
Natural Gas Reform Policies for the Development of Indonesian Chemical & Petrochemical Industries: Proposals and Recommendations

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In industrialized nations, natural gas is not only used as an energy source but also as a raw material for the chemical and petrochemical industries. Indonesia, one of the largest producers of natural gas, uses only less than 8% of the gas produced for its chemical and petrochemical industries. By increasing the amount of gas used as feedstock for chemical and petrochemical industries, Indonesia will generate more income for the government and provide employment. To do this, however, current Indonesian government policy on natural gas production needs to be reformed. This paper outlines an across-the-board reform policy on natural gas with the objective of optimizing the natural gas usage of the chemical and petrochemical industries.

NATURAL GAS AS FEEDSTOCK FOR CHEMICAL AND PETROCHEMICAL INDUSTRY

Global Trends for Natural Gas Utilization

Industrialized nations and developing countries have turned increasingly to natural gas not only as a source of energy but also as raw material for their chemical and petrochemical industries. In the United States of America (USA), 34% of domestic natural gas is used as feedstock for ethylene and other chemical plants(1); in Russia, 32%(2); and in Korea, 23% of imported natural gas is used as raw material for its petrochemical complex(3).

Several developing countries with sizeable natural gas reserves have reformed their natural gas policies to increase the natural gas value by utilizing it as a feedstock for downstream petrochemical industries. These countries include Argentina with its Natural Gas Reform program, and Malaysia with the Peninsular Gas Utilization program (PGU)(5).

Indonesia, the largest exporter of natural gas,

consumes less than 8% of natural gas for domestic chemical and petrochemical industries. This figure is among the lowest figures in the natural gas producing countries.

Indonesia's Natural Gas Utilization

Indonesia's current policy on exporting natural gas needs to be reconsidered. Statistics show that although natural gas export generates an income of USD 4.3 billion per year, the import of chemical and petrochemical products reached USD 2.62 billion in 1999(7). This import figure is expected to increase significantly in the future as Indonesia's economic growth stabilizes(7).

At present, Indonesia exports more than 30 million tons of LNG per year and holds about 32% of the LNG supply market in the world(8). The foreign exchange earnings obtain amounts up to USD 4.3 billion with exports to Japan, Korea and Taiwan. This high income is partly due to the increase in natural gas price which is caused by oil price increase in the past few years.

Indonesia's Chemical and Petrochemical Industries

Although the above exports value are impressive, Indonesia's imports for chemical and petrochemical products are also significant. In 1999, Indonesia imported USD 2.62 billion Hydrocarbon and refined petroleum products from various industrial countries including Singapore (USD 1.19 billion), Kuwait (USD 0.64 billion), Japan and Korea (USD 0.37 billion combined). The 1999 figure is a 36% increase from 1998 imports of USD 1.9 billion(7). Petrochemical industry is associated with a wide variety of other industries such as plastic processing, fibers, and home appliances; all of which are great contributors to the advancement and improvement of the national economy. Indonesia's plastic consumption is still 7 kg per capita which is very low compared with the 159 kg per capita in Germany or 78 kg per capita in Singapore(9). Hence domestic consumption for petrochemical and downstream products can be expected to grow in the future. As a whole, Indonesia is a net importer of petrochemical products(9). Therefore, without any policy reform in gas and oil regulations, the trend for import will surely increase in the future(7).

The most significant example for the need of policy reform can be seen in Indonesia's petrochemical complex, PT Chandra Asri, and feedstock supply. In all industrialized countries, locally produced naphtha and condensate are used for feedstock in local olefin petrochemical complex. Even in South Korea, whose crude oil and natural gas are all imported, 30% of the naphtha is used as feedstock for its olefin petrochemical complex(3). The government of Korea seriously understands the implication of upstream industries (such as petrochemical complex) for producing raw materials in downstream industries. In Indonesia, almost all of PT Chandra Asri Petrochemical Complex's feedstock demand is imported from other countries. The product of PT Chandra Asri Petrochemical Complex is even less competitive to imported ethane based ethylene because the production cost of naphtha based ethylene is four times higher than ethane based ethylene(9).

Benefits from Natural Gas Reform Policy

Situations in the natural gas usage, chemical and petrochemical products imports, local chemical and petrochemical industries, and feedstock conditions clearly show that Indonesia needs a policy that

maximizes the use of locally produced natural gas, naphtha and condensate for domestic chemical and petrochemical industries feedstock. The increase utilization of domestic natural gas as feedstock for chemical and petrochemical industries, for example from 8% to 20%, gives significant contributions to the country's foreign exchange savings and earnings (from exported downstream products), increased government revenues from taxes, and most importantly, create more employment for local people. These gains obtained from utilizing natural gas for chemical and petrochemical industries will be long-term gains and will accelerate economic growth in a significant multiplier effect.

Another positive aspect of utilizing natural gas for local chemical and petrochemical industries is the employment that can be created either in various direct or indirect jobs. A study of natural gas utilization in Indonesian fertilizer companies by PT Petrokimia Gresik has concluded the following figures(10).

- Indonesian fertilizer industry consumes 7% of natural gas produced in Indonesia;
- Estimated consumption of natural gas for fertilizer industries is 242.5 (MMBTU) per year;
- The number of direct and indirect jobs created for the natural gas consumption company is bigger (14.708 persons) compared with that of in an LNG plant (3,000 persons).

These figures mean that using natural gas as a petrochemical industry feedstock can create 500% more jobs compared with that of directly exporting LNG to other countries.

Although export earning from natural gas may decrease, government revenues from tax may increase when natural gas is utilized as feedstock for local chemical industry. Similar study by the Indonesian fertilizer industry has shown that by utilizing similar amount of natural gas, (i.e., 242.5 MMBTU, Indonesian fertilizer industry can generate US\$ 1.7 billion revenue or around US\$ 0.51 billion in tax revenue(10). Similar amount of natural gas can only generate USD 0.7 billion in revenue if the natural gas is directly exported.

Based on the above illustrations and examples, there is a strong need for policy reforms to utilize Indonesian natural gas as feedstock for local chemical and petrochemical industry. Those

reforms, which form part of the overall program of economic restructuring, must be aimed at improving economic efficiency and increasing investment through greater reliance on market forces and the involvement of private capital. A summary of the proposal will be discussed in the following section.

PROPOSAL FOR NATURAL GAS REFORM POLICY

In order to develop a natural gas based chemical and petrochemical industries, an across-the-board reform policy is required in Indonesia. The following proposal of policy reforms is gathered from experiences and lessons learned in other countries namely Canada, United States, United Kingdom, Argentina, and Malaysia. The outline of the reform policy proposal is as follows.

Main Objectives

The Indonesian natural gas reform policy covers three main objectives:

1. To increase natural gas exploration and drilling activities;
2. To expand infrastructure capacity while reducing its transmission and distribution costs;
3. To increase investment in the downstream petrochemical industry.

The policy reform shall have short-term and long-term security considerations. The short-term goal shall be the enhancement of the system's reliability and deliverability as a result of major investments in new capacity. The long-term goal is the enhancement of natural gas supply through increased drilling and also the prospect of continued expansion of gas trade domestically or internationally.

Basic Concepts Reform Policy

There are three basic concepts of natural gas reform policy:

1. *The creation of an independent regulatory authority.*

Industrialized nations with natural gas reserves have separated the task of regulators from natural gas producers. Regulators in the United States is called FERC (Federal Energy Regulatory Commission); and in Argentina, it is named Enargas. These regulators are independent regulatory authorities that are

separate from natural gas producers, pipeliners, distributors and marketers.

The task of this independent regulatory authority includes promoting competition in gas supply, and setting tariff rates for transmission services and distribution of company gas sales. The authority must also encourage long-term investment in the network. Pertamina or PGN, however, should not handle these tasks.

2. *The removal of wellhead and wholesale price controls.*

The removal of wellhead price controls will allow the price of natural gas to be set independently according to the market. On the other hand, the removal of wholesale price controls will deregulate pipeline companies so that they do not own the gas that is transported in their pipeline systems. Pipeline company only transports the gas to third parties. Therefore, purchasers of natural gas (either gas distributors or chemical industries) can negotiate price provisions and contract terms with many different suppliers while contracting separately with pipeline companies. The pipeline companies will provide services for transporting and storing natural gas to satisfy the purchaser needs.

3. *The reduction or elimination of monopoly practice in gas producers and gas distributors.*

In Indonesia, large and small gas producers explore and produce the natural gas. They also sell the gas to end users. Pertamina and the Indonesian government regulate the price at which producers can sell their gas. In residential areas and industrial zones, the gas is distributed and sold by PGN who built the existing infrastructure. In these areas, the natural gas supply price is regulated by PGN.

The above practices are basically policies that are against free market economy because the exact natural gas price at wellhead or at delivered point cannot be competitively determined. In order to promote growth and competition, monopoly practices of gas producer and distributor should be minimized or eliminated. One popular method to do this is to privatize the pipeliners and distributors of the natural gas industry.

The above points are just basic concepts of the

proposed natural gas reform policy. Detailed explanation of the above policies is explained separately.

Critical Success Factors

The above reform policy cannot be easily implemented in Indonesia. The following factors are critical in ensuring a successful implementation of the reform policy.

- A stable and attractive trading, investment and fiscal environment.
- The removal of government gas price controls and the transfer of control to independent regulatory authority.
- Clear definition of responsibilities of the regulatory body with an independent and well-researched authority.
- Diversification of players in the upstream sector through the removal of exclusive rights.
- The effective separation (unbundling) of the gas transmission business from gas supplies and trading that ensure nondiscriminatory third party access to the transmission system and efficient regulation of tariffs.
- Transparency in the nonprice terms and conditions of access to pipelines. This is a key factor in preventing discrimination between shippers and pipeliners to ensure efficient operation of the natural gas industry.

SUMMARY AND CONCLUSIONS

Less than 8% of natural gas produced in Indonesia is utilized as feedstock for local chemical and petrochemical industry. This value is below the standard of 20 to 35% in industrialized nations.

With its current policy, Indonesia exports natural gas, and imports high value added Hydrocarbon and refined petroleum products that use natural gas as raw materials. Utilizing natural gas as feedstock for local chemical and petrochemical industries will generate new employment and increase revenue for the government.

To spur investment in downstream chemical and petrochemical industries, an across the board natural gas reform policy should be implemented. The proposed reform policy basically un-bundles the regulators and the natural gas players (producers, pipeliners, and distributors). The basic concept of the proposal is to promote competition and generate free market economy.

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ABOUT PT REKAYASA INDUSTRI

PT Rekayasa Industri is a state-owned company established in 1981. Today, it is one of the leading engineering, procurement and construction company in Indonesia. The company's scope of business includes (EPC) projects of cement, mineral, power, oil and gas, pulp and paper, and chemical and petrochemical plants, along with plant maintenance, project management consultancy and feasibility studies. Some of Rekayasa's EPC projects include PT Semen Gresik Tuban IV Cement Plant In East Java, PT Tanjung Enim Iri Pulp Plant in South Sumatra, PT Pupuk Sriwijaya PUSRI 1B Ammonia-Urea Plant In South Sumatra and PT Mandala Nusantara Wayang Windu Geothermal Plant in West Java. PT Rekayasa Industri has already been the ISO 9001 certified and was been granted a Quality Management System Certification for Design and Engineering, Procurement, Construction, Installation and Project Management for Oil and Gas, Chemical and Petrochemical, and Power Plant.