

OPTIMIZATION OF INDONESIA'S PETROLEUM DEVELOPMENT THROUGH PARADIGM SHIFT

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Introduction

The oil and gas activities in Indonesia have a long history and up and down trends. Increases in exploration activities in the beginning of New Order Government has resulted in discoveries of new oil reserves and increased the oil production from about 600 thousands barrel per day in 1967 to 1,7 million barrels in 1977. In 1977 Indonesia also exported for the first time the liquified natural gas (*LNG*). Furthermore, since 1966 Indonesia has built new refineries and increased the refining daily capacity to 1.156 million barrels. This made oil and gas have become the main source for development funding. Such progress has been attributable to the conducive business climate created by the Government of Indonesia ("GOI") in cooperation with multinational companies, assisted by technology. These increasing trends, however, did not last long; oil production has been declining since the end of 1970, which later convert Indonesia to become net oil importer. Such a situation contributed to various notions, from those based on nationalism to more pragmatic approaches.

Given such background, this paper discusses one of the important issues related to the oil and gas development in Indonesia, namely how the legal policy on oil and gas should be developed for Indonesia, in its relation to their role to continuing support the GOI's revenue and meeting the domestic needs? A legal policy is the activity to determine the alternative with respect to the objective and ways that will be used to achieve the legal objective in the public. It will be the foundation in the process of law formation and policies for a certain field, which would affect the performance of the Government's institutions in the application of law product and policy in the operation.

Legal policy plays important role in the development of natural resources. This is because the development may deplete the natural resources, but at the other side it needs to be sustainable for the benefit of community. As stated by Prof. Djokosutono in the early 1950 and cited by Prof Awaludin Djamin (and quoted by Suyitno Patmosukismo in his dissertation): "Today is a result of the past and what we will do today will determine the future".²

Upstream Activities

Figure 1 is statistical data on upstream petroleum activities. The data shows that reaching its peak in 1977, oil and gas upstream activities in Indonesia has a declining trend, which was triggered by changing the sharing formula to 85/15. Oil and gas activities began to increase when the Government provided incentives and revised the Production Sharing Contract's terms, which treated that part of the 85% of Pertamina and Government's share of oil as payment of the Contractor's taxes. The other contributing

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² Awaludin Djamin, *Proses Pembinaan Cita Hukum dan Penerapan Asas-asas Hukum Nasional*, Majalah Hukum Nasional, Badan Pembinaan Hukum Nasional, Dep. Kehakiman, p 20

factors also included that newly discovered reserves tended to be lower than those discovered in 1970 and 1980's.

Also, the exploration since 1990 has been focused in producing areas which have a smaller risk. Also, the commercial success rate tended to decrease both in terms of the number of discoveries and size of reserves. In the non-producing areas, commercial success rate (oil and gas) in the past 20 years was only 10%, as compared to 14.3% for the period 1981 – 1991. In the producing areas, the discovery rate was higher, but it tended to discover gas and overall it was still also below the previous years. A large part of discoveries in the 1990's contained reserves below 25 million barrels.

Statistical data on gas discoveries might not reflect the actual conditions. Firstly, many wells were drilled for oil and would be classified as a discovery after finding gas. The increase in gas demand began in the end of 1980, for electricity generation that together with improved gas price for domestic created new interest to search for natural gas. Gas production continued to increase along with the increase in gas discoveries, although the first two developed gas fields (Arun and Badak) began to decline.

In the investment, during the period 1996 and 2008 the oil companies' spending capital for exploration and production activities in real terms tended to stay. Comparing to investment world wide, the investment in Indonesia for exploration activities has a decline trend, i.e. Indonesia's share declined from about 5.5% in 1997 to become only 2.6% in 2003 and 1.5% in 2009 of the total world-wide's investment. One of the constraints for the investment growth was attributable to the legal system that failed to create certainty and to balancing various conflicting interests to maintain stability and fairness.

Such a situation caused the continuing oil production decline. For example, between 1998 – 2001, oil production decline averaged 3.9 percent per year; the decline continued to become 5.7 percent for the subsequent years (2001 – 2004). The alarming cause may be seen from the facts that presently 80% of Indonesia's oil production came from fields that were discovered before 1975 or one-third of Indonesia's oil production come from oil fields that having reserves less than 50 million barrels, but they constitute 85 percent of the oil fields that are now still producing. Such reserves have relatively short producing life. The other concern is that 30% of the present production came from two giant fields that were discovered before Indonesia's independence (Duri and Minas).

Also, the gas production tends to be stagnant and declining, resulted that Indonesia is no longer the largest exporter of LNG anymore. The revenue contribution to the State Budget has also declined to 25 percent. Figure 1 (mid top) shows the estimated initial oil in place in oil fields that have been discovered in Indonesia. One of the constraints in Indonesia was the relatively small initial oil in place, as compared to those in the Middle East and Africa. Such constraint was reflected in oil production graph, which showed its high sensitivity to exploration activities (Figure 1 left top). Furthermore, the production follows the Peak Oil Theory that was introduced by King Hubbert (Figure 1 right top), stating that oil production from a number of fields in a certain area will increase and later decreases following the "bell shaped curve". For Indonesia, the oil production reached the top in the end of 1970. It is noted that the large part of Indonesia's oil production statistics derives from the Western Indonesia, the area in which the exploration to date has been focused and has produced 75% of Indonesia oil production (23 billion barrels).

For comparison, Figure 1 right bottom shows oil production from various countries. The data shows that of the six countries, three countries show a decline in oil production (Indonesia, Venezuela and Nigeria), two countries (China and Brazil) show an

increasing trend of oil production and one country (Malaysia) shows no change. The oil increase in China and Brasil was associated with the efforts by the Government in those two countries to maintain political stability and improve investment climate. Both China and Brazil and Malaysia also have utilized their State Owned Enterprise (SOE) to actively conduct exploration abroad, including in the deep sea.

Like Venezuela, the Indonesia's oil production decline was attributable to the decline in the investors' interests in upsteram oil activities that according to the results of the PriceWaterhouseCoopers (2002 and 2005) was not attributable to the decline in the investors' perception on the Indonesia's resource potential, the decline in oil prices or political instability, but mainly was associated with the uncertainty in the contract execution. For example, the recent controversy is associated with the cost recovery claim by the Contractor as the oil production continues to decline under the increasing oil price environment.

Downstream Activities

Since a New Order Government, new refineries have been built using the Government funds. The construction also included the infrastructures for product distribution, including storage and pipeline and other transportation facilities. However, since 1995 no new refining capacity has been added to accommodate the increasing demand. Also, the distribution infrastructure practically remains stagnant, as no significant capacity additions or modernization effort took place between 1995 and 2005.

Indonesia was until year 2006 the world's largest LNG exporter and LNG was exported at premium prices to Japan, Korea and Taiwan. There was then lack of priority for its use domestically. This was reflected, that the development of gas utilization infrastructure was severely lagged behind.

Given an average production of 1.35 million barrels a day in 2001, the crude oil production was still above the consumption; however, as the data shows the net trade revenues of oil exports versus imports of crude oil and product has been negative. Therefore, in monetary value the Indonesia has essemially been net importer since 2001. It was fortunate that the gas export revenue has kept the net trade balance of oil & gas positive.

Future Activities

In order to increase oil and gas production to satisfactory level, the exploration activities in Indonesia should be increased, particularly in the areas where no production has been established. Such areas are located in East Indonesia, in remote and difficult areas and deep sea, so new technologies are required to cope with difficult areas and deep sea. The technological advances involve exploration, drilling and production including reservoir management. Technological advances will continue in the 21th century, which will change in the identification, development and production of oil and gas. The advances also include the technology for environmental preservation, so the oil and gas exploration and production (E&P) will continue to be friendly to environment.

The growth in oil production may also be expected from the secondary or Enhanced Oil Recovery (EOR). As of 1995, the EOR projects recorded in Indonesia amounted to more than 40, the majority are still active and some have been discontinued as they been failed or matured. In addition to Minas and Duri, the successful projects included gas and water injection in offshore fields (Arjuna, Rama, Krisna), water injection

in fields operated by PT Chevron Pacific Indonesia in Riau and in Jene and Ramba Fields in South Sumatera and Handil in East Kalimantan. One of the spectacular EOR Projects is steam flooding in Duri Field and surfactant flood in Minas.

Application of EOR technology requires innovation and field pilot test that may require long-time to complete. For example, the steam injection project in Duri, the laboratory test and field pilot test started in 1967, yet only 13 years later it was declared complete; however it is still required 10 additional years to complete the formality, contractual requirements and construction of facilities before the project was officially declared by the President Suharto in the beginning of 1990. The project has been successful to increase oil production from 30 thousands barrel to 300 thousands barrel per day, while the oil recovery also increased from 600 million barrel to 3.0 billion barrel. Presently, Duri Field is producing 170 thousand barrel a day or about 20% of the total Indonesia's oil production.

Like exploration, the EOR process in Indonesia faces technical and contractual constraints. The technical constraints relate to the properties and characteristics of the reservoirs that tend to give high primary recovery factor if it manages well. Such good properties and characteristics include high porosity and permeability, strong water influx and relatively small oil-in-place so it fails to meet economic scale. The contractual constrain deals with lack of proper incentives.

From the preceeding discussions, it can be concluded that by utilizing the technological advances, the prospect for discovering new oil and gas reserves in Indonesia are still great. A successful effort to discover oil and gas reserves in a highly risk activities requires business climate that are conducive to attract investment. Good oil and gas management means managing the resources that are capable to provide optimum results to the owner of natural resources (State), but also provides protection and legal certainty to the investor.

Such legal certainty is an absolute necessity, in view of that the obvious characteristics of oil and gas upstream activities are that exploration and development of natural resources require a long time, so it would require considerable time to have the benefit from the development. The investment will grow if the legal system can provide predictability, stability and fairness. This means, that the law shall generate certainty, accommodate or balancing the conflicted interest to maintain the stability and fairness.

The urgency of all above will be more emphasized as we move to find oil and gas resources in Indonesia's waters, in which the resources are located far from land and/or in the deep sea. Activities in those areas have higher risk and require larger amount of fund and specialized technology and supported by dependable manpower.

Likewise, the downstream oil and gas is the crucial and the key sector for energy supply security. It is the sector where the usable energy is produced and supplied. The availability of infrastructures is of immediate importance. Also, as imports are continuously required whether it is crude oil for refineries feedstock or oil products (fuels) or gas for domestic consumption, then the appropriate supply, trading and strategic stock policy need to be in place.

The downstream sectors need huge investment, where existing processing and distribution infrastructures have insufficient capacity, design deficiencies and/or in technical substandard condition. This made energy security situation even today very vulnerable. Minor disruption of refinery operation and/or disruption of bulk transport of fuel, can cause supply shortages in certain regions

The national oil company and the government are not in position of providing it. But private investment in this sector has been for some period not attractive, as the economics are marginal. It is imperative, that government incentives are required.

New Paradigm

Given the changing situation and condition, Indonesia's policy in oil and natural gas resources exploitation is in the overall strategic national interest needs to be re-examined. Indonesia must therefore explore carefully whether the present policy would enable to balance effectively a number of competing factors, such as world demand and stability of oil prices, against Indonesia's urgent need to finance Indonesia's development programs. Whatever is the case, Indonesia must not only maximize and manage prudently income from its oil reserves, but more importantly must create investment climate that are conducive to attract risk capital. This will need paradigm shift; it is hoped that the GOI and National Parliament will all rise up to this imminent challenge.

On the legislation side, the prevailing Law no.22/2001 has not been able to promote investment in the upstream. To the investors, the implementation of Law Nr 22/2001 seemed to create more uncertainty rather than sanctity. The foreign investment in oil and gas is 'resource seeking kind', which means that one of the reasons for overseas oil and gas companies to invest outside of its country is because of that oil and gas resources. Furthermore, upstream business is a natural resources extractive industry, whereas downstream is a value added processing or services industry. So, they have different risks profile and consideration.

It is also noted that crude oil and gas production does not have immediate link to energy supply security. It is the feedstock, but it needs processing and other infrastructures to be able to become usable energy for consumers. If domestic production is not available, then it can be substituted directly from imports, where it is readily available in the international market. As a comparison, all developed and industrialized nations import the majority of their crude oil demand.

Furthermore, many see crude oil produced domestically is considered strategically important to secure energy based on various considerations. This may not be true from the refinery operator's viewpoint. In the case of Indonesia, for example, in its relationship to the State Budget the GOI has mandated the use of the Indonesia's crude oil production as a feedstock for Pertamina's refineries. The crude oil is sold to Pertamina based on the ICP (Indonesian Crude Price) formula. ICP is not a market price, but it was introduced in late 1980's as a mechanism for computing the Government and Contractor's crude oil entitlement under the PSC, so it would dampen the effect of high fluctuation of world oil prices in the computation of crude entitlement for the parties. In many cases ICP is higher than actual market price; in addition also various domestic crudes are not suitable for the refinery. This may affect the economics of Pertamina's refineries' operation.

In the upstream activities, as of today the Indonesia's oil and gas revenues that are returned to develop national oil and gas industry has been small, the majority has been used to fund the development outside the oil and gas industry. On the other hand, oil and gas are non renewable and will be depleted for certain time, however oil and gas are also required as energy sources for public activities. Therefore, the national oil and gas policies should be directed toward the sustainability of resources.

The resources sustainability issue is linked to the energy sustainability, which is the ability to provide the energy continuously and dependable. The energy sustainability

is important and strategic for Indonesia in its position as net oil importer. The sustainability should be manifested by adequate infrastructure, including refinery, storage, transportation and distribution system, and national reserves. The energy sustainability is more an issue for the downstream activities and in the condition as net oil importer it has become a strategic factor.

This is also true for energy independence, which originally conceived and defined in the context of the 1973 Arab oil embargo. In US the icon becomes the vision of America's energy future and the title of new energy policy. In Indonesia, the energy independence has been defined as the ability to produce energy from petroleum resources with the domestic refineries to meet the domestic demand. In the future, the energy independence should be viewed more broadly as the ability to produce energy from the domestic natural resources and the business sustainable is guaranteed by the market economics.

The upstream oil and gas activities include the management of oil and gas resources for state revenues, while the downstream sector is to supply for the public a ready-made energy from oil and gas resources. The upstream activity is extractive industry of natural resources, while the downstream sector is service and manufacturing industry for added value. Given their different characteristics, the regulation on downstream activities should be separated from the present Oil and Gas Law. The downstream activity will be more suitable if it is placed under the Energy Law or a specific downstream industry law.

Furthermore, investment climate needs to be improved through the restructuring of legal substance, structure and culture in Oil and Gas Contract. The improved climate shall include efforts to eliminate the excess of bureaucracy by increasing the professionalism, which emphasizes on leadership, legal right and obligation, and capable to promote conducive climate for investment, thereby fund resource's allocation may be made effective and efficiently.

BPMIGAS is basically not a regulator, but it represents the GOI in the PSC which is subject to the private law. Therefore, the operation of PSC shall be based on the public private partnership or equal partnership in carrying out its rights and obligations, which replaces the relationship between the employer (*bowwheer*) and labor in order to eliminate the bureaucracy of institution that has caused the delay and uncertainties. As representative of the GOI in the contract, BPMIGAS should do more corporate action rather than the regulatory function.

In order to develop the capability of oil and gas SOE, the Government should allocate the sufficient fund from the Indonesia's oil and gas revenue, for use in supporting and strengthening the financial capability of SOE, so the SOE can grow as world class company. This would allow the SOE to play significant roles in meeting the domestic needs for oil and gas from resources everywhere. Such strategy has been adopted by a number of countries, among others BRIC (Brazil, Rusia, India, China) and Malaysia.

Moreover, in order to meet domestic crude oil demand, the Indonesia Government should encourage its SOE and other national private companies to look for oil and gas abroad which has good potential and lower risk. Such strategy has been practiced by the Chinese Government with its four SOEs operate inside and outside the country, while the exploration in deep sea that has a higher risk be jointly operated with multi-national companies which have technology and fund that are dedicated for highly risk projects (risk

capital). Note that the risk capital is movable, seeking the business that are conducive for providing good returns.

Conclusions

The present discussions may be summarized by the following conclusions:

- 1) There are still good prospect of discovering new oil and gas reserves, particularly in deep seas and remote areas in Eastern Indonesia (frontier areas). However, this activity would perhaps not increase the oil and gas production substantially as has been experienced in the early 1970's. Nonetheless, the effort is expected to arrest or reduce the oil and gas production decline. The upstream sector is capital and technology intensive and higher risk, thereby the successful endeavor would require investment climate which is conducive to attract risk capital by means of Oil and Gas Contract which is capable to provide optimum benefit to the Country, but also to provide protection and legal certainty to the investor. The investment will be made when the legal system can generate predictability, stability and fairness. Oil and gas policies shall be formulated with the principle of sustainability that preserves the environment and is capable to anticipate changes in implementing the function of the law as a facility for development.
- 2) Indonesia needs to improve investment climate through restructuring of legal substance, structure and culture in Oil and Gas Contract. The improved climate shall include efforts to eliminate the excess of bureaucracy by increasing the professionalism, which emphasizes on leadership, legal right and obligation, and capable to promote conducive climate for investmen, thereby fund resource'd allocation may be made effectivey and efficiently. The restructuring would require paradigm shift in determining oil and gas management policies, including amending the law (Law Nr 22/2001) with the implementing regulations, which would accommodate the current reality and provides clear vision for the future.
- 3) The paradgm shift includes the following:
 - a) The upstream oil and gas activities include the management of oil and gas resources for state revenues, while the downstream sector is to supply for the public a ready-made energy from oil and gas resources. The upstream activity is extractive industry of natural resources, while the downstream sector is service and manufacturing industry for added value. Given their different characteristics, the regulation on downstream activities should be separated from the present Oil and Gas Law.
 - b) The Oil and Gas Law that will be amended shall contain only provisions for upstream activities and be made as such to attract the investment in upstream activities.
 - c) Oil and Gas Contract shall be made based on the public private partnership or equal partnership in carrying out its rights and obligations, which replaces the relationship between the employer (*bouwheer*) and labor in order to eliminate the bureaucracy of institution that has caused the delay in petroleum development.

FIGURE 1

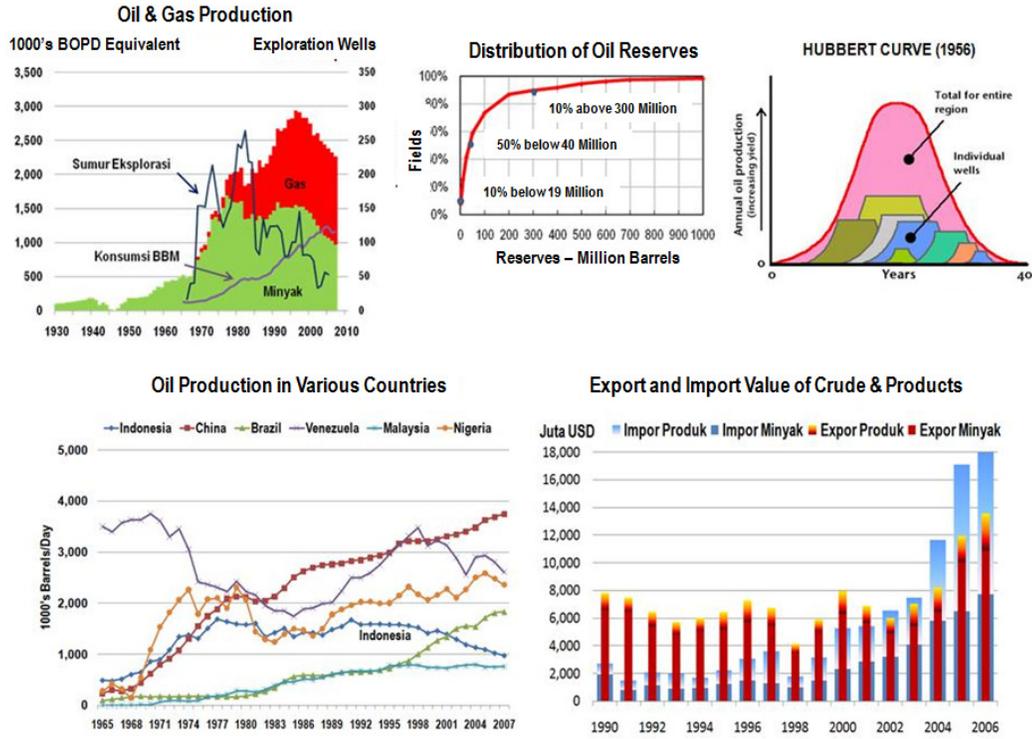


FIGURE 2

Indonesia's Oil Reserves Among Producers

