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Regional Expert Group Meeting  
on the Development of the Non-Ferrous  
Metals Industry in Latin America and  
Possibilities for Complementarity\*

Córdoba, Argentina  
27-30 March 1989

REPORT\*\*

62/5

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\* This meeting was organized by UNIDO together with the Government of Argentina.

\*\* This document has not been edited.

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## **INTRODUCTION**

1. The Regional Expert Group Meeting on the Development of the Non-Ferrous Metals Industry in Latin America and Possibilities for Complementarity was held at Córdoba, Argentina, from 27 to 30 March 1989. Attending as participants were 27 persons from 10 countries and a representative of ECLAC (see annex I). Attending as observers were one participant from Argentina, two from Peru, one from the European Association for Non-Ferrous Metals and two from the European Economic Community. This meeting was organized jointly with the Government of Argentina.
2. At its seventeenth session, held in 1983, the Industrial Development Board requested the Executive Director to start preliminary preparations for the possible holding of a first consultation on the non-ferrous metals industry during the 1986-1987 biennium. 1/
3. At the First Consultation on the Non-Ferrous Metals Industry held at Budapest, Hungary, from 30 November to 4 December 1987, it was recommended that UNIDO should prepare studies for the identification of possibilities for production complementarity in the area of non-ferrous metals production in the different regions, and play a co-ordinating role in the evaluation and analysis of existing studies on that subject.
4. In line with the aforesaid recommendation, the Secretariat of UNIDO decided jointly with the Government of Argentina to organize a regional expert group meeting in Latin America in which the main producers of non-ferrous metals in the region would participate.

### **Objectives**

5. The objectives of the meeting were:
  - (a) To analyse the situation and prospects of the non-ferrous metals industry in the region, particularly with regard to copper, aluminium, tin and nickel;
  - (b) To examine the possibilities for complementarity of production in the areas of concentrates, refined products and semi-finished products between the countries in Latin America producing non-ferrous metals;
  - (c) To establish specific lines of action for increasing subregional and regional co-operation in the areas of production, research and technological development and information.

### **Documentation**

6. The documents issued for the Expert Group meeting are listed in annex II.

## **1. AGREED CONCLUSIONS AND RECOMMENDATIONS**

7. The meeting arrived at the following conclusions:

- (a) The region of Latin America and the Caribbean possesses a combined potential favouring integration and complementation in the non-ferrous metals field. The diverse levels of development, together with the heterogeneity of the

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1/ Official Records of the General Assembly, Thirty-eighth Session, Supplement No. 16 (A/38/16), paragraph 76 (3).

production structure in the various countries, create objective conditions favouring the integration of production. Another aspect also favouring integration is the great diversity of non-ferrous metal resources in the region.

(b) Complementation depends to a great extent on the region's productive efficiency and maximum utilization of its comparative advantages.

(c) There are a number of factors affecting the process of complementation and integration in the region. Among these, reference was made to the tendency to approach the development of non-ferrous metals essentially in terms of export outside the region. The absence of adequate co-ordination in the tariff field was also highlighted.

(d) There are other factors with an impact on the integration process, such as the lack of appropriate financial mechanisms and of a suitable institutional framework, and obstacles of a bureaucratic nature.

(e) There is a need to establish regional prices for the various non-ferrous metal products, better reflecting the resources available in the region.

(f) There is a need for the identification and implementation of specific complementation projects that will make it possible to promote the complex integration process in a concrete manner.

(g) There is a need to develop a set of policies and measures that will make it possible to realize the various specific complementation programmes identified.

(h) UNIDO should assist in integration efforts in the non-ferrous metals area in the region.

## 8. Recommendations

The meeting adopted the following recommendations:

### A. Aluminium

(a) A study should be made of the technical and economic feasibility of establishing a specific complementation programme in the area of bauxite, alumina and primary aluminium between Venezuela, Mexico, Guyana, Jamaica and Argentina. In the case of semi-finished and finished products, a complementation programme for the whole region should be considered.

(b) Investment programmes in the area of semi-finished products should be harmonized, particularly as between Venezuela, Brazil and Mexico, as well as in the other countries of the region, in order to avoid unnecessary duplication which would affect the rational use of the region's scarce financial resources.

(c) The implementation of a set of medium-sized and/or small projects relating to semi-finished and finished products which will help establish a more coherent productive structure in the region should be promoted - for example, a pressure forging plant, a pigment and metallic powder plant and a plant to produce foil from coiled aluminium sheet.

### B. Copper

(a) A study should be made of the technical and economic feasibility of establishing a complementation agreement between the Caraiba Foundry and the Caraiba Metals company, in Brazil, and Peru and Chile.

(b) A detailed analysis should be made of the possibilities for complementation in the area of semi-finished products in order to make better use of idle installed capacities in Brazil and Argentina, through the supply of primary copper from Peru and Chile. The possibilities should also be explored of increasing the production in the region of bars, sections, tubes and other semi-finished products of high value. Another production line which should be promoted in the region concerns special copper-nickel alloys, which are used in electronics, for marine purposes, etc.

C. Other metals

A study should be made of the technical and economic feasibility of processing Peruvian, Bolivian and/or Argentine zinc concentrate in the Brazilian enterprise Paraibuna de Metais. The feasibility of processing surplus Mexican, Peruvian and/or Argentine lead concentrate at the Karachipampa foundry in Bolivia should also be studied. An analysis in the necessary detail should likewise be made of the possibilities for complementation in the zinc area between Mexico and Peru and the other countries in the region producing zinc.

D. Other possibilities for complementation and investment

(a) Specific possibilities for complementation and investment should be identified in the area of machinery and equipment for the processing of non-ferrous metals.

(b) Possibilities should be studied of encouraging, in a co-ordinated manner within the region, the manufacture of non-traditional non-ferrous metal products linked with the development of sectors with a high technological content.

(c) Specific possibilities should be identified for the substitution of imports from outside the region of inputs used in the non-ferrous metals industry, such as caustic soda and petroleum coke.

(d) Co-operation between the various research centres and between these centres and industry should be strengthened in order to make fuller use of the considerable experience accumulated in the region in the processing of non-ferrous metals and production of derivatives.

(e) Meetings should be promoted on a continuous basis, mainly devoted to individual metals, between the entrepreneurs of the various countries of the region.

(f) There should be a co-ordination of efforts throughout the region to improve financing mechanisms and tariff and non-tariff measures.

(g) A permanent portfolio should be maintained of projects allowing for joint investment among the various countries of the region.

(h) The establishment of a metals exchange for the region should be encouraged.

(i) The consumption of non-ferrous metals in the region should be promoted through the establishment of promotion centres in selected countries.

E. UNIDO should promote the organization of meetings of experts to consider the different metals in the region, and should assist in the carrying out of studies on complementation in the area of semi-finished and finished products.

F. UNIDO should render the necessary technical assistance, where the resources exist, in the implementation of the various forms of complementation identified at the present meeting.

G. UNIDO should sponsor an interregional consultation in the non-ferrous metals area in the period 1992-1993.

## II. ORGANIZATION OF THE MEETING

### Opening of the meeting

9. The Regional Expert Group Meeting was opened by the Secretary for Mining of Argentina. After welcoming the experts present and thanking the responsible UNIDO officials for having organized the meeting in Argentina, he discussed briefly the division of the world into large blocks in which countries were associated politically and economically, and in this context spoke of the need for Latin American integration. Then he described the situation of the mining industry in Argentina, stressing the various policies being promoted by the Argentine Government to develop mining.

10. The representative of UNIDO at the meeting highlighted the importance of the non-ferrous metals industry in Latin America, and the need to see its development in the context of the restructuring process which was taking place at the world level, and in the setting of the productive and commercial dynamics and structure within the region. He also gave a brief description of the non-ferrous metals industry in the region.

11. The Deputy Governor of Córdoba briefly described the future prospects for mining in Argentina, pointing to the need for the mining industry to become one of the central pivots of the country's development. In this context, he stressed the urgent need to promote Latin American integration as one of the most appropriate ways of improving the quality of life in the region. At the end of his statement, he declared the Expert Group Meeting open.

### Election of officers

12. Mr. Manuel Abichain, Chairman of the Confederación Minera Argentina, was elected Chairman. Mr. Carlos Sánchez Cepeda, Chairman of the Instituto Mexicano del Aluminio (Mexico), was elected Vice-Chairman and Mrs. Migdalia Martínez de Albo, Corporative Vice-President of the Corporación Venezolana de Guayana (Venezuela), was elected Rapporteur.

### Adoption of the agenda

13. The following agenda was adopted:

1. Opening of the meeting
2. Election of officers (Chairman, Vice-Chairman and Rapporteur)
3. Presentation of the main topic for discussion at the meeting
4. Presentation of the studies on possibilities for complementarity in South America (concentrates, refined products and semi-finished products)
5. Presentation of the study on possibilities for complementarity in the Caribbean and in Mexico;

6. Presentation by the various participants of the situation in the non-ferrous metals industry in their countries and its development prospects
7. Identification of specific possibilities for complementarity in Latin America
8. Co-operation in the field of research and information. Discussion of financial and commercial aspects affecting regional co-operation
9. Adoption of the conclusions and recommendations of the meeting

#### Adoption of the conclusions and recommendations

14. At the closing session, on 30 March 1989, the conclusions and recommendations of the meeting were adopted by consensus.

### III. SUMMARY OF DISCUSSIONS

#### Presentation of the discussion document and the studies

15. The UNIDO Secretariat gave a brief presentation of the topic for discussion at the meeting, as well as of the various studies prepared for the meeting. In the presentation of the topic for discussion, great emphasis was placed on the need to make maximum use of the technological and productive potential existing in the region for the manufacture of semi-finished and finished products. In this context, the need was stressed to restructure the non-ferrous metals industry in the region in order to improve the proportionalities between primary production and the production of semi-finished and finished products. Reference was also made to the need to strengthen integration within the non-ferrous metals industry and between this industry and activities concerned with the supply of machinery and equipment, inputs and services. In the introduction of the studies on possibilities for complementarity in South America and the Caribbean, detailed mention was made of the various specific possibilities for complementarity of production identified, which could be implemented through a better use of installed capacity and/or investments of limited size.

#### General discussion

16. In their various statements, the participants noted that there was great potential for the development of the non-ferrous metals industry in a harmonious manner within Latin America. This central postulate was based on the diversity of situations existing in the various countries of the region, for example with regard to the different levels of development of the industry, dissimilar production structures and different types of ore and degrees of processing.

17. Some participants said that the non-ferrous metals industry in the region was faced with a number of problems that were affecting its development at the regional level. Inter alia, they stated that the development of the industry concerned had been focused almost exclusively on meeting the demand of the world market, and that the possibilities existing within the region had been ignored. It was noted that that tendency in the development of non-ferrous metals had shown certain weaknesses, particularly at times when the demand for non-ferrous metals on the world market had declined. Some participants also stated that the non-ferrous metals industry was hindered by commercial and financial mechanisms within the region which did not permit acceptable levels of development and integration to be attained within the region. In addition to those problems, there were problems



relating to the lack of policy measures of a tariff and non-tariff nature which would permit the well-organized and balanced development of the non-ferrous metals industry throughout the region. The participants also noted that the regional development of the industry was encountering obstacles of a bureaucratic nature and was impeded by the lack of appropriate co-ordination mechanisms that would promote a concerted approach by the various social actors participating in the industry.

18. Some participants drew attention to the importance of increasing the productivity of this industry in order to raise the level of competitiveness of the industry in the region, with the aim both of replacing imports of products with a high added value and technological content and of increasing exports outside the region.

19. The various participants, in their statements on the situation of the non-ferrous metals industry in their countries, referred to the desirability of promoting production complementarities between the various producer countries of the region as one of the most important ways of guaranteeing the self-sustained development of this industry in Latin America. One representative said that the Karachipampa plant in Bolivia should be reactivated through the supply of zinc concentrate from other countries in the region. Another participant drew attention to the desirability of increasing the use of coking coal from the region in the development of the metallurgical industry in Latin America. He also stressed the need to seek to increase trade and the complementation of production in the nickel area, as such exchanges were at a very low level at the present time. One participant referred to the need to promote specialization in the aluminium area in order to avoid unnecessary duplication in new productive investment. He said that complementation agreements should be established between the various aluminium producers on the basis of an appropriate analysis of the comparative advantages of each country in the various production lines in the aluminium sector. In this regard, he said that a specific complementation programme should be established between the countries producing aluminium in the Caribbean, Venezuela, Mexico, Brazil and Argentina. The participant from Mexico said that his country was ready to increase its commercial and economic relations within the region in the area of non-ferrous metals if it received concrete proposals, involving appropriate prices, in regard to bauxite, alumina and nickel. Another participant said that the development of the copper industry at world level could be expected gradually to lose dynamism, which required a strengthening of the integration process within the region, particularly in the area of semi-finished and finished products with a high national value added. To achieve this, he said that complementarity should be considered at two levels: a first level entailing improved use of existing installed capacity in the region, and a second level involving a suitable selection of specific lines of production in regard to semi-finished and finished products with a high technological content to be promoted within the region. One representative said that better use should be made of the existing installed capacity of the Caraíba Foundry and the Caraíba Metals company in Brazil, taking advantage of the change in management of this enterprise through the use of copper from Peru and Chile. Among other possibilities of complementation, he also mentioned the use of the installed capacity of the Brazilian enterprise Paraihuna de Metais, through the supply of surpluses of zinc ore from the region. Another participant referred to the importance of the substitution of imports of some inputs used by this industry, such as caustic soda and creolite. It was also proposed that possibilities should be identified for the manufacture and use of machinery for the processing of non-ferrous metals within the region. One participant said that the Argentine enterprise ALUAR, which was importing bauxite from Australia at the present time, would be ready to purchase bauxite from within the region in the near future provided that it was guaranteed a continuous supply and suitable prices.

20. Several participants suggested policy approaches that could serve to support a programme for integration and complementarity of production within the region. Among the various policies mentioned, attention was drawn to the need to ensure better complementation between the State and the private sector, to develop a promotion programme for the use of non-ferrous metals within the region, to standardize tariff measures throughout the region and to establish co-ordinated research and development programmes. Reference was made to the need to hold periodical meetings, devoted to individual metals, between the entrepreneurs of the region. The desirability of receiving technical support from UNIDO and regional organizations such as ECLAC, the Andean Group and ALADI for the implementation of coherent complementarity programmes was also mentioned.

Annex I

List of participants

Argentina

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Mr. Mauricio M. Trzewik, Presidente, Cámara Metalúrgica de No Ferrosos, Alsina 1602, Buenos Aires

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Bolivia

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Venezuela

Mrs. Migdalia Martínez de Albo, Vice-Presidente Corporativo de Planificación, Corporación Venezolana de Guayana, Edificio General CVG, Av. La Estancia, Caracas

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Annex II

List of documents

<b>Countries producing non-ferrous metals: characteristics, prospects and strategies</b>	<b>ID/WG.481/1(SPEC.)</b>
<b>Identification of specific projects for the production of semi-finished non-ferrous metals in Latin America</b>	<b>ID/WG.481/2(SPEC.)</b>
<b>The development of non-ferrous metals in South America and the possibilities for complementarity</b>	<b>ID/WG.481/3(SPEC.)</b>
<b>Study on the identification of possibilities for production complementarities among the producers of aluminium and nickel in the Caribbean region</b>	<b>ID/WG.481/4(SPEC.)</b>
<b>The promotion of a more coherent productive system in the field of non-ferrous metals in Latin America: possibilities for complementarity (discussion document)</b>	<b>ID/WG.481/5(SPEC.)</b>

Annex III

List of technical assistance projects identified

I. Regional L.A.

1. Establishment of an Aluminium-Copper Metals Advisory Services Unit at OLAMI (Organismo Latinoamericano de Minería)

II. Argentina

2. Laboratory technological testing of Alunite Ore Samples
3. Laboratory/bench-scale testing of processing to Iron Aluminiferous and Titaniferous products
4. Bench-scale technological testing of ilmenite ore sample for beneficiation and metallurgical processing to Titania slag
5. Utilization of Aluminium foil scraps for aluminium pigment and powder production
6. Rational organization of small-scale gold mining and production operations in Argentina
7. Assistance in production of purified Calcium carbonate powder
8. Pilot-scale technological testing and feasibility study of processing of the borate ore Ulexite to Boron-oxide
9. Implementation of technology of continuous casting of Cu-Ni alloys

III. Bolivia

10. Techno-economic study of conversion of the Carachipampa Plant to Zinc production

IV. Chile

11. Prognostic study of market and product development to increase extensive and intensive utilization of copper in Chile and other countries

V. Guyana

12. Establishment of a Mineral Testing/Evaluation Laboratory at the Guyana National Resources Agency

VI. Jamaica

13. Pilot plant for production and refining of Gallium metal
14. Detailed project report on diversification of products of the Clarendon Alumina Plant
15. Feasibility study of conversion of alumina production to coal fuel

VII. Mexico

16. Aluminium quality standards testing laboratory

**VIII. Peru**

17. Assistance to the OLAMI sector in non-ferrous products development and marketing
18. Feasibility study of aluminium foil production
19. Feasibility study for establishment of a 10.000 tpy metallurgical refractories plant

**IX. Venezuela**

20. Project report on Establishment of an aluminium Research and Development Centre
21. Feasibility study for establishment of caustic soda production to supply the Interalumina plant.



**I. REGIONAL**

as per No.1:

Establishment of an Aluminium-Copper Metals Advisory Services Unit at OLAMI (Organismo Latinamericano de Minería)

Counterparts: \*

Jose Nendo Mizael de Souza, Vice President of OLAMI,  
Felipe de Lucio Peret, President of Peruvian Unit of OLAMI,  
Dr. Oscar Humberto Morales, Argentinian Unit of OLAMI

The idea of this Unit's activities is to follow up and further develop the proposals and concepts of complementary and product-market development of Aluminium and Copper semi-fabricated and finished products on a regional basis in Latin America.

Action: To formulate, in co-operation with OLAMI, a regional project proposal, financed from UNDP regional funds. The endorsement of the project proposal by at least 3 countries' Governments may be expected.

**II. ARGENTINA:**

as per No. 2:

Laboratory Technological Testing of Alumite Ore Samples

Counterparts:

Dr. Jorge R. Cuomo, President of Union Minera Argentina,  
Dr. Edmundo Macchiaverna, Director, Commercial Development of the Company ALUAR,  
Jose Pedro Delfino, Director of Materials Supply and Transportation of the Company ALUAR.

ALUAR is interested in testing of samples in two variants: One for production of Alumina, Potassium Sulphate and Sulphuric Acid, the other for production of Potassium Sulphate and Aluminium Sulphate. The deposits are located at Camarones in the South of the Country.

Action:

To co-operate with ALUAR and SIDFA/JPO in the preparation of a UNIDO project, financed from XP funds ("6X"-USSR contribution).

as per No. 3:

Laboratory/bench-scale testing of processing to Iron.

Aluminoferous and Titaniferous products

Counterparts:

Dr. Edmundo Macchiaverna, ALUAR,  
Jose Pedro Delfino, ALUAR.

The deposits are located in the North of the Country. The ore is a complex alumino-silicate-hematite-magnetite-ilmenite ore, with no viable technology proposed up to now for economic processing. However, my idea of application for processing of beneficiation a.o. through the recently developed non-coking coal-based direct reduction, with subsequent electromelting (for separation of metallic iron) and hydrometallurgical processing of the slag product (for separate recovery of the aluminium and the titania contents in the form of oxides) was found interesting and worth laboratory testing. The outcome of

\*) Under "Counterpart", the persons are named who participated on the national side in personal discussion, with agreement to pursue the project for formal request through the Government.

this testing may promise an alternative to the import of alumina by ALUMAR (abt. 340,000tpy) in the absence of deposits of good quality bauxites in the country.

**Action:**

To co-operate with ALUMAR and SIDPA/JPO in preparation of a UNDP/UNIDO project, expectedly financed from IPF.

- as per No. 4: Bench-scale technological testing of ilmenite ore sample for beneficiation and metallurgical processing to titania slag

**Counterpart:**

Dr. Jorge R. Cuomo

Argentina possesses about 600 million tons of reserves of alluvial-type complex ore. In view of relatively large iron content, its industrial processing appeared to be in attractive. New developments in direct reduction of ilmenite may be test-applied to assess viability under the new circumstances.

**Action:**

To pursue procurement of more technical data on the ore and formulation of a project proposal for UNIDO financing, in co-operation with national counterpart (to be proposed by Dr. Cuomo) and SIDPA/JPO.

- as per No. 5: Utilization of Aluminium foil scraps for Aluminium pigment and powder production

**Counterparts:**

Maurizio Trzernik, President, Camara Metalurgica de No-ferrosos.

The aluminium foil producer KICSA Industrial y Comercial SA produces about 10,000tpy of foil. An estimated 1500-2000tpy of foil scrap is developing and being recycled by melting, which is a process of very low efficiency, in view of oxidation of 20-30% of the scrap during smelting and the resulting secondary Aluminium ingots as product of relatively low value. The processing to pigment and powder (without melting) is a well-established and very profitable technology known worldwide. Its introduction brings about significant added-value and, at the same time, substitutes import to Argentina.

**Action:** To formulate a Feasibility Study project in co-operation with national counterpart and SIDPA/JPO, expectedly on UNIDO financing.

- As per No. 6: Rational Organization of small-scale gold mining and production operations in Argentina

**Counterpart:**

Gallino Luis, Director of Mining of Banco Nacional de Desarrollo (BANADE)

The consultant required should have experience in the organization of technical guidance and supply and also of collecting and purchasing the product of small-scale operators, exploiting alluvial-type gold deposits.

**Action:**

To prepare project proposal for UNIDO-financed project, in co-operation with national counterpart and SIDPA/JPO.

as per No. 7: Assistance in production of purified Calcium-carbonate powder  
Counterpart:

Manuel Abichain, President, Confederacion Minera Argentina,  
Alfredo Le Campone, Technical Director of the Corporacion Minera  
Tea S.A.

In Argentina, companies are mining and selling to the metallurgical industry calcium-carbonate, however, there is a significant market requirement both in the country and in the region for pure carbonate powder. The technology of production consists of dissolution of technical carbonate and precipitation from the solution of refined carbonate in powder form. Design, technological and process control consultancy is required to the investment for a 8000tpy PCC (Preapitated Calcium Carbonate) production to be started in 1990 and reaching full capacity in 1994.

Action:

To formulate a project proposal for a 2-3 man team of consultants plus study tour, in co-operation with national counterpart and SIDFA/JPO. UNIDO financing may be considered.

as per No. 8: Pilot-scale technological testing and feasibility study of processing of the borate ore Ulexite to Boron-oxide  
Counterpart:

Minera Tea S.A. Corporation  
Alfredo L. Campora, Technical Director of the Corporation.

Significant deposits (third largest in the world) of borate ore (Ulexite) are in the possession of the Corporation (2 million tons of Borate with 30% B<sub>2</sub>O<sub>3</sub> content), located at Atacama Puna in the Province Catamarca. Similar large deposits of borates exist at 3 locations only in the world (Turkey, USA, USSR). Latin America represents a significant market, being now supplied from overseas (at present 4000tpy of B<sub>2</sub>O<sub>3</sub>). A processing technology is to be selected and applied on pilot scale (carbonization or acid leaching) and a Feasibility Study to be prepared for the establishment of an industrial plant with a production capacity of 5-8000tpy of B<sub>2</sub>O<sub>3</sub>. A Preparatory Phase of laboratory-scale testing of samples may also be considered in view of the expected large scale of the project. The preparatory project could be considered for UNIDO financing and the main project - for UNDP/IPF financing.

Action:

To formulate project document in co-operation with national counterpart and SIDFA/JPO. To decide on best approach to this expectedly significant, large-scale TA project.

as per No. 9: Implementation of technology of continuous casting of Cu-Ni Alloys  
Counterpart:

Mauricio Trzervik, President, Camara Metalurgica de No-Ferrosos.

The sources of this casting technology are to be identified and the technology transferred, preferable through a subcontract and study tour components.

Action:

To formulate a project proposal in co-operation with national counterpart and SIDFA/JPO. It may be a UNIDO/SIS project.

### III. BOLIVIA

as per No. 10: Techno-economic study of conversion of the Garachipampa Plant to Zinc production

Counterpart:

Eliodoro Sandi Bernal, Director General for Planning, Ministry of Mines and Metallurgy.

The plant is producing Lead and Zinc and Silver, however, because of depletion of local resources of Lead-containing concentrates, the Government wishes to study conditions and viability of conversion to Zinc production only. Since the utilization of plant capacity has decreased to 50% and continues to sink, the issue of employment in the given, rather poor region is adding to the importance of the project.

Action:

To prepare, in co-operation with the national counterpart, a UNDP/IPF Project Document for subcontracting a detailed technical/technological adaptation study, to be followed by a techno-economic feasibility elaboration.

### IV. CHILE

as per No. 11: Prognostic Study of market and product development to increase extensive and intensive utilization of Copper in Chile and other countries.

Counterpart:

Peter Lowick-Russel A., Director of Development, CODELCO (Corporacion Nacional del Cobre de Chile).

CODELCO, the predominant public producer of Copper Metal in Chile and one of the largest in the world, is anxious about the increase and extension of consumption in Chile, in the region and world-wide. A State-of-the-Art prognostic study, to be prepared by top level consultants, renown in this specific field, is required.

Action:

To prepare (preferably with the involvement of a consultant at this stage already) a project document, including terms of reference for the study (maybe a Preparatory Project), in co-operation with CODELCO and SIDPA/JPO. A medium-scale project, to be financed expectedly from UNDP/IPF.

### V. GUYANA

as per No. 12: Establishment of a Mineral Testing/Evaluation Laboratory at the Guyana National Resources Agency

Counterpart:

E. Lance Carberry, Director, Bauxite Industry Development Ltd.

The laboratory should apparently cover in its profile determination of chemical and mineralogical composition of different ores and minerals of national occurrence and industrial significance.

Action:

To prepare a Project Document for UNDP/IPF financing in co-operation with national counterpart and SIDPA/JPO.

**VI. JAMAICA**

**as per No. 13: Pilot-plant for production and refining of Gallium Metal**

**Counterpart:**

**Dennis Morrison, Director (Projects), Jamaica Bauxite Institute,  
Michael Mitchell, Market Analyst, JBI,**

The Gallium content of Jamaican Bauxites is significant. The Clarendon Alumina Plant's ownership partly (80%) belongs to the State, the same way as JBI. The Institute wants to test and introduce in the Clarendon Plant one of the existing technologies for Gallium extraction. A pilot-plant with a unit capacity of 250-500kg per year of refined Gallium metal is to be established and operated to demonstrate the optimum technology. A UNDP/IPF or UNIDO/XP (USSR budget contribution) project is to be prepared in co-operation with JBI and SIDFA/JPO.

**Action:**

**To prepare/draft in co-operation with JBI and SIDFA/JPO a Project Document.**

**as per No. 14: Detailed Project Report on Diversification of Products of the Clarendon Alumina Plant**

**Counterpart:**

**Dennis Morrison, Director (Projects), Jamaica Bauxite Institute,  
Michael Mitchell, Market Analyst, JBI,**

The Jamaican Government wants to develop possible and economic new products at the Clarendon Alumina Plant, based on international experience of similar complementary production, such as that of Gallium metal, Rare Earth elements, Vanadium pentoxide, special aluminas, alumina based ceramics and others. The techno-economic viability of such a product development programme is to be established.

**Action:**

**A Project Document for a UNDP/IPF financed project is to be prepared in co-operation with JBI and the SIDFA/JPO.**

**as per No. 15: Feasibility Study of Conversion of Alumina Production to Coal Fuel**

**Counterpart:**

**Dennis Morrison, Director (?), Jamaica Bauxite Institute,  
Michael Mitchell, Market Analyst, JBI,**

A similar conversion of the cement industry of Jamaica from fuel oil to coal has shown significant economic and commercial benefits. The same idea to be studied (techno-economic study) for the Alumina industry, on the case of the partly public-owned Clarendon Alumina Plant.

**Action:**

**To prepare a Project Document in co-operation with JBI and SIDFA/JPO for UNIDO donor financing.**

**VII. MEXICO**

as per No. 16: Aluminium Quality Standards testing Laboratory

Counterpart:

Carlos R. Sanchez Cepeda, President, Instituto Mexicano del Aluminio A.C.

The Institute was created and is operated by an association of Aluminium metal, semis and finished products producers in Mexico and it is engaged now a.o. in elaboration and introduction of quality standards in the country.

Action:

To prepare Project Document for a UNDP/IPF project of US\$400,000-500,000 in co-operation with the national counterpart and SIDFA/JPO.

**VIII. PERU**

as per No. 17: Assistance to the OLAMI sector in non-ferrous products development and marketing

Counterpart:

Felipe de Lucio Pezet, President of the Peruvian Unit of OLAMI, Director of the Plant ZINCAL.

The plants of non-ferrous semifabricates and finished products production need assistance on the subject. Concretely, the introduction of Aluminium slugs and collapsible tubes production and Zinc battery housings' production by deep drawing, also market research for the introduction of new products were mentioned as requirements.

Action:

A Project Document for UNDP/IPF financing is to be prepared in co-operation with the Peruvian OLAMI unit and SIDFA/JPO.

as per No. 18: Feasibility Study of Aluminium foil production

Counterparts:

Felipe de Lucio Pezet, OLAMI unit

This project requirement was identified by UNIDO consultants during the preparation of the Cordoba regional non-ferrous metals consultation meeting. The capacity envisaged is 8000tpy of foil products.

Action:

A project document for a Feasibility Study is to be prepared in co-operation with national counterpart and SIDFA/JPO.

as per No. 19: Feasibility Study for Establishment of a 10,000tpy metallurgical refractories plant

Counterparts:

Alfredo Barclay, Director, Metales Industriales del Peru, S.A.

The group of metallurgical operations of Metales Industriales del Peru, S.A.

Action:

A project proposal for a UNIDO financed project is to be prepared with the possible involvement of a consultant (proposed in this field for African countries earlier by Poland), in co-operation with the national counterpart and SIDFA/JPO.

**IX. VENEZUELA**

as per No. 20:

**Project Report on Establishment of an Aluminium R&D Centre**  
**Counterpart:**

Migdalia Martinez de Albo, Vice President on Planning,  
Corporacion Venezolana de Guyana (CVG).

CVG, operating the largest public Aluminium Industry in the Western hemisphere (1,360,000 tpy of Alumina, 4,000,000 tpy of Aluminium production in 1987, with plans of 4 million and 2 million tons respectively by 2000), plans to proceed with the establishment of a Centre, similar in profile to that being established now in India with UNDP/UNIDO assistance (UNDP input: US\$4,2 million). UNDP/UNIDO assistance would be welcome.

**Action:**

To prepare - based on the experience with the Indian project - a Project Document for the preparation of a Detailed Project Report on the establishment of the Centre, in co-operation with CVG and SIDFA/JPO. A UNDP/IFF project with significant cost sharing of the expected cost of about US\$500,000 for the preparation of the DPR (to be prepared on subcontract) could be considered.

as per No. 21:

**Feasibility Study of Establishment of Caustic Soda Production to supply the Interalumina Aluminium Plant**

**Counterpart:**

Same as No. 20, with possible joining of the Government of Jamaica for the Jamaican Aluminium industry.

A Caustic Soda plant of an annual capacity of abt. 400,000 tons is planned to be established, with possibilities of extension according to the increasing internal and eventually also external (Jamaica) requirements.

**Action:**

A project document is to be prepared in co-operation with CVG and SIDFA/JPO, expectedly to be implemented on UNDP financing with significant cost sharing. On both No. 20 and 21, contact is to be established with Leopoldo Suere Figarella, Minister, President of CVG.