxite resources evaluated by British experts with the intention to consider establishing an aluminum smelter and a supporting alumina plant. In 1977 the Sabah state government agreed with the Reynolds Metals Company to make a feasibility study for a power plant and aluminum smelter. Reynolds had also agreed with the Sarawak government to review possibilities of another smelter.

The Government of India hopes to become a major influence in export markets of bauxite, alumina and aluminum with market economy countries and the Soviet Union. Up to the present, bauxite, alumina and aluminum production in India have been primarily for domestic markets, as in the case of Brazil. The primary industry includes three privately owned enterprises, one State controlled enterprise, and the 100% Government owned Bahrat Aluminium Co. Alcan has a 55% interest in one of the private companies and Kaiser a 27% interest in another. The Madras State Government has 73% in a third company with the balance held by an Italian company. Indian capital owns the fourth company.

In the 1970's, explorations for bauxite by state governments and the national Government greatly increased the estimated reserves and stimulated proposals for new government sponsored projects. In the State of Orissa, current estimates are 1.25 billion tons of lower grade ore, and in neighboring Andhra Pradesh, 750 million tons. The national government in 1977 was negotiating with Alcan, VAW of West Germany, and Pechiney to establish an export complex including a 600,000 to 1 million ton alumina plant, and a 100,000 ton smelter. A new hydro project would supply the power for the smelter. The investment would be on the order of $1 billion to be financed by long term contracts with international aluminum companies to buy alumina and aluminum. Another alumina project of 600,000 ton capacity for the State of Andhra Pradesh is being studied by the U.S.S.R. This project would cost between $300 and $350 million, and would supply to the Soviet Union 300,000 metric tons of alumina per year to pay for services and equipment. The balance would have to find export markets.

Aluminum smelter ties

Brazil and India are the largest of the developing countries working for greater industrial growth. They have had integrated aluminum industries for many years, but they must rely heavily for their proposed new projects upon outside capital, technology and export markets. The same need is more intense for smaller countries including Guinea, Surinam and Guyana.

Middle East

The Government of Egypt obtained both an aluminum smelter (100,000 metric tons) and the supporting Aswan hydroelectric project with Soviet finances and technology.

The Bahrain Government, having gas resources available for electric power generation at low cost, in 1968 entered a joint venture in a smelter with a group of six British and Swedish aluminum consumers and merchants. The Government provided the gas at a very low price and exempted the company, Aluminium Bahrain (Alba), from taxes for 20 years aside from small royalties payable after 10 years. The Government began with a 27½% participation. But the project was not profitable for most of the participants who sold out to others, mainly to the Government, leaving the present ownership in Government, 78%, Kaiser, 17%, and a West German company, 5%.

The plant was built by a British company and financed with bank loans guaranteed by the British Government's Export Credit Guarantee Department, by the Kuwait Government, and equipment suppliers. Until 1971 Britain had provided for the defense of Bahrain. Design and technology were provided by the Italian aluminum company, Montecatini. The partners agreed to buy the metal at cost in proportion to their holdings. The metal is marketed largely on short-term sales throughout the world. The present capacity is 120,000 tons. Alumina is obtained under a 20 year contract from Alcoa of Australia.

In Dubai, a 180,000 ton smelter is under construction by the same British firm that built the Bahrain smelter. The aluminum company, Dubai Aluminium (Dubal), is 80% owned by the Government; 5% by local investors; 7.5% by the U.S. aluminum company National Southwire; and 7.5% by a Japanese company. The project including power plant, was financed by borrowing $344 million, guaranteed by the ruler of Dubai and partly by the British Government's Export Credits Guarantee Department. A major British bank managed the borrowing. Alcoa of Australia will supply half of the alumina and the balance may come from a Brazilian alumina project. Marketing arrangements have not been disclosed although some of the metal will go to Japan, some to the United States, and some may be taken by Alcan.

The smelter of the Iranian Aluminium Company, 55,000 tons, is a joint venture, 82.5% owned by the Government of Iran, 12.5% by Reynolds Metals who supplied technology, and 5% by the Pakistan Government. Capacity is being enlarged to 120,000 tons. A second smelter also is planned.

Other smelter projects in the Middle East are under consideration by the governments of Saudi Arabia, Libya, and Iraq. In North Africa, the Algerian Government is planning a smelter. If these projects are carried out, the region will become a major exporter of primary aluminum in the 1980's and a strong influence in the world aluminum industry. Whether they will be profitable enough to satisfy the governments is another question. It will depend, according to the experience of Bahrain, upon labor discipline and productivity, and ability to control costs, but above all, on having firm ties to dependable markets and not having to make short-term sales, sometimes at discounted prices.

Africa

In Ghana, the Volta Aluminium Company is a joint venture of Kaiser and Reynolds, operating a 200,000 metric ton smelter based on the Government's Volta River

hydroelectric project. The smelter and hydro project were built in the 1960's. The $190 million initial investment in th power project was loaned largely by the World Bank, the U.S. Government's Export-Import Bank, the U.S. Agency for International Development, and the United Kingdom Government. The smelter was financed by Kaiser and Reynolds, aided by a $110 million credit from the U.S. Export-Import Bank. Nearly all of the output is exported by the partners. The power investment serving the smelter is guaranteed by Kaiser and Reynolds through contracts to take the power or pay for it if not used.

South America

In South America, the smelters of Argentina and Venezuela should be noted in addition to Brazil, already discussed. The Argentine smelter began production in 1974 at Puerto Madryn with a capacity of 36,000 tons. This is now limited by power supply, but is designed to reach 140,000 tons when power becomes available in 1978 from a Government hydroelectric project, 350 miles west. The operating company, Aluar Aluminio Argentine (Aluar), is owned 51% by an Argentine tire and electronics firm (FATE), 48% by other locally owned Argentine fabricators, and less than 1% by Government. The smelter was built by Italian firms with financial aid from the Italian Government, and operates with technology supplied by the Italian aluminum company, Montecatini. The Argentine Government entered a contract with Aluar to provide hydroelectric power at a favorable price (U.S. 0.4¢ per kwh), and agreed to protect the price of aluminum sold in Argentina so as to yield to the investors after taxes at least 12% on their equity of U.S.$42 million. The capital cost was estimated at $150 million but has since increased to $170 million. Financing both the equity and advances by the Italian contractors was guaranteed by the Argentine National Bank of Development. This project was sponsored by the Argentine Government through the

Ministry of Defense and was intended to replace imports of aluminum and to absorb much of the power of the hydroelectric project. A substantial portion of output is expected to depend on export markets when full operation is reached at 140,000 tons per year. Delays in construction of the hydro power project have required the construction of a thermal power plant for an interim supply of power. Alcoa of Australia contracted to supply the alumina and to take payment partly in cash and partly in metal.

In Venezuela, the Government also is the sponsor of primary aluminum production This is related to the Government's development of the very large hydroelectric potential on the Caroni River system. One 50,000 ton smelter is owned 50-50 with Reynolds Metals through Aluminio del Caroni (Alcasa). Capacity is now being enlarged to 124,000 metric tons. A second smelter is under construction through a joint venture of Government with six Japanese companies. This company, VENALUM, is owned 80% by Government and 20% by the Japanese interests. Final capacity is to be 200,000 metric tons of which the Japanese companies will take 160,000 tons per year for 10 years and at 6% below the Alcan world price. The total investment in this plant is reported at $550 million to which the Japanese will contribute 20% and the Government 80%. With the full development of both smelters to a total capacity of 400,000 metric tons, Venezuela will depend heavily on export markets.

New Zealand

In the Pacific region, the Government of New Zealand in 1977 broke its 97 year power agreement of 1963 that was the basis for establishing the privately owned New Zealand Aluminium Smelters Ltd. This is a joint venture of two Japanese aluminum companies (50%) and an Australian company, Comalco (30%), in which Kaiser has an interest. The smelter has a capacity of 150,000 metric tons and could be increased to 220,000 tons if the company exercises its rights for additional power. The

hydroelectric project had been built by the Government primarily to serve the smelter. Without the smelter, the hydro project would not have been built. The company protested the violation of the agreement but yielded under threats of legislation to an increase in the price of power by about five times. The former price had been based on cost plus 10% profit to the Government, estimated at about U.S. 0.3¢ per kilowatt-hour. The new price may be about U.S. 1.5¢ per kwh and will escalate half with changes in the world price of aluminum and half with the cost of producing electricity in New Zealand. The new agreement is for 30 years,and the price formula is subject to review every 5 years. Although the right to additional power was retained by the company, that is now subject to future negotiations of price and other conditions. As a result of these changes, the company has indicated doubt that it will extend the capacity.

In breaking the power agreement, the Government felt that the price of power should be closely related to the rising cost of power in New Zealand, especially because of the rapid increase in cost of thermal power following the OPEC oil price increase. Originally, the Government encouraged the aluminum project to provide employment in an undeveloped part of New Zealand, to obtain foreign exchange from exports, and to develop a power supply that otherwise would not be gained. The company contends that without the firm long-term power contract at a favorable price, it would not have been able to support borrowings of $170 million to build the smelter from Japanese, German and U.S. sources. The company contended that the hydro supply afforded the necessary assurance that could not have been possible from thermal power sources (coal or oil), and that in considering the price of power from hydro projects, it is not relevant to consider the cost of power from other sources.[5/]

5/ Comalco Limited, The Manapouri Development and Comalco Agreement, Melbourne, Australia, November, 1976.

The New Zealand case is noteworthy because it raises an issue that faces developing countries that offer hydro power to attract smelters. They, too, may find in the future that the cost of alternative energy sources will have gone up so much that the original price of the hydro power no longer seems appropriate, or is subject to political criticism of being subsidized. On the other hand, the aluminum companies can contend that if the price of hydro is not to be an incentive based on cost, but instead is always to move close to the price of other sources of power, then the companies need not build in the developing countries but should stay at home or anywhere that is convenient to markets where alternative thermal power can be obtained.

The same issue could be faced by the Mid-East countries who offer power at a low price based on surplus gas resources. Conditions could change to make that gas more valuable for petrochemicals or liquified gas for export than for power generation. In cases where the Governments own all or most of the investment in the smelters and also own the gas, the choice may be to give up aluminum production in favor of other uses of gas and to lose the aluminum investment. That choice may not have to be made, however, if the world price of aluminum advances sufficiently so that the profit and other benefits are at least as great as would come from converting the gas to other uses. But if a government wishes to attract outside investment in a smelter based on power from gas, the problem will become the same to the investors as the case of New Zealand hydro: why invest in the first place?

Japan

In Japan, the financial and planning ties are very close between the primary aluminum industry and the Japanese Government. There are six aluminum companies, but only one, Nippon Light Metal, has a substantial interest held by a foreign partner, Alcan (50%). With 1.6 million tons of primary capacity, the industry is the

second largest after the United States among the open market economies. The developing countries are greatly affected by the size of the industry; its total dependence on imported bauxite; the uneconomical cost of its electric power supply which is based 67% on imported oil; the need to increase imports of aluminum; and the willingness of the Japanese Government to provide financial assistance to encourage investment in foreign smelters. Most important is the large surplus balance of payments of Japan and the pressure by various countries to have Japan reduce its surplus by importing more from them and by investing more in them.

The high cost of power has made the industry unprofitable, operating at a substantial deficit, and only able to avoid bankruptcy through support of bank loans assisted by the Government's Bank of Japan. More than 25% of domestic demand in 1976 and 1977 has been supplied by imports at the level of 400,000 metric tons per year/shut down about the same amount of capacity. For the next five years, the industry intends to keep that capacity down while imports increase further, possibly to 1 million tons by 1982. An industry committee has been advising Government's Ministry of International Trade and Industry (MITI). A duty is to be imposed on a limited quota of imported aluminum in order to provide a fund to be distributed by Government to the companies that have curtailed operating capacity. The Government also will finance the stockpiling of some surplus aluminum to help relieve the excessive inventories of the industry. while the producers

New foreign ventures in aluminum require approval of MITI and the Japanese Government. The Government agreed with the Indonesian Government in 1975 to the financing arrangements for the Asahan hydroelectric project and associated aluminum smelter. This position has been maintained as a matter of cooperative economic development with respect to the broader interests of Japan, even though the costs of the Indonesian projects have gone far above original estimates. Japanese Government

agencies will provide 70% of the 90% of the financing: the Overseas Economic Cooperation Fund, the Japan Export-Import Bank, and the Japan International Cooperation Agency. The very low interest rates charged by these agencies, 0.75% to 5.5%, reflect the Japanese Government policy to assist Indonesia. The balance of the Japanese funds will be provided by eight commercial banks.

The participation of the Japanese industry in the Brazilian smelter and alumina joint ventures (Albras and Alnorte) was also decided as a matter of Japanese Government policy, even though the companies were inclined to hold back in 1975 because of the growing difficulties of the industry in Japan and the financial commitment for the Indonesian projects. The Brazilian projects were approved by the Government of Japan in the interests of economic cooperation with Brazil in a visit of the Deputy Prime Minister of Japan to Brazil in 1975.

As originally conceived, the alumina-smelter program included a 1.8 to 2.7 million kw. hydroelectric project with a combined investment of $3.3 billion as estimated in 1975 ($1.5 billion for 1.3 million tons of alumina capacity, $633 million for 640,000 tons of primary aluminum capacity, and $ 81 million for the hydroelectric project plus $272 million for infrastructure, $74 million for working capital for the alumina plant, and $59 million for the smelter). At present, the Japanese participation is to the more limited 320,000 ton smelter (Albras) and 800,000 ton alumina plant (Alnorte). The Japanese investment will be 49% in each project, supplied through Nippon Amazon Aluminum Co. (Nalco) comprising 32 Japanese companies. As estimated early in 1977, the costs would be U.S.$955 million for the smelter and $409 million for the alumina plant, a total of almost $1.4 billion. Financial arrangements were being made as of early 1978. These will include for capital, $220 million from the Brazilian Government's CVRD, and $190 million from the Japanese Nalco. For loans, the Brazilian National Economic Development Bank is to provide

$513 million, and Japanese interests $442 million. The amount of loans through Japanese Govern ent agencies has not ye been announced.

The United States

The United States Government has no organized policy to encourage the U.S. aluminum industry either for protection of its present primary capacity within the country or for encouraging investment in new capacity abroad. The decisions are left to the individual companies, at least for the present. Although electric power agencies of the U.S. Government supply power to nearly half of the 4.6 million metric tons of U.S. primary capacity, the two power agencies, the TVA in the southeast, and the Bonneville Power Administration in the Northwest, decide at what prices to sell power to the aluminum companies and whether to renew contracts. The Northwest smelters are to lose all of their firm power contracts in the 1980's. Their power will be resold for general public use unless Congress adopts proposed legislation to continue some share of the Federal hydro supply for the aluminum smelters. Even if the decision is favorable to the companies, the cost of power is expected to rise substantially when it includes principally coal based and nuclear power. There is thus considerable uncertainty how much of the Northwest capacity of 1.5 million metric tons will be economical in the future. The present price to the companies of Northwest Federal power is very low, U.S. 0.35¢ per kwh, due to its hydro base and the legal obligation to sell power not much above Federal cost. In the TVA area, where the Federal power supply is now largely thermal, the cost to the aluminum companies has been about 1.6¢ per kwh. This will increase also as more thermal power, principally nuclear, is added to the TVA system.

A number of U.S. aluminum companies are participating in new smelter projects outside of the United States or are considering additional projects. The countries affected include Dubai (National Southwire), Brazil (Reynolds), Kaiser (Australia),

Martin Marietta Aluminum (Costa Rica), and Mexico (Alcoa). The companies admit that they are not planning enough capacity to meet growing domestic requirements in the 1980's, and that a substantial increase in imports is likely. But to what extent the additional imports will come from plants in which the U.S. companies will participate, or from companies without U.S. participation, is uncertain. The situation offers opportunities to less developed countries to attract either U.S. investment or long-term purchase agreements from U.S. companies that would help finance smelter projects.

To support U.S. investment abroad, the U.S. Government's Export-Import Bank has been financing or guaranteeing long-term credits for the purchase of U.S. goods, equipment and services. But the present policy is not to favor subsidized interest rates on such loans. Instead, the policy is to try to get other governments to agree not to subsidize their export credits in order to improve the competitive position of U.S. exporters. This policy is contrary to the interest of developing countries who not only want the best possible terms of credit but who are also asking for cancellation of some of their present long-term debt to the developed nations. From the U.S. Government they may still find some help in the U.S. Agency for International Development. Such cases may be a matter for the President to decide as a former President did in the early 1960's in approving credits for the smelter in Ghana and in requesting supporting loans through the World Bank.

Of particular interest to bauxite producing countries is the present concern of the U.S. Government over future increases in bauxite levies or increases in the costs of imported bauxite. The Government is giving a limited amount of financial aid for testing processes to use domestic low grade aluminous minerals to replace some imported bauxite. A Government agency, the General Accounting Office, is reviewing the question of increasing Federal financial aid for such process work and

is starting discussions on bauxite with various governments including Jamaica, Surinam, Guyana, Dominican Republic, Venezuela, Brazil, and Haiti.

The significance of this subject to developing countries is in two directions. First, will the U.S. aluminum industry be helped to produce alumina from U.S. minerals instead of increasing its reliance upon foreign bauxite and alumina. Second, if this becomes U.S. policy, then it is likely that more smelter capacity will be built in the U.S.A. near the new sources of alumina rather than in developing countries.

7. Types of agreements with governments on bauxite, alumina and aluminum

Most of the relationships that interest developing countries between governments of producing countries and foreign consumers fall into four broad classes.

First are the projects owned by the host governments and built under bilateral government-to-government agreements. They trade bauxite, alumina or aluminum for investment in the form of construction services, equipment and technology. Examples are the agreements between the Soviet Union and Guinea and Turkey.

Second are projects partly owned by host governments through agreements with individual private companies or consortia. The investment funds may be provided largely by the host government, and to varying extent by the private investors. The construction services and equipment may be supplied for cash by outside contractors and the technology may be supplied by any of the private investors. The investment is returned to the investors through shares of the alumina or aluminum. Examples are Bahrain, Venezuela, and Brazil,

Third are projects wholly owned by the private investors. In the case of bauxite and alumina, the investors receive concessions or bauxite leases from the governments, and they provide the capital, the construction, the technology, and they market the product. Examples are Sierra Leone, Haiti, Dominican Republic, Surinam, and Australia.

Fourth are the smelter projects owned by private investors for which power plants have to be built in order to support the smelters. Some privately owned power plants associated with smelters are found in Surinam and the highly developed countries of Western Europe, Australia, Japan, Canada and the United States. But most significant for new smelter projects are agreements in which the governments provide the power and own the generating facilities, hydro or thermal, that are financed with long-term power contracts with the private investors. Examples are Ghana, Argentina, Iceland, and New Zealand. Among the most developed countries, examples are in Western European countries and the United States.

The agreements of greatest concern to developing countries are those of governments with which they may have to compete in attracting capital. Those that want bauxite and alumina projects such as Mali, Guinea-Bissau, Niger, or the Solomon Islands, need not be particularly concerned with agreements in countries that are not likely to be competitive for new developments, such as Haiti, the Dominican Republic and Jamaica. Agreements of these governments can only offer a few guidelines to other governments. Otherwise, the only large potential for expansion may be in Jamaica, but that government has handicapped its prospects by internal instability, by the methods used to impose the bauxite levy and terms for obtaining majority control of the bauxite companies. Jamaica's latest agreements would offer useful guidelines if most other bauxite producing countries could adopt them. But the most important countries are not following Jamaica's example because they would not then attract the new capital they want. Furthermore, they would only accelerate the shift of the aluminum industries of the developed countries toward the use of their own non-bauxitic sources of alumina through new processes now being tested.

The more helpful guidance will be found in the agreements and policies of the most competitive countries with expanding potentials in bauxite-alumina such as

Sierra Leone, Guinea, Brazil, and Australia. These countries can set limits to what new bauxite-alumina producers may expect. On the other hand, some additional competition that also will affect the agreements for new projects in developing countries can come from those governments that have their own bauxite enterprises and are free to market where they will at competitive prices. Among governments with expanding sales potential from their own enterprises are Guinea, Guyana, and possibly Indonesia and India.

For developing countries that wish to attract capital to build smelters, the power contracts control the decisionsof the investors. Of interest are those hydroelectric contracts with the governments of Ghana, Iceland, and New Zealand, and the power contracts based on natural gas in the Middle East.

Principles in various agreements

The varieties of present agreements illustrate the different conditions they were designed to meet. For new agreements it is not practical to select any as complete models due to different circumstances, but some common elements or requirements for most agreements can be considered.

The initial principles of agreement

A common first stage before an agreement is reached is for the parties to adopt an interim agreement on principles they will include in negotiating a final agreement. One purpose of the interim agreement is to establish a framework so that the investors will know in advance whether they will be able to finance the investment if it proves feasible, and whether there is a sufficient understanding with the government and enough confidence to proceed. Another purpose is to justify the investors in spending the substantial sums necessary to investigate the economic feasibility of the project. Feasibility studies include surveys of the volume and

grades of bauxite, the mining and processing problems, the costs of mining and processing, and the associated facilities including transportation, towns, housing, and harbors and ports. If alumina plants, smelters and power facilities are also contemplated, the feasibility studies become even more time consuming and expensive. These studies can cost millions of dollars and spread over a number of years.

They are required by international financial agencies such as the World Bank when loans are to be made, and they are needed by private banking groups who may help in financing. They are also essential to the private investors for their own decisions.

The package concept

After principles are agreed and feasibility studies are completed, there may be room for negotiating variations in individual terms of the final agreement. But the agreement as a whole must meet the condition that, compared with alternative opportunities in other countries, the agreement offers at least equal profitability including return of original investment and dependable supply. No agreement will be possible if the government proposes to include the right to interrupt production or exports, or even if underlying political and economic conditions indicate extended interruptions.

Dependable supply is the foremost condition to be met. It affects profitability and return of original investment not only in the developing country but in the further processing or markets outside of the developing country that depend upon the exports. Since the investors operate an international business that usually includes processing facilities in other countries, and in any event includes customers with their own investments in other countries, all of these outside activities have to be protected with assured supplies from the developing country.

Equally essential is the package of terms that affect the cost to investors to take away the bauxite or alumina or aluminum after all internal costs and payments to the developing country. In this package of terms are all taxes, royalties, levies, and import and export duties of whatever nature. All of these costs and payments can be reduced to figures per ton for different volumes of export. With these data both the government and the investing parties can calculate the expected return of investment and rate of profit over some period of years in accordance with assumptions of price of the exports.

Feasibility studies contain such information. The developing country should request copies of these studies by the investors and have them independently appraised by engineers and other consultants in order to help determine the terms of agreements. Costa Rica is following this procedure before entering negotiations.

One of the obstacles to long-term understanding between developing countries and outside investors is the absence of advance agreement on some fair rate of return on investment that government will protect. Such lack of understanding has led to charges of excessive profits and unfair treatment of developing countries without solid information to back up the complaints. Feasibility studies can help the parties reach agreement on a fair rate of return over the appropriate number of years, and to include conditions for adjustment if unforeseen events occur to reduce or exceed the rate of return, or if there should be a change in the standard for an appropriate long-term rate of return.

With such feasibility studies, the developing country can understand why if one payment condition is increased, such as income tax or bauxite levy, then there must be a reduction in some other payment, so that the total returns are not reduced to the investors.

The principle to protect an agreed rate of return on investment has not yet appeared in bauxite-alumina-aluminum agreements seen by this writer, but it is being accepted in other mineral industries. The Government of the United Kingdom has granted petroleum concessions in the North Sea in which the investors are allowed 175% recovery of investment before taxes on profits become effective. The Government of Papua New Guinea has agreed with Australian and other investors in a copper mining project to terms of profit taxation that allow recovery of original investment in 4 years plus the equivalent of a 20% discounted cash flow return on equity and debt capital.6/

Government ownership or participation

If dependable supply and adequate rate of return of investment can be assured, investors would not be concerned over the extent of government ownership. They recognize that the bauxite is owned by the host country and the production facilities are in physical control of the country. They are concerned mainly with protection of the return of the investment they have to make; control over the design, construction and efficiency of the facilities so as to obtain the lowest capital cost; and control over production so as to obtain quality of product at lowest possible cost. But as a practical matter, government ownership can interfere with these concerns, and it is necessary that agreements satisfy these matters or there will be no project. Even in the case of the Soviet Union providing to the Guinea Government the means for 100% ownership of a bauxite project, the agreement is designed to supply bauxite to the Soviet Union over a 30 year period, and to repay the loan in 12 years.

6/ Professor Raymond F. Mikesell (University of Oregon), Trends in Foreign Investment Agreements in the Resources Industry, paper delivered at the Resources Policy Conference, Oxford, England, March 22, 1978.

Some investors recognize that it is politically necessary or even desirable from their view point that government obtain some ownership. The question of how much ownership depends on what the government can initially contribute in finances, services, and resources including bauxite, infrastructure, or electric power facilities. At the beginning the government may obtain a part of ownership, and a larger part later if the agreement includes the right for additional investment. Thus, Billiton has agreed to give the Surinam Government the right to buy a 25% interest in the present bauxite operations, and has also agreed to a separate joint venture, 50-50, in another bauxite-alumina project.

The investors want agreements to state clearly the conditions of ownership, present and future. They do not want to be exposed to broken agreements and forced sales of their interests below value as has occurred in Guyana and Jamaica.

Guinea is following a mixture of ownership policies that should be of special interest. The Government has 100% ownership and operating control with Soviet technical help of the bauxite project built and largely financed by the U.S.S.R. The Soviet personnel manage the railroad. The Soviet investment and other debts of Guinea to the U.S.S.R. are repaid in bauxite under a 30 year contract. In each of the two other operating bauxite projects, CBG and Friguia, the Government has a 49% interest. In the CBG case, the interest was obtained in exchange for bauxite leases and by financing the railroad and other infrastructure with borrowed funds, guaranteed by the private investors. In Friguia, the Government has purchased the 49% interest, but the terms have not been publicly reported. Both CBG and Friguia are subject to a 65% tax on profits. In the case of CBG, the tax revenues include the repayment of the loans for infrastructure. The 65% level is far above the tax level on bauxite-alumina in other countries, but it is justified by Guinea giving up the right to dividends out of its 49% ownership. The income tax provides the return on that ownership.

Guinea also will have 51% ownership in a bauxite project to be developed with Yugoslavia, 50% in a project to be developed and managed by Alusuisse, and 50% in a group of projects to be financed largely by a consortium of Arab governments. The Guinea ownership policies and terms for payments to the Government have been flexible.

Developing countries should also note certain conditions in the latest agreements between the Jamaica Government and outside companies that may seem attractive but are not likely to be accepted by new investors. In buying a 51% interest in two bauxite companies, Jamaica retains the right to manage the operations after a 7 or 8 year period. This right might be used in conflict with the private partners. The Government has long been interested in the large volume of lower grade ores that are not presently economical. Under Government management, the companies might be required to mine some of the lower grades and raise the costs of producing alumina at their plants in the United States. The Government also obtained the right to have the companies mine bauxite for disposal by the Government. That right could be used to compete with the companies depending on how the bauxite is disposed.

Accordingly, developing countries might consider guidelines for new agreements that (1) provide a share to government in exchange for bauxite rights and other real values; (2) offer the right to increase the share in the future; (3) agree to terms that do not interfere with stability of supply and lowest costs to the managing operators; and (4) avoid the threat of competition with the investors. As a guideline to 100% government ownership, the type of arrangement with the Soviet Union may also be considered after comparing the benefits with other arrangements.

Duration (term) of agreement

To the investors, the [illegible] must be sufficient for recovery of investment and a suitable profit in the bauxite, alumina or smelter project. But the investors also want the term to be long enough to support related investments whether made in the developing country or elsewhere. If construction of an alumina project alone or with a smelter and a power plant are also to be a possible obligation of the investors in the bauxite project, then the term must be long enough to justify private investment in these additional projects. Where the bauxite or alumina are exported to processing facilities in other countries owned by the investors, then the term of the bauxite agreement should be long enough to equal the expected service life of those facilities. Consequently, the terms of bauxite agreements usually run for extended periods of time, including rights to renew.

Among examples may be noted the 40 year term for bauxite supply in the 1976-1977 agreements between Jamaica and the bauxite companies. Jamaica buys the bauxite lands from the companies but still assures the companies additional years needed to operate their alumina plants in the United States that are specifically designed to use the Jamaica bauxite. The durations of the Haitian and Dominican bauxite leases are 60 to 75 years. These bauxites also serve specific alumina plants in the United States. The Surinam agreement with Alcoa in 1958 to build an alumina plant, smelter and hydro project provides for a 75 year bauxite mining right. The Guinea bauxite agreements with the CBG partners and the Friguia partners also run for 75 years each. Bauxite leases granted by the State of Western Australia have been associated with alumina plants. The lease to Alcoa has a 21 year limitation but the right to renew on the same terms for three more consecutive periods of 21 years each, and for a fourth 21 year period upon terms and conditions to be proposed by the State. Three other agreements for alumina plants not yet built provided for

21 year terms of bauxite leases, renewable for shorter terms than the Alcoa leases, but still at least for a 42 year total before additional renewal upon terms to be negotiated.

If a government wants to limit to a short period the term of any agreement, the primary purpose is to renegotiate terms of renewal, taking into account changed conditions. However, instead of using a short term subject to negotiation for renewal, a government may seek a right to negotiate a change in terms of the agreement in the event of unforeseen conditions that are to the detriment of the government. Some agreements have such a clause that also gives the same right to the company to renegotiate. However, that right is only a statement of intent and may not lead to agreement. On the other hand, the right of a government to renew only if acceptable terms can be renegotiated is a more effective way of assuring better terms provided the company will accept. The alternative would then be to terminate the project, an action that would be most unlikely to take place. But a project can actually terminate and the investment abandoned as may be the outcome of the alumina plant built by Revere in Jamaica. This plant had become uneconomical due to small capacity and problems of technology. Revere wanted to enlarge and improve it with new partners, but this became impossible due to the bauxite levy. A new agreement was not reached with the Government. The plant has been closed and more than 800 persons have lost their jobs.

Settlement of disputes

Provisions are usually included for settling disputes over interpretations or breach or violations of the agreement by either party. They strengthen confidence of the investors in the government, and of government in the investors. Such provisions do not guarantee that the government will abide either by the agreement or by the methods for settling a dispute, but the provisions do put the burden of

defense on a government not to act arbitrarily. They put an equal burden of responsibility upon the other party. If a government does not abide by the provision for settling the dispute, it runs the risk of destroying confidence of investors in new projects or from lenders of funds for other purposes, such as the World Bank.

The Government of Jamaica undertook that risk when it violated its agreements with six companies by enacting the bauxite levy. The Government then refused to carry out the obligations under its agreements with three of the U.S. companies to use the arbitration services of the World Bank's International Center for the Settlement of Investment Disputes. The Government unilaterally withdrew bauxite from the materials that were subject to arbitration within the Government's own agreement with the Center.

These actions by Jamaica were a very serious risk to its other interests. The Center had set up an arbitration Tribunal which was proceeding without the Government of Jamaica and could have made an award in favor of the companies against Jamaica equal to the amount of bauxite levy improperly collected each year by Jamaica. The amount for 1974 alone was more than $100 million. In that event, the U.S. Government, as a participant in the Center, would have been obligated to enforce that award in whatever way it could, including seizing assets of Jamaica held in U.S. banks or planes of the Air Jamaica airline. Events did not reach this point because the companies agreed to new arrangements with the Government and withdrew their requests for arbitration.

However, developing countries should understand the obligations of arbitration conditions in agreements they adopt, and in particular the importance of arbitration through the World Bank/International Center for the Settlement of Investment Disputes. They do not have to become participants in that Center, but if they do, they are obligated to conform to the Convention of participation. Also, they do not have to include

the use of the Center as an arbitration method in any agreement with investors because they can agree to other arbitration procedures. But it enhances their borrowing power and standing with the World Bank and other financial institutions if they agree to use the arbitration procedure of the Center.

Countries besides Jamaica that have bauxite and are signatories to the Convention of the Center include Australia, Cameroon, Ghana, Greece, Guinea, Guyana, Indonesia, Malawi, Malaysia, Mali, Niger, Sierra Leone, and Yugoslavia.

If the latest agreements between Jamaica and the companies are considered, the clause for settling certain classes of disputes may provide first for a procedure of conciliation and, if that fails, for either of two procedures. For disputes over minor matters, it may be agreed to have the matter settled in the courts of the developing country or by a commission set up within or outside the country. For important matters it may be agreed to set up an arbitration commission of three, one appointed by each party and the third as chairman by the other two or by some judicial body outside of the developing country. The arbitration may be held inside or outside the developing country as either party requests. Each party agrees to abide by the decision and award of the arbitration commission. In the Jamaica case, disputes over mining rights are excluded from such procedures.

The agreement between the Government of Guinea and the investors in CBG sets up a procedure for conciliation and, if necessary, for arbitration by three arbitrators chosen by the President of the International Chamber of Commerce and for the arbitration to take place in Geneva, Switzerland.

The first agreement between the State of Western Australia and Alcoa for an alumina plant provided that disputes be settled under the Arbitration Act of 1895 of the State.

Organization, responsibilities, associated agreements

The first parts of agreements deal with the form of the organization, the country acceptable for legal incorporation, the contributions and responsibilities of the government and of the outside investors, and the types of supporting agreements to be made. If the government takes a participation, the percent of equity is defined, the extent of representation on the board of directors, and the responsibilities and powers of the government's directors. The obligations are stated between government and outside investors with respect to providing capital, loans, and facilities. The government's contributions may be limited only to bauxite mining rights over certain areas, or may include much more such as lands for railroad, other roads, towns, ports, harbor, airport, and for the various structures.

The various supporting agreements are stated. These may include the mining rights and areas for mining in a separate agreement. If government has a substantial or controlling interest, there may be a management agreement for the services of the outside managers. There may be separate agreements for construction, and compensation for technology.

Financial contracts and guarantees of debt repayment may be additional agreements where financing is to be obtained by the government or by the outside investors, and the financing sources, whether international banks or private banking consortia, require supporting agreements between the government and the outside investors.

Fiscal regime

The fiscal regime includes the conditions relating to the payments the government may receive and the limitations on such payments such as profit share, income taxes, royalties, export and import duties, social welfare payments for workers,

and government services for water, electricity, railroad and port. There is no useful guideline for any specific financial condition, such as the Surinam limitation on income tax in an agreement with Alcoa based on a rising level from 30% of profits, or the Guinea agreement with CBG, taxing profits at 65%. The meaning of each income tax provision and the effect on the incentive to the outside investors is not defined by any one profit rate but by the entire package of financial payments which determine the recovery of the investment and the rate of profit thereafter.

Once the other payment obligations are determined, a profit tax rate may be agreed at whatever level will attract the investment. If the tax law of the government fixes a rate in advance for all enterprises, then the law could be changed to grant an exception, or there could be other incentives so that the tax law does not discourage the investment. Exemption from all or a portion of income tax may be granted for a period of years. It is also common practice in many agreements to exempt the enterprise from most import duties, all export duties, and other levies with minor exceptions, and to concentrate the government's revenues on the income tax.

The income tax principle can take various forms. One form is a percentage of profits calculated under accounting standards that are stated carefully in advance. This method raises a number of problems that developing countries may wish to avoid. They may not have the technical staff to analyse the accounts. The accounts may not all be accessible. Some of the costs are incurred outside of the developing country and are not subject to verification directly. Most difficult is the situation where the bauxite, alumina or metal is transferred outside the country in sales to affiliated companies of the investors. The transfer prices are difficult or impossible to verify for fairness. In these cases, it is necessary

to decide on other methods to calculate taxable profits. One method may be to use a formula for an assumed profit per ton of export as has been done in Jamaica with respect to bauxite. Another method as used in Guinea is to apply a formula relating changes in the export price of bauxite to changes in some published price of primary aluminum and to changes in wage rates, oil prices, and another indicator.

Whatever method is used, it will try to relate changes in payments of tax to changes in values of the exports due either to changes in profitability of the business or in international inflation or deflation of prices, or in the international value of the currency in which the tax is paid.

This subject is extremely difficult to settle in permanent terms. Therefore, a very important condition that is placed in some agreements is to provide for review of the tax procedure at intervals, such as every 5 years, and to try to revise the payment arrangement if it seems to be unreasonable or works a hardship on either party. Because the text for revision can itself become a matter of controversy, it would be helpful if, as already suggested, some concept of acceptable rate of return on investment could be agreed in advance against which to measure the need for future changes in tax payments.

In addition, in order to give governments some stability of income from a project, an acceptable practice is to fix some minimum annual payment that will be made to government regardless of profitability or output. Then, if the minimum payment is greater than the payment that should be made by other terms of the agreement, the excess payment may be deducted from future payments to government, at least for a limited period of years. Another condition designed to protect the government's stability of income is to require that the investors produce in the developing country at least a certain proportion of their total international production of bauxite, alumina or aluminum. This condition gives the developing country a certain minimum share of the investors' total business when general business conditions fluctuate.

Supporting measures to the fiscal regime

In order to protect the competitive position of the enterprise, the outside investors usually request a provision that the government will grant them any more favorable terms that it grants to another enterprise in the same business. This is known as the most favored company clause.

In addition, the agreements provide that the outside investors may freely repatriate any funds kept in banks of the developing country in order to withdraw profits and recover their original investment. They also may maintain in outside countries the foreign exchange from sales, and may not be required to keep in the developing country more than the amount of foreign exchange needed to pay for labor, services, purchases and other obligations within the country.

Labor supply

It is commonly required by developing countries that the outside investors agree to give priority to employing qualified native citizens and to provide technical training to increase the ability of citizens to be employed in the enterprise. This may include training supervisory personnel outside the developing country. In Guinea for the CBG bauxite project some technical personnel were trained in Switzerland. Jamaicans have been sent to gain technical experience at the alumina operations of the North American companies. In remote areas where labor is scarce or not available, government may have to cooperate in supplying labor, and government or the outside investors may have to provide adequate housing and other conditions to attract workers.

Special provisions are also usually granted to permit foreign personnel to receive pay in foreign exchange outside of the developing country, to be exempt from import duties on personal property brought in for their own use, and not to be subject to discriminatory taxation of their incomes. Such provisions are advisable in

order to attract and retain foreign supervisory personnel under the hardship conditions of some undeveloped countries.

Protection of people, land and water

It is becoming more common in agreements to provide for the protection of agriculture, other resources, workers and nearby populations from activities of the enterprise. Where agricultural land is scarce as in Jamaica, the mining companies must remove, preserve, and restore the soil after mining, or make payments to the government for that purpose. In Western Australia, a similar obligation is imposed to protect the forest lands. Alumina plants that must dispose of waste liquids and muds may be required by various methods of disposal to prevent pollution of ground water supplies for towns and agriculture. In the case of smelters, the fumes of fluorine must especially be controlled to prevent harm to animals, crops, workers and nearby population. As it is extremely expensive to install some protective measures, a government should require only that degree of protection as is reasonable under the local conditions. For this purpose, the government may rely on technical consultants to assist in determining requirements.

As another measure to protect against claims for damages caused by the enterprise, a provision for indemnification may be required by the government. This obligates the private enterprise to defend the government in legal actions against others claiming harm or damages from operation of the project, and to make compensation for any awards. Also, it may be required that the enterprise will make fair compensation to others for land or other property it acquires. A procedure may be set up for that purpose with or without the participation of the government in acquiring the property.

Developing country services, materials, and equipment

Some agreements may require that the project will give priority to citizens and enterprises of the developing country in contracting for services, materials and equipment when these can be supplied of equal quality and at competitive prices. Governments that are establishing an ocean shipping business or that wish to protect national private shipping enterprises may require that exports of bauxite, alumina or aluminum be shipped in some proportion, such as half, in such ships provided they are competitive in price and quality of service. This condition was included in the Guinea agreement with CBG. A recent agreement by one bauxite company uses some Jamaica shipping. But the condition may not be satisfied when specially designed ships are required or where the outside investor has its own shipping company with equipment acquired at pre-inflation costs.

Commitments toward related projects

Agreements have been made obligating the outside investors within certain periods of time to make feasibility studies for additional projects, such as alumina plants, smelters and power plants, and to provide such studies to the government. The agreement may also provide incentives to the investors to build such additional projects if they become feasible. Thus, the royalty may be less on bauxite used in the country to produce alumina than on bauxite exported, or a tax credit may be granted on alumina converted into metal in the country.

Other obligations that have been included in some agreements are to reserve a portion of the metal produced for sale to consumers in the developing country. In the case of the CBG agreement in Guinea, the outside investor also agreed to build a small fabricating plant.

Force majeure

A standard provision in agreements is that the obligations of either party are suspended during the period of time that they cannot be performed due to conditions beyond the control of either party. These conditions include revolution, invasion, riot, civil commotion, sabotage, blockade, military or civil usurped power, explosions, fires, lightning, storm, wind, drought, flood, earthquake, epidemics, labor disputes, strikes, delays by contractors, and other conditions that either party cannot reasonably control.

Waiver

A very important provision known as waiver is that in the event either party does not enforce or suspends any obligation of the other party, the obligation not enforced and the remaining obligations under the agreement still continue. This provision protects the government in the event it is not possible for a period of time to carry out some provision. The government will not want the other party to assume that the obligation has been given up and then claim that there has been an implied amendment of the agreement.

Power contracts

Agreements for power supply from a project that has to be constructed to serve a smelter usually require a separate group of agreements. The power project may cost as much or more than the smelter. It may require extensive investigations as to feasibility. Hydro-electric sites have to be investigated by geologists, hydrologists, and engineering firms. Such investigations may take a few years and may include the study of a number of alternative sites. Power plants based on natural gas require an assured supply of gas committed to that purpose.

The arrangements to finance the power project may be by agreement with parties who do not finance the bauxite, alumina or smelter project. A portion of the power output may be reserved for governmental uses or other uses than for the smelter. Such conditions affect how much of the investment and operating cost of the power plant must be paid by the smelter operator and how much paid by government or others.

In general, the power plant can only be financed when the revenues will repay the debt and interest to those who advance the loans. This condition requires that the smelter investors guarantee to take or pay for their share of the power whether or not they use it. That guarantee can only be made by investors with ample financial resources unless the government is able and willing to assume the debt obligation as guarantor. Most developing countries lack that financial ability.

A troublesome problem is to agree on the long-term price of power. If the power comes from a hydro-electric project, the cost is largely fixed initially by the investment and interest rates because the costs of operation and maintenance are very small. In that case, the smelter operators may want an agreement that pays for the actual costs and a limited return to the government. On the other hand, the government, if it owns the power project, may find over a period of time that the costs of other power supplies for serving the general public have gone up substantially, and it will seem unfair if the smelter continues to receive the power at a price based on the low initial cost. This was the situation that led the New Zealand Government to unilaterally break the power contract with a smelter company.

There are various ways of handling this difficulty, including provision for some periodic adjustment in the price of power based on a formula. But if a developing country cannot attract the smelter project with such a condition, there are alternatives that avoid the problem. The government can permit the private investor

to build and operate a power project at their own cost as Surinam did in the case of Alcoa. If today such a solution in large projects requires more investment than the private investors can provide, a government can sell the right to the investors to install some of the power generating facilities at their own cost in the entire power project, provided the government can sell the rest of the power output for which it makes the rest of the investment. With respect to power generated from natural gas, a similar solution would be for the government to sell to the smelter investors the rights to drill and extract certain quantities of gas from known gas fields.

Whatever the method chosen, the private investors will make their decision based on the security of long-term power supply at lowest possible cost and where, in addition, the other cost factors of bauxite, alumina and aluminum give the greatest assurance of dependable supply at lowest possible cost for the metal delivered to the markets. Consequently, the developing country cannot make the best informed decision on a price arrangement for a long-term power supply unless it also has information on the total feasibility of the smelter project and its delivered costs to markets.

That information is obtainable if the private investors will supply the government with the results of their feasibility studies, and if the government has the studies independently reviewed by outside engineering firms and other technical advisors. This procedure will be acceptable to the outside investors if it is required by an international financing agency that is to lend an important part of the investment funds. This procedure should also be acceptable to the investors if they can agree in advance with the government on the terms for recovery of their investment and an acceptable rate of profit for the long-term. This procedure will go a long way toward establishing mutual confidence between a government and the outside

investors and help allay the suspicion of governments that they are at a disadvanta in negotiating with the private investors. Removal of that suspicion may contribute to preventing future unilateral breaking of contracts by governments or unfair methods of nationalization, and may increase for the outside investors the assurance of stability and dependable supply at acceptable costs.

8. Conclusions for guidelines to new agreements

(1) Agreements for new projects in bauxite-alumina-aluminum should be framed by developing countries to meet needs for long-term stability because major projects require more than seven years for investigation and construction, and an additional 20 to 50 years for service life.

(2) Individual projects now being planned cost from a few hundred million dollars each to one or more billion dollars. Collectively to the year 2000, the world-wide requirements in this industry are in the tens of billions of dollars to support up to a three-fold increase in world demand.

(3) Developing countries, even those in the Middle East with present surpluses of investment funds, need outside investors and technology.

(4) These outside investors may come from the centrally planned economies, particularly from the Soviet Union, or the open market economies, particularly from Japan and from six multinational corporations, aided by international financing agencies, such as the World Bank.

(5) The developing countries are competing between themselves but also with some developed countries to attract the new investments. The greatest competition is from the huge bauxite potential of Brazil, Australia and Guinea.

(6) An additional overhanging threat is from the abundant non-bauxitic resources in the United States and other countries that can be used to produce alumina if developing countries impose conditions of too high costs or instability on long-term supplies of bauxite, alumina or aluminum.

(7) Investors from both the centrally planned economies and the open market economies require the same long-term conditions of lowest possible cost, dependable supply, recovery of their investment and a fair rate of return on it whether labelled profit or some other term. The investors will favor those countries in which they can have confidence that these conditions are most likely to be met, where agreements no longer will be unilaterally broken, or investments taken away with little or no compensation.

(8) Investors are accepting the international trend toward total or partial ownership by governments of some projects, but they will only make the investments when such ownership does not endanger the stability and cost of the bauxite, alumina or aluminum, production by most efficient methods to serve the markets of the investors, and the recovery and fair rate of return on their share of investment.

(9) A most important guide-line that can help create mutual confidence for long-term agreements is an understanding to assure recovery of the investment of the outsiders and to give them an annual rate of return thereafter that is competitive with alternative returns they can get elsewhere from long-term investments.

(10) To achieve this understanding, a developing country will need access to the feasibility studies made by the investors in order to determine what terms can be negotiated for taxes, other revenues to the government, and other conditions affecting long-term cost and return on investment. This information may be requested by international lending agencies, such as the World Bank, and should also be obtained by the developing countries for review by their own expert advisors.

(11) Agreement between the developing country and the outside investors on return of investment, a fair rate thereafter, and how to adjust that rate of return to changing long-term conditions will contribute significantly to reducing suspicion against the outside investors and to improving stable relations, stable supply, and stable costs.

(12) Once agreement is reached on this basic problem, it will be easier to negotiate terms relating to the most important other conditions such as payments to the government, and exemptions from certain taxes or levies; prices of the exported products; responsibility for management and operation; labor supply and priority for employing and training citizens of the developing country; protecting people, land and water against harmful operations; giving preference to use of services, materials and equipment produced in the developing country; and power contracts when smelters are to be built.

(13) As overall generalizations to these guidelines, developing countries should recognize that the values of their bauxite, alumina and aluminum have largely been created by markets and technology of the developed countries. On the other hand, the developed countries want bauxite, alumina and aluminum from developing countries but only if the costs or prices are less than alternatives. Finally, the basis for more investment and mutual trade exists only if mutual trust and confidence can be built and preserved.

APPENDIX A

ECONOMIC CLASSES AND REGIONS

DEVELOPED MARKET ECONOMIES

North America

Canada
United States

Europe

Austria
Belgium
Denmark
Finland
France

Germany, F.R.
Greece
Iceland
Ireland
Italy

Luxembourg
Netherlands
Norway
Portugal
Spain

Sweden
Switzerland
Turkey
United Kingdom
Yugoslavia

[illegible]/Asia/Oceania

South Africa
Japan
Australia
New Zealand

CENTRALLY PLANNED ECONOMIES

Europe/USSR

Albania
Bulgaria
Czechoslovakia
Germany, D.R.
Hungary

Poland
Romania
USSR

Asia

China, P.R.
Korea, D.P.R.
Mongolia
Viet-Nam, D.R.

DEVELOPING MARKET ECONOMIES

Includes - Latin America plus Caribbean (including Cuba)
- Asia (incl. Israel and Rep. of China; excl. Japan & Turkey)
- Africa (excluding South Africa)
- Oceania (excluding Australia and New Zealand)

Source: World Bank, Commodity Trade and Price Trends (1976 edition, page xxiii.

[illegible] of Mines
Mineral Trade Notes, Vol. 74, No. 3 September 1977

Bauxite: World Production 1/, by country (metric tons)

Country	1974	1975	1976 p/
North America and Caribbean:			
Dominican Rep. 2/ 3/	1,203,5[illegible]	753,601	516,652
Haiti 4/	652,170	921,100	660,432
Jamaica 5/	19,32[illegible],394	11,570,[illegible]24	10,305,983
United States 2/	1,[illegible],47	1,[illegible],714	1,989,424
South America:			
Brazil	[illegible],457	868,954	e/1,000,000
Guyana e/ 2/	3,250,000	3,250,000	2,640,000
Surinam e/	6,[illegible]6,000	4,[illegible]5,000	4,565,000
Europe:			
France	2,[illegible],000	2,563,000	2,330,000
Germany, West	1,407	755	1,000
Greece	3,[illegible]2,[illegible]	3,243,[illegible]	2,746,863
Hungary	2,[illegible]51,000	2,[illegible]39,000	2,91[illegible],000
Italy	31,640	[illegible]2,15[illegible]	24,200
Rumania	[illegible],000	779,000	e/ 800,000
Spain	[illegible],456	11,2[illegible]0	e/ 11,000
USSR:			
Bauxite e/	4,300,000	4,400,000	4,500,000
Bauxite equivalent of nepheline concentrate e/ 6/	1,650,000	1,[illegible]70,000	1,920,000
Bauxite equivalent of alunite ore e/6/	170,000	200,000	200,000
Subtotal e/	6,120,000	6,470,000	6,620,000
Yugoslavia	2,870,000	2,306,000	2,033,000
Africa:			
Ghana	363,129	319,526	267,27[illegible]
Guinea	7,600,000	e/9,140,000	10,847,548
Mozambique	5,364	2,175	e/ 2,000
Rhodesia, Southern e/	2,000	2,000	2,000
Sierra Leone	672,000	716,000	660,000
Asia:			
China, Peoples Rep. of e/ 7/	970,000	970,000	1,100,000
India	1,114,000	1,273,000	1,436,000
Indonesia	1,[illegible]90,0[illegible]	[illegible]92,556	[illegible]40,269
Malaysia	[illegible]47,49[illegible]	703,561	660,235
Pakistan	[illegible]74	-	e/ 240
Turkey	664,909	631,200	520,000
Oceania: Australia	1[illegible],[illegible]34,309	20,[illegible]57,[illegible]27	24,0[illegible]5,114
TOTAL	[illegible],477,061	77,737,209	79,6[illegible]2,233

e/ Estimate p/ Preliminary

1/ Data include estimated bauxite equivalent of nepheline concentrate and alunite ores produced in the USSR as source for alumina

2/ Dry bauxite equivalent of crude ore

3/ Shipments

4/ Dry bauxite equivalent of ore processed by Haitian plant

5/ Bauxite processed for conversion to alumina in Jamaica plus exports of kiln-dried ore

6/ Nepheline syenite concentrates grade 25 per cent to 30 per cent alumina, alunite ore grades 10 per cent to 1[illegible] per cent alumina; estimated outputs of these aluminum ore materials have been reduced to bauxite equivalent using a factor of 1 ton of nepheline concentrate equals 0.55 ton bauxite and a factor of 1 ton of alunite ore equals 0.34 ton bauxite

7/ Diasporic bauxite; includes an estimated 1[illegible]0,000 tons annually of production for refractory applications

Alumina: World production, 1/ by country

(Metric tons)

Country 2/	1974	1975	1976 p/
North America:			
Canada	1,264,700	1,133,709	e/455,000
Jamaica	2,871,357	2,257,663	1,626,979
United States	6,884,815	5,134,848	e/5,806,000
South America:			
Brazil	e/218,100	241,000	e/250,000
Guyana 3/	321,394	310,888	280,692
Surinam	1,185,000	1,148,000	1,155,312
Europe:			
Czechoslovakia e/	100,000	100,000	110,000
France	1,114,620	1,094,200	1,020,000
Germany:			
East	48,183	48,300	e/48,500
West	1,307,414	1,246,138	1,333,425
Greece	493,765	475,300	449,500
Hungary	710,300	775,400	e/780,000
Italy e/	736,600	742,000	742,000
Romania e/	374,000	400,000	400,000
United Kingdom	94,700	82,500	e/90,000
U.S.S.R. e/	2,300,000	2,400,000	2,500,000
Yugoslavia	272,740	283,090	e/464,000
Africa: Guinea	665,000	642,837	560,039
Asia:			
China, People's Republic of e/	400,000	420,000	520,000
India e/	326,000	337,000	435,000
Japan	1,800,859	1,565,041	1,411,441
Taiwan	45,000	46,400	e/45,000
Turkey	123,084	81,706	e/125,000
Oceania: Australia	4,899,489	5,127,162	6,205,828
Total	28,557,720	26,093,175	26,813,716

e/ Estimate. p/ Preliminary.

1/ Figures presented generally represent calcined alumina; exceptions are noted individually.

2/ In addition to the countries listed, Austria produces alumina (fused aluminum oxide), but output is entirely for abrasives production. Output totaled 28,223 metric tons in 1973; production data for 1974-76 are not available.

3/ Calcined alumina plus calcined alumina equivalent of alumina hydrate.

Aluminum: World production, 1/ by country **Appendix B, page 3**

(Metric tons)

Country	1974	1975	1976 p/
North America:			
Canada	1,020,881	886,826	626,000
Mexico	40,862	40,090	42,359
United States	4,448,315	3,519,103	3,856,802
South America:			
Argentina	700	23,600	45,000
Brazil	126,040	121,400	135,000
Surinam	34,700	44,800	2/46,207
Venezuela	52,429	58,500	50,000
Europe:			
Austria	91,554	88,848	88,700
Czechoslovakia	49,844	43,321	50,000
France	393,340	382,630	384,529
Germany:			
East e/	60,000	60,000	60,000
West	688,877	677,584	697,057
Greece	148,991	135,200	133,900
Hungary	69,043	70,221	70,440
Iceland	69,500	61,800	65,300
Italy	215,612	190,409	206,465
Netherlands	251,711	260,833	255,504
Norway	662,802	594,828	608,129
Poland 3/	102,000	102,900	100,000
Romania 4/	187,000	204,000	200,000
Spain	191,347	212,300	214,200
Sweden	82,480	77,393	81,430
Switzerland	87,153	79,041	78,172
U.S.S.R. e/	1,430,000	1,530,000	1,600,000
United Kingdom	293,082	308,328	334,545
Yugoslavia	147,089	168,270	197,679
Africa:			
Cameroon	46,842	51,913	55,000
Egypt	--	2,000	55,000
Ghana	157,198	143,220	146,647
South Africa, Republic of	75,000	75,900	78,100
Asia:			
Bahrain	118,000	116,300	122,058
China, People's Republic of e/	150,000	160,000	200,000
India	128,913	167,062	211,835
Iran	49,000	51,000	30,600
Japan 5/	1,118,373	1,013,259	919,425
Korea, Republic of	17,671	18,000	17,605
Taiwan	31,320	28,111	25,512
Turkey	--	16,500	35,500
Oceania:			
Australia	219,089	214,191	232,284
New Zealand	110,300	108,600	139,800
Total	13,167,064	12,108,281	12,496,873

e/ Estimate. p/ Preliminary.
1/ Output of primary unalloyed ingot unless otherwise specified.
2/ Exports.
3/ Includes secondary unalloyed ingot.
4/ Includes primary alloyed ingot.
5/ Production of superpure aluminum (99.99 percent Al) is reported as follows, apparently included in the reported total unalloyed ingot production (figures in metric tons): 1974--5,630; 1975--7,970; 1976--3,856.

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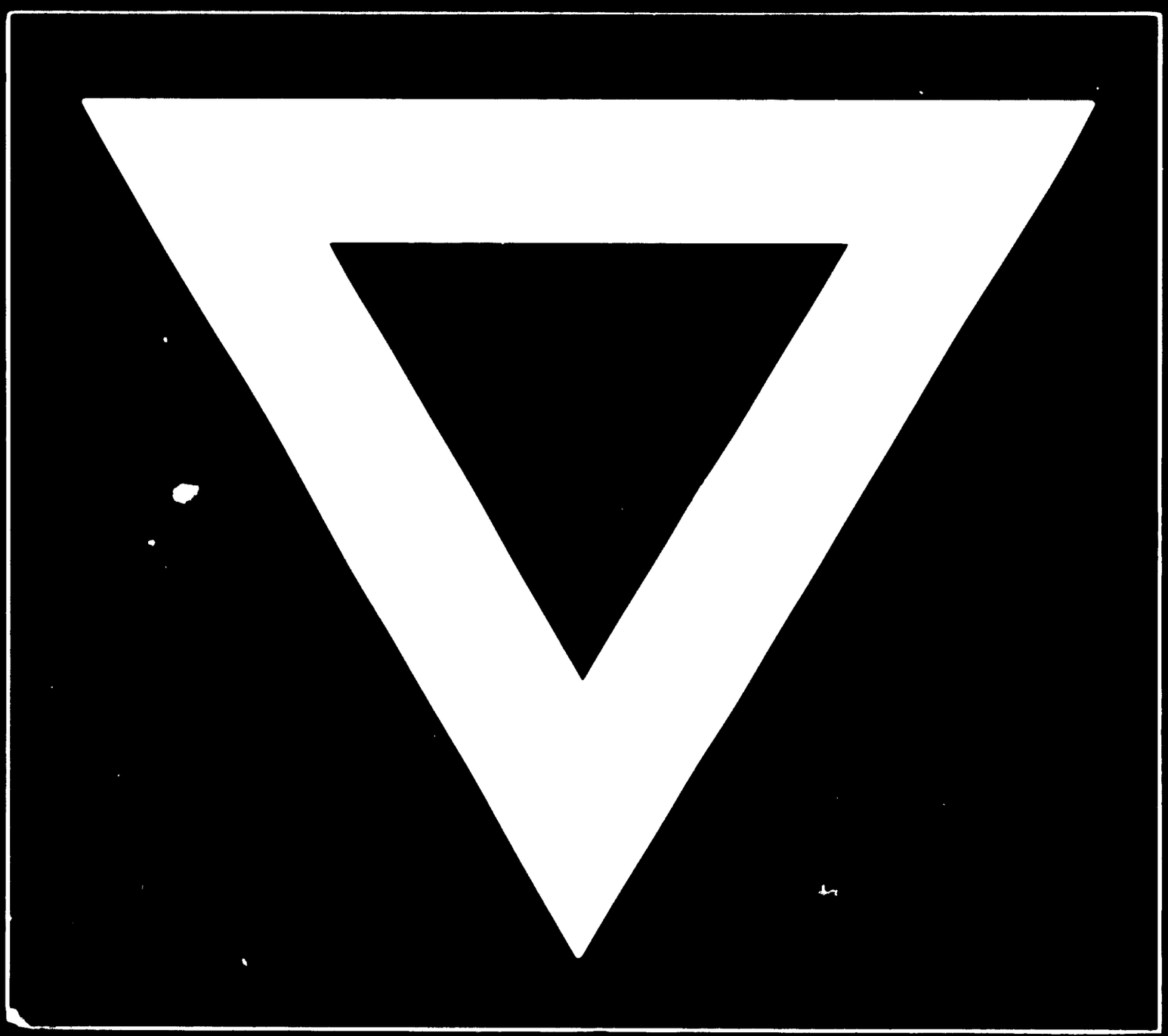

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