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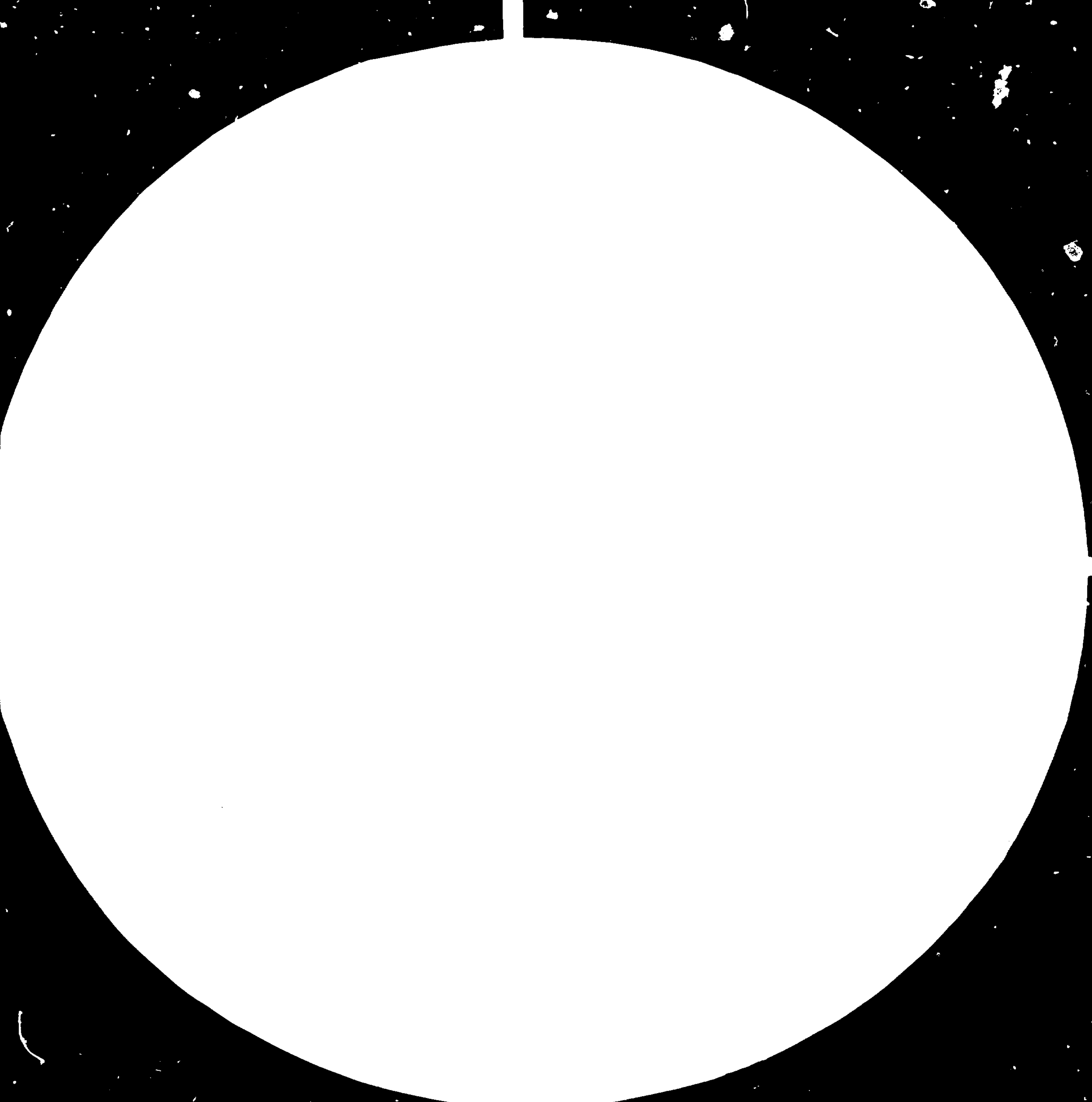

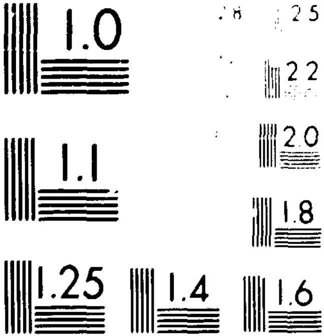
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THE PETROCHEMICAL AND POLYMER INDUSTRIES IN COLOMBIA*

by

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1.- THE OIL SITUATION.-

The prospects of the oil importing countries is gloomy. Only those having sufficient production and reserves to fulfil their internal needs will be safe from the future determinations to be taken by OPEC. Nevertheless, this does not mean that they will not have to confront other problems implacably affecting the world economy such as the declination in the grouth of productivity, inflation, decreasing investments, unemployment, etc.

In the presence of this aspect, one of the principal objectives considered by the Colombian Government is the achievement of selfsufficiency in oil supply, which can be reached through an active exploitation programs by Ecopetrol (State Company), and also maintaining the existing incentives, so that private companies in their turn may develop important projects in search of new oil deposits economically exploitable.

The intensive exploring activity being followed in the country, the discovery of new fields commercially exploitable and the growth of incremental production, are good signs that this anxiously desired goal can be reached in the near future.

Thanks to the policy of incentives adopted by the National Government in 1980 there has been a remarkable increase in the recovery of the incremental crude existing in the fields, whose extraction was economically impossible due to the internal buying prices prevailing in the country.

On the basis of the results obtained, the national oil production is expected to be as follows (in thousands barrels per day)

EXISTING FIELDS	1980	1981	1985	1990
Base production	111.1	115.2	68.6	37.3
Incremental production	14.7	20.7	20.2	8.1
New fields	-	4.1	65.5	138.7
Total Production	125.8	140.0	154.4	184.1

On the basis of the above data, the oil and gasoline imports up to 1990 will be as follows: (Barrels per day).

YEAR	OIL	GASOLINE
1981	30.600	24.700
1985	60.200	7.000
1990	33.000	35.500

For year 1985 it is expected that gasoline imports will have a significant decrease due to the expansion of the Cartagena refinery, whose processing capacity will grow from 50.000 to 70.000 barrels per day starting from 1983.

These satisfactory results obtained in the country as a product of the intensive labor being followed both in the extraction of incremental crude and the search of new deposits, together with the exploitation of coal, natural gas, and hydroelectricity, will allow Colombia to overcome successfully its heavy dependence on oil which at the present time is 45% but by year 2000 will be rather different as it is estimated that it will be of only 2_% as a consequence of the considerably increasing coal and hydroelectricity contribution as alternative energy sources just as can be observed in the following table of energy consumption forecasts for year 2000

Oil	[illegible]
Gas	[illegible]
Coal	30.5%
Hydroelectric	35.0%
	100.0%

Likewise, the investments on test pits, on the part of private oil companies, [illegible] increased continuously year after year, as can be seen in the following table.

YEAR:	1976	1977	1978	1979	1980	1981
INVESTMENT: (millions US$)	[illegible] 2	[illegible].9	[illegible]	107	109	200

With regard to supply [illegible] of the oil industry for the present decade, the following projections can be made: (thousands barrels per day)

	1980	1981	1985	1990
a. Demand.				
Gasoline and naphthas	[illegible]	79.3	87.5	102.9
Aviation fuels	10.1	10.6	12.2	15.3
Kero-Diesel	[illegible]	31.0	36.6	40.4
Fuel-Oil	14.6	14.4	15.7	17.3
Other by-products (1)	[illegible].3	25.3	28.8	32.5
Subtotal:	**161.9**	**160.9**	**179.8**	**211.9**
Fuel-oil exports	25.9	33.1	47.2	47.1
TOTAL DEMAND:	187.8	194.0	227.0	259.0

(1) Lubricants, asphalts, petrochemicals, fuels used in refineries, etc.

	1980	1981	1985	1990
b) Supply				
Production in refineries:	144.3	[illegible]	[illegible]	210.9
Crude and liquid natural gas, used as products:	8.2	9.8	9.1	12.6
Import of by-products (gasoline, gas oil, Ethylene, Diesel):	35.3	24.7	7.0	25.5
Total supply:	187.8	194.0	227.0	259.0

In accordance with calculations for the next ten years, the demand for derivated products shall grow at a rate of only 2.7% per year, during the period 1980-1990 when it will go from 161.900 to 211.900, contrasting favourably with the previous decade growth rates which *show a fluctuation between 7% and 5%. In this growth rate declination* of the oil by-products, the more efficient use being given to energy has played a very important role, so has the moderate use the Colombian population has been performing with the consumptions of the traditional energy sources.

2.- THE PETROCHEMICAL INDUSTRY.-

The development in Colombia of the Petrochemical Industry is handled by the Fondo de Estudio Petroquimicos (Petrochemical Surveys Fund), created in July 1978, and formed by official and private entities (Ecopetrol, Instituto de Fomento Industrial (IFI), Institute of Industrial Development, Fondo de Promoción de Exportaciones (Export Promotion Fund), and Asociacion Nacional de Industriales (National industrial Association) all of which have a directrelation with the development of this industry. The Fund has as its responsibility, the elaboration of pre-feasibility surveys in connection with projects derived from the assignations given by the Andean Group and operates also as an adviser to the national Government with respect to the development of the Petrochemical Industry, within the frame of Resolution 91 issued by the Commission, which is the maximum organism of the Andean Group, it is also in charge of the conformation of entreprises to carry out socially and privately viable projects.

The basic scheme stated above identifies a group of projects regarding to derivates of basic aromatic products, speciafically Caprolactam, DMT or TPA to manufacture Polyesteric fibers, Maleic Anhydride and Phthalic Anhydride. These products would conform a complex integrated by aromatics consisting of the following plants:

PLANT	TONS/YEAR
Aromatics BTX	230.000
Toluene Hydroalkylater	95.000
Isomerizer and Xylene separator	20.000 O-Xylene
	100.000 P-Xylene
Caprolactam	40.000
DMT and TPA	150.000
Maleic Anhydride	10.000

In a second phase, Colombia will consider its remaining asignations namely: Rubber, ABS-SAN resins and Acrylic Fibers.

All these projects are stagnant at the present time on the basis that the Government, in view of the oil crisis both, internal and external, has established as a priority, to maintain the existing production capacities in the Petrochemical fiel of the State and also the exploration efforts in search of new oil fields leading to self-sufficiency of the country and also because the private industry has not shown the required atraction to these projects due to the high investment and risk involved.

In order to determine the future of same, it will be necessary to wait for the delineations of the new Government, to be constituted in the near future, regarding to the existing Petrochemical industry in Colombia. It can be said that Petrochemicals constitute a minimum part in the crude oil treatment (near to 2.5%), notwithstanding they provide proportionally more important yields than the refining destined to produce fuels.

The following table of products can be established.

2.1 Basic Petrochemical: Fundamentally developed by the Government through the Empresa Colombiana de Petroleos "ECOPETROL" (Colombian Petroleum Company).

PRODUCT	CAPACITY MET/TON/YEAR	PRODUCTION MET/TON/YEAR	DESTINED TO	PRODUCER PLANT
Ethylene	119.000	59.000	Feeding the low density Polyethylene Plant, PVC production	Ecopetrol
Propylene	10.000		As GLP gas, there is no immediate production of derivates	Ecopetrol
Benzene	43.000	31.500	Production of Caprolactam, Nitrobenzene, Dodecyl Benzene	Ecopetrol (Petrochemical) Carboquimica Colombiana (Carbochemical Industrial Product)
Xylenes	8.300 (O-Xylenes) 34.000 (Xylenes mixes)	8.300 31.000	Production of Caprolactam, Nitrobenzene, Dodecyl Benzene	Ecopetrol (Petrochemical) Carboquimica Colombiana (Carbochemical Industry)
Toluene	30.000	3.300	Production of explosives, pigments, paints, solvent, Benzoic Acid, Toluene Disocyanate	Ecopetrol (Petrochemical) Carboquimica Colombiana (Carbochemical Industry)

2.2 Plastics, Resins and by-products.

PRODUCT	CAPACITY MET/TON/YEAR	PRODUCTION MET/TON/YEAR	DESTINED TO	PRODUCER PLANT
Phenol Formaldehyde	4.200	3.100 liquid resin 1.085 Solid resin	Adhesives, coverings, laminating, printed electronic circuits, molding powder	BASF Quimica Colombiana Cia. Quimica Borden S.A. Colombiana de Resinas S.A
Urea-Formaldehyde	7.300	7,300	Adhesive, molding, textile finishings	Cyanamid de Colombia S.A. Quimica Borden S.A. BASF Quimica Colombiana
Formaldehydes	20.400	15.200	Production of Urea Formaldehyde Resins, Phenol-Formaldehyde, Desinfectant, Tannery, Textile Finishings, Chemical Industry	Cyanamid de Colombia S.A. BASF Quimica Colombiana Cia. Quimica Borden S.A.
Melamine-Formaldehydes	1.500	500 Liquid resin 1.000 Powder resin	Molding Poweder Textile finishing	Cyanamid de Colombia S.A. Quimica Borden S.A. BASF Quimica Colombiana
Alkydic resins	7.500	7.200	Manufacture of paints, lacquers, varnish and enamels	Anhidridos y Derivados de Colombia "ANDERCOL" Movil Ami S.A. Sherwin Williams de Col.
Polyester resins		1.300	Articles molded with glass fiber, buttons.	BASF Quimica Colombiana Anhidridos y Derivados de Colombia "ANDERCOL" Carboquimica

PRODUCT	CAPACITY MET/TON/YEAR	PRODUCTION MET/TON/YEAR	DESTINED TO	PRODUCER PLANT
Polyurethanes	N A.	1.500	Mattresses and cushions, leather finishings, furniture finishings, thermal insulation	Setton & Milhem Bayer Quimicas Unidas Keyton Ltda. Industrias Quimicas Delta
Low density Polyethylene	40.000	16.000	Bags, films, toys, packing, hoses, coverings.	Ecopetrol
Phthalic Plasticizers	14.300	7.850	Manufacture of PVC compounds, paints.	Anhidridos y Derivados de Colombia "ANDERCOL" Carboquimica S.A.
Polyvinyl Chloride (PVC)	48.000 Suspension type and copolymer. Will increase capacity to 88.000 ending 1984	48.000	Film, coated fabrics, footwear, piping, cables, packing, toys, floor tiles.	Colombiana de Carburos "Colcarburos" Petroquimica Colombiana
Polystyrene	14.000	9.300	Packing, thermal insulation, molding of toys and industrial products.	Dow Colombiana S.A.
Regenerated Cellulose (Cellophane)	11.000	N.A.	Wrapping of food and other consumer products.	Celanese Colombiana (Actually Shut Down)
Acrylic Emulsions	N.A.	2.400	Paints and leather industries	Plastificantes y Derivados S.A. "PLASTIDER" BASF Quimica Colombiana Carboquimica S.A.

PRODUCT	CAPACITY MET/TON/YEAR	PRODUCTION MET/TON/YEAR	DESTINED TO	PRODUCER PLANTS
Phthalic Anhydride	14.000	8.000	PVC Plasticizer, Alkydic Resins, Paint.	Carboquimica S.A. Anhidridos y Derivados de Colombia "ANDERCOL"
Benzoic Acid	650	240	Manufacture of Sodium Benzoate. Alkydic Resins. Textile Industry-Catalyst. Curing of Epoxy Resins.	Organoquimica S.A.
Caprolactam	22.000	16.000	Textile and Industrial Nylon	Monomeros Colombo Venezolanos.
Dodecyl Benzene	15.000	N.A.	Manufacture of formulated detergents.	Ecopetrol.
Polyvinyl Acetate (PVA)	2.600	2.600	Manufacture of adhesives. Latex for paints. Textile finishings. Bases for floor carpets.	BASF Quimica Colombiana. Colombiana de Resinas S.A. Hoechst Colombiana S.A.

2.3 Synthetic Fibers.

PRODUCT	CAPACITY	PRODUCTION FIL - STAPLE	DESTINED TO	PRODUCERS PLANTS
Polyester	25.900 Fil 10.600 St 36.500 total	20.800 Fil 8.500 St 29.300 total	Textile Industry	Celanese Colombiana Enka de Colombia Polimeros Colombianos Zilette
Nylon	13.200 6.500	7.500 5.700	Textile Industry. Industrial	Celanese Colombiana Enka de Colombia
Acetate	5.400	3.500	Textile Industry	Celanese Colombiana

The excess capacity is explained by the fact that the market is being affected by the smuggled products coming into the country, not only as raw materials but also as finished products. In the case of polyester fiber, around 45.6% of it is produced by means of importing polyester chips.

3.- CONCLUSION.-

The Petrochemical Industry is in stagnation, due to the uncertainty prevailing in the country and caused by the oil situation and problems of economic as well as political nature.

There is a need for governmental decitions which make it possible to clear out the way for this industry so that it can continue with the impulse the Andean Group wanted for it. There is no project being developed at the present time related with basic Petrochemical and the derived industries at governmental level are only trying to maintain their existing installations.