



**UNIVERSITI PUTRA MALAYSIA**

**Case Study of  
"Value Based Management (VBM) in  
Petronas Gas"**

**Assoc. Prof. Dr. Zainal Abidin Mohammed**

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Case Study  
of  
"Value Based Management (VBM) in  
Petronas Gas"

for

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# I. CASE SCENARIO

## 1. BACKGROUND

Encik Abdul Rahim was quite disturbed with the discussion that had transpired last month between him and his general manager of Corporate and Commercial Services Division, Encik Ahmad Hafifi. The validity on how the company had been allocating funds and resources on new investments was the main topic of the discussion.

Traditionally, Petronas Gas Bhd (PGB) had been trying to cope with various established corporate performance criterions such as boosting the Earnings per Share (EPS), maximising Price per Earnings ratio (P/E) and also increasing net profit. Throughout the history of PGB, these were the important figures to indicate the performance of the company. New investments likewise, were evaluated based on their contributions in improving these figures.

Encik Abdul Rahim as CEO of PGB, felt that the issue must be looked at seriously. This could have huge impact on how PGB looked at future investment opportunities. As far as he could remember, the existing accounting based indicators used by the company had been accurate in showing PGB's performances in the past. His view was also shared by Encik Basharuddin, the general manager of Finance Division.

Encik Ahmad Hafifi explained "The value based management (VBM) is the tool that will help us in developing competitive strategy and propel us to greater heights in



managing our business. The value culture should be instilled in every aspect of our business." He added that there were a few commonly used measures that had correlation with value creation. They were Return on Equity (ROE), Return on Total Assets (ROTA), Free CashFlow (FCF), CashFlow Return on Investment (CFROI) and Share Value Added (SVA). The only difference between these measures were the degree of correlation with the value created.

Most of these measures were the popular financial ratios. FCF was the conventional cash flow forecast measures used by most companies. CFROI measure was introduced by the Boston Consulting Group. On the other hand, SVA was established by Stern Stewart Inc., a New York consultant which was similar to Economic Earnings (EE) and Economic Value Added (EVA).

Encik Abdul Rahim knew about VBM from the literature that he had read. He had brushed it aside by saying to himself that he was doing all right with the current indicators. Three weeks ago, the board of directors of PGB had asked him how could he ensure that shareholders wealths were maximised with every investments made by PGB. He knew most of the indicators used by the company to evaluate investment had no or little correlation with value creation. After his discussion with Encik Ahmad Hafifi last month, he had set his staff to evaluate all the value based measures and compared them with the existing measures. The next board of director meeting would be next week and he would need an answer by then.



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## 2. HISTORY OF PGB

The development of gas industry as a commercial entity in Malaysia originated with the discovery of gas reserves in the 1970s. Following the discovery of these reserves offshore of Sarawak, Sabah and Terengganu, various studies were conducted to assess the importance of gas to the nation and the suitability of gas as an alternative source of energy. Strategies were formulated for the development and utilisation of gas as energy fuel of the future. The government expected that development of the gas industry would provide more jobs for the locals and opportunities for the transfer of technology from international contractors to Malaysian.

The gas industry in Malaysia could be grouped into two main sectors namely upstream and downstream. The upstream activities were essentially the exploration and production of the natural gas. Seismic and geological surveys, drilling and getting the gas out of the ground were the main activities. The downstream activities were largely the processing and transmission of gas. The main activities were to process the natural gas into its component which had more commercial value and sending the processed products through the pipelines to the customers.

Petronas Gas Berhad (PGB) was incorporated as a private limited company in Malaysia on 23 May 1983 and commenced business on 1 April 1984. It was converted into a public limited company on 28 March 1995 and was successfully listed on the Main Board of the Kuala Lumpur Stock Exchange on 4 September 1995 with the Initial Price Offer was RM5.30. PGB had a paid-up capital amounting to RM1.8 billion



and PETRONAS became the main shareholder with a 75 percent interest in PGB. PETRONAS, a government owned company owned all the oil and gas reserves in the country based on the Petroleum Act 1974. At the point of listing, it was estimated that PGB:

- ◆ share value of RM7.30-RM8.10.
- ◆ EPS for the year 1996 was RM0.405
- ◆ Net Profit was RM729.9 million.

PGB's main business activity comprised of processing natural gas produced from the gas fields offshore. It played an important role in the processing of natural gas from gas fields on the east coast of Peninsular Malaysia and the transmission of the processed gas to end-users throughout Peninsular Malaysia including Singapore. Basically, PGB was a service contractor providing the service of processing and transmission of processed gas to various end-users on behalf of PETRONAS under the Throughput Fee Arrangement.

The incorporation of PGB was to undertake and implement the massive Peninsular Gas Utilisation (PGU) project. The project was implemented in three phases namely PGU I, PGU II and PGU III. The company had fully implemented PGU I & II. It had started the process of constructing the remaining facilities in PGU III.

PGB's only source of input for its plants came from PETRONAS from its offshore gas fields. These gas fields were operated by the PETRONAS' Production Sharing Contracts (PSC) contractors. The natural gas was piped directly from the fields to





PGB's processing plant in Kertih. The gas would then be processed and separated into its components namely methane, ethane, propane, butane and condensates (see Figure 2.1).

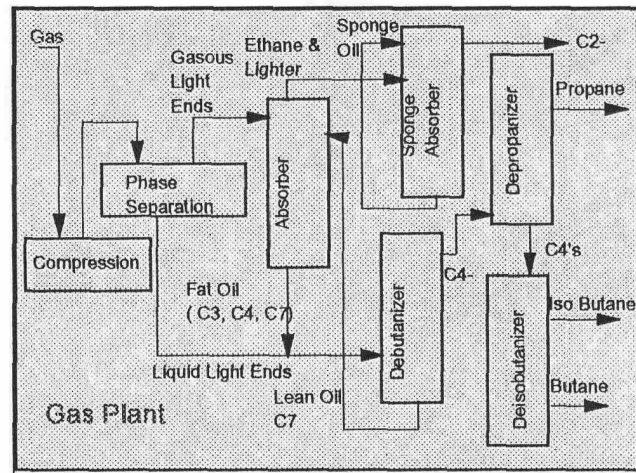


Figure 2.1: Gas Processing

The processed gas would then be sent directly to PETRONAS' customers through dedicated transmission lines or lateral transmission lines which branch off from the main pipelines. In return, PETRONAS would pay PGB a fee based on the volume of gas processed and delivered to its customers.

Apart from the PGU Systems in Peninsular Malaysia, PGB owned and operated a gas distributions network supplies gas for power stations, domestic and industrial users in Miri in East Malaysia.

### 3. COMPETITION & NEW ENTRY

PGB's services were unique in Malaysia and had no direct competition. The government in its effort to develop the gas industry had imposed no restrictions or regulatory limitations on entry into the business of providing gas processing and

transmission services in Malaysia. There were some significant barriers to entry such as the acquisition of land for the construction of pipelines system and the securing of the raw material in this case, the natural gas. The construction of a competing pipelines would require substantial capital investment. The main source of natural gas came from offshore Terengganu and produced under PSC arrangements with PETRONAS, PGB was ensured of continuous supply of feedgas from PETRONAS while others might not. With these conditions, it would be unlikely that there would be any entrants to the gas processing and transmission market. A new entry would find it difficult to secure a steady and abundant supply of feedgas to process.

#### 4. CONSUMER & SUBSTITUTE

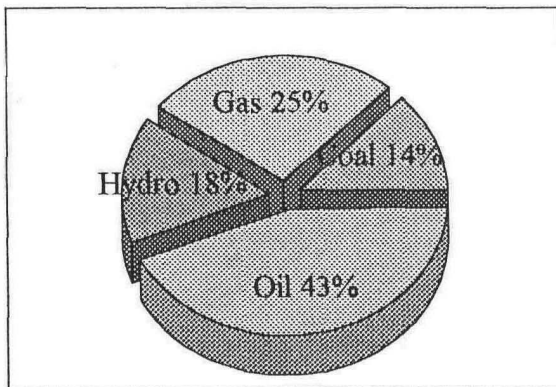


Figure 4.1: Electricity Mix,1990

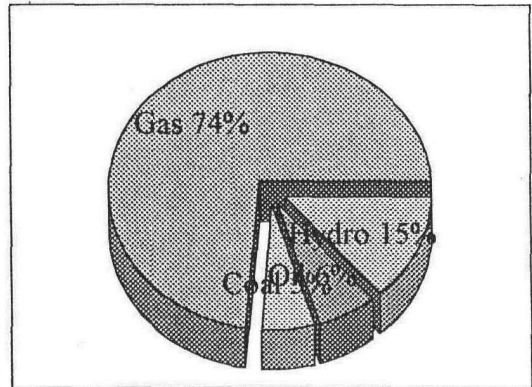


Figure 4.2: Electricity Mix,1995

The market share for gas an energy source had increased over the years and the overall energy demand for the nation was also projected to increase. Malaysian's energy demand grew at 9.3 percent per annum from 1991 to 1993. With the wider availability of gas due to the completion of PGU I and II, the percentage of gas used as the source

of fuel for electricity would be expected to increase from 25 percent in 1990 to 74 percent in 1995 (see Figure 4.1 and Figure 4.2).

Other sources of energy such as coal and petroleum products would be expected to decline drastically while hydro would remain stable. This trend was projected because of PGB's production capacity and PETRONAS' reserves were enough to fuel for the nation. This also meant Malaysia could reduce dependency on imported fuels. Oil as the primary source of energy for power generation would decline from 43 percent in 1990 to 6 percent in 1995, coal from 14 percent to 5 percent and hydro would remain at 15 percent.

Approximately 75 percent of the natural gas transmitted by PGB was distributed to the power industry in Malaysia including Singapore and 15 percent was for export market with the remaining 10 percent distributed to industrial and non-industrial end-users. The remaining 10 percent served as feeds for the petrochemical and steel industries, natural gas for vehicles and domestic users.

Methane gas, the highly sought component of the natural gas fuelled most of the gas turbine stations for power generation. Tenaga Nasional operated seven gas-based power-stations while the independent power producer (IPP) operated additional five gas-based stations. District Cooling System plant (DCS) used gas as source of energy to produce chilled water for air-conditioning of building. Chilled water was used in place of the conventional gas due to cheaper, more efficient and environmental friendly



system. PETRONAS Twin Towers and Kuala Lumpur International Airport were the two main and large users of DCS.

PETRONAS itself had in recent years embarked on the development of its petrochemical business which used natural gas components as readily a feedstock. MTBE (M) Sdn Bhd plant in Kuantan utilised butane and methanol as its feedstock to produce methyl tertiary butyl ether (MTBE) and utilised propane to produce propylene. MTBE was used as a substitute to lead in unleaded petrol while propylene was used as a feedstock for producing polypropylene. Ethylene (M) Sdn Bhd used ethane as the feedstock to produce ethylene. Polyethylene (M) Sdn Bhd used ethylene as the feedstock in the production of polyethylene. Polyethylene and polypropylene were used as raw material for the manufacture of a wide range of plastic based products.

Petronas Fertiliser (Kedah) Sdn Bhd utilised drygas as the feedstock in the production of ammonia and urea. Urea could be used in the production of adhesives, moulding powders, varnishes, foams and commercial fertiliser. Perwaja Steel Mill Berhad, utilised natural gas supplied by PGU I pipeline in the production of Direct Reducing Iron.

The natural gas was the fuel for the Natural Gas Vehicle (NGV) marketed by Petronas Dagangan Berhad through its six NGV refuelling stations in the Klang Valley. NGV offered motorist an economical, clean and environmental friendly alternative to the conventional transportation fuel. The small scale end-users including household as well

as commercial and industrial users used the processed gas too. The clean burning methane was used for cooking and heating.

Some of the processed gas were exported overseas. Propane and butane were exported to mainly Japan and South Korea. Drygas on the other hand, was exported through pipelines to the Public Utilities Board, Singapore.

## 5. SUPPLY

The ownership of all oil and gas reserves discovered in Malaysia territory was in the hand of PETRONAS. The exploration and production services activities in Malaysia were undertaken via PSCs entered between PETRONAS and other major oil exploration companies including Petronas Carigali, Shell and EPMI.

Malaysia's gas reserves came from 203 gas fields located offshore Terengganu in Peninsular Malaysia and offshore Sabah and Sarawak (see Figure 5.1).

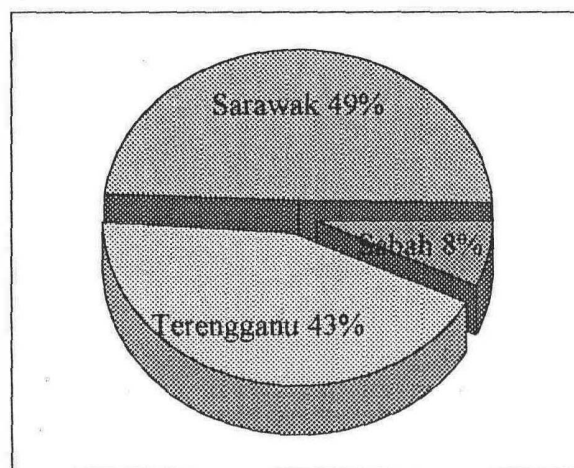


Figure 5.1: Gas Reserves Distribution



The gas fields offshore Terengganu supplied the Peninsular Malaysia's market. Most of the fields in offshore Terengganu were located within a radius of 160 to 240 kilometres offshore and natural gas was piped onshore to PGB's facilities through pipelines operated by PSC contractors. A large portion of the gas would be for the domestic gas consumption requirement, with some quantity of propane, butane and LPG for export

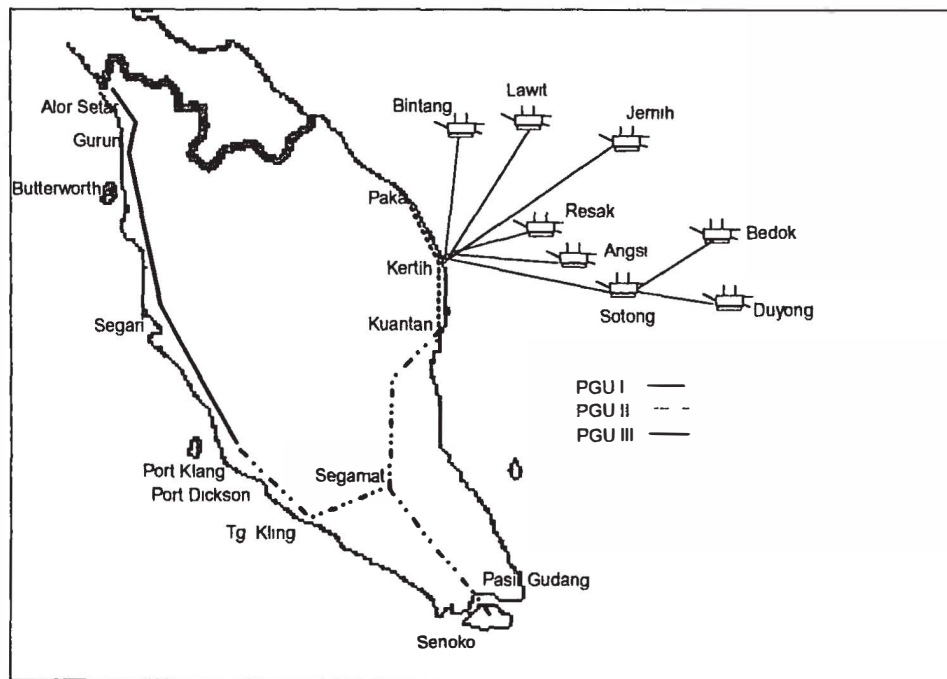
The gas fields offshore of Sarawak were mainly developed for export market in the form of LNG and a small portion for Miri gas distribution scheme. The gas fields offshore of Sabah were used for the domestic users on the island of Labuan as well as for the manufacture of methanol for domestic consumption and export.

The current level of production volumes was approximately 1,100 mmscfd where 750 mmscfd from Jernih, 250 mmscfd from Duyong and 100 mmscfd from the southern fields. New field such as Lawit would come on-stream in 1997 with production capacity of 400 mmscfd. On the other hand, Duyong production would decrease below 250 mmscfd in the next few years. Based on the reserves and production figures, it was estimated that these gas reserves offshore Terengganu would last for approximately another 100 years. However, assuming the full implementation of PGU III and continuing growth in demand for natural gas in Malaysia, the current reserves would last for the next 50 years.

## **6. GOVERNMENT**

The thrust of Malaysia's energy policies focused on the diversification of available energy resources which was aimed at reducing the dependency on oil-based petroleum products through greater utilisation of natural gas. It was principally due to the recognition of the need to diversity that PETRONAS initiated the implementation of the PGU project in 1981. The nation was looking for a cheaper energy source to fuel its rapid industrialisation. Usage of gas would replace imported fuel which will save foreign exchange and improve the nation's balance of payment. Due to this factors, PGB was not subjected to any regulation regarding the pricing of gas.

## 7. PGU SYSTEM



**Figure 7.1: Peninsular Gas Utilisation System**

The PGU project was an important part of Malaysia's economic development plans and involved the construction and development of facilities to enable the processing and transmission of gas to end-users throughout Peninsular Malaysia. The PGU System

comprised of gas processing plants, a comprehensive network of gas pipelines and support facilities including compressor stations, an export terminal, regional centres, metering stations and lateral pipelines to the eventual end-users (see Figure 7.1). The current estimated cost of the PGU System upon completion was RM9 6 billion

Under PGU I stage, the main facilities constructed comprised of the first gas processing plant named GPP 1 in Kertih (Terengganu). A 32 kilometres main pipeline from GPP 1 to the industrial users on the east coast of Peninsular Malaysia was also constructed. This facilities came on-stream in 1984. This plant served the export terminal in Tanjong Sulong (Terengganu), the 1,000 households in PETRONAS Housing Complex in Kertih, Tenaga's Sultan Ismail and YTL's power stations in Paka (Terengganu), Perwaja Steel Mill and Tioxide Malaysia in Telok Kalong (Terengganu), Ethylene Malaysia plant and Petronas Penapisan Terengganu in Kertih.

During the PGU II stage, two more gas processing plants were constructed in Kertih named GPP 2 & 3. A 680 kilometres pipelines from Telok Kalong to Pasir Gudang (Johor) and Senoko (Singapore), Segamat (Johor) to Meru (Selangor) were also constructed. Five regional centres were established in Segamat, Bandar Indera Mahkota (Pahang), Pasir Gudang, Seremban (NS), and Shah Alam (Selangor) These facilities came on-stream in 1992. With the completion of GPP 4 in 1994, the company's aggregated processing capacity was 1,000 mmscfd and 1,065 kilometres of pipelines.



With such facilities, PGB was able to provide services to power station in Tg Kling (Melaka), Telok Gong (Melaka), Port Dickson (NS), Kuala Langat (Selangor), Port Klang (Selangor), Serdang (Selangor), Pasir Gudang and Senoko. It also served MTBE plant in Gebeng (Pahang), Petronas Penapisan Melaka in Tangga Batu (Melaka) and Petronas Dagangan's NGV stations in Selangor.

The last phase of the PGU project was the PGU III. Under this phase, two more gas processing plants would be constructed named GPP 5 & 6. Additional 450 kilometres would be constructed to extend the gas supply to the northern regions of Peninsular Malaysia. The main route of the pipeline would pass through Rawang (Selangor), Sitiawan (Perak), Prai (Penang), Kulim (Kedah), Sg. Petani (Kedah) and Gurun (Kedah). With the completion of the final phase, the total processing capacity would be 2,000 mmscfd and 2,000 kilometres of transmission pipelines.

## 8. THROUGHPUT FEE ARRANGEMENT

Under the arrangement, the throughput fee charged for PGB services in Peninsular Malaysia was calculated based on the formula stated in Figure 8.1.

$$\text{Fee} = \text{RC} + (\text{FC} \times \text{V})$$

where **RC = Reservation Charge in RM million per month**  
**FC = Flowrate Charge in RM/GJ of gas processed**  
**V = Volume of gas processed in mmscfd**

Figure 8.1: Throughput Fee

The agreed RC for Peninsular Malaysia was at initial rate of RM71.75 million per month in 1995 and would gradually increased to RM101.25 million per month in the year 2000. The agreed FC was an initial rate of RM0.095 per GJ in 1995 and capped at RM0.882 per GJ in the year 2000. For Miri, a standard fixed RC was charged at RM1.75 per mmbtu of gas processed. This fee was determined based on various factors including:

- ◆ PGB's fixed cost of capital,
- ◆ its operating cost,
- ◆ development and production cost,
- ◆ gas sales prices and
- ◆ expected volume of gas to be supplied to PGB.

The agreement allowed both parties to change the RC and FC in the event of any substantial change in any of the factors listed above. Review of the formula to determine the charges beyond the year 2000 would be in the financial year 1998.

## **9. FINANCIAL STATEMENTS**

The following table summaries the results of PGB five years ended 31 March 1995 (see Figure 9.1) prior to listing in the KLSE. The company's income had increased gradually throughout the years.

RM'000	1991	1992	1993	1994	1995
Turnover	137,796	273,420	402,193	737,967	908,664
Profit (before interest & depreciation)	73,124	180,285	282,919	618,467	754,915
Depreciation	(24,562)	(36,478)	(123,368)	(164,924)	(200,876)
Interest expense	(5,027)	(9,114)	(67,187)	(105,207)	(133,430)
Interest income	-	-	-	-	60
Profit (before tax)	43,535	134,693	92,364	348,336	420,669
Taxation	-	-	-	-	-
Profit (after tax)	43,535	134,693	92,364	348,336	420,669

**Figure 9.1: Financial Statement ending 31 March,1997**

At the point of listing, a share price valuation was conducted to show the prospect of the company (see Figure 9.2). The common indicators were calculated based on the assumption the share price was at RM8.00. Future earnings were estimated to increase too. The estimated earnings in 1998 was RM822.7 millions. The EPS was estimated to grow by 7.4 percent in 1998.

Fiscal Year	1994	1995	1996E	1997E	1998E
Net Profit (RM'000)	348.3	420.7	729.9	766.2	822.7
Net EPS (RM)	NA	NA	0.41	0.43	0.46
EPS Growth (%)	NA	NA	NA	5	7.4
P/E*	NA	NA	19.8	18.8	17.5
Cash EPS (RM)	NA	NA	0.56	0.61	0.72
Net Yield* (%)	NA	NA	0.8	0.8	0.8
* Based on RM8.00					

**Figure 9.2: Share Price Valuation**

## 10. INVESTMENT DECISION

"The estimated EPS for PGB in coming years are likely to go up (see Figure 9.2). This trend indicates a good performance by the company and this is also reflected in the

market value of PGB shares. This, will increase the shareholders value" explained Encik Abdul Rahim. He tried to recall what was discuss in the meeting last month.

Encik Ahmad Hafifi had argued "The public tends to assume that improving EPS is synonymous with improving value performance". What could be worst he added, was the management could make a mistake by committing its fund and resources towards any activities that supported this phenomena. He quoted an example of a company that had issued capital of RM1000 (1000 shares of RM1) and debt of RM500. If in the first year, the net profit after tax was RM100, the EPS would be 10 sen. If in the second year, the company expanded its capital base by debt funding RM250 and the incremental earnings after tax was RM1, EPS would still go up to 10.1 sen. In actual fact, value was destroyed.

A 'cash cow' company or company that had large amount of funds on deposit and no net borrowing was considered good by many including Encik Abdul Rahim. He added "We need a lot of capital to finance new business ventures. In the past we can afford to finance it internally but now with so many new projects, we can't afford it anymore". Shareholders would also agree to this condition which would meant high dividend for them. Potential investors would take that company with high Current Ratio would mean to certain extend, a good company to invest. "From a value based measures this could be potentially be a value destroyer" warned Encik Ahmad Hafifi. The earning rate of the cash in hand could be low based on the interest rate of 6 percent. It would also potentially contain no inherent capital growth. Another point explained Encik Ahmad Hafifi was the fact there was opportunity loss. The loss occured for not



leveraging off the capacity to expand the capital base. This would be considered destroying value.

In the area of cashflow management, the cash based earnings were required to be associated with the capital base which would be more accurate representation of the real cash invested in the company. If company had received actual cash in advance, the cash was available to be invested regardless when the cash would be recognised as earnings. In a normal accounting practise, the cash would be adjusted as 'accrual' or put back in some other period where it was supposed to be 'earned'.

In the assessment of new projects, most managers would proceed to borrow 100 percent of the entire capital if they had calculated by doing so the cash returns still exceed the cash cost of borrowing. Encik Ahmad Hafifi would have agreed to projects with positive NPV in the past but now he was not too sure. This decision might not be prudent because although borrowed capital was a discrete borrowed amount, it formed part of the overall capital base of the borrowing entity. The real cost would be higher than the cost of borrowing and might exceed the projected return and therefore destroying value.

Encik Ahmad Hafifi summarised the discussion by pointing out that corporate value would be enhanced if earnings could be increased without increasing capital. Secondly, investment should be made in projects only where the after tax returns exceed the cost of capital. Another factor that could increase corporate value was making investment



that were divested where capital charge exceed the return foregone. Lastly, value would increase if cost of capital could be reduced.

Encik Abdul Rahim was in dilemma and knew he must decide on whether the company should continue with the way it had done in the past or to change to the value based measures. If it was to change, which of the measures be adopted that would suit PGB. He needed to prepare an answer for the board meeting and had little time for him to decide.



## II. CASE ANALYSIS

### 1. CASE SYNOPSIS

Petronas Gas Berhad (PGB) is involved in the processing and transmission of natural gas in Malaysia. It is subsidiary of PETRONAS, the national oil and gas company of Malaysia. PETRONAS is a company which is wholly owned by the Government of Malaysia. Under the Petroleum Act 1974, PETRONAS is entrusted with the country's entire oil and gas reserves onshore and offshore. PGB was established in 1983 to implement the PGU project. This project consists of building a network of facilities such as gas processing plants and pipelines to enable the processing and transmission of gas within Peninsular Malaysia. Its implementation is separated into 3 stages namely PGU I, II and III. Under the PGU project, raw natural gas produced some 160-240 km offshore of Terengganu is piped to Kertih and send to the Gas Processing Plants (GPP) where it is treated and processed to methane, propane, butane, ethane and heavy hydrocarbons or condensates. The processed gas is transported through the PGU pipeline to PETRONAS' customers such as Tenaga Nasional, the independent power producer (IPP), petrochemical plants, Gas Malaysia and other industrial customers. PGB currently has four GPPs with a combined capacity of 1,000 mmscfd and a network of transmission pipelines measuring 1,065km in Peninsular Malaysia. Once PGU III is completed, it will have six GPPs with combined capacity of 2,000 mmscfd and over 2,000 km of transmission pipelines. All of PGB's revenue is derived from throughput fees payable under a Throughput Fee Agreement between the company and PETRONAS.



## 2. PROBLEM IDENTIFICATION

Shareholders want to make money on the company's ventures and therefore have financial requirements on management's strategic decisions. Most decisions made by companies, including PGB used purely accounting based measurements which had resulted in it destroying value without even realising it. The best way of increasing PGB's value is to make a better investment decisions. In order to achieve this, management requires more accurate method of measuring financial performance. This measuring methods are also lacking in PGB. Top management reluctant to change is evident as what Encik Rahim experienced when he tries to maintain existing indicators.

Earning per Share (EPS) and Price per Earning (P/E) based measurements for performance evaluation used by PGB are hindered by two issues. First, results on studies on determining the link between growth in EPS and P/E multiples for US companies showed no correlation between them<sup>1</sup>. EPS can be going up but value can be going down. This means that pricing factors for stock market is not tie so much with earning performance but also influent by other factors such as management credibility and the company's potential to expand. Secondly, EPS based measurement created a gap between Market Value and Balance Sheet elements such total assets, debt and equity. Therefore assessment on whether the invested capitals really create value to investors can not be rationally quantified. Other measurements such as Return on Assets (ROA) and Return on Equity (ROE) are also utilised together with the Market Value to indicate whether value is created or destroyed. This leads to another

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<sup>1</sup> "Managing the VBM way", *Malaysian Business*, 1 July 1996





predicament since the reliability of 'Return' has made the quality of ROA and ROE questionable too.

A value measurement indicator of a company should:

- ◆ Have high correlation with value creation. The indicator should give clear snapshot of the company performance, reinforces value-creating investments and considers cost of capital as one of the analytical criteria.
- ◆ Be easy to apply consistently. The measure should be readily extracted from accounting results, has straightforward calculation and acceptable by all stakeholders within the organisation without have to adopt massive change management.
- ◆ Relate to both income statement and balance sheet results. It should not be bias to Profit & Loss performance only.
- ◆ Be assignable to various strategic plans so that judgement is made based on best value creating plan.
- ◆ Be usable as performance targets. The indicator should be consistent and not be affected by sentiments whether internal or external.

### **3. ALTERNATIVES**

In the past, PGB has been committing internal reserve for new projects. However, scarcity forces it to seek external borrowing for new projects and also forced it to evaluate more careful the return of such projects. Project that create values would be selected over those that destroy them. Current management tools seemed inadequate

