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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

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THE PRICING OF BAUXITE FROM PRINCIPAL EXPORTING COUNTRIES, 1974-1978 1/

prepared by

Samuel Moment*

* Consultant, Portland, Oregon, USA.

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ABSTRACT

This study reviews bauxite prices and impacts on alumina costs for 10 Western countries for the period 1974-1978. These countries produce 84% of the bauxite among all Western countries. Australia is cited as the leading market influence, contributing more than one-third of the output of the group, with Jamaica, Guinea and Brazil holding other positions of influence. The year 1974 is chosen as the reference year when Jamaica enacted a bauxite levy, followed by some other countries, leading to sharp increases in bauxite and alumina prices.

The diversity is noted of conditions that lead to considerable price differences in bauxite, both those inherent in the variable qualities of the mineral and those affecting relationships between buyers and sellers in commercial and non-commercial transactions. Trade practices in pricing are described to clarify the somewhat technical subject.

Difficulties in making valid comparisons of bauxite prices are emphasized. Subject to limitations and various adjustments, delivered prices and transportation costs are compared for a number of bauxites in all 10 countries, and for markets in Japan and the U.S.A. The important effects of special bauxite taxes are measured. These comparisons are converted into bauxite costs per ton of alumina. They show highest costs and prices among the Caribbean countries led by Jamaica, as compared with countries with the largest bauxite reserves that are engaged in encouraging new projects, Australia, Guinea and Brazil. The high prices of the Caribbean countries reflect the heaviest taxes on bauxite as a result of Jamaica's actions in 1974.

The recent minimum price recommendations of the International Bauxite Association are quoted, and the official opposing position of the Government of Australia is stated. Major problems of defining a reasonable price for bauxite are examined. The conclusion resulting from experiences in the 10 countries is that a reasonable price for bauxite cannot be defined by a rigid formula. What is reasonable will

change from time to time, from country to country, and will be whatever buyers and seller can negotiate after weighing all relevant factors, especially competition from others in both bauxite and alumina, and from both existing and pending new supplies.

F o r e w o r d

by the UNIDO secretariat

The Programme of Action on the Establishment of a New International Economic Order (General Assembly Resolution A/RES/3202(S-VI) Section I, May 1974) elaborates on the fundamental problems of raw materials and primary commodities as related to trade and development and especially underlines the need for urgent and effective measures to promote the processing of raw materials in the producer developing countries. This goal was also stated in the Lima Declaration and Plan of Action on Industrial Development and Co-operation adopted at the Second General Conference of UNIDO, held in Lima, in March 1975. The declaration particularly recalls "that effective control over natural resources and the harmonization of policies for their exploitation, conservation, transformation and marketing constitute for developing countries an indispensable condition for economic and social progress;". It was in this spirit that the present study on comparative cost data of bauxites was prepared. It is designed to assist decision-makers (both governmental and private) in developing countries in their negotiations of bauxite and alumina prices. The need for the present study was also stressed at UNIDO's Seminar for High-Level Governmental and Corporate Officials "Bauxite - Alumina - Aluminium: Analysis of Demand for Decisions on Industrial Development", held in Budapest, Hungary, in May 1978, where a number of developing countries' representatives recommended the elaboration of a document comparing cost data of bauxites from various sources and of various qualities, since such information was, so far, not readily available for consultation.

PREFACE

This study was prepared for the United Nations Industrial Development Organization for the use of governments and others concerned with bauxite pricing and the aluminum industry. The principal subject is the relation of pricing practices, including bauxite taxation, to government policies toward revenues and encouragement of investments in bauxite and alumina projects, particularly in less developed countries.

Details are presented that have not previously been published or widely known. They are based on the writer's 38 years in serving a number of governments and multinational enterprises.

The subject is technical. Some details may seem excessive. They are included in order to clarify matters that influence decisions governing very large investments and other vital interests of governments and producers and consumers of bauxite, alumina and aluminum. Foremost among recent political actions in this subject have been efforts of the International Bauxite Association to follow the pattern of price domination set by the Organization of Petroleum Exporting Countries, OPEC.

The writer has served as consultant to three of the governments before they joined the I.B.A, and tried to help them obtain greater revenues and also greater development of the bauxite industry. One of these governments, Jamaica, was served for 19 years. The writer also has served as consultant to a few corporations now operating in some I.B.A. countries. Consequently, the intent is to be impartial and objective in order to contribute to future efforts toward stability and durable arrangements.

Certain portions of this study have been reviewed and corrected by some participants in the aluminum industry. Other sections have not been exposed to reviewers out of concern over bias to serve their own interests. Therefore, some errors of detail may remain aside from statements over which there may be unavoidable disagreements.

THE PRICING OF BAUXITE FROM PRINCIPAL EXPORTING COUNTRIES, 1974-1978

I. INTRODUCTION

The purpose of this study is to present for the period, 1974-1978, the price levels for metallurgical bauxite and to explain the pricing practices used by principal exporting countries and importing consumers. The effects upon costs or prices of alumina are noted in those cases where available information is significant. The concluding section examines the question of a reasonable price for bauxite.

Ten Western producing countries are included in this study, accounting for 84% of the production of bauxite in 1977 by all Western countries. Their bauxite exports comprise most of the international trade in bauxite, especially the sea-borne trade, and excluding trade between the Eastern countries. The price levels of these exports are of greatest interest to the less developed countries including members of the International Bauxite Association. The 1977 estimated production of all grades of bauxite by the 10 countries is given in the following Table 1, along with the production of other countries.

Table 1. Estimated production, all grades of bauxite, 10 Western countries, 1977
(Thousand metric tons)

10 Western countries:		Excluded Western countries:	
Australia	26,070	Greece	2,900
Jamaica	11,433	France	2,059
Guinea, Rep.	11,300	Yugoslavia	2,044
Surinam	4,856	U.S.A.	2,013
Guyana	3,344	India	1,512
Indonesia	1,301	Malaysia	616
Brazil	1,035	Turkey	567
Sierra Leone	745	Ghana	275
Dominican Republic	729	Others	48
Haiti	685	Total excluded Western countries	12,034
Total 10 countries	61,498		
		All Western countries	73,532
		All Eastern countries	11,449
		Total, World	84,981
		10 countries, percent of:	
		Western Countries total	84%
		World total	72%

Source: Metallgesellschaft, Metal Statistics, 1967-1977.

Of the Western countries excluded from this review, most of the metallurgical bauxite produced by the U.S.A. and India is consumed domestically and does not enter international trade. France, Yugoslavia, Greece and Turkey use considerable proportions of their metallurgical bauxite but also export substantial amounts within the sphere of Europe and the Soviet Union. Malaysian bauxite is shipped mainly to Japan and Taiwan, and Ghana bauxite largely to the British Isles.

The period, 1974-1978, shows the changes affected by three major developments. These were the four-fold increase in 1974 in the price of oil from the OPEC countries; the four-fold increase in 1974 in the tax on bauxite by the Government of Jamaica, followed in varying degrees by some other countries; and the coming into operation of the International Bauxite Association (IBA) of leading producing countries, followed by efforts to recommend minimum reference or "floor" prices for bauxite and alumina for member countries to consider. Of the 10 countries surveyed in this study, all but Brazil are members of IBA. That organization includes Ghana and Yugoslavia besides the 9 countries included in this study.

Information is presented, to the extent available, on the grades of bauxite, prices at shipping points, delivered prices at destinations, and the costs of insurance and freight. Limitations on the meanings of the various prices are considered, and the relationship to revenues of the governments of exporting countries and to the costs to the users or consumers. In some cases, the effects on costs of conversion of the bauxite to alumina are noted because such costs affect the real value of bauxite to the individual user and, in some cases, the delivered price or cost he is willing to pay for the bauxite.

The ten countries disclose at least five types of market relationships between producing countries and consumers in determining price levels:

(1) Prices may be determined between investor owned producing companies and unrelated consumers, as in Australia. Such prices are used by others as standards to be met by competition.

(2) Prices may be determined by government owned producing enterprises in contracts with independent consumers, as in Guyana and Indonesia. These prices also are used by others as standards to be met by competition.

(3) Prices may be determined or approved by governments under laws and through contracts with consumers as in the Dominican Republic, Surinam, Guinea and Brazil. A principal purpose in such prices is to produce revenues for governments through taxes and levies.

(4) Prices may be determined between investor owned producing companies and their affiliated companies under common ownership as in Jamaica, Sierra Leone and Haiti. Governments do not in these cases fix the bauxite prices but affect them through the level of taxes and levies. Since the buyers and sellers are under common ownership, bauxite prices are at times determined so as to keep to a minimum the combined taxes paid in the producing country and the consuming country, as affected by the laws of each country.

(5) Prices are also affected as between all buyers and sellers by different conditions governing long term and short term or spot agreements. Long term agreements relate prices to total costs and profits for the seller. Short term agreements or spot transactions relate prices to temporary conditions affecting either buyer or seller, such as interruptions of output or demand from uncontrollable causes, producing temporary shortages or surpluses. A special case has occurred where market relationships and prices have been upset by nationalization of bauxite mines, creating problems of replacement of supplies to the dispossessed companies and problems to find new markets for the nationalized venture.

These types of pricing relationships may lead to considerable differences among the various price levels. Contributing further to differences in price levels at shipping points are differences in the costs of transportation to the points of consumption of the bauxites. Also, very important are differences in the costs of extracting the alumina as affected by the qualities of the bauxites.

Transportation costs from mine to alumina plant frequently are greater than the total production costs of bauxite. High transportation costs have prevented development indefinitely or for long periods of some major bauxite deposits, and have

reduced the prices or values of other bauxites. Like the many varieties of bauxite, the many varieties of transportation costs complicate the prices or costs buyers or developers are willing to incur. Varieties of transportation economies reflect changes in technologies of loading and unloading ships; the sizes and designs of vessels; limitations on vessels by port, harbor and river depths; the use of time charters to hold down fluctuations in shipping costs or the use of spot charters, subject to fluctuations in shipping rates; the ownership of fleets of vessels in some cases; and carrying return cargoes or back-haul cargoes for one or more countries in order to reduce bauxite shipping costs. Each bauxite consumer has a different set of circumstances affecting his shipping costs and the value or price of bauxite he can afford. These circumstances are reflected in wide differences in true transportation costs between shipping points and delivery points.

Most of the bauxites of the 10 surveyed countries differ in some important qualities. They are not uniform, comparable minerals. Differences include physical qualities; chemical composition, particularly as between the proportion of monohydrate and trihydrate alumina; impurities that may require special treatment for removal; the proportion of free moisture that is removed or retained and shipped; and as a commonly regarded index, the percentage of recoverable alumina. In the same country, characteristics may differ between bauxite deposits in various locations. Over a period of time, the characteristics of the bauxite within the same mining area may change. Even in high grade bauxites some complex impurities appear at times, dislocate plant operations, cause declines in efficiency, increase the consumption of chemical additives, and require unusual operating measures. All of these differences affect the cost of extracting the alumina content at any one point of time, and affect the changes in costs over a period of time. Such differences in costs include the capital investment related to methods of mining, handling, drying, transporting, and processing the bauxite, and the operating costs at each stage from mine to alumina plant.

The period of this survey, 1974-1978, has seen the introduction of a new cost factor affecting the price or value of bauxite to the consumer. This has been the large increase in taxes or levies imposed by some governments at levels greater than costs to produce and transport the bauxite. Until 1974, the highest tax levels per ton were considerably less than the cost of production. Now, the new levels are so great in some countries that they have reduced the economic value of bauxite and curtailed possibilities of expanded production in favor of other countries. Some prices that are used to include such high taxes are only bookkeeping figures to the companies concerned, and are not prices that can be obtained in commercial transactions.

To simplify the concept of bauxite pricing, some members of the International Bauxite Association support the principle of a minimum value of bauxite. In 1977, the IBA recommended a minimum price for bauxite delivered to the North American markets at U.S.$24.00 per metric ton, c.i.f., with appropriate adjustments for grade, and that in normal market conditions the price in that market should be between 2.5 percent and 3 percent of the American Metal Market list price for 99.5 percent primary aluminum ingot. For other world markets, members were advised to seek appropriate relative prices with adjustments for traditional market differentials.[1/] At the IBA meeting in December, 1978, the recommendation was changed to 2% of the average list price for 99.5% pure aluminum ingot as quoted in the American Metal Market.[2/] At the average list price of approximately 56.25¢ per pound of aluminum, the minimum reference price for bauxite would become U.S.$24.81 per metric ton, close to the level recommended the previous year.

1/ Announcement of the Council of Ministers, International Bauxite Association, Kingston, Jamaica, December 5-7, 1977.

2/ Wall Street Journal, December 20, 1978.

The presumption of the IBA recommendation is that the minimum price level can be imposed by governments. This means imposed by those governments who have their own producing and exporting bauxite companies, and also imposed upon the other producers and exporters at the point of shipment, and also imposed by some means upon buyers in other countries at the point of delivery to include insurance and freight. However, the obstacles to this recommendation have thus far proven insurmountable for much of the bauxite trade as is evident in the price experiences for the 10 countries surveyed here. The five principal classes of relationships between producing countries and consumers, as just noted, do not facilitate uniform pricing. More formidable obstacles are in the underlying economics of bauxite. These are differences in transportation costs and the differences among bauxites and the effects upon costs of extracting alumina at the various processing plants. It is still true today as in 1956 when the then British Guiana Government (Guyana today) was advised by the Reynolds Metals Company that

> "Metallurgical grade bauxite is not a commodity of trade whose market price is quoted daily in the world's financial centres as is done for lead, tin, silver, etc., but is a product whose dollar value is determined by the value of recoverable alumina and the cost of effecting that recovery. These factors are not measurable by mere chemical analysis as they are influenced by peculiar physical and mineralogical characteristics governing adaptability of the ore to metallurgical treatment. Price of metallurgical bauxite is normally a subject of negotiation between buyer and seller with no fixed market quotation serving as an absolute criterion of value."

Consequently, the prices reported in this study are meaningful only in relation to the particular circumstances in each case. They do not offer guidelines to some reasonable or "fair price" level or minimum level. They deal with complex minerals called by the common name, bauxite, but not comparable in price simplicity with oil, copper, aluminum, wheat and other commodities that are traded simultaneously according to precise specifications in many markets of the world between unrelated buyers and sellers. For those governments whose main interest is the amount of taxes

obtainable from bauxite, the complex price picture offers no simple guideline. Instead, the underlying tax structure on bauxite varies among countries, reflecting adaptation of each government to its own special conditions.

II. TRADE PRACTICES IN PRICING BAUXITE

In commercial trade between unrelated parties, a common practice in pricing bauxite has been to allow for changes in grade over a period of time and for principal differences that contribute to different costs of extracting the alumina. During the 1940's and 1950's, this practice was accompanied by relatively stable prices, commonly throughout the world between U.S.$4.00 and $7.00 per metric ton, dry basis, f.o.b. exporting country. However, under the condition of spreading world-wide inflation in the 1960's and 1970's, and fluctuating values of currencies in foreign exchange, prices within contracts running for a number of years have been subject to periodic renegotiation or to formulas of escalation combining in various ways changes in costs of production of bauxite or taxes or the price of aluminum.

In the much larger volume of non-commercial bauxite trade between affiliated companies, where governments obtain income tax revenues related to the profits left after expenses are deducted from the pricing of bauxite, the pricing practices have been different. They have reflected concern of the governments to benefit from the highest possible prices. Also, in the case of U.S. companies operating in the Western Hemisphere, for the 1950's and through the 1970's, the prices have been affected by the tax advantage obtainable under U.S. tax law from pricing the imported bauxite as high as possible in order to reduce the volume of profits, taxed at higher rates, from the aluminum produced within the United States from the imported bauxite. That advantage has been gradually eliminated by the recent changes in U.S. tax law.

But for both trade between related and unrelated parties, the basic pricing or valuation principle is the same. Bauxite analysis used in price quotations may state the <u>total alumina</u> content or the <u>available alumina</u> content. <u>Total alumina</u> is the percentage of Al_2O_3 before deduction of any loss due to combination with reactive

silica. Available alumina is the percentage theoretically extractable after loss due largely to chemical combination of alumina with reactive silica. The loss is often measured as one percent alumina for each one percent of reactive silica. The actual proportion of the alumina recovered in the production process will be less than the available alumina because of handling losses, inefficiencies of plant operation, or the deliberate choice of a lower recovery rate when processing costs are minimized. A recovery rate of 94 percent of the available alumina is practicable with a trihydrate ore (Al_2O_3-$3H_2O$). A recovery of only 89 percent has been found economical for some Jamaica ores containing a small proportion of monohydrate alumina (Al_2O_3-H_2O).

The silica content may be stated as total silica or reactive silica. In the treatment of trihydrate ore, some silica such as quartz or sand does not react with the soda and alumina, and does not reduce alumina recovery. In the treatment of monohydrate or mixed ore, more of the silica may be reactive, depending on the operating temperature and steam pressure.

It is customary in the bauxite trade to establish in an individual contract a base price for a particular bauxite and to vary the base price by specific amounts according to variations from the base content of alumina, silica, and free moisture. For some bauxites, the price also is adjusted for variations from a specified titania content. The price contracts thus state a specific premium to be added for each percentage addition in alumina content, and a specific penalty to be subtracted for each percentage addition in silica, titania, or free moisture content. For variations of less than one percent, price adjustments are made proportionately.

These variations reflect the fact that the value of the bauxite is reduced by the extra cost required to transport the free water content; by the extra cost of alumina lost along with caustic soda with each unit of reactive silica in the bauxite; and by the extra cost of processing the bauxite as the alumina content declines

or the reactive silica content rises, and also in some instances as the titania content rises. It is not customary, however, to specify changes in the quoted base price in accordance with the proportion of the alumina content in the trihydrate or monohydrate form. Although some alumina plants are designed to use one form or another or a mixture, any variation in the value of the bauxite to the user would be reflected in the negotiation of the basic price itself.

Accordingly, the price discussions for the surveyed countries indicate to the extent known

(a) Commercial prices and non-commercial prices.

(b) Bauxite grades used in base pricing and for the actual grades shipped.

(c) Free moisture content, if any, in the base pricing and in the actual grades shipped.

(d) The inclusion or exclusion of special taxes.

Distinctions must be made between prices for base or reference grades and prices for the grades as actually shipped which in some cases differ significantly in quality and free moisture content from the base grade. In such cases, the reported transportation cost should not be added to the base grade for purposes of comparing delivered prices. Instead, for purposes of comparison, the transportation cost has to be adjusted in each case for the same moisture content that applies to the base grade.

Finally, prices have to be converted into a common currency, such as the U.S. dollar, if the original prices are quoted in other currencies. Recent large changes in currency exchange rates make meaningful comparisons even more difficult over the four year period but have less effect on comparisons for any one point of time.

III. AUSTRALIA BAUXITE PRICES

Australia commands first place in a bauxite price review because it is by far the largest producer in the world and exerts the largest influence on markets for metallurgical ore and consequently, upon alumina. Production of 26 million metric tons in 1977 was 43 percent of the bauxite output of the 10 surveyed countries and just over one-third of the output of all Western countries. The bauxite exports are not publicly reported by the Commonwealth Government but are nearly all accounted for in the import data for three countries. For 1977, these were 7.3 million metric tons taken by Japan (3.5 million), West Germany (2.2 million), and Italy (1.5 million). An additional 16 million tons, approximately, were exported in the form of alumina. Much of the Australian alumina has been produced at low cost relative to other countries and sold at the lowest reported prices in the world. Guinea and Jamaica each exported a larger tonnage of bauxite in 1977 than Australia, but a much smaller tonnage when combined with the alumina exports.

Australia has only three bauxite producing companies, Alcoa of Australia Limited, Comalco Limited, and Nabalco Pty. Limited. Bauxite exports come only from the mines of Comalco and Nabalco. The Nabalco enterprise is jointly owned by Swiss Aluminium Ltd. and an Australian partner, Gove Alumina Limited. The bauxite exporting companies are only Gove and Comalco. Alcoa of Australia does not export bauxite because of its low grade but is able to process abundant bauxite resources at such low costs that the company has become the largest alumina exporting enterprise in the world. It exerts the strongest influence on alumina prices in many countries, and indirectly restrains the markets of competing bauxites.

One other Australian company produces alumina, also largely for export through its joint owners. This is Queensland Alumina Limited (QAL), jointly owned in 1978

by Comalco, Kaiser Aluminum & Chemical Corporation (U.S.A.), Alcan Aluminium Limited (Canada), and Pechiney Ugine Kuhlmann (France). These partners obtain bauxite from Comalco at a slightly reduced price compared with the price of the bauxite sold by Comalco to other parties. They pay for their shares of alumina on the basis of actual cost without profit, and then sell the alumina largely to export markets that include affiliated companies. Each partner fixes its own selling prices and profit rates for alumina.

Until 1973 bauxite and alumina export prices were free from direct government controls. In 1973 the newly elected Labor government imposed export licensing restrictions on all raw minerals, and semi-processed materials including alumina. Yet, no previously existing contracts were breached through government refusal to issue export licenses. However, in the early years of the Labor government, there were frequent rejections of new contracts, particularly for coal and iron ore. Subsequently, as a result of prior consultation with producers and the government department concerned, such rejections were rare. Late in 1978, in the succeeding government, and as a result of pressure on prices and calls for tonnage reductions on existing contracts, the Minister of Trade and Resources announced that all new coal, iron ore, bauxite and alumina contracts and changes to existing contracts, were to be within guidelines approved in writing by government in advance of negotiations. Subsequently, the Minister issued a statement with particular reference to bauxite and alumina to the effect that existing contracts would be honored, but that there remained a strong obligation on the part of producers to improve prices and terms of existing contracts where these have become unrealistic.

Income taxes are imposed only by the Commonwealth government, presently at the rate of 46.0% of taxable profits. The Commissioner of Taxation has challenged as too low some alumina prices between QAL partners and their affiliates. Royalties are imposed by the states of Western Australia and Queensland upon the respective producers in those states, Alcoa and Comalco, and by the Commonwealth government upon Nabalco in the Northern Territory. The range of royalties per metric ton for 1978 was between U.S.$0.17 for Western Australia and A$1.00 (U.S.$1.13) for Queensland bauxite. These amounts added to the income tax are among the lowest level of revenues per ton of bauxite received by various governments from private companies. This situation enhances the competitive position of Australian bauxite and alumina.

Alcoa of Australia bauxite

The comparatively low level of costs of producing Alcoa's bauxite and processing it into alumina are noted here because of the large volume of alumina exports based on the cost advantages. Alcoa's two alumina plants, located in Western Australia, have an annual capacity of 3.6 million metric tons (1978). A third plant is under construction with an initial capacity by 1981 of 200,000 tons and an ultimate capacity of 4 million tons in 20 more years. Less than 10 percent of present capacity is needed for Alcoa's Australian smelter, and the balance serves export markets. The outlook is for substantial growth of Alcoa's export role in alumina, supported by revised indications of well over 1 billion tons of bauxite reserves, as compared with previously publicized estimates of 500 to 600 million tons.

Output

Bauxite output in 1974 was about 5.4 million metric tons but more than doubled by 1977 to over 11 million tons. Alumina output also advanced in the same years from about 2 million tons to nearly 3.5 million tons. Only the alumina is exported, the volume almost doubling from approximately 1.6 million tons in 1974 to about 3 million in 1977. The balance is consumed by Alcoa within Australia. The principal alumina customers are in Norway, South Africa, Japan, Bahrain, Iran, Argentina, Canada, and the United States. The U.S.A. customers include besides the Pacific Northwest smelters of the Alcoa parent company, the Anaconda Aluminum Company and the Alumax share in the INTALCO smelter in Washington State, a joint venture with Pechiney. Over three-fourth of the Alcoa trade is through independently negotiated contracts with unrelated companies. A portion at times is used to trade or "swap" alumina with some companies in order to share savings on ocear shipping costs.

Bauxite grade

Initially in the 1960's, the reported grade of Alcoa bauxite was 100% trihydrate, 38% to 42% total alumina, and less than 2% reactive silica.[1/] Free moisture as mined was nearly 8%. About 3 tons as mined were then used to produce a ton of alumina.

1/ Visit of the writer to the Alcoa mine at Jarrahdale, Western Australia, December 12, 1967.

More recent reports include the opening of additional mining areas and indicate a decline in the grade of some ore being used to approximately 33-34% total alumina, 31.3% available alumina, and 1.7% reactive silica. Up to 3.8 tons of this grade produce one ton of alumina. The new Wagerup alumina plant, 4 million metric tons ultimate capacity, will require 15 million tons of bauxite per year, also at a ratio of 3.8 tons per ton of alumina. Opposition by environmentalists, who object to the cutting down of the jarra forest and the risk of salinization of the water table, could result in an ultimate capacity lower than 4 million tons as happened in the case of Alcoa's Pinjarra refinery. That refinery was originally designed to go up to 4 million tons, but under intense opposition, the government did not allow it to go above 2 million tons.

The combination of economies of mining and processing costs, including favorable capital costs of the alumina plants and availability of existing infrastructure, are indicated in the price levels of the Alcoa alumina exports, f.o.b. Western Australia per metric ton: 1/

1973.....U.S.$	61- 69	to Japan and U.S.A.
1974.....	63- 90	to U.S.A.
1975.....	90-114	to Japan and U.S.A.
1976.....	97-117	to Japan and U.S.A.
1977.....	110-130	to U.S.A.

The relatively favorable level of these prices is indicated by the higher prices Alcoa and Reynolds Metals Company in the U.S.A. have charged to themselves for Jamaica alumina, starting in 1974 at about U.S.$73 per metric ton, f.o.b. Jamaica, shipped to Atlantic and Pacific Northwest ports, and rising by the end of 1977 to levels between $172 and $183. Other references for alumina prices in 1977 also indicate higher values than those used by Alcoa for its Australian sales to Japan and the U.S.A., and also when delivered prices are used to include freight and insurance for various destinations. 2/

Comalco bauxite

Output

Bauxite operations of Comalco are in the Weipa area at the northern tip of the

1/ Japan Metal Bulletin, February 15, 1977, conversion of Japanese prices to U.S. dollars; confidential trade sources; and U.S. Bureau of the Census, U.S. Imports for Consumption, IM 145 X.

2/ Unpublished studies by Stewart R. Spector, Oppenheimer & Co., New York City, and confidential trade sources.

State of Queensland. Output has been fairly level between 9.3 and 10 million metric tons per year between 1974 and 1978. Nearly all is metallurgical ore but a small amount of calcined bauxite of abrasive grade is also produced. Calcining capacity is 150,000 tons per year. Markets are throughout Europe, North America and Japan. Somewhat over 4 million tons per year are consumed at the QAL alumina plant in Queensland. Comalco's nearly exclusive markets for metallurgical bauxite are presently in West Germany, Japan and Italy. Comalco has a 20% interest in the Italian alumina plant in Sardinia, Eurallumina, to which it supplies bauxite.

Weipa bauxite, also relatively low cost, exerts an influence on world alumina prices through substantial alumina exports from QAL. Of 2 million tons produced in 1977, Comalco's Australian smelter capacity took about one seventh, and most of the rest was sent to companies affiliated with the QAL partners in Canada, the U.S.A., New Zealand, and Great Britian. The Soviet Union took a small share. The Weipa bauxite reserves of some 4 billion tons assure Comalco a substantial role in world bauxite and alumina for many years.

Grade

The bauxite grade, dry basis, has varied over the years during the 1970's, and also between customers. Total alumina has fluctuated around 56%, available alumina between 54% and 50%, total silica around 5%, the trihydrate percentage between 40 and 45%, and the monohydrate percentage between 9% and 10%. The ore is washed and then dried for shipping with a moisture content of 11 to 12%. QAL reported in 1975 the consumption of 2.1 tons of Weipa bauxite to produce one ton of alumina.

Prices

Most Weipa bauxite is sold under long-term contracts of 10 to 20 years. Conditions have varied between contracts. One practice uses a base grade and f.o.b. price in U.S. dollars expressed on a dry metric ton basis, subject to adjustments for variations in grade and subject to escalation. Some short term contracts have used delivered prices where Comalco provided the shipping service. However, escalation related to changes in production

costs proved unsatisfactory during the 1970's as a result of the increase in royalty imposed by the State of Queensland and fluctuations in the rate of exchange of the Australian and U.S. dollar. In 1974 Queensland passed a new royalty law, raising the rate on exported bauxite from A.10¢ per ton to a minimum of A$1.00 per ton. For bauxite converted into alumina in Queensland, the royalty rate is half the export rate, giving some advantage to exported alumina.

Trade sources indicate the following levels of pricing for Weipa bauxite since 1974. All but the U.S. price are under long-term contracts. Freight and insurance are for grades actually shipped with about 11% moisture content. Therefore, prices and freight and insurance should not be added without further adjustment.

		U.S. Dollars per metric ton		
Year	Destination	F.o.b. Weipa	As shipped, freight and insurance	
1974	Eurallumina, Sardinia, Sicily....	$ 7.08 dry	$ 3.85	
1974	Japan.....	6.50-7.15 dry	6.00	
1975	Galveston, Texas, U.S.A.....1/	8.17 as shipped	8.37	
	Japan.....	8.65 dry	6.50	(300 Yen=$1)
1976	Japan.....	8.50 dry	7.70	
1977	Japan.....	9.50 dry	...	
1978	Japan.....	12.50 dry	10.26	(190 Yen=$1)
	Eurallumina, Sardinia, Italy...	12.40 dry	...	

1/ Containing 10-12% free moisture.

The Japanese companies provide their own shipping arrangements. The substantial fluctuations in the exchange value of the yen strongly affected the U.S. dollar equivalent of Japanese shipping costs. Large fluctuations in the exchange value of the Australian dollar likewise strongly affected the U.S. dollar equivalent of bauxite prices.

The 1978 base price of Weipa bauxite for Japanese buyers is now about U.S.$12.50 per dry metric ton, f.o.b., including the Queensland royalty. The dry base grade is about 53% total alumina and 5% total silica, a lower alumina content than a few years ago. About 10% of the alumina is monohydrate and 43% trihydrate. The premiums and penalties for variations from grade and moisture content are not reported. A trade source points out that the value of the bauxite to an alumina plant unable to recover the monohydrate is considerably less than the value of a bauxite with little or no monohydrate but the same total alumina and total silica. Each 1% of monohydrate would be lost to such an alumina plant. At an approximate delivered price of U.S. $20 per metric ton, and an available alumina content assumed to be 50% or 40¢ per unit of alumina, the loss of 10% of the alumina content would reduce the value of the ore by $4.00, plus additional losses in caustic soda and other operating costs from handling a bauxite from which only 40% of the available alumina might be recovered. On the other hand, an alumina plant designed to operate at the higher temperatures and pressures required to recover the monohydrate portion of the alumina would attach a higher value to the bauxite.

Gove bauxite

The Gove bauxite and alumina operations are in the Northern Territory of the Commonwealth of Australia. The alumina plant started operation in 1972 and has a present rated capacity of 1 million metric tons. The bauxite output is divided between the alumina plant and the exclusive export marketing privilege of Gove Alumina amounting to 40 million tons over a 20 year period. Gove Alumina also has the marketing right to 30% of the alumina, the balance going to the partner, Swiss Aluminium.

For the year ending March 31, 1978, Gove's bauxite exports reached 2.2 million metric dry tons. Two-thirds went to four Japanese companies and the balance to others. Much of the Japanese purchases is under 10 and 20 year contracts running to 1984 and 1992.

Grade

The grade used for pricing contains on a dry basis 50% total alumina and 3% total silica of which 2.4% is reactive silica. Less than 1% is monohydrate. The shipping grade contains 50% alumina, 3.4% total silica, and 8% free moisture. Moisture is added for the shipments to Japan in order to reduce dust pollution at delivery points. On a dry basis, between 2.4 and 2.5 tons of bauxite yield one ton of alumina at Gove or in Japan.

Prices

Although there is some variation among prices for different customers and different contract terms, the price level has been trending upward as it competes with Weipa bauxite for the same markets. Japanese sources reported in 1977 a negotiated increase in price to U.S.$9.50 per metric ton, f.o.b. Australia, 20% more than the previous price, presumably then about $8.00 per ton. Prices for 1979 are above U.S. $11.00 but not publicly disclosed.

All contracts provide for escalation of the base price with changes in the Australian government index of average weekly earnings of all male workers and the consumer price index in Australia. The premiums and penalties for each 1% variation in total alumina from 50% are 2.5% of the escalated base price. The penalties and premiums for variations from 3% total silica are 5% of the escalated base price.

Costs of freight and insurance to Japan would be similar to those shown for Weipa bauxite.

Conclusions

Backed by at least 5 billion tons of commercial bauxite reserves, Alcoa and Comalco can be expected to compete vigorously for expanding shares of world bauxite and alumina markets and continue to offer among the lowest prices. More modest reserves on

the order of 500 million tons will restrict the competitive influence of Gove but still protect a substantial share of markets for both bauxite and alumina. Gove also has the advantage of an almost pure trihydrate bauxite. The fact that Alcoa's bauxite is not exportable has little overall effect on Alcoa's strength as a powerful indirect competitor in the world bauxite market. All grades of Australian bauxite will increasingly be exported in the form of alumina. Ocean transportation costs have always favored Asiatic markets over European markets, but Australia's main outlet, Japan, is drastically curtailing its alumina and aluminum production.

Tax and royalty policies of the Commonwealth and state governments are not likely to become as burdensome as Caribbean bauxite policies, as both the Commonwealth and state governments wish to promote the maximum expansion of the bauxite-alumina industry and to develop further processing in the production of metal. There are presently no restrictions imposed on the export of refined metal products including aluminum. The industry in 1977 contributed only about 8% of the value of all Australian exports, and less than 1% of all Commonwealth Government revenues.

During the next decade there are strong indications of a major expansion of the aluminum smelting industry in Australia based on coal-fired electricity generation and the ultimate role of Australia as a major source of alumina and aluminum.

IV. JAMAICA BAUXITE PRICES

Although Jamaica was the second largest bauxite producer in 1977, during the quarter century since production began in 1952 the bauxite has never had a recognized commercial price. It has been transferred only between the producers and their affiliates for direct production of alumina either in Jamaica or in the United States. The bauxite has served exclusively the producing companies and their affiliates. Only they have valued it and then for cost accounting or tax purposes. Alcan has directly converted it into alumina in Jamaica and has not had to price it for this purpose. The U.S. companies placed prices or values on the Jamaica bauxite they imported for the purpose of profit taxation under U.S. law and for the purpose of reports to U.S. customs officials at the ports of entry. Because no import duties were imposed on the bauxite, the declared customs values have not represented commercial prices but tend, usually after delays, to agree with the prices for U.S. tax purposes.

The accounting prices for U.S. tax purposes have been in controversy with U.S. tax officials since the 1960's due to the encouragement of U.S. tax law in favor of high nominal prices and high nominal profits charged on U.S. books for the Jamaica operations. U.S. tax officials have considered them to have been higher than commercially justified prices in order to provide tax benefits in the United States. This was the consequence of the reduced tax rate in the U.S.A. on profits of Western Hemisphere Trade Corporations on their production outside the U.S.A. The incentive rate was for the purpose of encouraging companies to build up business in the Western Hemisphere. By maximizing U.S. taxable bookkeeping profits at the reduced tax rate on Jamaica bauxite, as well as on bauxite produced in Haiti and the Dominican Republic, the U.S. companies reduced their total combined profit taxes paid in the U.S.A. Their

bookkeeping costs of producing aluminum in the U.S.A. were raised, but their taxable profits were reduced on aluminum to which applied a higher tax rate than on the imported bauxite. The actual costs of the imported bauxite and domestic aluminum were not changed. Although U.S. tax law has now been revised and the Western Hemisphere Trade Corporation tax incentive is to be eliminated by 1980, the effects have persisted in the records of the bookkeeping prices used by the companies. However, the elimination of these effects after 1980 will not be noticed due to the even higher bookkeeping prices that result from the increased levels of production costs, and particularly the bauxite levy in Jamaica. Meanwhile, over the years some Western Hemisphere governments have obtained higher revenues than they would have gained without the effects of the U.S. tax laws.

The Jamaica Government has never fixed a price for bauxite, having recognized by law and by tax agreements with the companies that it was not practicable to determine market prices and profits. Instead, taxation has been based on an assumed profit figure, partially fixed and partially variable in relation to the U.S. price of aluminum. Furthermore, a higher tax is payable if it is calculated under U.S. tax law. At the same time, royalty had also been partly fixed and partly variable until the enactment of new laws in 1974. These raised the royalty rate and imposed a bauxite levy as the equivalent of a four-fold increase in income tax. That bauxite levy did not eliminate the income tax on bauxite but merely allowed the tax to be credited against the much higher levy.

Output and markets

As shown in the following Table 2, during the years 1972-1977 the production of bauxite ranged between 10 and 15 million metric tons per year. Over half was exported and the balance converted into alumina within Jamaica. In turn, all of the alumina was exported. Data for the years 1972-1973 have been included in order to provide a comparison with the years before enactment of the bauxite levy.

The exported bauxite has been produced by subsidiaries of the Aluminum Company of America, Kaiser Aluminum & Chemical Corp., and the Reynolds Metals Company. These exports have gone only to those U.S. alumina plants of these companies where the operations and equipment have been designed to treat the particular characteristics of the Jamaica ore. Other U.S. alumina plants do not use Jamaica ore. Alcoa terminated exports of Jamaica bauxite in 1976, except for a temporary restoration when the Alcoa Jamaica alumina plant was closed because of an accident.

Table 2. Jamaica bauxite production, exported and processed within Jamaica into alumina, and alumina exports, 1972-1977.
(Thousand metric dry tons)

Year	Bauxite production	Bauxite exported		Bauxite processed		Alumina exported
		Amount	Percent	Amount	Percent	
1972.....	12,538	7,162	57.1	5,377	42.9	2,136
1973.....	13,599	7,389	54.3	6,210	45.6	2,316
1974.....	15,326	7,999	52.0	7,327	48.0	2,804
1975.....	11,570	5,482	47.4	6,087	52.6	2,375
1976.....	10,311	6,284	60.9	4,027	39.1	1,621
1977.....	11,433	6,355	55.5	5,078	44.4	2,036

Source: Jamaica Bauxite Institute.

Bauxite is also produced in separate mines from the exported bauxite for direct conversion into alumina. The producers are subsidiaries of Alcan Aluminium Limited and Alcoa, and a consortium of Kaiser, Reynolds and the Anaconda Company (U.S.A.) known as Alumina Partners of Jamaica, or Alpart. Alcan operates two alumina plants, Alcoa one, and Alpart one. Another alumina plant had been operated by Revere Copper and Brass Inc. (U.S.A.), but has been closed since August, 1975 as uneconomical, and has been treated by the company as a lost investment.

The output of alumina and exports have varied between 1.6 million and 2.8 million metric tons per year during 1972-1977. The combined capacity of the producing plants is 2,790,000 metric tons, but since enactment of the bauxite levy in 1974, output has fallen considerably below capacity due partly to curtailment of aluminum production in North America and partly to lower costs of alumina available from other sources. The

same causes explain the drop in bauxite exports shown in Table 2. The drop in Jamaica bauxite and alumina is being partly replaced by expansion of Guinea and Brazilian bauxite and Australian bauxite and alumina.

Most of the alumina exports have gone to the parent companies in North America and to affiliated companies in other countries. Only small amounts from time to time have been sold to others. The Alcan affiliates are in Norway, Spain, Sweden, and the U.K. The Alpart companies ship to their parents in the U.S.A. and to affiliates in Ghana, the U.K., and Venezuela. Alcoa ships principally to its U.S. smelters.

All of the parent companies of the Jamaica bauxite-alumina producers are engaged in additional bauxite or alumina projects in other countries, principally Brazil, Guinea and Australia. Since enactment of the Jamaica bauxite levy in 1974 with profound effects upon bauxite-alumina costs, the companies have increased their interest in bauxite resources elsewhere. On the other hand, the Government of Jamaica entered into new agreements during 1976-1978 allowing the government to obtain shares of alumina from Alcoa and Alcan, and rights to obtain bauxite by financing expansion of Kaiser or Reynolds. The government can become an independent factor in further development of the Jamaica bauxite resources but at cost and price levels yet to be determined with respect to competitive attractiveness to prospective customers.

Grades

There are significant differences in grades of bauxite and processing costs into alumina among the Jamaica bauxite producers. Some important differences also have appeared as mining has progressed and as new physical or chemical problems developed for certain companies. At one extreme, the problems of extraction efficiency were so serious to Revere Copper and Brass that the 200,000 metric ton alumina plant was able to export only intermittently starting in 1971. After imposition of the Jamaica bauxite levy, the plant was closed in 1975 as an uneconomic

investment of U.S.$90 million. Even Alcan, the first and lowest cost alumina producer in Jamaica, has at times experienced processing problems, leading to reduced operations until the problems were solved. The most common physical characteristic of Jamaica bauxite, its fine mud-like particles, required from the very beginning the development of methods different from other bauxites subject to the same Bayer process. Such experiences have been the principal obstacles to Jamaica's bauxite becoming an article of commercial trade for alumina plants other than those of the Jamaica producers.

The principal specifications for the exported bauxite during one year of the 1970's were as follows:

	% Alumina (Al_2O_3)			% Silica (SiO_2)
		Available		
	Total	At 230°C	At 140°C	
Alcoa.....	50.6	45.1	42.6	2.1
Kaiser.....	51.4	-----45-------		0.7
Reynolds.....	49.8	43.9	36.7	1.9

Source: Richard A. Thomas, Jamaica: government partnerships and recent declines shape industry's profile, Engineering and Mining Journal, November, 1977; and Government of Jamaica, Ministry of Mining and Natural Resources.

As shipped from Jamaica, the ore is partly dried to a level of 14% to 16% free moisture from the condition as mined containing 17% to 25% free moisture. The amount of ore required to produce a ton of alumina at the plants in the United States depends upon the amount of monohydrate and whether it is recovered through the use of high temperature. Approximately 2.4 tons on a dry basis per ton of alumina would be representative for these specifications assuming high temperature and about 6% loss in handling and processing. About 2.8 tons of the ore as shipped with free moisture then would be required per ton of alumina.

Principal specifications for the bauxite converted in Jamaica into alumina during one year of the 1970's were as follows:

	% Alumina (Al_2O_3)			% Silica (SiO_2)	Long dry tons of bauxite consumed per long ton of alumina produced
	Total	Available At 230°C	Available At 140°C		
Alpart.....	51.6	42.9	37.2	2.2	2.8
Alcan.....	49.3	...	44.5	1.4	2.4
Alcoa.....	50.6	45.1	42.6	2.1	2.6

Source: Ibid., Engineering and Mining Journal, November, 1977; and Government of Jamaica, Ministry of Mining and Natural Resources.

Alpart uses the high temperature process because of the monohydrate content. Alcoa uses both high and low temperature processes. Alcan uses only the low temperature process, having the best grade of trihydrate bauxite as a result of being first to explore and select most of its bauxite holdings in the 1940's. The ore is fed in wet condition to the alumina plants. Therefore, the tons of dry bauxite per ton of alumina indicated above are the equivalent of the ore consumed. The range between 2.4 and 2.8 tons of dry bauxite per ton of alumina yields different operating costs to each producer and reflects different values of the bauxite.

Prices

Different published sources support considerably different calculations of prices for Jamaica bauxite as imported to the United States. This situation is illustrated for recent years in Table 3, comparing prices based on four recognized sources: the U.S. Bureau of Mines; the International Monetary Fund; the Jamaica Bauxite Institute; and the World Bank.

Table 3. Prices of Jamaica bauxite imported into the United States, 1972-1977, U.S. dollars per metric ton

Year	U.S. Bureau of Mines 1/	International Monetary Fund 2/	Jamaica Bauxite Institute 3/	World Bank 4/
1972.....	13.27	11.93	11.94	12.00
1973.....	13.07	10.00	11.84	12.50
1974.....	...	18.32	16.27	23.50
1975.....	22.15	21.46	19.81	25.30
1976.....	25.44	21.73	19.72	27.20
1977.....	...	18.65	34.19	30.80

Source: 1/ Minerals Yearbook, U.S. Bureau of Mines. Adjusted by U.S. Bureau of Mines to dry basis per long ton, 1972-1975, and converted to metric ton values. 1976 value is on a wet basis.
2/ Calculated from International Financial Statistics, International Monetary Fund, December, 1978, p. 206, value of Jamaica bauxite exports in Jamaica dollars, converted at official exchange rates. U.S. dollars per Jamaica dollar: 1.25 in 1972 and 1.10, 1973-1978. Export tonnages from Jamaica Bauxite Institute.
3/ Calculated from export tonnage and values in Jamaica dollars as reported by the Jamaica Bauxite Institute to the U.S. Embassy, Kingston, converted into U.S. dollars per ton at official exchange rates. U.S. dollars per Jamaica dollar: 1.25 in 1972 and 1.10, 1973-1978.
4/ Commodity Trade and Price Trends (1978 edition), Economic Analysis and Projections Department, World Bank, p. 98, "U.S. import reference price based on imports from Jamaica."

Because of the tendency to quote these sources, some detailed clarification is desirable. The differences derived from the various sources are due to the absence of official published transfer prices as used by the exporting companies and their affiliates. One problem arises from using values given in Jamaica dollars and converting them into U.S. dollars as the rates of exchange fluctuate. Another problem occurs because the tonnages used in the calculations have been stated in dry tons in the export figures reported from Jamaica but are more often reported in the United States in the wet condition as shipped. The Bureau of Mines has adjusted its import figures to an assumed average dry basis except for the year 1976. If the U.S. imports average about 15% of free moisture, then the 1976 value of the Bureau would have to be

raised on a dry basis to about $30 instead of $25.44 per ton, wet basis, as shown in Table 3. However, even the U.S. Bureau of Mines estimates on a dry basis are questionable because they assume that all three of the Jamaica bauxite importers have reported to U.S. customs the tonnage of wet ore. That has been true for Kaiser and Reynolds but not for part of the time for Alcoa which reported tonnage on a dry basis.

The least unsatisfactory indications of actual transfer prices used by the U.S. companies and publicly available are shown in Table 4. These are the monthly averages of U.S. prices of Jamaica bauxite, 1974-1978, based on values and long tons as reported to each U.S. customs district by the importing company. Kaiser reports to the New Orleans, Louisiana customs district, and Alcoa and Reynolds report to the Galveston, Texas district where their data are combined. The Kaiser reports are in wet tons, and the combined Alcoa-Reynolds data are in a mixture of wet and dry tons except for those months when only Reynolds data in wet tons were reported.

Table 4. Prices of Jamaica bauxite, U.S. customs districts, 1974-1978, U.S. dollars per long ton, grade as shipped with free moisture.

At New Orleans, Louisiana for Kaiser Aluminum & Chemical Corporation.

	F.O.B. price	C.I.F. price	Insurance and freight
1974			
January.....	$11.03	$12.37	$1.34
February....	11.03	14.54	3.51
March.....	11.03	14.58	3.55
April.....	11.03	15.42	4.39
May.....	10.94	13.98	3.04
June.....	11.03	14.49	3.46
July.....	11.03	14.36	3.33
August.....	11.03	13.93	2.90
September...	11.43	14.87	3.44
October.....	11.44	14.27	2.83
November....	11.77	14.90	3.13
December....	11.52	14.31	2.79
1975			
January.....	16.17	19.42	3.25
February....	18.49	21.46	2.97
March.....	20.64	24.00	3.36
April.....	21.96	24.21	2.25
May.....	22.27	24.97	2.70
June.....	21.22	23.40	2.18
July.....	21.43	23.57	2.14
August.....	20.98	23.54	2.56
September...	21.56	24.12	2.56
October.....	24.58	27.30	2.72
November....	23.29	25.54	2.25
December....	21.29	23.73	2.44
1976			
January.....	21.67	...	...
February....	23.34	...	...
March.....	23.24	...	...
April.....	24.11	...	...
May.....	24.23	...	...
June.....	23.95	...	...
July.....	24.62	26.15	1.53
August.....	24.19	26.08	1.89
September...	24.91	26.55	1.64
October.....	23.26	25.16	1.90
November....	23.88	25.67	1.79
December....	23.87	25.54	1.67
1977			
January.....	$24.13	$25.97	$1.84
February....	24.13	26.05	1.92
March.....	28.78	30.69	1.81
April.....	29.20	31.41	2.21
May.....	28.80	31.47	2.67
June.....	28.78	31.55	2.77
July.....	28.80	31.57	2.77
August.....	28.88	31.56	2.68
September...	28.80	31.56	2.76
October.....	28.80	31.56	2.76
November....	29.09	34.27	5.18
December....	28.78	31.55	2.77
1978			
January.....	34.70	37.33	2.63
February....	34.09	36.45	2.36
March.....	34.40	36.85	2.45
April.....	35.36	37.79	2.43
May.....	35.38	37.81	2.43
June.....	35.36	37.76	2.40
July.....	35.36	37.79	2.70
August.....	35.34	37.75	2.21
September...	35.37	37.80	2.43
October.....	35.37	37.80	2.43

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Table 4, continued. Prices of Jamaica bauxite, U.S. customs districts, 1974-1978, U.S. dollars per long ton, grade as shipped with free moisture for Reynolds, and dry basis for Alcoa.

At Galveston, Texas for Alcoa and Reynolds Metals Company.

	F.O.B. price	C.I.F. price	Insurance and freight
1974			
January.....	$11.44	$13.65	$2.51
February....	12.08	14.59	2.51
March.....	10.11	12.78	2.67
April.....	12.16	15.21	3.05
May.....	10.75	13.33	2.58
June.....	12.16	15.43	3.27
July.....	12.09	15.47	3.38
August.....	12.09	15.46	3.37
September...	12.08	15.32	3.24
October.....	10.18	12.92	2.74
November....	10.14	13.41	3.27
December....	11.96	15.33	3.37
1975			
January.....	12.00	15.28	3.28
February....	20.23	23.42	3.19
March.....	25.49	28.53	3.04
April.....	28.96	30.32	1.36
May.....	26.74	28.05	1.31
June.....	28.65	31.21	2.56
July.....	30.63	31.37	.74
August.....	30.13	31.85	1.72
September...	28.16	30.74	2.58
October.....	28.35	32.01	3.66
November....	28.40	32.06	3.66
December....	28.36	32.02	3.66
1976			
January.....	27.98	...	...
February....	28.25	...	...
March.....	28.07	...	...
April.....	28.40	...	...
May.....	27.05	...	...
June.....	26.67	...	...
July.....	28.40	32.01	3.61
August.....	27.95	31.50	3.55
September...	28.22	31.64	3.42
October.....	30.01	33.62	3.61
November....	28.40	32.00	3.60
December....	29.50	33.35	3.85
1977			
January.....	$28.40	$31.88	$3.48
February....	28.49	32.11	3.62
March.....	29.70	33.30	3.60
April.....	28.40	32.00	1.60
May.....	28.40	32.00	1.60
June.....	25.47	28.70	3.23
July.....	25.82	29.10	3.28
August.....	28.40	32.00	3.60
September...	28.40	32.00	3.60
October.....	26.57	29.94	3.37
November....	28.40	32.00	3.60
December....	25.33	28.54	3.21
1978			
January.....	28.40	32.00	3.60
February....	24.14	27.20	3.06
March.....	28.40	32.00	3.60
April.....	24.93	28.09	3.16
May.....	24.15	27.21	3.06
June.....	24.14	27.20	3.06
July.....	24.08	27.21	3.13
August.....	24.14	27.23	3.09
September...	24.14	27.41	3.27
October.....	24.14	27.42	3.28

Source: Calculated from tonnages and values, U.S. Bureau of the Census, Imports for Consumption, IM 145 X. Alcoa intermittently suspended bauxite imports after April, 1976.

A summary of the monthly data is presented in the following Table 5, converted into metric tons and estimated on a dry basis. Following enactment of the Jamaica bauxite levy in mid-1974, the reported and estimated f.o.b. prices rose from a level of $11.71-$12.75 per metric dry ton that year to a level in 1975 of $28.47-$35.47. Each company reported different prices, although from month to month until increases took place, each company reported little change in its prices. The bauxite levy was made retroactive to January, 1974, but was not reflected until the following year in the reports of the companies. Additional cost increases leading to the higher prices were for fuel oil following the OPEC petroleum price increases of 1974, and increased wage rates agreed to by the companies in 1976. The costs of insurance and freight have remained at levels little changed over the five years, partly due to long term arrangements the companies have made for shipping, including the use of their own vessels, and partly due to reduced spot charter rates following a large increase in 1974.

Table 5. U.S. price levels, low and high each year, imported Jamaica bauxite, 1974-1978, estimated on dry basis, U.S. dollars per metric ton.

	F.O.B.	C.I.F.	Insurance and freight
Imports by Kaiser Aluminum & Chemical Corporation			
1974.....	$12.67-13.63	$14.33-17.86	$1.55-5.08
1975.....	18.73-28.47	22.49-31.62	2.48-3.89
1976.....	25.10-28.85	29.14-30.75	1.77-2.20
1977.....	27.94-33.82	30.08-39.69	2.10-6.00
1978 to October.....	39.48-40.97	42.21-43.79	2.56-3.13
Imports by Alcoa and Reynolds Metals Company			
1974.....	11.71-14.08	14.80-17.92	2.91-3.91
1975.....	13.90-35.47	17.70-37.13	0.86-4.24
1976.....	30.89-34.75	36.48-38.93	3.96-4.46
1977.....	29.33-34.40	33.05-38.56	1.85-4.19
1978 to October	27.89-32.89	31.50-37.06	3.54-4.17

Source: Calculated from Table 4, assuming 15% free moisture in wet ore as imported, dividing by 0.85 to obtain dry weight equivalent, and then multiplying by 0.984375 to convert to metric tons.

Jamaica bauxite levy and royalty

The Jamaica law imposing a bauxite production levy was passed on June 4, 1974 and made retroactive to January 1. It contained no language establishing or relating to a price of bauxite. It was strictly a measure to increase the revenues of the government, as was the associated amendment to the Jamaica mining law to raise the royalty on bauxite.

The bauxite Act did not fix a specific amount of levy per ton of bauxite but only established a procedure for calculating the amount of the levy and the minimum tonnage to which the levy would apply whether or not that tonnage was produced or exported. The levy had no connection with the grade of the bauxite of each producer nor with the cost of extracting the alumina from that bauxite nor with any commercial price of bauxite.

The levy was calculated in U.S. dollars per long dry ton of bauxite by applying a basic percentage rate to the average realized price per short ton of primary aluminum of the preceding year and dividing the rate by 4.3. The assumption was that 4.3 long dry tons of Jamaica bauxite after conversion to alumina yield one short ton of aluminum, or alternatively, that 4.4 metric dry tons of bauxite yield one short ton of aluminum after conversion from alumina. The implicit assumption also was that each producer required about 2.5 dry tons of bauxite to produce one ton of alumina from the customary ratio of 1.9 tons of alumina per ton of aluminum.

The 1974 Act established for that year a rate of 7.5% of the value of the aluminum, and a provisional levy of U.S.$11.16 per long dry ton for 1974, subject to adjustment the following year after the realized price of aluminum could be determined for each bauxite producer. The rate of 7.5% was subject to whatever changes the Government chose to make from year to year. The Government also could reduce or eliminate the levy for any producer for "just and equitable" cause. Thus, the Government kept the door open for future changes.

As has been noted, the three alumina producers in Jamaica consumed different amounts of bauxite per ton of alumina, ranging between 2.4 and 2.8. Consequently, the levy is more costly to those with the highest useage.

The Government announced in 1974 that the rate for the levy would be 7.5% for 1974 and to April 1, 1975. The rate would then rise for one year to 8% and for the third year to 8.5%. However, as a result of subsequent agreements for the Government to buy back bauxite lands and acquire a participation in operations of some of the companies, the rate was reduced to 7.5% for Kaiser and Reynolds from January 1, 1974 to December 31, 1983, and for Alcoa from January 1, 1976 to December 31, 1983. Alcan is reported to have obtained in 1978 arrangements comparable to Alcoa's. The 8% rate applied during 1975 to Alcan, Alcoa, Revere, and Anaconda's share in Alpart, and during 1976 to Alcan and Anaconda's share in Alpart. Kaiser and Reynolds also are allowed a one-half percent reduction in the rate for any year in which their respective outputs of bauxite, including shares in Alpart bauxite production, reach at least 3 million long tons and if in the same year their sales of alumina to third parties made from Jamaica bauxite, including their share of alumina in Alpart, are at least 500,000 short tons.

The levy rate is applied to the arithmetic average of three prices per short ton of primary aluminum obtained by the producers, Alcoa, Kaiser and Reynolds, as annually reported by them to the United States Securities and Exchange Commission, Form 10-K.

The various agreements also continue until 1983 the royalty of J.50¢ per long dry ton of bauxite as originally imposed by the Government in 1974.

The U.S. dollar levies approved by the legislature for each year, subject to adjustments, are compared with the levies based on realized prices of aluminum, as follows:

Per long dry ton of bauxite exported or converted into alumina

	Levy rate	Provisional levy	Levy on realized price of aluminum
1974.....	7.5%	U.S.$11.16	U.S.$11.98
1975.....	7.5%-8%	14.51	13.58-14.49
1976.....	7.5%-8%	15.62	14.84-15.83
1977.....	7.5%	17.86	17.78
1978.....	7.5%	18.49	...

Source: Levy rate as provided by the Jamaica legislature and agreements with the companies. Provisional levy as provided by the Jamaica legislature. Levy on realized price of aluminum calculated from the arithmetic average of three values of primary aluminum shown on the reports of Alcoa, Kaiser and Reynolds to the U.S. Securities and Exchange Commission, 10-K.

Impact of bauxite levy on alumina costs and prices

The parent companies of the Jamaica producers and studies made for U.S. Government agencies[1/] concluded that the bauxite levy had raised the cost of Jamaica bauxite and alumina considerably higher than alternative bauxites and alumina and would encourage expansions elsewhere but not in Jamaica. These conclusions were verified as projects were planned in Australia, Guinea, and Brazil, and in the case of Ireland, for alumina based on Guinea bauxite. The Jamaica Government realized this situation by 1976 in agreeing to restrict the levy not to exceed 7.5% at least until 1983. By early 1979, the Government was concerned that it would have to concede more if it were to obtain greater development of the 1.5 billion tons of bauxite reserves. The Government started discussions with some of the companies for a further reduction of the levy provided the companies would increase production.

The impact of the levy and royalty upon alumina is indicated in the following tabulation applied to the number of long tons required by each producer to produce

1/ Charles River Associates Incorporated, Cambridge, Massachusetts, Cartelization in the World Aluminum-Bauxite Market: Economic Analysis and Policy Implications, prepared for National Bureau of Standards, January, 1976; and Commodities Research Unit Limited, London and New York, The Economic Effects of An Increase in Jamaican Bauxite and Alumina Export Taxes and Royalties on the Aluminum Industry, prepared for the U.S. Overseas Private Investment Corporation, November, 1974.

a ton of alumina. The Jamaica income tax is excluded from this tabulation because, as an offset to the bauxite levy, it is deducted as long as it is less than the levy. The comparison is for the years 1974 and 1977, expressing the impact as a percentage of the prices of alumina, f.o.b. Jamaica, as reported to U.S. and Canadian customs districts by the parents of the Jamaica companies. These alumina prices, unlike the bauxite prices, are either actual prices to third parties or similar prices used by the parent companies for intra-company transfers.

	Long dry tons of bauxite per long ton of alumina	Total levy and royalty per long ton of alumina U.S. dollars	Range of f.o.b. prices of alumina from Jamaica to U.S.A. or Canada	
			U.S. dollars per long ton	Levy and royalty as percent of prices
1974: levy and royalty, U.S.$12.53 per long dry ton of bauxite				
Alcan and Reynolds,Can.	2.6	$32.58	73- 86	45-38
Alcoa, U.S.A. ...	2.4	30.07	74- 91	41-33
Alpart, U.S.A. ..	2.8	35.08	71-121	49-29
1977: levy and royalty, U.S.$18.33 per long dry ton of bauxite				
Alcan and Reynolds,Can.	2.6	47.66	167-184	29-26
Alcoa, U.S.A. ...	2.4	43.99	142-186	31-24
Alpart, U.S.A. ..	2.5	45.83	122-183	38-25

Source: The Alcan and Reynolds alumina prices are calculated from imports into Canada, converted from Can. to US $, using customs figures from Statistics Canada, Imports by Commodities (Ottawa). Alcoa and Alpart prices are calculated for imports into U.S. customs districts: Alcoa at Norfolk, Virginia and Portland, Oregon; and the Alpart companies, imports into New Orleans, Louisiana and Seattle-Everett, Washington, U.S. Bureau of the Census, Imports for Consumption, IM 145 X. Royalty of J.50¢ equal to U.S.55¢.

In 1974 before the bauxite levy could be reflected in the reported alumina prices, the most common price level in the U.S. and in Canada used for the Jamaica alumina was between $71 and $74 per long ton. A few imports were reported at higher levels between $86 and $121 per ton. The bauxite levy and royalty then amounted to between 41 percent and 49 percent of the common alumina price level. By 1977, the alumina prices to both Canada and the U.S. had about doubled. The combined bauxite levy and royalty went up by a lesser proportion, but still amounted to between 29 percent and 38 percent of the lowest import prices for alumina that year.

Alcan reported that as a result of the bauxite levy, the alumina operations in Jamaica lost money in each year, 1974-1977, and did not become profitable until 1978. The disadvantage of Alcan's Jamaica alumina was initially measured by the company at U.S.$28 per short ton as compared with other sources of alumina. Alcan ships part of its Jamaica alumina to unrelated customers as well as to its own companies. The high costs of Jamaica alumina supported the decision of Alcan in 1977 to build an 800,000 metric ton alumina plant in Ireland, supplied primarily with bauxite from Guinea. Anaconda had joined Alcan in Ireland rather than exercise its right to expand Alpart in Jamaica.

Impact on Government revenues

In 1974 the Jamaica Government announced that the principal purposes of the bauxite levy and royalty increase were to help offset the adverse balance of payments resulting largely from the OPEC increases in oil prices, and to help meet the growing internal financial deficits. The result was a very substantial gain in revenues and an increase in the share of government revenues contributed by bauxite from 8 percent in 1973 to 37 percent in 1974. However, the deficit in the balance of payments and the budgetary deficit have continued and grown worse. The data, given in Table 6, clearly reveal that the economic problems of Jamaica remain.

Table 6. Jamaica Government revenues from bauxite, total revenues, expenditures, deficit, and balance of payments, 1974-1977

	1973	1974	1975	1976	1977
	Millions of Jamaica dollars				
Revenues from bauxite levy and royalties..	24.5	168.5	139.2	118.4	172.1
As % of Government revenues.....	8%	37%	22%	19%	23%
Government revenues...	326.4	459.0	634.1	616.3	733.3
Government expenditures	416.9	626.9	823.2	1,012.6	1,103.5
Deficit.....	-90.5	-167.9	-206.0	-418.3	-428.2
	Millions of U.S. dollars				
Balance of payments, goods, services and transfers.....	-247.6	-91.9	-282.8	-302.7	-68.1

Source: Revenues from bauxite levy and royalties: Dr. Carlton Davis, Jamaica Bauxite Institute, reported in the Jamaica Daily Gleaner, August 20, 1978. Other data from the International Monetary Fund, International Statistics, December, 1978.

V. GUINEA BAUXITE PRICES

The Republic of Guinea is alternating with Jamaica as the second or third largest bauxite producer but is promoting additional developments that may compete with Australia for first place. The Guinea reserves rival those of Australia and may exceed 4.5 billion metric tons. The grade is trihydrate, less than 3% monohydrate, and is the highest quality and quantity possessed by any country. All of the reserves are on government lands and owned by the government. The prices of exported metallurgical bauxite are determined by contracts between the government and the exporting companies, but the contracts limit the use of the bauxite to the buyers and their subsidiaries and affiliates. The prices, therefore, are not the equivalent of commercial prices. Calcined bauxite also is exported.

Of the estimated 11.3 million metric tons of bauxite produced in 1977, less than 2 million tons were converted into alumina in Guinea, and over 10 million tons were exported (Table 7). The alumina plant and associated bauxite mines are operated by a joint venture, Friguia, in which the government owns 49% and a consortium 51%. The consortium, Frialco, consists of Noranda Mines Ltd. (Canada), Pechiney Ugine Kuhlmann (France), British Aluminium Co. Ltd., Alusuisse, and Vereinigte Aluminium Werke (West Germany). The bauxite is too low in grade to be exported, and the alumina output, varying between 560,000 and 730,000 metric tons per year, is exported principally for use of the consortium members. The alumina is priced by the consortium members, not by the government, but the government assures revenues by imposing since January 1, 1975 an export tax per ton of alumina equal to 1% of the price of a ton of aluminum ingot, presumably the Alcan world price.

Table 7. Guinea bauxite and alumina, 1974-1977
(Thousand metric tons)

	Bauxite			Alumina production
	Production	Exports 1/		
		Halco	U.S.S.R.	
1974.....	7,609	3,707	253	636
1975.....	8,406	5,419	1,844	639
1976.....	11,316	6,797	2,484	552
1977.....	11,300	7,677	...	562

Source: U.S. Bureau of Mines, U.S. Bureau of Census, Imports for Consumption, IM 145 X and IM 145 V; and Metallgesellschaft, Metal Statistics, 1967-1977.
1/ Compiled from import data, West Germany, France, Italy, U.S.A., Canada and U.S.S.R.

Of the exported bauxite in 1977, up to 2.5 million went to the USSR which financed and has guided production since 1974 at the mine owned by the government enterprise, Office des Bauxites de Kindia. This bauxite does not enter into commercial trade and is priced under a 30 year contract with the USSR. One million tons per year will repay the Soviet loan of some U.S.$113 million advanced for the bauxite development. The balance of the Soviet purchases is credited against some $190 million of other debts of Guinea to the U.S.S.R. The grade ranges between 46% and 48% total alumina and about 2% silica. The 1976 price was reported at U.S.$17.50 per metric ton plus a bauxite export tax of $4.50, equivalent to a total price of $22.00, f.o.b. Conakry. In 1977, the U.S.S.R. agreed to an increase in the price, not publicly reported.

Boké bauxite

Nearly 8 million tons were exported in 1977 from the Boké area by the joint venture, Compagnie des Bauxites de Guinea (CBG), owned 49% by the government and 51% by the international consortium, Halco (Mining) Inc. Members of Halco are Alcoa (27%), Alcan (27%), Martin Marietta Aluminum (20%), Pechiney Ugine Kuhlmann (10%), Vereinigte Aluminium Werke (10%) and Alumetal, (6%, formerly Montecatini-Edison of Italy).

The arrangements for pricing and taxation of this consortium are the most significant influence by Guinea in the present world bauxite trade and upon costs and prices

of alumina. The agreements with CBG have been used by the government as a model for the Friguia joint venture and may affect pricing and taxation of future bauxite-alumina projects, as well as programs for hydroelectric power, iron ore, uranium, petroleum, diamond and gold mining. The bauxite based projects include a joint venture with Energoproject of Yugoslavia (5 million tons of bauxite, 300,000 tons of alumina, and 150,000 tons of aluminum per year); the Guinean-Arab Alumina and Aluminium Company (9 million tons of bauxite, 2 million tons of alumina, and a possible aluminum smelter); and a joint venture with Alusuisse, SOMIGA, for an 8 million ton per year bauxite project. Combining the 22 million tons per year of bauxite from these projects with 9 million tons programmed for CBG, 2.5 million with the U.S.S.R., and 2 million for Friguia, Guinea could become the world's leading bauxite producer on the order of 35 million tons per year. The need for access to western capital and markets for these and other resource developments, and the apparent success of the CBG arrangements, seem to limit the extent to which the government is following policies of the International Bauxite Association that may be inconsistent with the Guinea long-term programs.

Production at Boké began in 1973 and is scheduled to reach a level of 9 million tons per year. The Halco participants entered initial contracts with CBG aggregating 5.4 million tons per year over a 20 year period, each on the same pricing basis. Expansion contracts were then adopted for an additional 3.6 million tons per year over the 20 year period, but at a higher price. In 1976, the government agreed to a temporary increase in price on both the initial and expansion contracts and that a newly enacted export tax also be included in all prices.

Grade and base prices

The base grade for each initial contract is 58-60% total alumina, 1.5% or less silica, and 3% free moisture. The price per ton as shipped is reduced in proportion to the percentage of free moisture above 3%. The bauxite as mined contains up to 12% free moisture and is dried before shipment to about 4% free moisture.

The base price for the initial contracts was U.S.$7.00 per metric ton, f.o.b. the Guinea port of Kamsar. This price is adjusted every six months for changes since February 15, 1967 in four indices measuring weekly mining wages of the Friguia project, prices of fuel oil, prices of Bunker C oil, and the U.S. wholesale commodity index. For each 1% of alumina between 60% and 66%, the base price increases by U.S. 15¢. For each 1% of alumina below 58%, the base price decreases by U.S. 30¢. For each 1% silica above 1.5%, the base price decreases by U.S. 70¢. For each 1% of free moisture above 6%, the base price decreases by U.S. 10¢. Proportional adjustments are made for variations less than 1%. From the base price thus calculated, the price of the ore as shipped is reduced by the percentage of free moisture above 3%.

The base price of the expansion contracts is U.S.$9.00 per metric ton, f.o.b. the Guinea port of Kamsar for the first 15 years, and $10 for the next five years. The base grade is 58.5% alumina and 1.5% silica or less. For each percentage variation of alumina above or below 58.5%, the base price increases or decreases by U.S. 30¢. For each percent silica above 1.5%, the price decreases by U.S. 40¢. For each percent of free moisture above 6%, the price decreases by U.S. 10¢. In addition, the base price after all adjustments for grade is further increased by changes every 6 months since January 1, 1970 in the same four indices used in the initial contracts. The price of the grade as shipped is then decreased by the percentage of free moisture above 3%.

Following the example of the Jamaica bauxite levy, the Guinea government obtained an increase in revenues from both bauxite and alumina by imposing an export tax enacted January 13, 1975, and made retroactive on bauxite to October 1, 1974 and on alumina to January 1, 1975. As in the case of Jamaica, this tax violated the existing contracts under which no additional taxes or levies could be imposed. In the case of Guinea, unlike Jamaica, the government was already a 49% partner in the

CBG-Boké and Friguia projects and was entitled to 65% of the profits. However, the CBG project at Boké had not produced net profit during the first few years aside from profit used for debt service of loans from the World Bank and others. Therefore, in order to obtain additional revenues, the export tax was imposed. The tax was graduated according to the alumina content of the exported bauxite as a percentage of the price of primary aluminum ingot, presumably the Alcan world price. The tax ranged per ton of exported bauxite from 0.50% of the price of a ton of aluminum ingot for bauxite containing at least 45% alumina, up to 0.75% of the price of a ton of aluminum ingot for bauxite containing over 56% alumina. On each ton of exported alumina, the tax was 1% of the price of a ton of primary aluminum. Thus, the export tax applied to both the Halco and U.S.S.R. bauxites, and to the Frialco alumina.

In order to increase the funds needed for CBG's operations, on February 25, 1976 the government agreed with the Halco companies on an increase of U.S.$2.00 in the price of bauxite, effective April 1, 1976 and that the total price include the bauxite export tax. The $2.00 increase was to be discontinued when the escalation of the base price for the initial and expansion contracts related to the four cost indices reached $2.00 more per ton than the prices of April 1, 1976, that is $11.93 and $13.80 per ton respectively.

The new agreement stated that effective April 1, 1976, the price under the initial contracts would be U.S.$20.38 per metric ton and under the expansion contracts U.S. $22.25 per ton. The $20.38 price was stated to include the base price of $11.93, the additional amount of $2.00, and the export tax as the difference, or $6.45. The expansion contract price of $22.25 was stated to include the base price of $13.80, the additional amount of $2.00, and the export tax as the difference or $6.45. The price of aluminum was taken at $860 per metric ton or 39¢ per pound.

Boké price record

The effect of the bauxite export tax and the $2.00 addition to the prices of April 1, 1976 is shown in the following Table 8. This table also compares the government agreed prices with those reported to U.S. customs officials by Alcoa and by Martin Marietta Aluminum. From January through September, 1974, the base price as escalated under the initial contracts rose from U.S.$8.40 to $9.57 per metric ton. No bauxite was shipped during this period under the expansion contracts. These prices also were reported by Alcoa at the ports of entry, Mobile and Galveston. Martin Marietta Aluminum likewise reported almost the same prices at the port of entry in the Virgin Islands, St. Croix.

From October 1, 1974 through March, 1976, the two base prices for initial and expansion contracts ranged between $10.75 and $13.93 per metric ton before export tax, and between $17.20 and $20.38 including the export tax. As the Alcan price of aluminum increased, by June, 1978 the prices including export tax were $23.19 for the initial contracts and $25.05 for the expansion contracts. These prices were based on a continuation of the government agreed prices before tax of $13.93 and $15.80 for the initial and expansion contracts. During this period, the averages of prices reported by Alcoa at Mobile excluded the export tax while those reported by Alcoa at Galveston included the export tax. Those reported by Martin Marietta Aluminum at St. Croix excluded the export tax. Other differences between the averages of reported prices to the U.S. customs and the government agreed prices may be due to differences in the amounts of bauxite shipped under the initial contracts and under the expansion contracts, to differences in free moisture content, or to statistical or reporting errors. In the same years, Alcan reported to Canadian customs officials similar prices, excluding the export tax.

Table 8. Prices of Boké bauxite, f.o.b. Guinea, 1974-1978
(U.S. dollars per metric ton)

Date	Alcan world price of aluminum, U.S.¢/lb.	Guinea export tax, 0.75% of Alcan price per metric ton, aluminum	Boké prices, f.o.b. Guinea, metric ton		Alcoa average prices, metric ton, f.o.b. Guinea		MM Aluminum average prices, metric ton, f.o.b. Guinea to St. Croix
			With tax	Without tax	To Mobile	To Galveston	
Jan.-Sept. 1974...	30¢-39¢	None	No tax in effect	$ 8.40-9.57	$ 8.40-9.57	$ 8.40-9.42	$ 8.14-9.37
Oct. 1974-March, 1976..	39¢	$6.45	$17.20-20.38	10.75-13.93	9.57-11.61	9.42-18.07	9.37-11.27
April-Aug. 1976.....	43¢	7.11	21.04-22.91	13.93-15.80	11.61-15.04	19.45-21.41	10.06-12.25
Aug. 1976-April, 1977..	48¢	7.94	21.87-23.74	13.93-15.80	13.73	20.69-23.19	12.25
April, 1977 June, 1978...	51¢	8.43	22.36-24.22	13.93-15.79	13.73	21.48-24.28	12.25-(1977)13.71
June-Oct. 1978.....	56¢	9.26	23.19-25.05	13.93-15.79	13.93	22.81-24.16	...

Source: Alcoa and Martin Marietta Aluminum average prices calculated from monthly data, U.S. Bureau of the Census, Imports for Consumption, IM 145 X and 145 V. Boké prices, January-September, 1974 are for the initial contracts. For the other years, the two prices are for initial and expansion contracts.

Transportation costs

Table 9 presents representative average f.o.b. and delivered prices per long ton for Boké bauxite from Guinea to U.S. ports as reported by Alcoa during 1974-1978, listing the differences for insurance and freight. The prices at Mobile exclude the Guinea export tax, and those at Galveston include the tax. No distinction is reported for deliveries under the initial contract and the expansion contract. The free moisture content is assumed to be about 4% or less. The summary of these prices converted to metric tons is in the preceding Table 8.

The costs of insurance and freight from Guinea to Mobile are similar to those from Guinea to Galveston for most years, between U.S.$8.00 and $8.55 per long ton as shipped. Lower costs were reported at Mobile for some months. No information is available on the shipping arrangements or accounting methods used to report these transportation costs. To St. Croix and also to Rotterdam, transportation costs have been reported for 1978 at about $3 to $5 per ton.

Impact of Boké export tax on alumina costs

About 1.9 tons of Boké bauxite are required to produce a ton of alumina, using the grade of 58.5% alumina, 1.5% silica, and 4% free moisture. The impact of the export tax on Boké bauxite per metric ton of alumina made from that bauxite rose from U.S.$12.26 in 1974-1976 (1.9 times $6.45) to about $17.59 in 1978 (1.9 times $9.26). There is no royalty on the bauxite, unlike the situation in Jamaica and most other bauxite producing countries. But there is an additional payment received by the government from Boké bauxite through the 65% profits tax which includes the share of 49% of profits of CBG. The amount of this tax per ton is not publicized. For the purpose of comparing the impact of Guinea government revenues from Boké bauxite upon the cost of alumina with bauxite revenues of other countries, it is necessary to compare totals of reported delivered prices of bauxite and processing costs at different alumina plants, adjusted for the number of tons and grades of bauxite per ton of alumina. The problems of making such comparisons are reviewed in the final section of this report.

Export tax on Soviet bauxite

The 1976 tax on the bauxite exported by Office des Bauxites de Kindia to the Soviet Union was reported at U.S.$4.50 per metric ton by the U.S. Embassy at Conakry. The grade of bauxite, about 46% total alumina, required a tax of 0.0055% of the price of a ton of aluminum. Based on the Alcan world price in June, 1978 of 56¢ per pound or $1,234 per metric ton, the bauxite tax would have been about $6.79 per ton.

Export tax on Friguia alumina

On Friguia alumina, the export tax is 1% of the price of a ton of aluminum. That tax would have risen from U.S.$8.60 per metric ton of alumina in 1974-1976 to about $12.35 in 1978.

Impact on Government revenues

By 1977, the export tax on bauxite and alumina apparently produced approximately U.S.$88 million in revenues. The proportion received in hard currency depended on how the Soviet payments were made or credited against the Guinea debt to the U.S.S.R. The revenues from the Halco and Frialco consortia were approximately U.S.$72 million. In 1977, the revenues from bauxite and alumina were about four times those of 1974. In relation to the recurrent budget of Guinea in 1977, the revenues from bauxite may have been as much as 43%. This contribution is extremely important to the government as the annual budget has been in deficit in recent years.

Table 9. Prices of Guinea (Boké) bauxite, U.S. customs districts, 1974-1978, dollars per long ton, grade as shipped with free moisture, about 4% or less

At Mobile, Alabama for Alcoa

	F.O.B. price	C.I.F. price	Insurance and freight
1974			
January.....	$ 8.53	$14.16	$ 5.63
February....	8.53	16.56	8.03
April.....	8.54	16.56	8.02
May.....	9.72	17.75	8.03
June.....	9.72	17.75	8.03
August.....	9.72	16.41	6.69
September...	9.72	17.75	8.03
October.....	9.72	14.28	4.56
November....	11.26	19.00	7.74
1975			
January.....	10.96	19.15	8.19
February....	10.96	19.30	8.34
March.....	10.96	19.30	8.34
April.....	10.96	19.30	8.34
June.....	10.96	19.30	8.34
July.....	11.63	16.75	5.12
August.....	11.63	17.15	5.52
September...	11.38	17.72	6.34
October.....	11.63	17.54	5.91
November....	11.71	18.84	7.13
December....	11.78	20.13	8.35
1976			
January.....	11.65	...	...
February....	11.79	...	...
March.....	11.53	...	...
April.....	11.79	...	...
May.....	11.79	...	...
June	11.79	...	...
July..	15.28	20.83	5.55
August.....	13.95	19.97	6.02
September...	13.95	19.46	5.51
October.....	13.95	22.29	8.34
November....	13.95	19.07	5.12
December....	13.95	19.35	5.40
1977			
January.....	$13.95	$21.06	$ 7.11
February....	13.95	18.43	4.48
March.....	13.95	21.28	7.33
April.....	13.95	19.97	6.02
May.....	13.95	21.38	7.43
June.....	13.95	19.97	6.02
July.....	13.95	21.23	7.28
August.....	13.95	22.29	8.34
September...	13.95	22.29	8.34
November....	13.95	22.29	8.34
December....	13.95	22.29	8.34
1978			
January.....	13.95	22.29	8.34
April.....	14.85	23.20	8.35
May.....	14.15	22.50	8.35
July.....	14.15	22.50	8.35
August.....	14.15	22.50	8.35

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Table 9 continued. Prices of Guinea (Boké) bauxite, U.S. customs districts, 1974-1978, dollars per long ton, grade as shipped with free moisture, about 4% or less

At Galveston, Texas for Alcoa

	F.O.B. price	C.I.F. price	Insurance and freight
1974			
March.....	$ 8.53	$11.28	$ 2.75
April.....	8.40	16.95	8.55
May.....	8.50	13.07	4.57
June.....	9.31	16.13	6.82
July.....	9.49	18.04	8.55
August.....	9.57	18.12	8.55
September...	9.50	18.06	8.56
October.....	10.84	19.39	8.55
November....	9.57	18.13	8.56
December....	10.70	19.25	8.55
1975			
January.....	10.72	19.27	8.55
February....	10.65	19.09	8.44
March.....	10.65	19.04	8.39
June.....	10.79	19.19	8.40
July.....	16.60	24.98	8.38
August.....	17.68	26.07	8.39
September...	17.55	25.93	8.38
October.....	17.85	26.24	8.39
November....	14.82	23.20	8.38
December....	18.05	26.43	8.38
1976			
January.....	17.02	...	...
February....	18.29	...	...
March.....	18.36	...	...
April.....	19.76	...	...
May.....	20.98	...	...
June.....	21.75	...	...
July.....	21.56	29.94	8.38
August.....	21.02	29.40	8.38
September...	21.71	30.10	8.39
October.....	21.48	29.86	8.38
December....	22.02	30.41	8.39
1977			
January.....	$23.14	$31.52	$ 8.38
February....	23.56	31.95	8.39
March.....	22.81	31.19	8.38
April.....	22.97	31.36	8.39
May.....	22.95	31.33	8.38
June.....	21.82	30.20	8.38
July.....	23.03	31.42	8.39
August.....	23.21	31.59	8.38
September...	23.24	31.76	8.52
October.....	23.83	32.34	8.51
November....	22.29	30.81	8.52
December....	24.25	32.77	8.52
1978			
January.....	24.67	33.09	8.42
February....	23.58	30.34	6.76
March.....	23.49	32.04	8.55
April.....	23.56	32.08	8.52
May.....	23.17	31.70	8.53
June.....	24.54	31.06	6.52
August.....	23.13	28.91	5.78
October.....	24.09	30.03	5.94

Source: Calculated from tonnages and values, U.S. Bureau of the Census, Imports for Consumption, IM 145 X.

VI. SURINAM BAUXITE PRICES

Surinam is the fourth ranking bauxite producer in the Western world. Its recent peak output was 6.9 million metric tons in 1974. The trend has since been downward to 4.9 million in 1977 due to limited reserves of the two producers and their growing interest in bauxite projects in other countries. The two producers are Alcoa through a subsidiary, Suriname Aluminum Company (Suralco), and Billiton, a subsidiary of Royal Dutch Petroleum Company (Netherlands). Alcoa produces metallurgical bauxite, calcined bauxite, alumina and aluminum. Billiton produces metallurgical and chemical grades of bauxite, and sells alumina from its own bauxite converted at the Alcoa alumina plant in Surinam. Both companies export metallurgical bauxite. The Billiton exports are sold primarily to Alcan in Canada, and the Ormet Corporation for processing into alumina at a plant near New Orleans, Louisiana. The Alcoa metallurgical bauxite is shipped principally to the Alcoa alumina plants at Mobile, Alabama and at Point Comfort, Texas through the Galveston port of entry.

Table 10 presents the production and exports of the two companies for 1974-1977.

Table 10. Surinam bauxite, alumina and aluminum, production and exports, 1974-1977
(Thousand metric tons)

	Bauxite production		
Year	Total	Billiton	Alcoa (by difference) (Suralco)
1974.....	6,863	2,995	3,868
1975.....	4,751	2,135	2,616
1976.....	4,760	2,202	2,558
1977.....	4,924	2,137	2,787

Source: Totals for 1974-1975 from Surinam Central Bank, Bureau of Statistics, and companies as compiled by World Bank mission in Economic Position and Prospects of Surinam, November 24, 1976; Billiton data from annual reports, Royal Dutch Petroleum Company. 1976 data are from Royal Dutch Petroleum Company and U.S. Embassy, Paramaribo. Alcoa data are the differences between the totals and the Billiton data.

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Table 10 continued. Surinam bauxite, alumina and aluminum, production and exports, 1974-1977
(Thousand metric tons)

	Exports								
	Billiton				Alcoa (Suralco)				
		Bauxite				Bauxite			
Year	Alumina	Total	Chemical grade	Metal grade	Total	Calcined	Metal grade	Alumina	Aluminum
1974..	498	1,88[illegible]	186	1,702	2,085	...	...	580	54
1975..	443	1,305	291	1,014	1,024	189	...	648	26
1976..	506	1,114	156	958	898	...	...	560	46
1977..	563	1,042	113	929	1,164	173	992	541	58

Source: U.S. Embassy, Paramaribo.

Alcoa metallurgical bauxite

The contract under which Alcoa was granted in 1958 a 75 year concession by the government, the Brokopondo agreement, provides a price formula for a base grade of bauxite. Calculations under the formula require certain information known only to Alcoa and cannot be independently made except by indirect estimates. For this reason, it is necessary to rely upon Alcoa's reports to the U.S. customs for indications of Alcoa's prices of the bauxite transferred to its alumina plants. The price formula, f.o.b. Surinam, is based on a grade of 56% total alumina and 3% total silica, a 1960 reference of 21 Surinam guilders per metric ton or U.S.$11.76 (1.785 guilders per U.S. dollar, 1974-1978), and an adjustment index related to the year 1959 weighted 35% by the U.S. wholesale index for iron and steel, 35% by the price of 99.5% aluminum pig in the American Metal Market, and 30% by the average compositeprice of six major mill products of Alcoa. For variations from the basic grade of bauxite, a further adjustment is made for the percentage changes in costs of processing the bauxite at Alcoa's alumina plant at Mobile.

The prices as calculated under the Brokopondo agreement and the prices reported by Alcoa to U.S. customs have increased as a result of the net bauxite levy adopted by Surinam and Alcoa in two agreements. The first was effective January 1, 1974 until December 31, 1975. The second covered the years 1976-1978. The levy was agreed by Alcoa and the government on December 20, 1974 following enactment in June of the bauxite levy of Jamaica. The Surinam levy applied to each ton of bauxite exported or shipped for processing within Surinam. Billiton bauxite was subject to a comparable but separately negotiated levy.

Effect of levy on Alcoa's prices

Under the agreement for 1974-1975, the levy was fixed for 1974 at U.S.$9.77 per dry metric ton. This was related to an assumed price for aluminum of 35¢ per pound. For 1975, the levy was adjusted on the basis of 6% of the average realized price by Alcoa per short ton of aluminum, divided by 4.3. The aluminum was defined as primary unalloyed aluminum ingot having a purity of 99.5% to 99.79%. The average realized price included the costs of delivery and sales only to unrelated customers as reported by Alcoa to the U.S. Securities and Exchange Commission in the 10-K annual report. This formula differed from the Jamaica formula which imposed a higher levy of 7.5% and applied it to the average price of primary aluminum in all forms and grades realized by the three companies, Alcoa, Kaiser and Reynolds. Again, for the Jamaica levy the income taxes of the companies were offset as long as they were less than the levy, but the total Surinam levy was reduced by the amount of income taxes paid by Alcoa on all of its combined profits from bauxite, calcined bauxite, alumina and aluminum. The effect was further to reduce the net amount of levy per ton of bauxite as compared with the Jamaica levy.

Under the agreement for 1976-1978, the initial levy for 1976 before adjustment was raised to $10.33 per dry metric ton based on an assumed realized price of 37¢

per pound of aluminum. The conversion ratio of 4.3 metric tons of bauxite per short ton of aluminum was continued only on an interim basis and was to be changed to the actual ratio to be experienced by Alcoa in converting Surinam bauxite in Surinam and elsewhere. In addition, a minimum annual tonnage was fixed for shipments, subject to changes in market conditions or force majeure.

Tentative estimates of the Alcoa bauxite levy can be made on one assumption that during the years, 1974-1978, the grade was fairly constant and required 4.3 dry metric tons per short ton of aluminum. With that assumption and applying 6% to the average price realized by Alcoa per short ton of ingot having a purity of 99.5% to 99.79% as reported by Alcoa to the U.S. Securities and Exchange Commission, the levy would have increased from the fixed level of U.S.$9.77 per metric ton in 1974 to about $13.31 in 1977:

	Average realized price of aluminum, short ton	Estimated bauxite levy 6% of realized price of aluminum divided by 4.3
1974.....	$625.00	Fixed, $ 9.77
1975.....	731.51	10.21
1976.....	755.82	10.55
1977.....	953.30	13.31

On the other hand, the average grade of bauxite probably was better than a ratio of 4.3 metric tons per short ton of aluminum. The ratio replaced under the Surinam agreement for 1976-1978 was the actual ratio experienced by Alcoa. Both Billiton and Alcoa bauxite had an approximate content of at least 50% available alumina as compared with less than 45% for Jamaica bauxite. Billiton bauxite was being converted by Alcoa in Surinam in 1976 in the ratio of two tons of bauxite per ton of alumina and 3.63 metric tons of bauxite per short ton of aluminum, the bauxite levy would have risen from $9.77 per metric ton in 1974 to about $15.76 in 1977.

Whatever is the correct formula, Alcoa's realized price of aluminum rose by 52% between 1974 and 1977, raising the levy possibly by as much as $5.00 per metric ton. Taking into account also increases in production costs, the cost of converting Alcoa's Surinam bauxite into alumina had to increase, both in Surinam and in the United States. This condition was reflected, although not consistently, in the values of Surinam bauxite reported principally by Alcoa to U.S. customs. At Galveston, Texas, the calculated prices per metric ton almost doubled between 1974 and 1975 to a level around $25.58, f.o.b. Surinam, and then fluctuated around that level, up and down, through 1978. At Mobile, Alabama, the calculated price level also doubled between 1974 and 1975, but then appears to have declined somewhat through 1978.

Table 11 shows representative levels of average f.o.b. and c.i.f. prices for 1975-1978 reported principally by Alcoa to U.S. customs districts, f.o.b. Surinam, c.i.f. at the port of entry, and the differences in insurance and freight. These prices are per metric ton, converted from the details in long tons given in Table 12. Also shown in both tables are price levels reported largely or exclusively by the Ormet Corporation to U.S. customs for Surinam bauxite received from Billiton at New Orleans, Louisiana. The Ormet prices have been consistently a few dollars less per ton than the Alcoa prices, at least until 1978. They represent a commercial transaction between unrelated parties which differ to some extent from the prices of Alcoa in trading with its subsidiary which, as previously discussed, are in accordance with the price formula negotiated with the Surinam Government in 1958. The grade of ore is assumed to be comparable to Alcoa's, both trihydrate, requiring about two tons per ton of alumina, and not over 4 % free moisture as shipped. In 1977 the Billiton grade was reported at 59 % total alumina, 54 % available alumina, and 4.8 % silica, largely reactive. 1/ Free moisture varied between 3 % and 4 %. 2/

1/ Engineering and Mining Journal, November, 1977, p. 93.

2/ World Mining, March, 1976, p. 51.

Table 11. Representative average prices of Surinam bauxite at U.S. ports shipped by Alcoa and Billiton, 1974-1978
(U.S. dollars per metric ton)

	Alcoa (Suralco) bauxite received by Alcoa						Billiton bauxite received by Ormet at New Orleans		
	At Mobile			At Galveston					
	F.O.B. price	C.I.F. price	Insurance and freight	F.O.B. price	C.I.F. price	Insurance and freight	F.O.B. price	C.I.F. price	Insurance and freight
1974...	$12.30	$18.89	$ 6.59	$12.52	$18.17	$ 5.65	$ 9.63	$15.79	$ 6.16
1975...	25.86	33.60	7.74	25.58	33.84	8.26	22.39	28.56	6.17
1976...	22.04	29.77	7.73	24.52	...	...	22.95	30.58	7.63
1977...	18.36	26.07	7.71	28.05	36.31	8.26	24.12	33.97	9.85
1978 to October	17.99	25.72	7.73	23.21	29.87	6.66	24.12	33.97	9.85

Source: Converted from monthly data in long tons shown on Table 12.

Impact of Surinam levy upon alumina costs and prices.

Two different levies apply to Alcoa and Billiton using a 6% factor. The Alcoa levy is based on 6% of the realized price of a short ton of aluminum divided by whatever ratio of conversion results from Alcoa's alumina operations in Surinam and the U.S.A. This levy is then reduced by income taxes paid on profits of bauxite, alumina and aluminum of Alcoa in Surinam. In the case of Billiton, a different reference price of aluminum is used because the company is not integrated in the production of aluminum and has no realized price of aluminum to report. Furthermore, a fixed conversion ratio of 4 metric tons of bauxite per short ton of aluminum is reported to have been adopted.[1/]

For 1976, Billiton was required to use a fixed bauxite levy of U.S.$10.65 per metric ton based on an assumed aluminum price of 36¢ per pound. By 1977, if the Alcan world prices of 48-51¢ were used, the levy would have been about U.S.$15 per metric ton of bauxite before any deduction for income tax. This assumes more than $4.00 increase in the bauxite levy in one year, but this assumption is not supported by the

1/ World Bank, Economic Position and Prospects of Surinam, November 24, 1976, Table 8.6.

Table 12. Prices of Surinam bauxite, U.S. customs districts, 1974-1978, U.S. dollars per long ton, graded as shipped with free moisture not over 4%

At Mobile, Alabama, usually from Alcoa to Alcoa

	F.O.B. price	C.I.F. price	Insurance and freight
1974			
January....	$11.98	$17.83	$ 5.85
February...	12.10	18.78	6.68
March.....	11.56	18.25	6.69
April.....	11.80	18.49	6.69
May.....	11.90	18.68	6.78
June.....	12.40	19.07	6.67
July.....	12.69	19.46	6.77
August.....	12.80	19.49	6.69
September..	12.65	19.32	6.67
October....	12.50	19.19	6.69
November...	12.54	19.51	6.97
December...	12 50	19.27	6.77
1975			
January....	12.86	19.95	7.09
February...	20.05	27.90	7.85
March.....	26.27	34.13	7.86
April.....	26.73	34.59	7.86
May.....	28.14	36.05	7.91
June.....	27.46	35.32	7.86
July.....	28.07	35.93	7.86
August.....	26.92	34.78	7.86
September..	27.63	35.49	7.86
October....	25.10	32.95	7.85
November...	25.18	33.03	7.85
December...	23.56	31.41	7.85
1976			
January....	21.59	...	...
March.....	23.51	...	...
April.....	24.69	...	...
May.....	22.39	...	...
June.....	22.39	...	...
July.....	23.11	30.97	7.86
August.....	20.87	28.72	7.85
September..	20.25	28.12	7.87
October....	20.18	28.03	7.85
November...	20.16	28.01	7.85
December...	19.86	27.69	7.83
1977			
January.....	$19.94	$27.79	$ 7.85
February....	19.26	27.11	7.85
March.....	19.91	27.76	7.85
April.....	18.65	26.49	7.84
May.....	19.34	30.76	11.42
June.....	22.70	30.58	7.88
July.....	19.30	26.75	7.45
August.....	16.34	24.61	8.27
September...	18.32	26.08	7.76
October.....	19.30	26.43	7.13
November....	17.02	25.07	8.05
December....	18.60	25.17	6.57
1978			
January.....	19.20	27.05	7.85
February....	19.02	26.89	7.87
March.....	20.31	28.16	7.85
April.....	18.28	26.13	7.85
June.....	21.32	29.17	7.85
July.....	21.90	29.75	7.85
August.....	21.10	28.95	7.85
September...	17.24	25.08	7.84
October.....	15.23	21.28	6.05

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Table 12 continued. Prices of Surinam bauxite, U.S. customs districts, 1974-1978, U.S. dollars per long ton, grade as shipped with free moisture not over 4%

At Galveston, Texas, usually from Alcoa to Alcoa

	F.O.B. price	C.I.F. price	Insurance and freight
1974			
March.....	$13.48	$19.24	$ 5.76
April.....	12.49	18.24	5.75
May.....	12.43	18.22	5.79
June.....	13.26	19.04	5.78
July.....	12.72	18.46	5.74
August.....	12.77	18.58	5.81
September..	11.78	17.52	5.74
October....	12.48	18.23	5.75
November...	12.44	18.18	5.74
December...	12.76	18.51	5.75
1975			
January....	24.02	32.52	8.50
February...	29.87	38.26	8.39
April.....	27.18	35.56	8.38
June.....	25.97	34.35	8.38
August.....	25.35	33.74	8.39
October....	24.89	33.28	8.39
December...	25.99	34.38	8.39
1976			
February...	26.95	...	...
May.....	24.91	...	...
June.....	23.16	...	...
August.....	27.45	35.84	8.39
1977			
April.....	$28.82	$37.21	$ 8.39
May.....	28.41	36.93	8.52
June.....	27.92	36.31	8.39
July.....	28.50	36.89	8.39
August.....	28.24	36.63	8.39
September...	28.11	36.63	8.52
October.....	29.60	38.18	8.58
November....	29.61	38.13	8.52
December....	27.63	36.34	8.71
1978			
January.....	24.67	33.09	8.42
February....	23.58	30.34	6.76
March.....	23.49	32.04	8.55
April.....	23.56	32.08	8.52
May.....	23.17	31.70	8.53
June.....	24.54	31.06	6.52
August.....	23.13	28.91	5.78
October.....	24.09	30.03	5.94

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Table 12 continued. Prices of Surinam bauxite, U.S. customs districts, 1974-1978, U.S. dollars per long ton, grade as shipped with free moisture not over 4%

At New Orleans, Louisiana, usually from Billiton to Ormet

	F.O.B. price	C.I.F. price	Insurance and freight
1974			
January....	$ 9.78	$16.52	$ 6.74
February...	14.19	21.85	7.66
March.....	9.78	16.04	6.26
April.....	9.78	16.04	6.26
May.....	10.12	17.00	6.88
June.....	9.78	16.04	6.26
July.....	10.41	17.71	7.30
August.....	10.39	16.64	6.25
September..	10.53	17.58	7.05
October....	9.85	16.06	6.21
November...	9.72	15.82	6.10
December...	10.38	17.05	6.67
1975			
January....	9.85	15.53	5.68
February...	21.49	28.07	6.58
March.....	19.50	26.10	6.60
April.....	19.50	26.47	6.97
May.....	20.52	26.98	6.46
June.....	19.50	26.98	7.48
July.....	21.33	27.11	5.78
August.....	22.48	29.87	7.39
September..	23.19	30.65	7.46
October....	22.75	29.01	6.26
November...	22.75	30.39	7.64
December...	22.75	27.62	4.87
1976			
January....	22.75	...	...
February...	22.75	...	...
March.....	22.75	...	...
April.....	21.63	...	...
May.....	23.31	...	...
June.....	23.31	...	...
July.....	23.31	31.63	8.32
August.....	23.30	31.05	7.75
September..	23.31	31.30	7.99
October....	23.31	31.15	7.84
November...	23.31	30.54	7.23
December...	23.31	32.26	8.95

	F.O.B. price	C.I.F. price	Insurance and freight
1977			
January....	$23.31	$33.32	$10.01
February....	24.50	34.50	10.00
March.....	24.67	34.74	10.07
April.....	24.06	33.83	9.77
May.....	24.50	34.51	10.01
June.....	24.50	34.51	10.01
July.....	25.16	34.87	9.71
August.....	25.21	34.91	9.70
September...	24.50	34.51	10.01
October.....	23.78	33.46	9.68
November....	24.50	34.51	10.01
December....	24.50	34.51	10.01
1978			
January.....	24.28	33.80	9.52
February....	24.50	28.00	3.50
March.....	24.48	34.62	10.14
May.....	24.50	34.51	10.01
June.....	23.85	33.86	10.01
July.....	24.50	34.50	10.00
August.....	24.50	34.50	10.00
September...	24.50	34.50	10.00
October.....	24.50	34.51	10.01

Source: Calculated from tonnages and values, U.S. Bureau of the Census, Imports for Consumption, IM 145 X.

prices reported to U.S. customs by Ormet on Billiton bauxite. As shown in Table 12, the most common average price per long ton was $23.31 in 1976 and $24.50 in 1977. Consequently, it is not possible from published data to calculate dependably either for Alcoa or Billiton the impact of the levy first on bauxite prices and then upon alumina costs or prices. As a rough approximation, it could be assumed that the bauxite levy for both companies in 1977 was between U.S.$13 and $15.00 per metric ton. The maximum royalty of U.S. 56¢ per ton should be added for the purpose of comparison with other bauxite producing countries. Assuming two tons of Surinam bauxite per ton of alumina, the combined impact of royalty and levy in 1977 may have been between U.S.$26.12 and $31.12 per metric ton of alumina whether produced in Surinam or in the U.S.A.

If the impact of the levy is looked for in the prices of Surinam alumina imported into the United States as reported to U.S. customs, the clearest picture is given in the imports of Alcoa for its smelter at Badin, North Carolina through the port of Norfolk, Virginia. Other imports of Surinam alumina enter the port of New Orleans but reflect prices for different buyers and different contracts, complicating any interpretation. On the other hand, Alcoa usually is the sole importer at Norfolk.

Alcoa also imports alumina from Jamaica to Norfolk. Therefore, a comparison of the f.o.b. prices for Surinam and Jamaica alumina reflects differences in costs of production to Alcoa in the two countries, including respective royalties and bauxite levies. This comparison is shown in Table 13 along with delivered prices and extremely low transportation costs as reported. The comparison supports two conclusions:

(1) In 1974, before the bauxite levies of both Surinam and Jamaica could be reflected in the f.o.b. prices of alumina, Alcoa's Jamaica price of $72.77 per metric ton was about $3.25 less than Alcoa's Surinam price.

(2) By late 1977 after the bauxite levies of both Surinam and Jamaica had fully made impact as well as other increases in costs of production, the Jamaica price level of $183 per metric ton was about $35 higher than the Surinam level of $148.

These conclusions are not affected by the questionably low costs of insurance and freight reported by Alcoa from both Jamaica and Surinam, most frequently less than $2 per metric ton. The shipping distance from Surinam to Norfolk is over 2000 miles and from Jamaica to Norfolk about 1200 miles. On Alcoa's bauxite shipped from Jamaica to Gulf ports, as shown in Table 12, the level of $8 per metric ton was far above the alumina shipping charges to Norfolk. Information is not available on the different shipping procedures and costs used by Alcoa in these instances.

Impact of bauxite levy upon Surinam revenues

Bauxite, alumina and aluminum are the principal contributors to Surinam's revenues, gross domestic product, and balance of trade. The combination of bauxite royalties and levy by 1975 produced about U.S.$69 million, an estimated 42% of all current government revenues. Out of all exports in 1975, bauxite, alumina and aluminum accounted for about 84% of value. They also contributed about 37% to gross value added in gross domestic product. The government's principal concern is to maintain stability of income from the bauxite producers, to encourage expanded production, and to facilitate development through a joint venture with Billiton the development of additional bauxite in Western Surinam, and possibly also alumina and aluminum. Therefore, the government is sensitive to maintaining or improving its competitive position relative to other bauxite producing countries.

Table 13. Prices of Surinam and Jamaica alumina, produced by Alcoa and delivered usually to Alcoa at Norfolk, Virginia, 1974-1978. U.S. dollars per metric ton

	From Jamaica				From Surinam		
	F.O.B. price	C.I.F. price	Insurance and freight		F.O.B. price	C.I.F. price	Insurance and freight
1974				1974			
January....	$72.77	$84.86	$12.09	March.....	$77.98	$82.68	$ 4.70
February...	72.77	73.03	0.26	April.....	72.13	77.52	5.39
March.....	72.77	77.33	4.56	June.....	76.02	80.57	4.55
April.....	72.77	76.97	4.20	July.....	76.02	79.38	3.36
May.....	72.77	79.40	6.63	September..	76.02	77.27	1.25
June.....	72.77	81.65	8.88				
July.....	72.77	85.05	12.28	1975			
August.....	72.77	73.99	1.22	February...	108.38	109.77	1.39
September..	90.01	91.33	1.32	March.....	108.39	110.12	1.73
October....	84.40	85.69	1.29	April.....	108.39	110.12	1.73
November...	90.01	91.32	1.31	May.....	108.39	110.12	1.73
December...	90.01	91.33	1.32	July.....	114.29	115.72	1.43
				August.....	123.39	124.87	1.48
1975				September..	121.64	123.12	1.48
January....	90.02	91.33	1.31	October....	121.64	123.12	1.48
February...	122.07	123.55	1.48				
March.....	122.07	123.55	1.48	1976			
May.....	125.51	126.76	1.25	September..	133.66	134.91	1.25
July.....	144.98	146.58	1.60	December...	133.66	134.91	1.25
August.....	141.23	142.80	1.57				
November...	140.50	142.07	1.57	1977			
December...	140.82	142.40	1.58	January....	142.03	143.29	1.26
				March.....	141.08	142.34	1.26
1976				May.....	141.08	146.92	5.84
January....	141.21	...	...	June.....	142.27	...	...
February...	156.75	...	...	August.....	152.67	153.94	1.27
July.....	156.13	157.44	1.31	November...	148.17	149.41	1.24
September..	138.13	139.37	1.24	December...	148.17	149.44	1.27
November...	88.16	89.27	1.11				
December...	156.67	157.96	1.29	1978			
				April.....	155.73	159.22	3.49
1977				May.....	155.73	157.55	1.82
January....	161.84	163.15	1.31	July.....	154.53	...	...
March.....	140.03	141.28	1.25	August.....	155.73	157.00	1.27
April.....	169.80	171.13	1.33	September..	160.74	162.00	1.26
May.....	140.02	145.82	5.80	October....	160.74	....	...
June.....	176.43	...	...				
August.....	177.25	177.80	0.55				
October....	174.20	176.74	2.54				
November...	183.80	185.12	1.32				
December...	183.15	184.52	1.37				
1978							
March.....	183.31	184.58	1.27				
April.....	178.28	179.59	1.31				
May.....	182.24	183.56	1.32				
July.....	181.04	...	...				
August.....	187.04	188.37	1.33				
September..	186.83	188.16	1.33				

Source: Calculated from tonnages and values, U.S. Bureau of the Census, Imports for Consumption, IM 145 X.

VII. GUYANA BAUXITE PRICES

Guyana, the fifth ranking producer of bauxite in the Western world, contributed 3.3 million metric tons in 1977. Production has declined from the peak of 4.4 million tons reached in 1970 under private operation by two producers. In July, 1971 the Guyana Government acquired by purchase under nationalization Alcan's Demerara Bauxite Company (DEMBA), and in 1975 the bauxite operations of Reynolds. The DEMBA operations were placed in the Guyana Bauxite Company (GUYBAU) and the Reynolds operations in the Berbice Mining Enterprise (BERMINE). DEMBA produced metallurgical and chemical grades of bauxite, calcined bauxite of refractory grade, and alumina. Reynolds produced metallurgical and chemical grades and calcined bauxite. The same products have been continued by GUYBAU and BERMINE under the control of the government's Bauxite Industry Development Company, Ltd., (BIDCO). However, output and sales of metallurgical bauxite and alumina have fallen since 1971, and GUYBAU has expanded production of the more profitable refractory grade of calcined bauxite in which Guyana has enjoyed almost a world monopoly. The average price of calcined bauxite in 1976 was about U.S.$83 per metric tons as compared with $14.50 for metallurgical and chemical grades.[1/]

The production of calcined bauxite grew from 689,000 metric tons in 1971 to 772,000 in 1975 but dropped by 1977 to 709,000. Alumina output declined from a peak of 317,000 metric tons in 1970 to 277,000 in 1977. Output of metallurgical and chemical bauxite fell from 2,390,000 tons in 1970 to 878,000 in 1977.[2/] Metallurgical grade output dropped from 737,000 tons in 1971 to 582,000 in 1977. BIDCO was unable to retain the markets for metallurgical bauxite following the transfer of ownership from DEMBA and Reynolds, and has accepted from both companies and others prices below

1/ World Bank, Economic Memorandum on Guyana, June 7, 1977, Table 8.1.
2/ Ibid, and statement of Bauxite Industry Development Company, Ltd., Georgetown, Guyana, January 17, 1978.

competitors and far below the prices used by the Jamaica bauxite producers after the Jamaica bauxite levy was imposed in 1974. Although the Guyana Government also adopted a bauxite levy in 1974 comparable to Jamaica's, it did not apply to the government's own operations. The levy applied only to any bauxite producers who also produced aluminum, thereby exempting the government's own bauxite operations. Transportation costs of bauxite and alumina from Guyana have always been higher than from other Caribbean countries due to river navigation for both the former Reynolds and DEMBA operations, the shallow river bars limiting the draft and size of vessels, and the transshipment into larger vessels at storage depots in Trinidad and Venezuela. These conditions and costs have been similar for Surinam bauxite. The grade of Guyana metallurgical bauxite has been somewhat superior to that of Surinam and far superior to that of Jamaica, Haiti and the Dominican Republic.

Grade

The superiority of the Guyana metallurgical bauxite was indicated in the formula used in the bauxite levy law of 1974 of 3.39 long dry tons of bauxite per short ton of aluminum. This was the equivalent of 2 tons of bauxite per ton of alumina as compared with the Jamaica formula, equivalent to 2.5 tons of bauxite per ton of alumina. The grade exported from GUYBAU and BERMINE in 1976 and 1977 averaged 58% total alumina and 3.5% free moisture, silica not stated. In 1975 the average was 58.5% total alumina and 4.23% free moisture. In 1972 the grade solely from GUYBAU was 57.4% total alumina and 3.8% free moisture.[1/] The ore is trihydrate.

The grade used for the 25 year term of a bauxite agreement of February 16, 1965 between Reynolds and the Government (then British Guiana) was 57% available alumina, 3% reactive silica, and 1.5% free moisture. For DEMBA, the 25 year bauxite agreement entered with the government on October 29, 1965 used a base grade of 53% available

1/ U.S. Embassy, Georgetown.

alumina, 4.5% reactive silica, and 3.0% free moisture. This was similar to the grade for GUYBAU bauxite from the former DEMBA operations used for the base grade six years later in a contract of November 18, 1971 with Harvey Alumina Virgin Islands, Inc., containing 57% total alumina, 4.75% total silica, and 4.5% free moisture.

Prices

The 1971 contract with Harvey Alumina applied to 700,000 long tons, as amended in 1972, for delivery during 1972-1973. The price was for delivered ore at the Virgin Islands, U.S.$9.95 per long ton, with premiums and penalties for variations of alumina, silica and free moisture content from the basic grade. The price varied up or down by U.S.33¢ for each 1% variation in alumina content; down or up by 66¢ for each increase or decrease of 1% in silica content; and down by 17¢ for each additional 1% of free moisture.

The pricing basis for 25 years under the 1965 agreement with Reynolds was U.S. $10.28 per long dry ton f.o.b. Everton, Guyana, with premiums and penalties for variations from the base grade, and with proportional changes in relation to the changes from U.S. 24.5¢ per pound in the U.S. price of 99.5% unalloyed aluminum ingot, as published in the American Metal Market. For DEMBA the pricing basis, also for 25 years under the 1965 agreement, was U.S.$8.00 per long ton, f.o.b. Mackenzie, Guyana, with premiums and penalties for variations from the base grade, and with the same proportional changes related to changes in the U.S. price of aluminum as specified in the Reynolds agreement.

The Reynolds and DEMBA agreements were terminated when the government nationalized their properties in the 1970's. Had they remained in effect through 1977 when the U.S. price of aluminum, as reported by the American Metal Market, averaged 51.33¢ per pound or 109.5% higher, the price of the Reynolds bauxite would have become U.S. $21.54 and the DEMBA price would have been $16.76 per long ton. The actual average

price for 1977 reported by BIDCO to the U.S. Embassy in Georgetown, converted to U.S. currency, was $16.99 per long ton as shipped, considerably less than would have been the average price under the abandoned Reynolds-DEMBA agreements.

Because of the difficulties of finding new metallurgical grade markets after nationalization of DEMBA, the base price to Harvey Alumina for 1972-1973 was only $9.95 per long ton and included transportation costs. In 1976 after nationalization of the Reynolds operations, BERMINE sold 300,000 tons of bauxite to Reynolds at $12 to $14 per ton, apparently f.o.b. Guyana. Under the 1965 agreement with Reynolds, the price of the bauxite would have been higher, about U.S.$18.67 per long ton, reflecting an 81.6% increase in the U.S. price of aluminum to 44.49¢ per pound. GUYBAU also sold bauxite to Alcan, former owner of DEMBA, but the prices have not been reported. In 1976, GUYBAU announced that sales to Canada (Alcan) in 1975 had been 779,000 tons or 94% out of total sales of 825,000 tons of metal grade bauxite.

For the years 1970-1977, the average prices received for metallurgical grade bauxite per long ton, f.o.b. Guyana, were as follows:[1/]

1970.....U.S.$	9.50
1971.....	9.70
1972.....	9.40
1973.....	9.00
1974.....	7.50
1975.....	11.91
1976.....	13.83
1977.....	16.99

The grade was at least 58% total alumina and between 3.5% and 4.12% free moisture during 1975-1977. Silica content was not reported.

Shipments to the alumina plant of Martin Marietta Aluminum at St. Croix, Virgin Islands (Harvey Alumina), were reported to U.S. customs in 1975 between $10.15 and $16.61 and for 1976, between $14.39 and $15.54 per long ton, f.o.b. Guyana.

1/ Prices for 1970-1974 from World Bank, Economic Memorandum on Guyana, June 21, 1976, Table 8.1; for 1975-1976, U.S. Embassy, Georgetown, Guyana.

The average prices of metallurgical bauxite in recent years as imported to the U.S.A., principally to the port of New Orleans, cannot be determined from the U.S. customs statistics due to the inclusion of chemical grade bauxite in the tonnages. The values of that grade have been between $2.00 and $6.00 higher per ton than for the metallurgical grade, reflecting also a higher alumina content.

The transportation costs per long ton on metallurgical and chemical bauxite shipped to the United States, New Orleans, and reported to U.S. customs, were as follows, 1974-1978:

1974.....	U.S.$ 7.29-$ 8.14
1975.....	7.29
1976.....	7.13- 8.22
1977.....	6.32- 10.01
1978.....	10.00- 12.48

The Surinam and Guyana metallurgical bauxite, shipped to the U.S.A., are closely comparable as trihydrate, each consuming about 2 tons per ton of alumina. Transportation costs are also similar, involving transshipment at Caribbean loading stations. The apparent commercial prices of Billiton in Surinam to Ormet, from Reynolds in 1974 and from BERMINE in 1975-1976 to Reynolds, and approximate transportation costs for the period 1974-1976, were as follows:

	Surinam bauxite to Ormet, New Orleans, La.			Guyana bauxite to Reynolds, New Orleans, La.		
	F.O.B.	C.I.F.	Insurance and freight	F.O.B.	C.I.F.	Insurance and freight
1974.....	US$ 9.78	US$16.04	US$6.26	US$ 8.00- 9.50	US$15.25- 16.80	US$7.25- 7.30
1975-1976.	22.75- 23.31	29.01- 31.07	6.26- 7.76	14.00- 16.00	21.00- 24.00	7.00- 8.00

The Surinam bauxite was sold to Ormet at considerably higher prices than the Guyana bauxite sold to Reynolds in 1975-1976. One reason is that the former was under a long-term contract while the Guyana sale was a short-term transaction resulting from

the need to maintain sales and production during a period of reduced North American aluminum production and during the adjustment following nationalization of the Reynolds properties.

Impact upon alumina prices

The lower delivered prices of Guyana bauxite and the higher quality conferred an advantage to the buyers in lower costs of producing alumina compared with Caribbean bauxites from Jamaica, Haiti and the Dominican Republic. But Guyana also was selling alumina produced from its own bauxite at prices considerably lower than other Caribbean alumina both in commercial sales and intra-company transfers. Contributing factors again were the decline in metal production of the North American aluminum industry and GUYBAU's dependence upon short-term sales in an industry where long-term arrangements for alumina to serve existing smelters offer limited opportunities to share in the existing markets. Sales were made by GUYBAU to China, the U.S.S.R., Italy, Norway, Sweden, Spain, the U.K., the U.S.A., and Canada, but many of these sales fluctuated annually in quantity to various buyers or were not continuous.

Table 14 shows the average prices received during 1974-1977 by GUYBAU from all customers and from deliveries to Mobile, Alabama. As an indication of the price concessions made by GUYBAU, the higher prices are shown as used by Alcoa from Surinam and from Jamaica to Norfolk, Virginia for Alcoa's own use. The average prices received by GUYBAU from all customers, f.o.b. Guyana, were lower than Alcoa's in all years. The c.i.f. delivered prices to Mobile, Alabama were also lower, somewhat narrowly in 1974 but widely lower by 1977. In that year, Alcoa's transfer prices from Surinam were $46 to $53 higher than GUYBAU's, and from Jamaica were up to $78 higher per long ton. There were, of course, considerably lower delivered alumina prices from Australia to U.S. ports and other markets than Alcoa's prices delivered from Surinam and Jamaica during the same years. GUYBAU may have had to compete with

temporary surpluses of alumina from Australia also sold at comparable low prices, but the impact of GUYBAU's bauxite and alumina pricing is clearly shown by comparison with alumina prices from nearby countries, particularly Surinam.

Table 14. Average prices of alumina, GUYBAU, and Alcoa from Surinam and Jamaica, 1974-1977
U.S. dollars per long ton

	GUYBAU sales 1/			Alcoa transfer prices to Norfolk, Virginia 2/			
		Mobile, Alabama		From Surinam		From Jamaica	
	All customers, net to GUYBAU	F.O.B. price	C.I.F. price	F.O.B. price	C.I.F. price	F.O.B. price	C.I.F. price
1974..	$ 70.39	$63.45-82.34	$73.51-89.96	$73.27-77.23	$78.75-81.85	$73.93-91.44	$75.16-92.78
1975..	82.98	74.69-89.61	83.94-105.34	110.10-125.35	111.51-126.85	91.45-147.28	92.78-148.91
1976..	95.29	70.91-82.32	... 93.98	135.78	137.05	89.56-159.24	90.69-160.47
1977..	117.06	83.88-93.98	91.84-110.07	143.32-155.09	144.60-156.38	142.25-186.72	143.52-188.06

Source: 1/ All GUYBAU customers, World Bank, Economic Memorandum on Guyana, June 13, 1978, Table 7.1. Other data from U.S. Bureau of the Census, Imports for Consumption, IM 145 X.
2/ Converted from metric tons, Table 13, Chapter IV.

Bauxite-alumina and the Guyana economy

The Guyana economy depends heavily upon the bauxite-alumina industry. The industry contributes half the value of all Guyana exports (1977), a matter of great significance due to the continuous negative balance of payments of Guyana in recent years. The industry contributed in 1977 about 8.2% of current revenue of the government in the dividends declared by GUYBAU, although over the entire dividend paying years, 1972-1977, the dividends totalled only 4.8% of all government revenues.1/ However, the government obtained other benefits including social welfare contributions of BIDCO and the undistributed earnings. The government hopes to build a much larger industry, based particularly upon a proposed hydroelectric project and aluminum smelter, but the prospects are not yet certain.

1/ World Bank, Economic Memorandum on Guyana, June 13, 1978, Table 5.1.

VIII. INDONESIA BAUXITE PRICES

Indonesia supplied in 1977 about one-fourth of the metallurgical bauxite requirements of Japan, second largest primary aluminum producer among the Western countries. The prices of Indonesian bauxite have in the past exerted a competitive influence upon Australian bauxite, now 65% of Japan's supplies. This influence is declining due to the limited reserves of exportable bauxite of the present mining operations on the island of Bintan near Singapore.

Indonesia could ultimately become a stronger influence in the future through alumina rather than bauxite if the resources of lower grade ore are developed in Kalimantan (Indonesian Borneo). These had been investigated by Alcoa and believed to be sufficient to support for many years a 1.6 million ton alumina plant, the minimum size required because of the heavy costs of infrastructure and transport. The reserves have been reported on the order of one billion tons. However, Alcoa withdrew from the project in 1975 and its future is presently doubtful. Another alumina project of 600,000 tons capacity was suspended early in 1979. This plant was to utilize lower grade bauxite deposits on Bintan that are not suitable for export. The output was to serve the Japan Asahan Aluminium Company smelter, 225,000 tons capacity, under construction near the Asahan hydroelectric project. The cost of alumina, estimated at $225 per ton by 1982, was much higher than the alternative of $180 based on processing Australian bauxite in Japanese alumina plants that now have idle capacity.

The Indonesian Government through the company Aneka Tambang has been the sole bauxite producer since the properties of Billiton were nationalized in 1959. Production, and imports by Japan since 1973 have been as follows:

	Thousand metric tons	
	Output	Japan imports
1973.....	1,229	1,137
1974.....	1,290	1,292
1975.....	992	985
1976.....	940	967
1977.....	1,301	1,208

Although Japan has been recently the exclusive buyer of Indonesian bauxite, other countries have taken some quantities, particularly Italy and Canada, as recently as 1973 and 1975. In the event the Japanese companies cannot use all their contractual commitments, some Indonesian bauxite may seek other markets.

Four Japanese aluminum companies have combined to purchase the bauxite under a 10 year contract dated 1974 for 1,200,000 metric tons per year. The quantities were reduced in 1976 and 1977.

Grade and prices

The base grade under the contract expiring in 1984 is 53% total alumina, 5% total silica, 1.2% titania. The shipping grade is guaranteed at a minimum of 51% alumina, maximum of 5.5% silica and maximum of 1.5% titania. The free moisture as shipped is about 10%. The base price is adjusted by 1.5% proportionately for each variation of 1% of alumina, and reduced or increased by 5% for each 1% reduction or increase in silica or each 1% in titania. The ore is all trihydrate.

The bauxite is very hard, contains considerable impurities, and is more costly to process than Australian bauxite. Recent estimates are that the reserves will last for only 10 more years at current production rates.

Export values per metric ton f.o.b. Indonesia, reported by the Indonesian Central Bureau of Statistics from customs documents and by trade sources have been as follows:

1973.....	U.S.$5.25
1974.....	5.35
1975.....	6.19
1976.....	7.39
1977.....	8.39
1978.....	9.39

For January 1, 1979, trade sources state that the price was U.S.$9.83 per metric ton.

Ocean transportation costs to Japan have varied between U.S.$5.00 and $7.00 per ton during 1974-1976, raising delivered costs to the level in 1976 of $14 per ton.

IX. BRAZIL, BAUXITE PRICES

Although Brazil has not been a major bauxite producer, holding 12th rank among Western countries, the position is changing rapidly with the start of new bauxite operations in the Amazon basin in 1979. Instead of the present production level of 1 million metric tons in each year, 1975-1977, primarily for use within Brazil, the Amazon basin development initially will be largely for export of bauxite. The first project near the Trombetas River, tributary of the Amazon, is to produce 3.35 million tons per year by 1980, 5.1 million tons by 1982, and ultimately may produce between 8 and 10 million tons per year. Brazil will thus become a major exporter of bauxite and a rival in production with Jamaica for third or fourth place among Western countries, behind only Australia and Guinea.

Supporting this and other projects in the Amazon basin are reserves of medium grade bauxite estimated in excess of 2.8 billion metric tons.[1/] The Trombetas project alone has an estimated 600 million tons of washed dry reserves. Among the other bauxite holdings are Alcoa, Reynolds, D.K. Ludwig, Rio Tinto Zinc, Companhia Brasileira de Aluminio, and the Brazilian Government's Cia Vale do Rio Doce (CVRD).

The Amazon bauxites are to support not only export markets for the ore but a long-range program of alumina-aluminum projects and associated hydroelectric power. Already committed is an 800,000 ton alumina plant at Belem to be a joint venture of CVRD and 32 Japanese companies (Alunorte). The alumina plant will support a 320,000 ton smelter in a similar joint venture of CVRD and Japanese interests, (Albras). The bauxite will come from the expanded stage of the Trombetas project.

This project is being developed by the consortium, Mineracao Rio do Norte, consisting of the Government's CVRD (46%), Alcan, (19%), Brasileira de Aluminio (10%), Reynolds, (5%), two Norwegian aluminum companies controlled by the Government of Norway, (5% each), and two other European aluminum companies (Billiton of the Netherlands

1/ E. A. Schiller, Mineral Exploration and Mining in Brazil, 1977, Mining Magazine (London), September, 1977, p. 245.

and a Spanish aluminum company). Alcan will initially take 1.2 million tons annually for shipments to alumina plants in Canada, and the shares of the other participants will vary over the years.

The development is the result of exploration initiated by Alcan and requiring about 8 years until Alcan started work in 1971 on the project. Market conditions forced Alcan to postpone the project until it was reactivated under the consortium, Rio do Norte.

Trombetas grade

The ore is trihydrate with less than 1% monohydrate. It is found in two layers, a nodular form above a massive form, each with a somewhat different analysis. The lower nodular grade will not be shipped initially. The massive grade averages 55.9% total alumina, 50.0% available alumina, 4.8% total silica, 4.6% reactive silica, 1.3% titanium dioxide, and 9.4% iron oxide.[1/] The bauxite is crushed, washed to remove clay and other impurities, and then dried.

One of the joint venture partners has offered for purchase by others a similar grade of 55.8% total alumina, 3.64% total silica, 3.6% reactive silica, 1.1% titanium dioxide, and 10.5% iron oxide. Available alumina will be 51.5%.

The shipping grade to Alcan will average 3% free moisture, but others are offered a 13% free moisture content.

Price

The price is currently being negociated between CVRD and other partners and also the premiums and penalties for variations from grade. As of 1977, the cost was then estimated to be U.S.$9 per metric ton, f.o.b. Trombetas river port, about 682 miles from the Atlantic Ocean. At that time, the capital cost for 3.35 million tons of capacity was estimated at about $250 million. By 1979, the capital cost had increased

1/ E. W. Greig, Trombetas and Other Amazon Bauxites, Brazil, Society of Mining Engineers of AIME, Atlanta, Georgia, March 6-10, 1977, Preprint Number 77-H-92, p. 26, and Trombetas: major bauxite reserves in search of a future, Engineering and Mining Journal, November, 1975, p. 155.

to about $390 million or 56% more. Operating costs have also increased by about 91%. As a result, total costs including depreciation and interest charges have increased from nearly $9 to $14. The return to shareholders was agreed to be included in the selling price at 13% on equity. The financing was to be 35% equity and 65% debt. By 1979 the return to be allowed on equity had increased from approximately $1.18 to about $1.85 per metric ton. Consequently, the price now has to cover about $16 of total charges including 13% profit on equity as compared with $10 per ton in 1977. As capacity expands to 5.1 million tons, the incremental and average costs will decline.

Subject to current negotiations, the base price, as of March, 1979, was to have been $24.32 per metric ton, f.o.b. Trombetas, for the grade with 3% moisture, and $20.48 for the grade with 13% moisture.

These prices were to escalate by a weighted average based on the wholesale price index and the machinery and equipment index in Brazil, each adjusted for changes in the exchange rate of the cruzeiro to the U.S. dollar; the published price of oil in Brazil; and changes in the U.S. price of aluminum.

As of 1975, the price was to be about $18 per metric ton to amortize the investment in 20 years, according to the president of Rio do Norte. In October, 1978, the president was reported as citing a price of U.S.$22.34 per ton, f.o.b. Trombetas. That price would leave a profit of about $6 per ton additional to the 13% return on equity. The transportation costs from Trombetas to U.S. Gulf ports is estimated at about $9 per ton, bringing the total estimated delivered cost as of late 1978 to $25 per ton, including the 13% return on equity.

The original arrangement took into account the need for incentives to establish this project in a remote tropical jungle area, uninhabited, requiring the construction of a town for 2,600 persons, a 15 mile railroad from mine to river port, and a port to serve ships of 50,000 tons capacity. The consortium, accordingly, was granted a 10 year exemption from income tax and a limited mining tax, approximately 1% of price, comprising export duty and social security payments.

Impact on alumina costs

The impact on alumina costs of the price and cost of Trombetas bauxite will vary among those consortium members who convert the bauxite into alumina at different locations. Alcan will process its bauxite in Canada, Reynolds in the U.S.A., and one of the Norwegian partners, Ardal og Sunndal Verk, is considering various alternatives. At least one partner is offering to sell bauxite to others. The net cost of the bauxite, delivered to each partner, will be less than the selling price by the amount of profit on equity as allocated to each partner.

Assuming at 1979 cost levels a delivered net cost after profit sharing and return of 13% on equity to Reynolds and Alcan of approximately $25 per metric ton, 3% free moisture in the shipping grade, the impact on alumina costs would be somewhat over $50 per metric ton of alumina on the dry basis ratio of 2 tons of bauxite per ton of alumina. To compare the cost with other bauxites, it would be necessary to know all costs of processing into alumina, having particular regard to the cost of fuel and caustic soda.

X. SIERRA LEONE BAUXITE PRICES

Sierra Leone on the west coast of Africa produces about the same annual tonnage of bauxite as each of the Caribbean countries, Haiti and the Dominican Republic but has followed a very different policy toward bauxite pricing even though all three countries are members of the International Bauxite Association. A key difference in conditions is the need by the Sierra Leone Government to promote an additional bauxite project of some 3 million tons per year annual output whereas in Haiti and the Dominican Republic no expansion projects are likely due to limited reserves. Sierra Leone wishes more revenues from greater output while the two other countries rely on the present levels of output.

One producer has operated in Sierra Leone since bauxite production began in 1963, the Sierra Leone Ore and Metal Company, subsidiary of the Swiss Aluminium Co. (Alusuisse). Output since 1974 has varied around the level of 700,000 metric tons per year:

Production, thousand metric tons

1963.....	30.4	1970.....	449.0
1964.....	130.5	1971.....	590.5
1965.....	207.3	1972.....	693.9
1966.....	275.2	1973.....	693.0
1967.....	334.5	1974.....	672.0
1968.....	470.3	1975.....	716.0
1969.....	453.8	1976.....	660.0
		1977.....	745.0

Source: Metallgesellschaft, Metal Statistics.

The bauxite has been exported exclusively. The markets have been subsidiaries or affiliates of Alusuisse in West Germany, Italy, and the Ormet Corporation alumina plant at Burnside, Louisiana, partly owned by the Alusuisse subsidiary, Consolidated Aluminum Company (Conalco). Alcan has been purchasing as much as half of the exports during some of the years, 1973-1978, for conversion into alumina in Canada.

Grade

Limited information indicates a trihydrate ore, less than 59% alumina and 4 to 5% silica after washing. Since the ore has been processed by Alcan in Canada along with trihydrate bauxite from Guinea and Guyana, and by Ormet in Louisiana along with trihydrate bauxite from Surinam, the consumption per ton of alumina may be comparable, estimated at 2 to 1.

Prices

The Sierra Leone Ministry of Mines reported average f.o.b. prices, equivalent after conversion to U.S. dollars, at U.S.$8.39 per metric ton in fiscal year ending June, 1976-1977, and $9.35 per ton in fiscal year 1977-1978. These values were affected by the fluctuation in the value of the Leone currency (Le). Higher values were reported to U.S. and Canadian customs.

Prices calculated from reports to U.S. customs at New Orleans, Louisiana have recently been U.S.$12.30 per metric ton, f.o.b. Sierra Leone, and transportation costs between $7.40 and $9.85:

Prices, Sierra Leone bauxite, New Orleans customs district, U.S. dollars, metric ton

	F.O.B.	C.I.F.	Insurance and freight
1976			
October.....	$ 9.84	$17.24	$ 7.40
1977			
January.....	9.84	17.24	7.40
March.....	12.30	20.44	8.14
June.....	12.30	20.44	8.14
1978			
February.....	12.30	21.16	8.86
March.....	12.30	22.15	9.85
May.....	12.30	22.15	9.85

Source: Calculated from U.S. Bureau of the Census, Imports for Consumption, IM 145 X.

Comparable prices, f.o.b. Sierra Leone, after adjustment from Canadian to U.S. dollars, were reported by Alcan to Canadian customs. The Canadian imports were more

continuous than the U.S. imports, and the price record back to 1973 is as follows:

Canadian prices f.o.b. for Sierra Leone bauxite, 1973-1978, Canadian and U.S. dollars, metric ton

	Canadian dollars	Can/U.S.$ exchange rate	U.S. dollars
1973.....	C$ 8.35	1.00	U.S.$ 8.35
1974.....	9.46	.98	9.65
1975.....	9.89	1.02	9.70
1976.....	10.29	.98	10.50
1977.....	11.11	1.07	10.38
1978 (to August)...	12.58	1.13	11.13

Source: Calculated from Statistics Canada, Imports by Commodities; and International Monetary Fund, International Financial Statistics.

Impact on alumina costs

As of 1977 or 1978, assuming not more than two tons of Sierra Leone bauxite per ton of alumina, the cost of bauxite delivered to the alumina plants in Canada or Louisiana may have been around U.S.$45 per metric ton of alumina.

Government policy

The bauxite prices are not subject to government control. Under the influence of Jamaica's bauxite policy adopted in 1974, the Sierra Leone Government entered an agreement with the Alusuisse subsidiary on August 24, 1976, retroactive to January 1, 1974, to increase rents, royalty and income tax on bauxite and to give the Government two members of the six member board of directors of the mining company. The income tax and surtax rate was raised from 50% to 60%, and royalty rate from the equivalent of U.S.21¢ to U.S.27¢ per ton exported. Mining and surface rents also were increased. The net effect may be estimated as of 1977 to total not over U.S. $5.00 per metric ton for all payments to Government.

In the national economy, bauxite thus far has been a very small factor, amounting to about 4% of exports (1977) and less than 1% of gross domestic product. The trade balance has been in deficit for years and the balance of payments and current

budget were in a financial crisis in 1978, leading to remedial discussions with the International Monetary Fund.

A significant expansion of the bauxite industry is possible based on the discovery by Alusuisse of possibly 100 million tons of commercial grade ore in northern Sierra Leone near the deep sea harbor of Pepel. The feasibility of development is under investigation. The Government is interested in the possibility of a 3 million ton export level yielding in foreign exchange U.S.$30 million per year, and also an alumina plant.

XL DOMINICAN REPUBLIC BAUXITE PRICES

Ever since bauxite exports began in 1959 from the Dominican Republic, Alcoa has been the only producer through a subsidiary, Alcoa Exploration Company, and the only consumer in the Alcoa alumina plant at Point Comfort, Texas. Exports reached a peak of 1.2 million metric dry tons in 1974, fell by more than half in 1976 to some 516,000 tons, and then recovered to less than 800,000 tons in 1977.

Bauxite is not important in the Dominican Republic economy, accounting for only 3% of all exports and less than 1% of gross domestic product in 1977. Although the government had been hoping since 1957 to have Alcoa or others build an alumina plant, this was never done due to limited bauxite reserves and other conditions. Reserves presently may be considerably less than 50 million tons.

In 1974 Jamaican officials encouraged the government to seek arrangements for increased bauxite revenues comparable to the bauxite levy adopted by Jamaica that year and imposed on Alcoa and other companies. The government accepted Alcoa's initial proposal for a supplemental royalty additional to regular royalty and income tax. By 1975, the arrangement was revised to become similar to the Jamaica bauxite levy and royalty.

Grade

The ore is a mixture of monohydrate and trihydrate. Alcoa has treated the ore separately in two operations at Point Comfort. High temperature digestion was used for one grade, reported for 1967 as typically 47.27% total alumina and 6.34% silica. Lower temperature digestion has been given to the other grade, reported as typically 49.26% alumina and 2.25% silica. The ore is dried only in the sun and contains between 15% and 19% free moisture as shipped. However, it has been reported by Alcoa to U.S. customs on a dry basis.

The grade is lower than Jamaica bauxite, and was rated for the purpose of calculating the supplemental royalty at 4.8 dry metric tons per short ton of aluminum,

equivalent to 5.3 dry metric tons of bauxite per metric ton of aluminum, or about 2.7 tons per ton of alumina. The Jamaica formula is the equivalent of 4.8 dry metric tons per metric ton of aluminum and 2.4 tons per ton of alumina.

Prices

Under the 1957 concession agreement and supplemental agreement between the government and Alcoa, the price of bauxite had been negotiated by the parties at US$1.50 per metric dry ton, subject to escalation with changes in the price of aluminum. This price was used in applying an income tax rate of 52% on profits. A royalty was also paid of US 25¢ per ton. The 52% tax rate was adopted so that the tax paid to the Dominican Republic would exactly equal and be deducted from the Alcoa tax due to the U.S. government for Western Hemisphere Trade Corporations.

On November 29, 1974, a provisional agreement for the period April 1-December 31, 1974 was adopted, retaining the same principle for pricing bauxite but raising the royalty to 55¢, the income tax rate to 40%, and adopting a supplemental royalty per metric dry ton of bauxite equal to 5.5% of Alcoa's realized price of aluminum ingot of grade 99.5% to 99.79% as reported to the United States Securities Exchange Commission, Form 10-K. From this figure was deducted the income tax and regular royalty to obtain the net supplemental royalty.

In 1975, the arrangement was revised, again retroactive to April 1, 1974,similar to the Jamaica bauxite levy, 7.7% for 1975 and 1976. The income tax would be deducted from this tax, but not the royalty. On May 2, 1977, a new agreement was adopted for 1977 fixing the reported rate at 33 times the realized price of a pound of aluminum, and assuring a minimum annual payment based on 625,000 tons of bauxite. The formula of 33 times the price of a pound of aluminum was a simplification and approximately 7.7% times the price of a short ton of aluminum divided by 4.8.

For 1977, the realized price to Alcoa of the specified grade of ingot was 47.7¢ per pound, and the payment at the multiple of 33 would have been $15.74 per metric ton, plus royalty of 55¢, a total of $16.29. From this would be deducted the income tax. The $16.29 compared with $18.04, the apparent amount of bauxite levy and royalty in Jamaica per dry metric ton of bauxite.

Alcoa continues to determine the price of bauxite used for calculating profits tax in the Dominican Republic and in the United States. It has not been publicly reported whether the practice continues of escalating the $12.50 price by increases in the price of aluminum.

The average prices of Dominican Republic bauxite per long dry ton reported by Alcoa to U.S. customs at Galveston, Texas, are shown in Table 15. The f.o.b. prices have increased from the level of $14 per ton in 1974 to $27-30 per ton in 1977. Transportation costs as reported by Alcoa have remained stable over the period, between $3 and $5 per ton. presumably on a dry ton basis. It is not possible to compare these prices directly with Alcoa's Jamaica prices because, as indicated in Table 4, the bauxite received from Jamaica at Galveston came from both Reynolds and Alcoa in some years, and more recently from Reynolds alone.

Impact on alumina costs

On the basis of 2.7 dry tons of Dominican Republic bauxite per ton of alumina, as apparently used by Alcoa recently, the delivered price of this bauxite per long ton of alumina produced by Alcoa at Point Comfort, Texas, would have been in 1977 between $83 and $91. The actual cost of the bauxite would have to be calculated by deducting from the delivered price the profit after taxes.

The impact of the Dominican Republic bauxite tax and royalty on the cost of alumina in Texas to Alcoa would seem to have been for 1977 about $44.68 per long ton of alumina ($16.29 per metric ton, adjusted to long ton, times 2.7). This figure is

close to the apparent impact of the Jamaica bauxite levy and royalty upon the alumina produced by Alcoa in Jamaica of $43.99 per long ton of alumina (see Section IV, page 15).

Table 15. Prices of Dominican Republic bauxite, Galveston, Texas customs district, produced by and shipped to Alcoa, 1974-1978
U.S. dollars per long dry ton

	F.O.B. price	C.I.F. price	Insurance and freight
1974			
January....	$14.29	$17.05	$2.76
February...	14.92	17.68	2.76
March.....	12.08	15.20	3.12
April.....	14.72	18.51	3.79
June.....	14.68	18.46	3.78
July.....	14.68	18.51	3.83
August.....	14.74	18.51	3.77
September..	14.68	18.47	3.79
October....	12.70	16.00	3.30
November...	12.92	16.31	3.39
December...	11.83	14.96	3.13
1975			
January....	16.60	20.45	3.85
February...	17.94	21.57	3.63
March.....	17.87	21.50	3.63
May.....	18.07	21.71	3.64
June.....	18.14	21.78	3.64
July.....	18.23	21.85	3.62
August.....	18.43	22.06	3.63
September..	18.67	22.31	3.64
October....	18.60	22.23	3.63
November...	18.82	22.46	3.64
1976			
January....	21.98	...	...
February...	24.89	...	...
April.....	23.34	...	...
May.....	23.51	...	...
June.....	24.91	...	...
July.....	24.28	27.91	3.63
August.....	24.85	28.49	3.64
September..	29.89	34.31	4.42
October....	31.91	36.31	4.40
December...	28.21	32.09	3.88
1977			
January....	$31.91	$36.32	$4.41
February...	27.20	30.83	3.63
March.....	32.89	37.27	4.38
April.....	27.37	31.00	3.63
May.....	26.68	31.32	4.64
June.....	28.52	32.15	3.63
July.....	28.40	...	...
August.....	28.62	32.25	3.63
September..	30.08	33.77	3.69
October....	30.00	33.65	3.65
December...	29.70	33.40	3.70
1978			
February...	30.03	33.72	3.69
March.....	30.37	34.07	3.70
April.....	30.50	34.20	3.70
May.....	30.27	33.96	3.69
June.....	30.12	33.47	3.35
July.....	30.23	33.43	3.20
August.....	29.75	32.96	3.21
September..	31.32	34.53	3.21
October....	32.28	35.49	3.21

Source: Calculated from tonnages and values, U.S. Bureau of the Census, Imports for Consumption, IM 145 X.

XI I. HAITI BAUXITE PRICES

Haiti has exported bauxite since 1957 and through only one producer. Reynolds Haitian Mines, Inc. ships bauxite to the Reynolds alumina plant at Corpus Christi, Texas. Due to limited reserves and other conditions, Reynolds restricted its exports during the first 10 years to not over 500,000 long tons per year. Between 1973 and 1977, the volume varied between 500,000 and 743,000 tons, dry basis. The minimum obligation of Reynolds under the latest agreement with the government of Haiti is 650,000 long dry tons per year through 1981. In the Haitian economy, the value of the exported bauxite in 1977 was 26% of all exports, but in 1973, prior to the increase in bauxite taxes, the proportion was only 12%. The revenues from bauxite in 1977 were about U.S.$12 million or 7% of all government revenues. Bauxite makes a significant contribution to reducing the substantial annual budgetary deficits since 1975 and the more extended deficits in the balance of trade.

Grade

The ore is a mixture of monohydrate and trihydrate, averaging close to 50% total alumina and about 3% total silica. As mined, it contains about 25% free moisture and is dried before export to about 12% free moisture. In the current tax agreement with the government, the ratio of long tons of dry bauxite per short ton of aluminum is 4.49, indicating a less favorable grade for tax purposes than the ratio of 4.3 used in the bauxite levy calculations for Jamaica. This is equivalent to 5 long dry tons of bauxite per long ton of aluminum, or about 2.5 tons per ton of alumina. The agreement assumes that available alumina is only 43%, and reduces the tax if reactive silica exceeds 2.88%.

Prices

Following the enactment of the Jamaica bauxite levy in June, 1974, discussions were held in Jamaica between Haitian and Jamaica officials, leading to a new tax

arrangement between Haiti and Reynolds. An interim agreement was adopted in December, 1974 and then superseded in August, 1975 by an agreement applicable to the years 1974-1976. In November, 1976 an agreement was adopted applicable to the years 1977-1981.

None of the agreements established a price for bauxite. All dealt with taxes, but the effects were to cause Reynolds to raise the prices of bauxite as reported to U.S. customs, and the prices as used in Haiti and in the U.S.A. for income tax purposes.

The payments to Haiti for 1974 consisted of a proportional tax of U.S.50¢ per long dry ton exported; a severance tax of 7.5% of the price of a short ton of aluminum produced from bauxite exported by Reynolds in 1974, taken at 33.5¢ per pound, the value then divided by 4.32. The resulting total tax was $12.13 per dry long ton of bauxite. From this total was deducted all income and other taxes, and an allowance of 70¢ for the higher cost of Haitian bauxite over Jamaica bauxite. The net of $11.43 was then applied to 626,367 long dry tons to yield $7,159,000, prescribed as the maximum to be paid by Reynolds in 1974. This was about four times the revenues from bauxite in 1973.

For 1975 and 1976, the payments consisted of the 50¢ proportional tax and a severance tax of 8% of the average price of a short ton of aluminum realized each year by Reynolds, divided by 5.00 instead of 4.32. No allowance was made for the extra cost of producing Haiti bauxite as compared with Jamaica bauxite in view of the new factor of 5 tons of bauxite per short ton of aluminum, instead of the former factor of 4.32 tons. All other taxes paid by Reynolds were then deducted from the severance tax. But an additional severance tax was imposed on Reynolds of $2 million for 1975 and $1.5 million for 1976. A further one time payment was exacted of $89,183. Reynolds was obligated to export a minimum of 600,000 long dry tons per year, subject to reduction by conditions of force majeure or by any proportion that Reynolds reduced its use of all bauxite in the United States due to market conditions and a reduction in worldwide or regional production of bauxite by Reynolds.

The estimated payment made by Reynolds per long dry ton of bauxite for 1975 was $16.23 based on 8% x $775 realized per short ton of aluminum divided by 5 plus 50¢ plus $2 million divided by the estimated minimum export tonnage of 600,000. For 1976, the estimated payment was about $16.70 per long dry ton based on 8% of the realized price of $856 per short ton of aluminum divided by 5, plus 50¢ plus $1.5 million divided by the minimum export tonnage of 600,000.

The new agreement of November, 1976 applied to the years 1977-1981. The payments are a proportional tax of 55¢ per exported ton of bauxite; the severance tax of 7.5% of the average value of a short ton of aluminum realized by Reynolds for each year divided by 4.49; and a deduction of $1.00 for each percent of reactive silica in excess of 2.88%, fractions prorated. The severance tax is reduced by all other tax payments made by Reynolds except the proportional tax. The minimum to be exported each year is 650,000 long dry tons, subject to reduction for the same conditions stated in the agreement for 1975 and 1976.

For 1977, the estimated payments per ton were U.S.$17.02 consisting of severance tax of $16.47 based on a realized price of $986 per short ton of aluminum, and 55¢ for the proportional tax. In Jamaica, the Reynolds bauxite levy and royalty came to an estimated $18.23 per dry long ton.

The prices calculated from reports of Reynolds to U.S. customs at Galveston, Texas are shown in Table 10, applying to ore as shipped, containing approximately 12% free moisture. The f.o.b. level rose from U.S.$9.40 per long ton in 1974 to $24 in most of 1978. For much of 1976 and 1977 the f.o.b. price was reported at $28 per ton. Delivered prices were higher by transportation costs ranging between $3.51 and $4.52 per ton.

Impact on alumina costs

On the basis of 2.5 dry tons of Haitian bauxite per ton of alumina, the 1977 delivered price, adjusted downward by 12% for free moisture, may have been about

$91.34 per long ton of alumina ($32.15 x 2.5 divided by 88%), produced at Corpus Christi, Texas. The actual cost of the bauxite to Reynolds would have to be calculated by deducting the profit after taxes from the delivered price.

The total taxes paid on Haitian bauxite in 1977 may have been about $45.58 per long ton of alumina ($18.23 x 2.5).

The real costs to Reynolds of using Haitian bauxite compared with other bauxies would have to be further adjusted for differences in processing costs.

Table 16. Prices of Haiti bauxite, Galveston, Texas customs district, produced by and shipped to Reynolds, 1974-1978

U.S. dollars per long ton as shipped, approximately 12% free moisture

	F.O.B. price	C.I.F. price	Insurance and freight		F.O.B. price	C.I.F. price	Insurance and freight
1974				1977			
June.....	$ 9.40	$12.84	$3.44	January.....	$28.00	$32.15	$4.15
November...	9.40	12.83	3.43	February....	29.57	33.96	4.39
December...	9.41	12.84	3.43	March.....	28.00	32.16	4.16
				April.....	28.00	32.16	4.16
1975				May.....	28.00	32.16	4.16
January....	8.96	12.23	3.27	June.....	23.67	27.19	3.52
July.....	32.06	...	...	July.....	23.49	26.97	3.48
September..	32.26	...	...	August.....	28.00	32.15	4.15
October....	28.00	32.19	4.19	September...	28.00	32.15	4.15
December...	28.00	32.26	4.26	October.....	23.46	26.94	3.48
				November....	28.00	32.15	4.15
1976				December....	25.31	29.07	3.76
January....	28.00	...	...				
February...	28.00	...	...	1978			
March.....	28.00	...	...	January.....	28.00	32.15	4.15
April.....	28.00	...	...	February....	24.00	27.55	3.55
May.....	25.68	...	...	March.....	28.00	32.15	4.15
June.....	25.72	...	...	April.....	23.87	27.41	3.54
July.....	28.00	32.20	4.20	May.....	23.65	27.16	3.51
August.....	28.00	32.15	4.15	June.....	23.67	27.19	3.52
September..	28.00	32.16	4.16	July.....	23.80	27.33	3.53
October....	28.00	32.16	4.16	August.....	23.71	27.34	3.63
November...	28.00	32.15	4.15	September...	23.51	27.34	3.83
December...	28.00	32.15	4.15				

Source: Calculated from tonnages and values, U.S. Bureau of the Census, Imports for Consumption, IM 145 X.

XIII. PRICING PRACTICES AND A REASONABLE PRICE FOR BAUXITE

Price and cost comparisons

A summary of the information for 1977 on the prices and taxation of bauxites from the 10 Western countries and impact on costs of alumina is given in Table 17. The table is divided into two groups according to commercial transactions between unrelated buyers and sellers and non-commercial transactions between affiliated companies. The approximate delivered prices per metric ton of the various types of bauxite to various destinations are shown after adjusting to a dry basis. These prices are then converted into estimated cost of the bauxite per ton of alumina at the destination in accordance with the estimated number of tons of bauxite used per ton of alumina. Also shown, where applicable, are the taxes, levies and royalties per ton of bauxite and the equivalent cost per ton of alumina. The destinations shown are to Japan and the U.S.A. Other delivered prices would apply to European ports such as higher ones from Australia and the Caribbean, and lower ones from Guinea, because of differences in shipping costs.

Three main conditions restrict the ways these comparisons may be used:

(1) The calculations are approximations based on the supporting sections of the report.

(2) The costs of processing each bauxite at each destination alumina plant are not publicly reported and would have to be considered in evaluating the relative value of each bauxite to each using plant.

(3) The transaction prices between affiliates contain an unreported profit after income taxes in most cases. The true cost of each bauxite to each affiliate is reduced by the amount of profit.

Effects of special taxes on bauxite. To facilitate meaningful conclusions, the prices may be grouped by countries that do not impose special bauxite taxes and those that do. Countries that have not imposed such taxes have the lowest bauxite prices in U.S. dollars per dry metric ton and lowest costs of bauxite per ton of alumina:

	C.I.F. price	C.I.F. cost per ton alumina
Australia to Japan.....	$18.20- 18.50	$38.85- 43.68
Indonesia to Japan.....	16.17	35.57
Guyana to U.S.A.	25.62	51.24

Those countries with the special taxes have much higher c.i.f. prices, some about 100% higher, and comparable impacts on the bauxite cost of alumina, aside from processing costs.

	C.I.F. price	C.I.F. cost per ton alumina
Jamaica to U.S.A.	$36.56	$84.09
Surinam to U.S.A.	27.16- 37.82	54.32- 75.64
Dominican Republic to U.S.A.	31.68	85.54
Haiti to U.S.A.	35.97	89.93
Guinea to U.S.A.	30.95- 32.81	58.81- 62.34

Expansionist countries. Australia, Guinea and Sierra Leone have substantial expansion objectives for bauxite-alumina,and bauxite prices and impacts on alumina costs at the lower or lowest levels. Brazil is in the same group of expansion minded countries, and the impact on alumina costs at the indicated delivered price level will be in the same class as Guinea.

Special bauxite taxes. The range of special taxes or levies on bauxite is from $8.43 per dry metric ton for Guinea to as high as $18.04 for Jamaica. Haiti, the Dominican Republic and Surinam have imposed special taxes between $15 and $17 per ton. The impacts of these taxes alone on the costs of alumina are double or more the amount of special taxes except for Guinea where the grade of ore takes less than two tons per ton of alumina.

Pricing controls and formulas for escalation. Of the 10 countries reviewed, five have no bauxite price arrangements controlling the price levels used by any

Table 17. Approximate bauxite prices, taxes, and impact on alumina costs, Western Countries, 1977

U.S. dollars per metric ton

Exporter	Importer	Base grade, Al_2O_3 - % SiO_2 - % Monohydrate-% Trihydrate-% (1)	Free moisture as shipped % (2)	Price, dry basis, f.o.b. (3)	Transportation cost: Wet basis (4)	Transportation cost: Dry basis (4)÷(1-(2)) (5)	C.I.F. price, dry basis, (3) + (5) (6)	Tons dry bauxite per ton alumina (7)	C.I.F. cost, bauxite, per ton alumina (6) X (7) (8)	Special taxes, levies, [illegible]: Per ton bauxite (9)	Special taxes, levies, [illegible]: Per ton alumina (7) X (9) (10)	[illegible] bauxite [illegible] conditions?
						COMMERCIAL SALES						
AUSTRALIA Comalco-Weipa bauxite...	Japan	Al_2O_3-56% SiO_2- 5% Mono-9-10% Tri-40-45%	11%	$9.50	$8.00	$9.00	$18.50	2.1[2/]	$38.85	NOT APPLICABLE		YES
Gove....................	Japan	Al_2O_3- 50% SiO_2 -3.4% Mono - 1% Tri - 49%	8%	9.50	8.00	8.70	18.20	2.4	43.68	NOT APPLICABLE		NO
SURINAM Billiton................	U.S.A.	Al_2O_3-59% SiO_2- 4.8% Tri- 59%	3-4%	25.13[3/]	9.85	10.26	35.39	2	70.78	$15.56	$31.12	NO
GUYANA Guybau (Government).....	U.S.A.	Al_2O_3-58% SiO_2- 5% Tri - 58%	4%	17.42[4/]	7.98	8.20	25.62	2	51.24	NOT APPLICABLE		NO
INDONESIA Aneka Tambang (Government)...................	Japan	Al_2O_3- 53% SiO_2- 5% Tri - 53%	10%	8.39	7.00[e/]	7.78	16.17	2.2[e/]	35.57	NOT APPLICABLE		YES
					NON-COMMERCIAL SALES TO AFFILIATES, INCLUDING PROFITS AFTER TAXES							
JAMAICA Kaiser..................	U.S.A.	Al_2O_3- 51.4% SiO_2- 0.7% Mono - N.A. Tri - N.A.	14-16%	33.35[5/]	2.73	3.21	36.56	2.3[e/]	84.09	18.04	41.49	NO
SURINAM Alcoa...................	U.S.A.	Al_2O_3-56% SiO_2- 3% Tri - 56%	4%[e/]	19.13[6/] 29.22[7/]	7.71 8.26	8.03 8.60	27.16 37.82	2[e/] 2[e/]	54.32 75.64	15.56[e/] 15.56[e/]	31.12[e/] 31.12[e/]	NO NO
DOMINICAN REPUBLIC Alcoa..................	U.S.A.	Al_2O_3- 47-49% SiO_2- 2-6% Mono - N.A. Tri - N.A.	15-19%	28.05[8/]	N.A.	3.63	31.68	2.7[e/]	85.54	16.29	43.98	YES
HAITI Reynolds...............	U.S.A.	Al_2O_3- 50% SiO_2- 3% Mono - N.A. Tri - N.A.	12%	31.32[9/]	4.10	4.65	35.97	2.5	89.93	16.75	41.89	YES
GUINEA Alcoa..................	U.S.A.	Al_2O_3- 58-60% SiO_2- 1.5% Mono - 3% Tri - 55-57%	4%	22.36- 24.22 [10/]	8.25	8.59	30.95- 32.81	1.9	58.81- 62.34	8.43	16.02	NO
SIERRA LEONE Alusuisse.............	U.S.A.	Al_2O_3- 59% SiO_2- 4-5% Tri - 59%	N.A.	12.3 - 14.00	8.14	N.A.	22.50[e/]	2[e/]	45.00 [e/]	NOT APPLICABLE		NO
BRAZIL Reynolds...............	U.S.A.	Al_2O_3- 55.9% SiO_2- 4.8% Tri - 55.9%	(one grade) 3% (one grade) 13%	22.34[11/]	9.00[e/]	9.28- 10.34	31.62- 32.68	2[e/]	63.24- 65.36	1.00	2.00	NO

Footnotes, next page

Table 17 - Footnotes

1/ Equivalent to total government revenue including any deductions for income tax or other levies paid separately. Excludes general taxes applying to all industries such as property or social insurance taxes.

2/ Assumes same useage as at QAL in Australia.

3/ Price on page VI-6 adjusted for 4% free moisture to dry basis.

4/ Price on page VII-4, converted to metric ton, adjusted for 4% free moisture to dry basis.

5/ Price on page IV-9, converted to metric ton, adjusted for 15% free moisture to dry basis.

6/ Price at Mobile, page VI-6, adjusted for 4% free moisture to dry basis.

7/ Price at Galveston, page VI-6, adjusted for 4% free moisture to dry basis.

8/ Reported on dry basis, page XI-4, converted to metric ton.

9/ Price at Galveston, page XII-4, converted to metric ton, adjusted for 12% free moisture to dry basis.

10/ Prices under two contracts, page V-7.

11/ Proposed by president of Trombetas consortium, October, 1978.

N.A./ Information not available.

e/ Estimate.

producers: Australia, Jamaica, Guyana, Indonesia, Sierra Leone and Haiti. The producers in Australia, Jamaica, Sierra Leone and Haiti fix their own prices either for sale to unrelated parties or to affiliated companies. In Surinam, one of the producers is free to set prices independently for sales to unrelated parties. The producers in Guyana and Indonesia are government enterprises, and set whatever prices they can negotiate with buyers.

Price levels and formulas for price changes are used in agreements between producers and the governments of Guinea, Surinam, and the Dominican Republic, and in the agreement between members of the Brazilian consortium, Rio do Norte, in which the government's agency, CVRD, is a major participant. In addition, price adjustment or escalation formulas are used in agreements between customers and producers in Australia and Indonesia.

Where initial price levels are fixed, they are set in relation to the grades of bauxite, the time and the conditions then prevailing. Thus, the CBG consortium in Guinea adopted an initial price of U.S.$7.00 per metric ton from a 1967 base, and in 1970 a $9.00 base for expansion contracts. Surinam and Alcoa adopted in an agreement in 1958 a base price of $11.76 per metric ton. Before nationalization, Guyana (then British Guiana) had adopted in 1965 a base price with Reynolds of $10.[illegible] per long ton and $[illegible].00 with the Alcan subsidiary, Demba. The Dominican Republic and Alcoa agreed in 1957 on a base price of $12.50 per metric ton.

The formulas for escalation of prices from the base levels reflect different practices in recognizing changes in production costs of bauxite, costs of processing the bauxite into alumina, general inflationary influences, and some relationship to a price of aluminum.

Australian bauxite from Gove escalates in price according to changes only in Australian indexes of male wage earnings and consumer prices. Guinea bauxite from Boké escalates in price for changes in mining wages in another bauxite operation

(Friguia), fuel and Bunker C oil, and the U.S. wholesale commodity price index. Surinam bauxite exported by Alcoa for Alcoa's own use escalates in relation to a U.S. wholesale price index for iron and steel, the U.S. price of pig aluminum, and the average price of six major aluminum mill products of Alcoa.

The Brazilian consortium, Rio do Norte, will escalate the price of Trombetas bauxite in relation to changes in indexes in Brazil of wholesale prices and of machinery and equipment, adjusted for changes in the exchange rate of the cruzeiro to the U.S. dollar; the Brazilian price of oil; and the U.S. price of aluminum. The price of Dominican Republic bauxite transferred by Alcoa for its own use escalates in relation to the price of aluminum.

The escalation of special taxes or levies in different countries likewise is based on different practices. The Jamaica bauxite levy on U.S. bauxite producers is geared to the average U.S. price of primary aluminum of three U.S. producers realized from their sales to other parties, and the amount of levy per ton is uniform regardless of variations in grade of bauxite among the producers. Guinea imposes an export levy related to the price of aluminum ingot, presumably Alcan's world price, but differing in amount according to the grade of bauxite. The Surinam bauxite levy is based on the realized price of aluminum by Alcoa, and on some other basis to Billiton. The Dominican Republic special tax is based on Alcoa's realized price of aluminum. The proportional tax of Haiti is based on the realized aluminum price by Reynolds.

Thus, a difference has developed in pricing bauxite for ordinary taxation of profits and taxing bauxite for special levies. The intent is to have the price on which profits are calculated for taxation advance in relation to cost increases and inflationary influences measured in various ways. The ordinary tax on profits rests on the pricing of bauxite by various formulae in which a price of aluminum in some market

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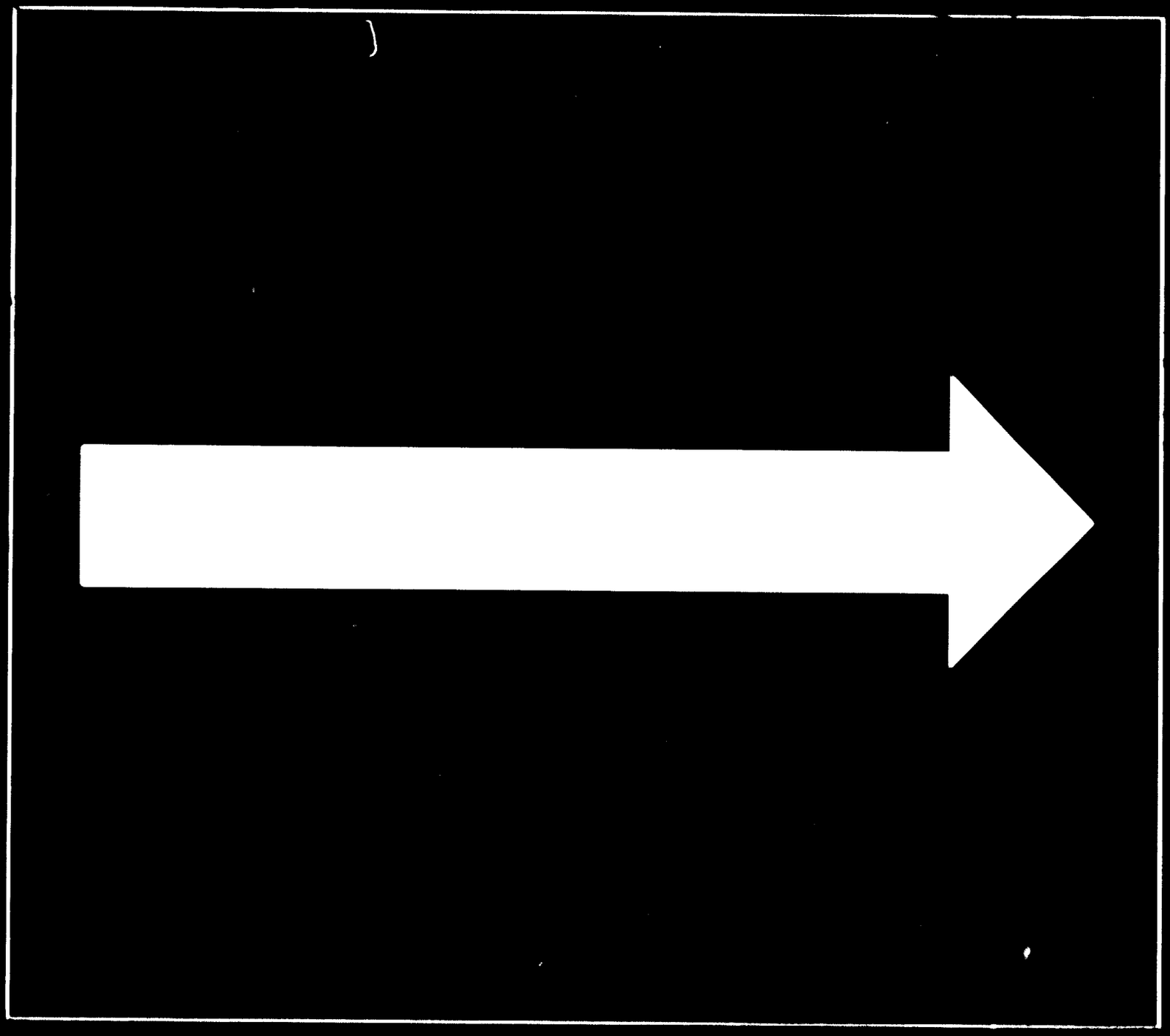

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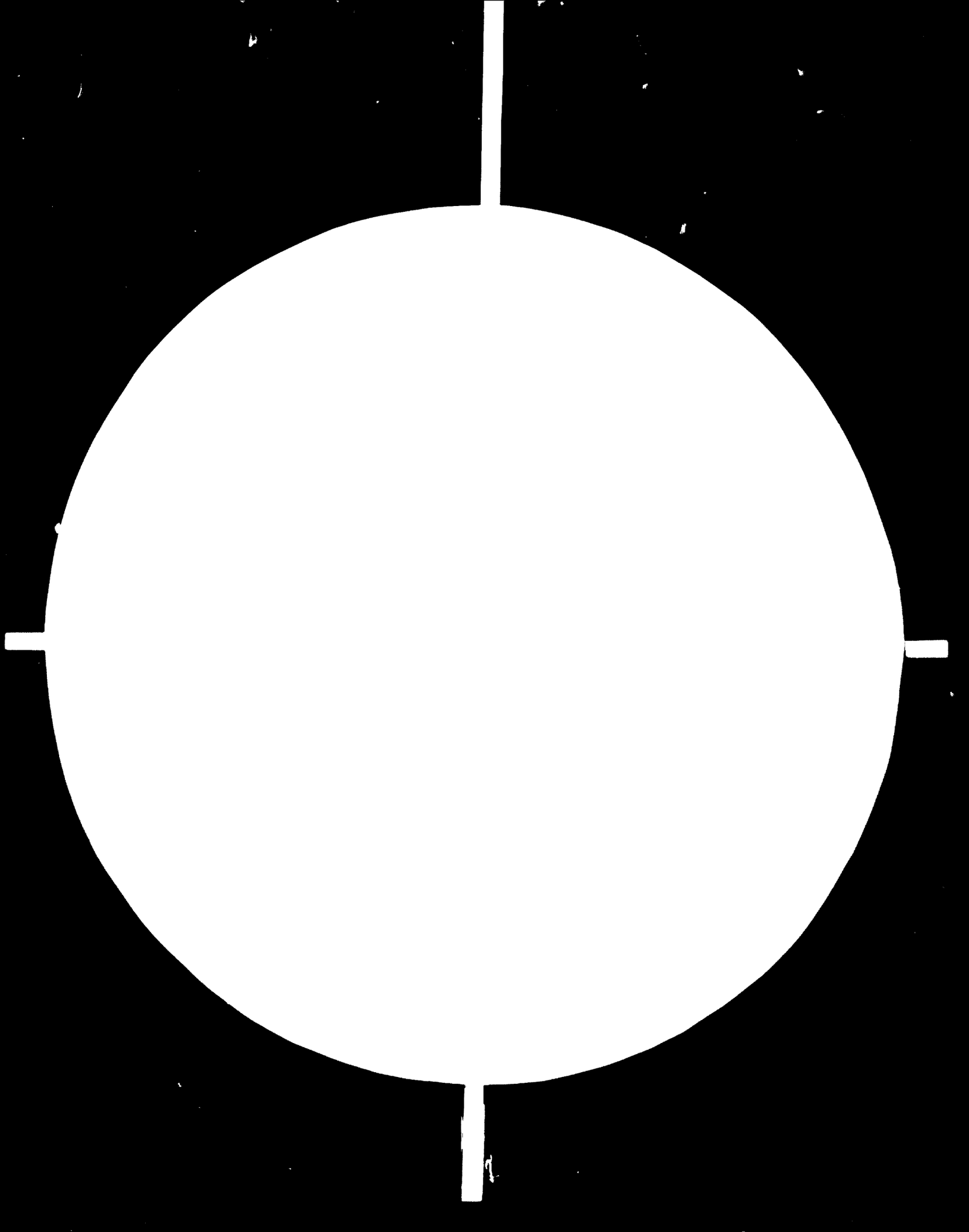

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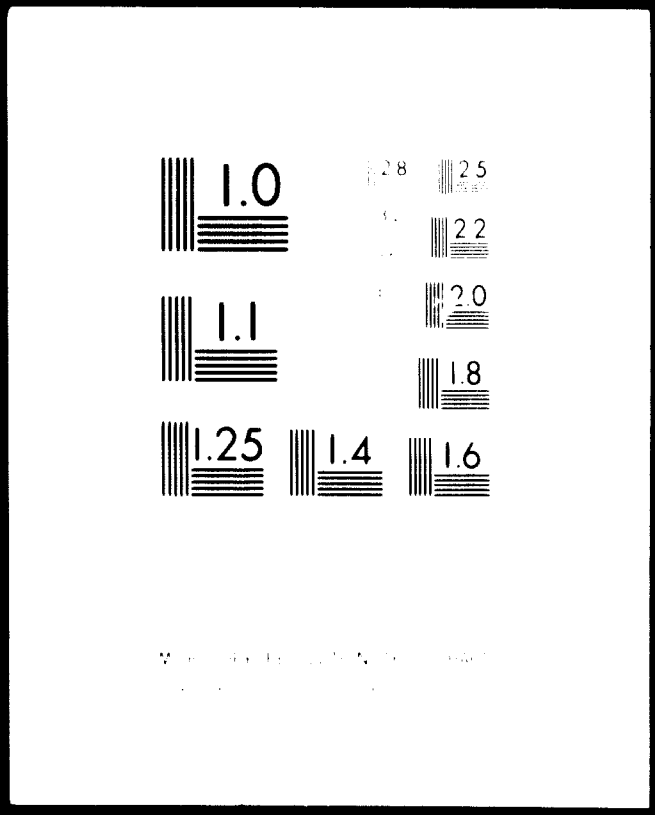

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may or may not be a factor. But the special taxation of bauxite, following the Jamaica bauxite levy of 1974, is geared to the price of aluminum obtained by the North American companies who are taxed. The Jamaica principle is to share in the value of primary aluminum in the country where the bauxite is ultimately used to make the aluminum. This principle is independent of the degree of profitability or unprofitability of the aluminum.

The I.B.A. price recommendations

As stated in Section I-5, the International Bauxite Association through the Council of Ministers has recommended prices for bauxite and alumina to guide its members. All of the countries but Brazil included in this review are members of the I.B.A

The first recommendation, unanimously issued in December, 1977, was that "for the calendar year 1978 the minimum price for base-grade bauxite in the North American market should be, for reference purposes, effectively U.S.$24.00 per metric ton, c.i.f., with appropriate adjustments for grade, and that in normal market conditions the price of bauxite in that market should be in the region of 2.5 percent to 3 percent of the American Metal Market list price for 99.5 percent primary aluminum ingot. For other world markets, members should seek appropriate relative prices, with adjustments for traditional market differentials." The second recommendation, issued in December, 1978, was that for 1979, given the current market conditions, the minimum price on an equivalent base grade of metallurgical grade bauxite in the North American market should be for reference purposes 2% of the average list price for 99.5% purity aluminum ingot as quoted in the American Metal Market, and that in normal market conditions, the minimum price should be 2.5 to 3 percent of the aluminum price. The base grade was defined as 45% alumina and 4% silica, a reference grade used in Jamaica.

In addition, a majority of the Council of Ministers endorsed the principle of indexing alumina prices in the range of 16 to 19 percent of ingot prices in normal market conditions. This recommendation was not binding as it lacked an unanimous vote.

The recommendation for 1978 of $24 for base grade bauxite for North American markets was for a grade much lower than prices for 1977 shown on Table 17, and those prices cannot be compared directly with the recommendation. The recommended minimum price for 1978 to North American markets, adjusted for grade, had already been equaled or exceeded in 1977 for Jamaica, Surinam, the Dominican Republic, Haiti and Guinea. Only the prices of the higher grades sold to North American markets from Guyana and Sierra Leone were below the recommended price, after approximate adjustment for grade. This fact can be more clearly seen in the c.i.f. cost of the bauxite of different grades per metric ton of alumina. Thus, a base grade of 45% alumina and 4% silica would require at least 2.5 tons per ton of alumina before allowing for losses, and the c.i.f. cost of the bauxite at $24 per ton would be at least $60. In 1977 the equivalent costs were lower from Guyana at $51.24 and from Sierra Leone about $45, both for much higher grades of bauxite.

The recommended minimum price did not distinguish between values of bauxite according to monohydrate and trihydrate content and their effects upon costs of processing into alumina. After such allowance, the Guinea bauxite also was priced lower in 1977 than the bauxites of Jamaica, Haiti, and the Dominican Republic. In addition, the recommended price in 1978 for Brazilian Trombetas bauxite would probably also prove to be lower. Outside the North American market, the Australian and Indonesian bauxites sold to Japan in 1977 were priced much lower than the recommended minimum. The same general relationships existed in 1978 as indicated by the prices shown in the other sections of this review.

The result of the true differences in c.i.f. bauxite costs, adjusted into costs of

extracting alumina, is to continue in 1979 the advantage of bauxite from Guinea, Guyana, Australia, and presumably Brazil, depending on the price adopted for Trombetas bauxite and return of tax free profits to the consortium members. These are the countries with the largest reserves and most important expansion projects. They put at a competitive disadvantage, when converted into alumina, the bauxites of Jamaica, Haiti, the Dominican Republic, and Surinam.

For 1979 the minimum recommended base grade bauxite price for North American markets of 2% of the price of a metric ton of aluminum ingot (58¢ per pound, January 31) would be $25.58. only slightly higher than the 1977 recommendation.

The recommended price per metric ton of bauxite under normal market conditions, 2.5 to 3 percent of the price of aluminum ingot, would have been for 1978 between $29 and $35, and as of January 31, 1979, between $32 and $38. These levels are up to 50% higher than the minimum recommendations.

More significant to alumina exporting countries was the recommendation of an alumina price range. This recommendation would have the effect of equalizing competition in alumina regardless of differences in cost advantages, promotional incentives, and costs of extracting the alumina from various bauxites. As of January 31, 1979, the recommended price range, 16 to 19 percent of the price of a ton of ingot, was between $205 and $243. This range is 10 to 20% above 1978 alumina price levels as illustrated on page VI-12. The effect of this recommendation would be to help those countries least able or willing to compete on a price basis.

Obstacles to I.B.A. price recommendations

(1) The expectation of normal market conditions to support a proposed price level is not supported by recent history. The aluminum industry has become a cyclical industry with ups and downs around a rising but slowing growth trend. Extended periods of surplus capacity of aluminum, alumina and bauxite have occured three times

in the past 25 years. One was after 1956 continuing into the early 1960's; one in the early 1970's; and one since 1975. The situation since 1975 has been further complicated with idle smelter capacity caused by power shortages or high power costs in the U.S.A., Africa, Japan and India. As of early 1979, about 40% of Japanese aluminum capacity was shut-down under a program to continue for some years, if not permanently. India had at least 25% idle capacity, the U.S.A. 7%, and in the entire Western world, a little over 10%. Every cut-back below capacity of primary aluminum produces a surplus or need to reduce production of alumina and bauxite, and pressure for lower prices. Given the outlook for continued cyclical and other fluctuations in the industry, the expectation of normal market conditions is not likely to be fulfilled.

(2) The promotion of new bauxite-alumina projects conflicts with the I.B.A. price objective. Such promotions are under way in the large bauxite resource countries of Guinea, Brazil and Australia. Other projects also depending on export markets are favored by Sierra Leone, India, Cameroun, Indonesia and Surinam. All require large capital investments from sources outside of the countries. The competition for capital stimulates the offer of inducements and incentives, and restraints on costs, taxes and prices for bauxite and alumina as compared with the tax and price levels desired by some I.B.A. countries.

(3) The government of Australia does not support the I.B.A. objective. More than one-third of the Western world bauxite is produced in Australia, exercising strong influence on the prices of both bauxite and alumina in many markets. Australia is committed to encouraging more projects under relative freedom of private enterprises to negotiate prices and without the higher tax levels imposed by some I.B.A. countries. The policy of the Commonwealth Government, as stated in a communiqué of January 8, 1979, is attached as an annex because of its importance. It favors pricing in which both consumers and producers participate rather than unilateral decisions

by producers through I.B.A. It honors existing contracts, contrary to the actions of some other I.B.A. members since 1974. It favors minimum involvement of government in decisions of the mineral production and processing industries, although the government does encourage exporters to improve prices of their old contracts where possible.

(4) The I.B.A. recommendations single out the North American markets and the price they pay for aluminum. The effect is to support especially the efforts of the Caribbean countries to take through bauxite taxes as much as they can get from the bauxite-alumina consumers of Canada and the United States. For other markets, I.B.A. members are advised to "seek appropriate relative prices, with adjustments for traditional market differentials." But these other bauxite-alumina markets are collectively larger than North America, producing about 55% of the primary aluminum among the Western countries. If bauxite consumed in these countries were priced in relation to the prices they pay for aluminum, the bauxite prices would be considerably higher. Thus, in January, 1979 when the U.S. aluminum price averaged about 55-56¢ per pound, it was 63¢ in Japan, 69¢ in West Germany, and 64¢ in the U.K., France and Italy, after converting to U.S. dollars the prices reported in the Metal Bulletin (London). By not recommending a higher bauxite price for these countries, the I.B.A. discriminates against the U.S.A. and Canada, and creates an inconsistent price policy.

But if the policy were to be consistent it would not work in Japan, the second largest bauxite-alumina market of the Western world. As of early 1979, with the Japanese price of aluminum about one-seventh higher than the U.S.A. price, a non-discriminatory I.B.A. policy would require that the c.i.f. prices of Australian and Indonesian bauxites, adjusted for grade as sold to Japan, would have to more than double. But 40% of Japanese primary aluminum capacity is already uneconomic and shut-down because of high electricity costs following price increases in oil. A more than

doubled increase in bauxite costs of making alumina would encourage turning to other sources of bauxite or even threaten additional curtailment of Japanese aluminum production. The effects would harm Indonesia, an I.B.A. member, now selling almost all of its bauxite to Japan. Indonesian bauxite also competes in Japan with Australian bauxite, and the Australian government does not support unilateral bauxite pricing by I.B.A. Thus, in the important case of Japan, a bauxite price policy would not work if equalized to the one directed against North America. But if the I.B.A. policy is to be fair everywhere, then the North American markets for bauxite should also be free to establish prices without I.B.A. unilateral direction.

A reasonable price for bauxite

A reasonable price or formula for bauxite would have to avoid problems that the I.B.A. has not solved, such as the periodic recurrence of non-existent normal market conditions; the needs of some governments to offer incentives in order to obtain additional bauxite-alumina projects; and equal treatment of all geographic regions. A reasonable price or formula would also recognize physical and chemical differences in bauxites, in costs of extracting alumina, and differences in ability of markets to pay the price. Above all, the price or formula would have to consider the largest bauxite producer in the world, Australia, which is presently committed against any unilateral direction of a price or formula. Accordingly, at present there does not seem to be any basis for establishing a price or formula that generally will be accepted as reasonable or fair.

Instead, at least three guiding principles might be considered.

First, for transactions between unrelated parties, including government sellers such as Indonesia and Guyana, prices should continue to be determined by conditions affecting the parties. Sellers compete to obtain the highest possible prices, and their competition is not only directly in bauxite but also indirectly with sellers of alumina. An overriding condition they face for some years may be a continuing

world surplus of bauxite and alumina capacity because of primary aluminum capacity made idle by problems of power supply and cost. This problem for sellers will be exaggerated by recurrent cyclical fluctuations in the aluminum industry.

Second, governments seeking to promote new bauxite-alumina projects and to attract the large investments, will continue to be urged to offer conditions of stable supply at costs, including taxes, sufficient to produce a rate of return on investment required by the investors. That rate of return may differ from time to time and between countries and investors, causing differences in bauxite costs and prices, and differences in the taxes that the governments may impose. One illustration is the agreement involving the Brazilian government and members of the Rio do Norte consortium for the Trombetas bauxite project. This allows a 10 year income tax exemption and a 13% return on equity plus recovery of investment through depreciation charges over 20 years. That arrangement was acceptable to investors from Spain, the Netherlands, Norway, the United States, Canada and Brazil. It requires bauxite pricing and profit sharing to produce the intended results. But for other governments and investors, some other arrangement and bauxite price agreement may be necessary if the investment is to be made.

Third, for governments concerned mainly with sustaining maximum revenues from bauxite and alumina and the highest possible prices necessary to support those revenues, flexibility may be needed from time to time. Thus, the Jamaica Government in early 1979 was offering to reduce the bauxite levy if producers would enlarge output. After reaching peaks in 1974 of 15.3 million tons of bauxite and 2.7 million tons of alumina, the Jamaica levels were down about 22% in 1978 even though bauxite output had advanced substantially in Brazil, Guinea and Australia. A cut in the bauxite levy will produce a cut in the price. Jamaica thus concedes the need for more flexibility in the concept of reasonable taxes and prices for bauxite.

The conclusion resulting from experiences in 10 countries is that a reasonable price for bauxite cannot be defined by a rigid formula. What is reasonable will change from time to time, from country to country, and will be whatever buyers and sellers can negotiate after weighing all relevant factors, especially competition from others in bauxite and also alumina, and from both existing and pending new supplies.

ANNEX - Section XIII 8 January 1979

Communiqué, Australia

Statement by the Deputy Prime Minister and Minister for Trade and Resources, the RT Hon. J.D. Anthony, M.P.

The Deputy Prime Minister and Minister for Trade and Resources, Mr. Anthony, today met with representatives of Australia's bauxite/alumina/aluminium companies. The discussions covered a range of issues including new development proposals, export control procedures and the outcome of the recent meeting of the Council of Ministers of the International Bauxite Association (IBA).

Mr. Anthony said that he had had a useful exchange of views with the companies on the draft procedural guidelines on export controls and these would be helpful to the Government.

Mr. Anthony said that he was particularly heartened by the general industry optimism for development of further capacity in the alumina/aluminium industry in Australia. The Minister referred to announcements by a number of companies of feasibility studies of aluminium smelting plants in Australia and to the earlier announcement by Comalco that it had decided in principle to proceed with a smelter at Gladstone. The Minister said that he hoped that the negotiations on the Gladstone smelter would soon come to a satisfactory conclusion.

Mr. Anthony commented that the development proposals under consideration reflected a recognition by investing companies of Australia's stability combined with its raw material and energy supplies.

The industry expressed concern at the moves within IBA to set minimum pricing policies for bauxite and alumina and asked that the Government set out its position.

Mr. Anthony explained that Australia has consistently taken the position in the IBA that there are formidable administrative and technical problems associated with adoption by the Association of minimum pricing policies for either bauxite or alumina.

The Australian Government's firmly held view is that international arrangements directly affecting the marketing of commodities can only be negotiated and effectively implemented where producers and consumers are directly involved so that due recognition is given to the interests of both parties, embracing the objectives of producing countries for fair and reasonable prices and the maintenance of the health of the consuming industry. Clearly this raises difficulties where the pricing policies are evolved by an organisation which comprises producers only.

The Australian Government has been particularly concerned with the conflict with its general policy and philosophical approach inherent in the unilateral adoption of a minimum pricing policy by the Association. Importantly, this concern includes its view that the development of Australia's mining and mineral processing industries should be undertaken by private enterprise with no direct Government involvement in either development or marketing except in the exceptional circumstances where some indirect involvement may be necessary to preserve or advance the national interest.

The Government has also been concerned to maintain its position of honouring existing contracts.

Against this background, the Australian Government has not been prepared to agree to the various proposals put forward in IBA for an overall minimum pricing policy for bauxite and alumina.

In December 1977 the IBA recommended a fixed price of US$24 per tonne for standard grade bauxite for 1978 in the North American market with adjustments in other markets for traditional market differentials.

The Government agreed on that occasion to a specific 1978 price for bauxite only, which was consistent with the price prevailing at the time in the North American market and the recommendation left it to member countries to make their judgements as to the appropriate relativity in other markets. Also recommendations of the IBA do not have binding force, rather, members shall use their best endeavours to secure compliance with them. Australia made it clear to other members of the Association that its acceptance of the recommendation was on the clear understanding that it would honour existing contracts.

At the request of the Australian Government many of the early contracts have however been re-negotiated at improved prices. Mr. Anthony commented that the Government is continuing to urge the Australian exporters to up-date the pricing provisions of their old contracts.

The communique of the fifth session of the Council of Ministers of IBA held in December 1978 reported Council recommendations to change from a flat figure by endorsing the principle of indexing bauxite and alumina prices to the price of aluminium ingot and nominated a range of percentages to determine the price of both bauxite and alumina in normal market conditions.

Mr. Anthony said that Australia was not included in the majority which voted for the pricing recommendations reported in that IBA communique. It needed also to be recognised that these were recommendations which do not have binding force on IBA members.

Mr. Anthony said there had been suggestions that bauxite and alumina had been included in the new export control procedures which he announced on 24 October 1978 as a result of Australia's membership of the IBA and because of moves within that Association for a minimum pricing policy.

The Minister said he wished to make it clear that the new export control procedures for bauxite and alumina were introduced because of the importance of these commodities to Australia's national interest and their introduction did not stem from the pricing policies being advocated within the IBA.

Mr. Anthony said that although Australia did not agree with other members that IBA should have a uniform pricing policy this was not the only matter discussed within the Association. The Association enabled members to be better informed and to have discussions on a variety of matters affecting their industries. All producing countries sought and were entitled to fair and reasonable prices for their production and exports and he believed that the knowledge and understanding which came from Association discussions helped individual Governments in determining what that fair and reasonable price might be. Australia's concern was that it did not see that the establishment of prices which were fair and reasonable in the circumstances of individual member countries should be done in a collective way by means of an Association pricing policy.

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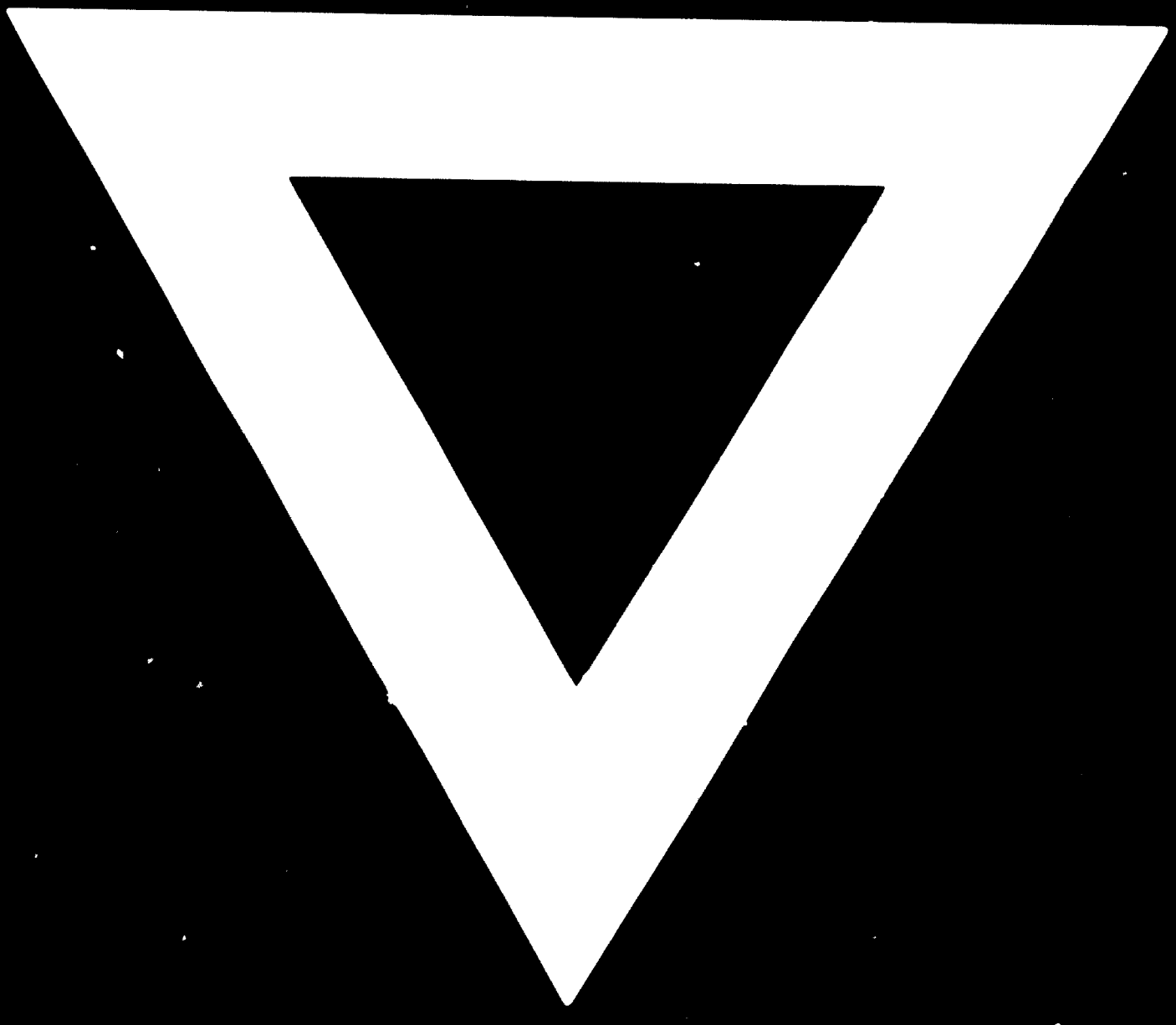

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