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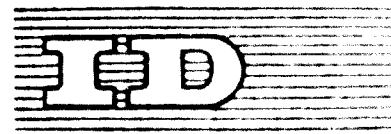
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Development of the Petrochemical Industries in  
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DEVELOPMENT OF THE PETROCHEMICAL INDUSTRY

IN BOLIVIA

by

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Bolivia is one of the less developed countries of South America, where the petroleum industry has begun to play a major role in the economy in the last few years and on which much hope rests for the development of a country of any size.

The gross national product of Bolivia is only US\$ 800 million. Petroleum accounts for eight per cent of the total, way behind items such as agriculture, manufacturing, commerce and finance as well as mining. The importance of the petroleum industry on foreign exchange is proportionally greater, accounting for 14 per cent of US\$ 170 million in exports. Eighty per cent of this total is represented by other minerals. The increasing importance of petroleum is underlined by a three-fold increase in the industry since 1956 and by being the sector with the highest growth rate in the country.

Continued attention has been paid by the Government to petrochemicals development because of the interesting characteristics of the industry and because of the natural resources of the country, and with much greater stress now that the great Bolivian projects are close to function. For this purpose, the Government has laid down a vigorous policy and has placed it in the hands of the *Estado del Porray, Yacimientos Petroliferos Fiscales Bolivianos*. This policy of placing the development of petrochemicals on the State Oil Company's management in Latin America has proved quite successful in Brazil and Venezuela. The petrochemicals division of Y.P.F.B. was created in 1961 with full responsibility for petrochemical projects and for the industrial use of natural gas. In the field of petrochemicals this division has analyzed the possibilities for Bolivia placing emphasis on natural resources, such as, regional agreements and on the main problems in the settling of petrochemical projects in Bolivia.

A list of some of the Bolivian natural resources of importance to the petrochemical industry is as follows: The proven reserves of Bolivian crude are reported to be 1.33 billion cubic meters of an excellent quality crude containing 1.3% sulphur content. The gas reserves are however considerable - 12,000 million cubic meters of gas containing approximately 80 per cent methane, two per cent propane and five per cent butanes and heavier, with negligible sulphur content. Other resources of importance

are large deposits of sulphur, salt and trona. The markets towards which the plans for development of the industry are directed may be divided in local and export markets. The domestic market for petrochemicals is, at the moment, quite small, furnishing a sound basis only for fertilizer projects. The export markets are the basis for most of the projects and these in turn are divided in the market of the Andean Group - Colombia, Chile, Ecuador and Peru - , and in the market of the remaining countries of the Latin American Free Trade Association - LAFTA or ALALC.

A regional petrochemical agreement was signed last year in the Andean Group region i.e. between Bolivia, Colombia, Chile and Peru, with the main objective of strengthening and hastening the process of economic integration of the region. Specific objectives of the agreement are the promotion of a balanced development of the petrochemical industry, the installation of plants of optimum size to take advantage of economies of scale, the attainment of levels of efficiency and productivity that will permit competitive products and prices in world markets, the reduction of gaps in the degree of economic development among participating countries, and accelerating the formation of a Latin American common market. The outstanding characteristic of the agreement is the localization of plants in the member countries according to technical and economic criteria to accomplish the specific objectives just mentioned. The possibilities for all participating countries of the agreement to develop their petrochemical industries are thus greatly enhanced and the region is now at a stage of determining which lines of production may be most convenient to each country.

For Bolivia, the possibilities that emerge from the regional agreement are extremely interesting for the agreement has opened doors that were previously almost totally impeding any entrance of Bolivia in the field of petrochemicals. It is true that intra-regional competition out classes Bolivian capabilities, but for this very same reason, my country has been given advantages as the least developed member of the group which tend to diminish the capability gaps basically existing. Within this frame of reference, it is that the prime objective is the crystallization of all those possibilities which are now present to Bolivia. Currently there are under execution various studies which will determine which concrete projects are most rewarding to the country.

A third possible market to Bolivian petrochemicals is that of the LAFTA

countries outside the Andean region, mainly Argentina, Brazil, Paraguay and Uruguay. Argentina and Brazil continue to develop fully integrated industries - vertically and horizontally - and their markets are practically closed to Bolivia, Paraguay and to a lesser extent, Uruguay, offer interesting but rather limited markets. Therefore, this third region has reduced importance to Bolivian projects, and only the market of the Andean Group may be considered a sound basis in the development of the petrochemical industry in Bolivia.

The small markets available are therefore the main obstacle that Bolivia faces. Then there are very limited financial resources, limited human resources especially in the form of experience in the petrochemical business. These problems are very serious, valuable assistance may be provided on these by one of our host organizations - the United Nations Industrial Development Organization. Another very significant problem which is quite peculiar to Bolivia, is that of transportation. Bolivia is a land-locked country with some very rugged mountains between its petroleum resources and the attractive markets on the Pacific. Products of high aggregate value must therefore be chosen by Bolivia so that the cost of transportation may not influence greatly their market price.

Now that the overall picture has been outlined, mention can be made of those specific projects which Bolivia is considering at the present time, and which constitute the basis of our plans for petrochemical development. These projects are listed by groups, and the order of appearance does not necessarily represent their importance.

First, a project for production of ammonia, nitric acid and ammonium nitrate, which will serve the needs of the agricultural and mining sectors. The state of this project is quite advanced. The financing for the plants (ammonia - 90000 USD, nitric acid - 150000 USD, ammonium nitrate - 200000 USD, and mixing plants - 100000 USD) is now in the final stages.

Second, a project for the production of intermediates that will allow for exports of considerable value and for utilization for sizable volumes of natural gas or coal. This is a daring project which must be carefully studied, but which may give great rewards.

Third, projects for those products which have already been assigned to Bolivia within the petrochemical agreement. These projects are not fully inter-

related and will most likely demand import of raw materials, but they have excellent probabilities of success because a definite market is assured. The principal products in this group are styrene and various pesticides.

Finally, projects within a wide list of products within specialized lines of production such as dyestuffs and pesticides, which represent various valuable characteristics to a developing country such as Benin.

From the above-mentioned projects priorities must be given according to the best overall effects on the economy and on the sound development of the petrochemical industry.





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