

CHAPTER 6

REGULATION OF THE GAS DISTRIBUTION SYSTEM

6.1 Introduction

The structure of the gas industry evidently shows that each component process, i.e. production, transmission and distribution, is monopolized by a single firm. This is because firstly, infrastructure industries are natural monopolies because of the huge investments which are specific or sunk investments. Also, the supply of many infrastructure services are delivered through a dedicated, network system (wires or pipes), to a very large number of users with inelastic demand. The unit cost of delivering an infrastructure service, typically declines as service output increases and provision by single entity makes sense as economies of scale is achieved. This rules out competitive supply. Secondly, the petroleum industry in Malaysia is heavily regulated by the Petroleum Development Act 1974, which gives the

government (Prime Minister) authority to decide on the participants in the energy sector.

Infrastructure services are usually provided by the government because of their economic characteristics. However, in recent years, infrastructure industries in Malaysia, as in other countries, are being privatized to reduce the government's financial burden and reform the unsatisfactory performance of the public enterprises²⁵. The natural gas distribution project was also privatized by the government in line with the privatization policy.

The privatization of infrastructure means ownership is no longer a mechanism of control for the government. Governments sometimes retain shareholder rights or a "golden share" as a form of ownership. However, in most of the infrastructure industries that are privatized, a regulatory framework is established as the main mechanism of control.

There are a number of reasons why private operators of infrastructure facilities need to be regulated. Firstly, privatized infrastructure facilities will continue to

play a strategic or pivotal role in the economy, not only because of its strong link with the other sectors, but also because infrastructure facilities have strong links to growth, poverty and environment. Secondly, privatized infrastructure facilities possess considerable market power and provide their services in non-contestable markets. What this implies is that, users are locked into the delivery system (wires or pipes) and cannot express dissatisfaction through choice. Therefore, a profit maximizing monopolist can raise price above its most efficient level and restrict output. Thirdly, firms in the infrastructure sector can have social obligations imposed on them. Therefore, some regulating mechanism is needed to ensure that they are being carried out. Finally, a regulatory mechanism is needed to ensure strict compliance with the conditions of the concession agreements and operating licenses. In short, regulation is needed to serve as a buffer between private suppliers and users, while also conforming to government policies (G. Naidu 1994).

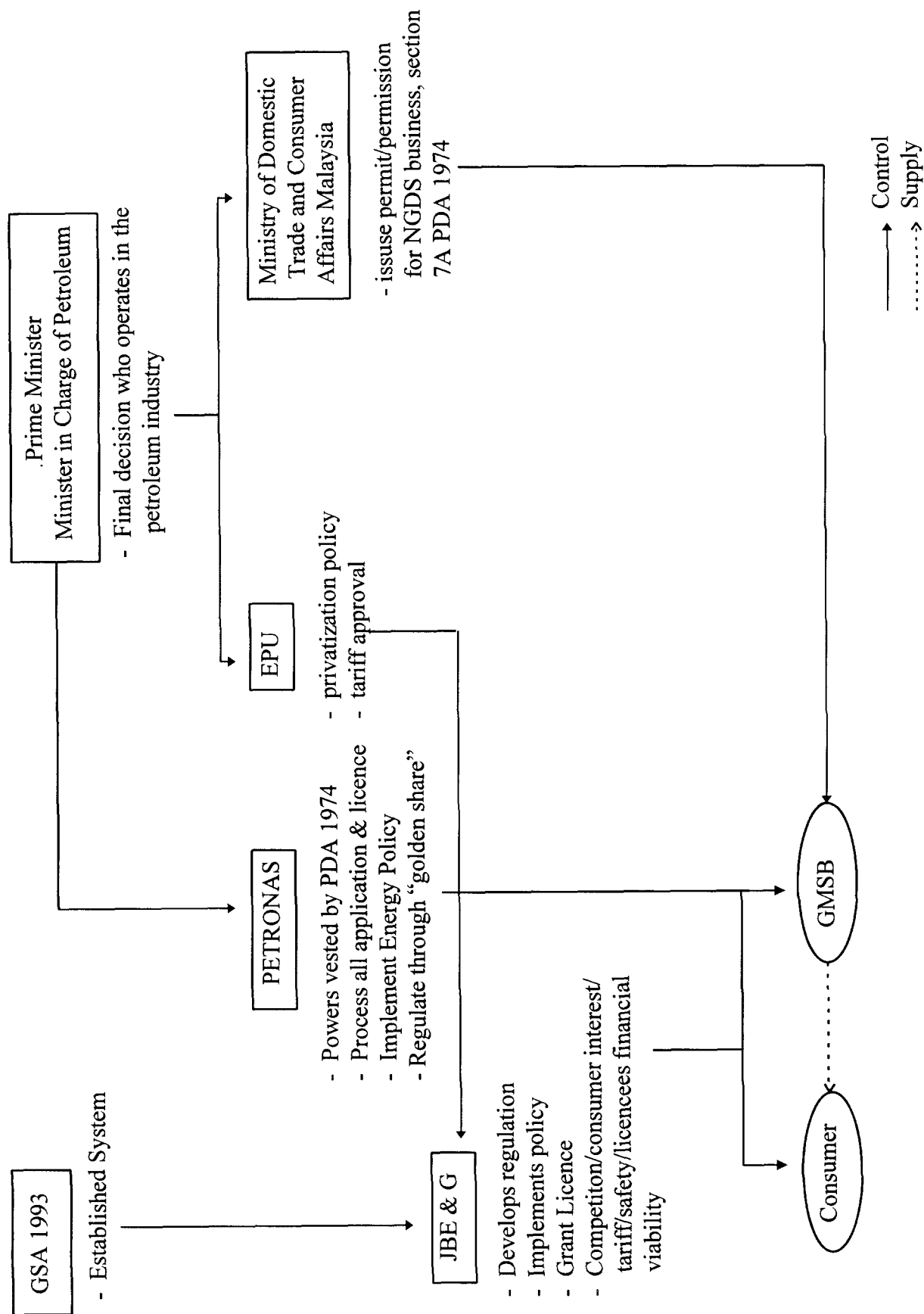
6.2 Regulatory Framework

The Gas Supply Act 1993 broadly defines the regulatory framework for the distribution sector, Figure 6.1 captures the basic elements of it. The Act only applies to the supply of gas to consumers through pipelines downstream of the city gate station.

The gas distribution regulatory system involves a number of government agencies. Under the provisions of the GSA 1993, the Minister In Charge of Petroleum i.e. Prime Minister appoints the Director General of the Electricity and Gas Supply Department to regulate GMSB through an operating license. Meanwhile, the Ministry of Domestic Trade and Consumer Affairs provides the permit²⁶ to GMSB. The difference is that the permit refers to the permission/approval by the government to GMSB to undertake the NGDS business. On the other hand, the license is a form of a periodical regulatory instrument for the government to regulate GMSB and its operation.

PETRONAS, which holds the "golden share", on the other hand ensures GMSB follows the government objective on

Figure 6.1 Regulatory and Policy Framework for Gas Distribution in Peninsular Malaysia



matters regarding energy policies. The Economic Planning Unit (EPU) in the Prime Minister's Department, is responsible for approval of the gas tariff policy.

The main objectives of the Gas Supply Act are a) to ensure that the licensee authorized to supply gas through pipelines, satisfies all reasonable demands for gas, b) to ensure that such licensee is able to finance the provision of gas supply services, c) to protect the interests of consumers pertaining to price, continuity of supply and quality of gas supplied, e) to promote efficiency and economy on the part of licensees and the efficient use of gas supplied, f) to enable persons to compete efficiently in the supply of gas, f) to protect the public against danger arising from the distribution of gas through pipelines or from the use of gas supplies through pipelines and g) to create rules and regulation issued under the Gas Act.

6.3 Regulatory Instruments

The regulatory instruments used by the government to regulate GMSB come in the form of equity ownership, operating license and safety regulation. In the equity ownership of GMSB the government, through PETRONAS, holds the "golden share"; giving it the right to oversee operations of the company, particularly in meeting government policies, in relation to energy. One particular aspect is the supply to the residential sector. It has been shown that the residential sector would be an unprofitable venture, due to its low demand which generally, arises from the need of cooking only. However, PETRONAS has made a strong request for GMSB to supply to this sector as it holds the right to the ownership of the country's resources which belongs to the nation and has to fulfill its social obligations and responsibility of a public nature. This is achieved through the supply of gas to the residential sector, which gives residents another alternative fuel as an energy source. The details of the operating license and

safety regulation are explained in the following subsections.

6.3.1 *License*

The license granted to GMSB specifies the regulatory environment in which GMSB operates. The license once granted, cannot be transferred, assigned, sub-licensed or otherwise disposed of, without written consent from the Ministry In Charge of Petroleum i.e. the Prime Minister. On the other hand, Prime Minister has to approval the granting of the gas license. This shows that there is a barrier to the entry and exit in the distribution sector.

The fundamental argument for entry and exit is that without a monopoly franchise, the firm will not be prepared to accept the costs of constructing and maintaining the NGDS to serve the entire market. This form of market failure i.e. the inability of the firm to take on the risk of large investments programs with heavy fixed costs before revenue is seen is most obviously addressed by entry and exit licensing. In accordance to the above, GMSB was granted the public utility license,

making it a statutory monopoly. The licensee or GMSB undertakes the responsibility to supply gas to any consumer within the area of gas supply. If gas is supplied by GMSB, GMSB has the power to recover expenses incurred and requires security (deposit) from the consumer/customer.

The Director General (DG) of Electricity & Gas is given the authority by the Act to regulate GMSB. Here, the DG can suspend or revoke the license if GMSB, fails to construct or operate the gas pipelines or breaches any conditions stipulated in the license, example by showing preference in gas supply among customers; does not meet the safety standards; practices price discrimination; etc. The activities of GMSB and businesses are monitored by the regulator. In accordance, GMSB is required to submit, to the DG, information relating to its performances. Also, every four years (condition 13 of the License), GMSB is required to carry out management or engineering audit to be submitted to the DG.

Another aspect of the Act is that the Director General of Electricity & Gas Supply is responsible in ensuring GMSB

is able to finance the provision of gas supply services (section 4 of the Act). This refers to the price of purchase and sale of natural gas which will generate sufficient revenue to meet the financial requirement of the gas company and to ensure the successful development of the NGDS. This is important due to the government's objective (energy policy) to promote the development of the natural gas resources as an alternative fuel to oil.

The license granted restricts changes in the share holding structure of the gas distribution company, unless it is approved by the Prime Minister. This is in line with the NEP policy, where a certain equity percentage of Bumiputera participation is required. Therefore, the disposal of the shares by any shareholder of GMSB needs approval of the Minister.

Other aspects of the license is that the licensee is obligated to adhere to government policy which includes Bumiputra equity participation for GMSB pipeline contractors, the transfer of knowledge and technology from foreign expertise, which is carried out by GMSB itself and the social obligation to supply gas to the

country. Here, the license does not explicitly dictate the type of social obligation. In general, it refers to the supply of natural gas to the residential sectors.

Briefly, the license issued covers operation and maintenance standards; distribution system design; approval of permit and other licenses; government policy; investments; audit; business undertaking; providing information; complaints handling procedure; economic purchasing; prohibition of cross subsidies; share holdings; the suspension, expiry and revocation of license.

6.3.2 *Safety Regulation*

One of the objectives of the gas regulatory framework is to ensure a safe gas system with regulation covering the gas supply chain from the city gate station to the end users. This involve rules, standards and code of practices for the construction of distribution networks, internal pipe work, meter testing, installation and repairs, setting standards and ensuring conformity for appliances, installation and services. There would also

be control over the training and certification of personnel/technicians who are trained for the gas industry.

Under the license, GMSB has to specify the code of practice for the operations, maintenance and safety of the distribution system. Generally, the draft of The Gas Supply Regulation provisions covers all aspects concerning the laying of the pipelines. It defines the rules for network operation; competency and certification; maintenance; inspection and testing; information; evacuation and safety of gas installation.

6.4 Pricing Mechanism

The Sixth Malaysian Plan 1991-1995 has outlined some basic principles in determining energy pricing. The pricing policies will be directed at ensuring that energy prices reflect the true or economic cost of supply and is able to raise sufficient revenue for the sector's development as well as remain competitive to encourage diversification of energy resources for greater

utilization of indigenous resources, such as gas. As a result, a competitively priced gas supply policy was introduced. In the industrial, commercial and residential sectors, prices will be determined based on competitiveness with alternative fuels. A competitive price will not only provide consumers with alternative option but also facilitate the penetration of gas in these sectors²⁷.

6.4.1 *The Existing Pricing Structure*

The current structure of natural gas pricing is simplified and does not reflect the economic cost of natural gas i.e. the true production cost of natural gas or the equivalent of gas supply and demand. The gas supply price from PETRONAS to GMSB is fixed at a single rate and pegged to the medium fuel oil (MFO) prices, quoted in the Singapore petroleum market. The formula is Foreign Exchange Rate (RM/US) x [50% MFO Spot (US\$/MT) + 50% MFO Posted (US\$/BBL)] x Z, where Z is the mark-ups by PETRONAS. This pricing formula is also adopted by the electricity sector. The gas price is pegged to the fuel oil because gas is used as a fuel oil substitute (four-

fuel diversification policy). As the gas cost is tied to the petroleum market, subject to fluctuation, this fluctuation is formulated in the form of indexation and passed through directly to the consumers.

In addition, the purchase agreement between PETRONAS and GMSB stipulates a take or pay condition for GMSB. For example, if the contract volume is 200,000 mmbtu per annum, with the condition of take or pay of 75 per cent. It means GMSB is obligated to take gas up to 150,000 mmBtu per year. The take or pay commitment is imposed by producers and transmission companies and is practiced by British Gas, European Gas, United States and Japan. The reason is to safeguard their high investment associated with transporting the gas from the gas fields to the customers, thereby providing financial security. On the other hand, the take or pay assures security of supply whereby PETRONAS is obligated to supply the minimum volume quantity.

6.4.2 *GMSB Principles of Gas Pricing*

The GMSB pricing policy is based on the competitiveness with alternative fuels. The current GMSB tariff practice, indicates that the gas price was set at a sufficiently low level to encourage existing non-gas and new fuel consumers to use gas. Here, differential pricing method is adopted where different prices are charged to each consumer group based on the price of the fuel replaced. This is because the gas network serve highly differentiated markets of differing demand elasticity.

This pricing principle has several advantages. Firstly, a single price which would be too low could lead to the development of non economic uses of gas. Secondly, a gas price charged for a particular application, below its break-even price may reduce the incentive to make energy savings and lead to wasteful use of gas. This is important, especially, when the gas reserves is limited. Thirdly, a differential pricing system is more flexible in ensuring an appropriate sharing of economic rent between consumers and gas sellers. For each gas

application, the seller is able to adjust the price in order to maximize its share of the economic rent. This is particularly important for the mobilization of financial resources required in the development phase of the gas industry. The arguments in favor of a differential pricing system are strong because such system encourages the conversion of gas for the successful development of the gas distribution market.

In accordance, in the residential and commercial sectors, GMSB's cost of gas delivered to the end consumer is set about 15 to 20 percent lower than the price of alternative fuels such as LPG and diesel. But in the industrial sector, where gas is in competition with various fuel oil, the gas cost is set higher than fuel oil which has the biggest load demand. This creates a barrier for the optimum penetration of natural gas in the industrial sector, thereby impeding the expansion or development of natural gas distribution network and the optimum utilization of natural gas. Also, some of the industrial consumers cannot enjoy the value of gas and its efficient benefits, from lower operations and maintenance costs of equipment.

Under Part IV, section 13 of the GSA, the utility or licensee is required to submit its tariff to the Ministry In Charge of Petroleum (Prime Minister's Department, EPU) for approval and, later, to be published. This section specifies that the tariff may include a standing or fixed charge, a commodity charge and a demand charge. This clause provides the GMSB with reasonable flexibility in the design of its rates which means that GMSB is able to formulate and submit its tariff to the JBE&G and the EPU for approval. However, GMSB has to consider that the utility tariff must be simple and easily understood, and should not show any undue preference or discrimination among consumers in the same tariff category (Appendix I). This requirement is widely accepted and practiced in the regulation of public utilities

The GMSB tariff is categorized into residential, commercial and industrial sectors. The gas rate design follows the two part tariff system i.e. Fixed Charge and Commodity Charge. Here, the gas price is set according to the level of consumption. Table 6.1 shows GMSB's tariff category where each category is classified based on

volume. Details of the tariff breakdown is shown in Appendix I. In accordance to that, volume of gas used per customer is set to be lower per unit for large consumption to further encourage gas consumption.

For residential and commercial consumers, a block tariff structure is applied whereby customers pay for the first energy units consumed during a period at a given price and the subsequently units at a different price. As for industrial and big commercial consumers, the tariff comprises fixed standing charge and demand charge grouped together as fixed charge and a commodity charge which is the variable charge.

Generally, the fixed charge is to recover the pipeline investment and maintenance costs while the commodity charge is to recover the gas cost, operation cost and profit margin. The fixed charge is about 15 to 20 percent of the total gas price. The reason for the small percentage is because, first, the recovery of the pipeline investment is spread over a period of 15 years and, second, due to customer's preference of variable cost as it is linked to the volume of gas, actually

purchased. This two-part tariff formula is commonly applied to gas utility companies in the US and UK.

Table 6.1 **GMSB Tariff Category**

Tariff	Classification	Volume Range (mmBtu/yr)	Average Prices RM/mmBtu
A	Residential		
B	General Commercial & Industrial	600 - 5,000	20.00 - 17.40
C	Small Commercial & Industrial	> 5,000 - 50,000	17.40 - 13.00
D	Medium Commercial & Industrial	> 50,000 - 200,000	13.00 - 10.30
E	Large Commercial & Industrial	> 200,000 - 750,000	10.30 - 8.40

Note: mmBtu = million British thermal unit (energy unit)

The gas cost is passed through directly to consumers in the form of indexation to the medium and large industrial customers only excluding the residential, small commercial and small industrial customers. This indexation is built into the commodity charge which fluctuates monthly because it is tied to the petroleum market. But there is a lag period of one month before the effect is felt in the domestic market.

There are mainly two reasons contributing to the application of the gas cost indexation in the pricing policy. First, in the medium and large consumer group,

the alternative fuels is tied to the Singapore petroleum market. Hence, indexing the medium and large customers will enable natural gas to maintain its marketability and competitiveness in the energy market (Appendix II shows indexation of the petroleum product). Second, in the residential and small commercial and small industrial consumers, the main fuel is LPG and this price is controlled by the government, by fixing it at a fixed rate. Therefore, the index by GMSB is excluded because these markets are not used to the fluctuation of fuel prices. Moreover, the gas cost fluctuation may reach very high e.g. in December 1996, the indexation reached to 1.500 which means the price had increased by 50 per cent. As a result, it will not be competitive for natural gas to penetrate these markets due to the high price of gas.

However, due to the market demarcation which states that GMSB must supply to the residential sector, GMSB plans to cross subsidise these market from the revenue earned from the medium and large industrial customers. This means that medium and large industrial customers will absorb the gas cost for the residential and small commercial and

small industrial users. Here, it shows discriminating practise by GMSB due to the monopoly power it holds. Also, because the customers are tied to the dedicated infrastructure network, they cannot voice out dissatisfaction, allowing GMSB less restrain in exploiting its market.

Hence, the gas price for the medium and large industrial customers are set higher and does not actually reflect the value of the competing fuels, it is to replace. According to Ken Kawakubo, General Manager Marketing, GMSB, the natural gas price for the Malaysian industrial sector is at least 20 to 30 per cent higher than the gas price in the US or UK. Since the gas price does not reflect the value of gas, this creates economic rents where the distribution company is able to earn excess profit, or invest in infrastructure.

However, if GMSB aggressively pursues the development of the residential sector due to its social obligation, it will have to maintain its current pricing to the large and medium users. This, in the long run may cause lower profit margin for GMSB as it cannot enjoy economy of

scale i.e. to bring down unit cost by connecting more customers (increasing volume) to its infrastructure network. The reason is GMSB's market is narrowed or sized down to LPG and Diesel market, where the market volume is limited. Moreover, the residential sector volume is too small to have any impact on the cost of infrastructure.

The take or pay condition is also implemented by GMSB. However, GMSB imposes these conditions only on the large industrial customers, i.e. a minimum take or pay of 75 percent of their annual consumption, since large volume requires a bigger pipeline capacity, meaning higher investment, and also to justify the main feeder pipelines. Also, the cap volume is essential to cross subsidise the residential sector.

6.5 Assessment of the Gas Regulation

The idea of regulation is to reduce the scope of monopoly and to induce the companies to behave as if they were stimulated by a more competitive environment or to create

a market-oriented system. However in the gas distribution sector the regulation is limited to safety standards and corporate ownership (due to NEP). There isn't instruments on price regulation, promotion of competitiveness for example open access to pipeline network or unbundling of services and removal of legal monopolies and exclusive rights. Therefore, the existing regulation is not adequate to promote economic efficiency.

The scope of regulatory conduct/action is also fairly underdeveloped. There is no clear link for the creation of incentives to achieve efficiency between the JBE&E and GMSB. There is no penalty imposed on performance, giving the freedom in conduct of business, where there is possibility of preferential allocation of gas supply to favored consumers. Also, due to information asymmetry, where the JBE&G is at a disadvantage when it comes to information about technology, cost and demand, GMSB was given the responsibility to draw up the regulation for quality, safety, service standards and pricing mechanism. This tantamounts to capture of the regulatory body by the gas distribution company.

Another feature of the gas regulation is that although the regulatory body, JBE&G exists, the Prime Minister and PETRONAS have considerable influence over the gas distribution sector and the GMSB policies. For example, rate approval or revision is not to be decided solely by the JBE&G. It needs the approval of the Prime Minister through the EPU. As for social obligations, the Act does not explicitly state that GMSB has to supply to the residential sector. But due to the insistence by PETRONAS, who holds the golden share and GMSB own market demarcation it is obligated to supply gas to the residential sector.

Overall, it is difficult to say if the current regulatory framework is sufficient to counter the concentrated economic power of the monopoly company, or to promote competition to attain economic efficiency. This is because the gas distribution sector is at the infancy stage and has no reference of past standards. Therefore, in accordance to new needs and requirements there is room for the gas regulation to be further developed.