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United Nations Industrial Development Organization

Distribution
LIMITED

ID/WG.54/76
23 July 1969

ORIGINAL: ENGLISH

...national Petrochemical Symposium on the
...opment of the Petrochemical Industries in
...loping Countries

..., USSR, 20 - 31 October 1969

PET.SYMP. A/26

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DEVELOPMENT OF THE PETROCHEMICAL INDUSTRIES IN INDONESIA[1/]

by

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Introduction

On 1st April 1969 Indonesia began with the implementation of her First Five Year National Development Plan, with the main objective to increase domestic food production particularly rice.

The emphasis in the industrial development is therefore directed towards the successful attainment of the main objective.

In the field of petrochemicals, the development of nitrogenous fertilizer and pesticide industries ranks high among the list of priorities. The development of domestic synthetic fibre industries is also being encouraged in view of the increasing consumption. A notable change taking place in Indonesia today is the increasing participation of the private sector in the economic development. The Government is also considering the establishment of a Board for the development of the petrochemical industries, to synchronise and coordinate the activities of the departments directly involved with this development.

Present Status

Fertilizer

The first nitrogenous fertilizer plant based on natural gas is the P.T. Pupuk Sriwidjaja or "Pusri" plant at Palembang, South Sumatera. The plant started production in 1963 with an actual annual output since its commission as follows:

Year	Urea in M.T./Y	Year	Urea in M.T./Y
1963	[illegible]	1966	[illegible]
1964	103,548	1967	93,337
1965	94,120	1968	95,531

The average annual output is about 95 % of the design capacity which is 100,000 M.T. Y urea, based on the Toyo Koatsu total recycle C process. The ammonia plant based on the Kellogg process using Topsoe catalyst has a design capacity of [illegible] M.T./D in excess to the design requirement for urea. The excess ammonia is sold for latex coagulant and refrigerant.

The second nitrogenous fertilizer plant the Petrokimia plant at Gresik, East Java, is designed to produce urea and ammonium sulphate and is at present in the final stages of construction. The trial operation is expected to be conducted early in 1970.

The design capacities and processes of the production units are as follows:

Production unit	Capacity	Process
Ammonia plant	220 MTD	Topsoe
Urea plant	185 MTD	Inventa partial recycle
Sulphuric acid plant	390 MTD	Designed by de Nora
Ammonium sulphate plant	455 MTD	Designed by De Nora
Gasification plant		Shell

Indigenous fuel oil will be used both for process raw material and plant fuel, while sulphur for the sulphuric acid production will be imported.

In line with the agricultural development, the plan for the development in the nitrogenous fertilizer industry consists mainly of the expansion of the Pusri plant and the construction of a new plant near Tjirebon, West Java, both to be based on natural gas. It is anticipated that these plants will be completed before the end of the First Five Year Plan period.

The Pusri plant will be expanded with 3 to 4 times the present capacity. A feasibility study has been completed in March 1969. The Government is waiting for final approval by the World Bank, which, together with some members of the IGGI (Inter Government Group on Indonesia) countries, are expected to finance the project.

The Tjirebon fertilizer plant is intended as a private investment project, the preparation of which has now reached the stage of appraisal by the Government on project proposals submitted by two potential foreign investors.

Depending on the gas availability an ammonia plant capacity of 1,000 MTD is envisaged. The end products will be urea and/or compound fertilizers.

Pesticides

At present there is one BHC/Lindane production unit owned by the state owned P.N. Soda Waru near Surabaja, East Java. It has a capacity of 15,000 kg/month but it is not operating now because it is in bad need of

rehabilitation. In 1969 two joint venture companies from Switzerland and West Germany have submitted project proposals for the construction of formulating plants utilizing imported pesticides. In the first six months of 1968 Indonesia imported about $ 2 million worth of pesticides and this import figure is likely to increase. The most important pesticides used in Indonesia at present are endrin, dieldrin thiodan, aldrin and zinc phosphides.

A survey is now underway to find the most suitable pesticides for Indonesia with a view of producing them in the country.

LPG and Carbon black

An LPG and carbon black plant owned by the state oil company P.N. Pertamina is now in the final stages of construction at Pangkalan Susu North Sumatera, and is expected to start operation early in 1970 to produce:

		Carbon black import	
carbon black	2,600 M.T.Y.	1964	1,458.4 tons
natural gasoline	7,000 bbl/d	1965	1,819.2 tons
butane	1,500 bbl/d	1966	1,281.6 tons
propane	850 bbl/d	1967	1,553.0 tons

Based on present and planned production of motor car tyres the demand for carbon black in 1972 is estimated at 2,190 tons.

Synthetic fibres

Almost all of domestic demand for synthetic fabrics has been met from imports as indicated in the following table:

Imports of synthetic fibres, yarns and fabrics (1964 - 1967) in TPY

Product	1964	1965	1966	1967
synthetic fibres	-	-	-	-
synthetic yarns	-	3	-	76
synthetic fabrics	586	2,711	3,232	6,700

In a survey on the development of petrochemical industries carried out by [illegible] in the last quarter of 1968, it was estimated that the demand for synthetic fibres in Indonesia in 1972 will be 12,900 tons comprising of nylon 1,700 tons, polyester 5,700 tons and acrylics 100 tons.

In view of the increasing demand for synthetic fibres there are two alternative for the development of domestic synthetic fibre industries:

1. To start from the polymers into staple fibre, spinning and weaving processes and when the market has been established to support an economic unit, the production of monomers could be started.
2. To start straight away with monomer production aimed at domestic market as well as export and at the same time develop the domestic textile industries in the manufacture, weaving and spinning of synthetic fibres.

A request has been submitted by the Government to UNIDO at the recent conference in Bangkok on the development of petrochemical industries, for assistance to carry out a feasibility study for the projected caprolactam plant to be established at Gresik next to the Petrokimia fertilizer plant, which is now in the final stages of construction. Ammonia and sulphuric acid for the manufacture of caprolactam will be obtained from the Petrokimia plant.

The primary raw material whether benzene, phenol or cyclohexane will be imported.

Numerous applications have been submitted by various textile manufacturers including leading manufacturers from Japan and the United States of America. The present consumption of synthetic textiles estimated at 20 % of the total textile consumption is likely to increase to 30 % of the total within the next five years.

A maximum target of 50/% of synthetic fibre production to meet domestic demand has been set during the First Five Year Plan period.

Plastics

In 1968 the plastic raw material requirements for domestic industries are as follows:

1. General plastic wares	
polyethylene L.D. and H.D., polystyrene and polypropylene	3,800 t/y
2. Buttons	
polyester, acrylics, amylic and urea formaldehyde	400 t/y
polyethylene L.D.	1,000 t/y

3. Tooth brushes		
nylon bristle		35 t/y
4. Plastic sheets		
PVC	1,750 t/y	
D.O.P. oil	800 t/y	
PVC resin	1,150 t/y	
D.O.P. oil	500 t/y	4,200 t/y
5. Special plastic wares		
a. water pipes	1,500 t/y	
b. plastic roofing	45 t/y	
c. ropes	25 t/y	
d. records	110 t/y	
e. others	500 t/y	2,240 t/y
T o t a l		11,175 t/y*)

*) Based on the potential capacity of 1 shift/day

Detergents

The first detergent plant was established in Djakarta by the Unilever company and started operation in the middle of 1969. Quite recently the second detergent plant was put into operation. The plant owned by a joint company from Honakong has a capacity of 6,000 TPY is also located in Djakarta.

An application for the erection of a cleaning wax plant has been submitted to the Government by a company from Switzerland.

Prospects for development

Although the shortage of food is the most pressing problem to be overcome, the Government is also aware of the importance of the development of domestic petrochemical industries because of the existence of substantial raw material resources. Explorations which in the past were primarily aimed at discovering oil are now also directed towards natural gas due to the latter's ever increasing importance as raw material for the petrochemical industries.

Preliminary surveys have been conducted by foreign consultants for ... fertilizers in order to draw up programme for the development of the petrochemical industries. While the market for petrochemical products at

the present time is still relatively small the expected increase in GNP during the Five Year Development Plan period may induce people to buy goods made of petrochemical products instead of the conventional ones.

In order of importance, fertilizer, synthetic fibres and pesticides will most likely be developed. However from raw material consideration and in line with the development in the agricultural and industrial sectors, plastic materials such as polyethylene, polypropylene and PVC will play also an important part in the development of the petrochemical industries.

Because of the capital intensiveness of the petrochemical industries the Government expects these industries to be developed through foreign investments, whose laws and regulations have been promulgated since the beginning of 1967.

The requirement in skilled labour for the petrochemical industries is not expected to present any big problem since experience have shown in the existing refineries, fertilizer and other industries that through proper training adequate amount of skilled labour can be created.

Natural gas reserves (non associated and associated gas)

(in BSCF) in January 1969

Area	Proven	Probable/possibel
North Sumatera	188,824	
Central Sumatera	828,329	
South Sumatera	787,495	
Java	4,962	225,925 *)
Kalimantan	133,625	
T o t a l	1,943,235	225,925

*) exploratory status

Gas usage (petroleum industry) in BSCF/year (average)

Fuel for refineries	4,797
Fuel for fields	15,262
For repressuring	16,798
Others	645
T o t a l	37,502

Present problems

1. Present market for petrochemical products is not large enough to support an economic size plant. Regional cooperation in the production and marketing of petrochemicals as suggested by UNIDO of the ESCAFE would to some extent alleviate this problem.
2. The shortage of domestic capital for the generally capital intensive petrochemical industries will most likely hamper their development. The Government aware of this fact has promulgated laws on foreign investment to invite participation of foreign investors in the economic development. Capital market will also be created to facilitate the industrial development.
3. Shortage of public utilities compels most plants to provide their own electricity and water. The establishment of petrochemical industrial complexes can be considered to promote the growth of the industry by providing the utilities and infrastructure required.

Summary and conclusions

1. At present the petrochemical industry in Indonesia is at the infant stage of development.
2. Preparation is being made to set a good ground for future growth through surveys and planning to ensure proper and balanced development of the industry.
3. From raw material and potential market considerations the future of the petrochemical industries is bright.
4. In order of importance the development of petrochemical industries will be emphasized on nitrogenous fertilizers, pesticides and synthetic fibres.
5. Foreign investors are invited to participate in the economic development for which inquiries and/or letters of intent should be directed to the Minister of Industry, Djalan Kebon Sirih 36, Djakarta Indonesia with a copy to the Director General of Chemical Industries Djalan Kebon Sirih 31, Indonesia.


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