Chapter 18

GAS IN THAILAND

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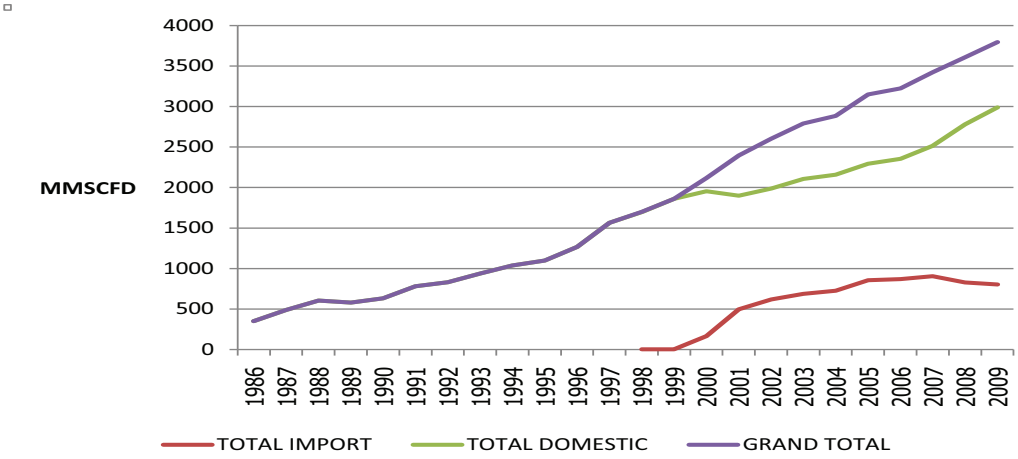
- A comprehensive plan for gas reform in Thailand was designed but only partially completed.
- The privatisation stage that has been completed is associated with increases in supply.
- Subsidies for some forms of consumption are rising and in the longer term provide new forces for further change.

18.1 INTRODUCTION

In 2009 Thailand ranked 27th in terms of natural gas production (28.7 million m^3) and 40th in terms of proven natural gas reserves (317 100 million m^3) according to the US Central Intelligence Agency (2009). Thailand has a vast natural gas supply in the Gulf of Siam and the Andaman Sea. However, domestic supply was not able to keep up with the surge in demand prompted by escalating global petroleum prices and government subsidies of the use of natural gas for vehicles (NGV) and home cooking (liquefied natural gas; LNG). During 2004–09 demand for natural gas increased on average 5.26% per year compared with 0.4% for petroleum. Thailand has been an importer of natural gas since 1998 (Figure 18.1).

The bulk of the demand for natural gas in Thailand comes from the power generation sector which relies heavily on natural gas. In 2009 more than 70% of consumption went to electricity generating plants, with the remaining 17% going to gas separation plants and 11% to industrial use (Figure 18.2). Thailand relies heavily on natural gas for power generation.



Note: MMSCFD = millions of standard cubic feet per day

Figure 18.1: Thailand's natural gas supply, 1986–2009. (Source: Energy Policy and Planning Office)

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A reform plan for the gas sector was developed in the late 1990s. This plan included extensive change. However in 2001 a new government adopted a policy of support of national champions which focused on privatisation and corporate development rather than market reform and the introduction of competition. This study case explains how the reform plan was adjusted in the light of the adoption of that policy and identifies some of the economic consequences of doing so. The first step is to provide some background information on the gas industry.

18.2 THE CURRENT STRUCTURE OF THE GAS INDUSTRY IN THAILAND

18.2.1 Domestic competition

The gas industry in Thailand is dominated by two players – the Petroleum Authority of Thailand (PTT) on the supply side and the Electricity Generating Authority of Thailand (EGAT) on the demand side. Both entities are majority government owned, although PTT is now a listed company with 49% of its equity share floated on the stock market and the remainder held by the Ministry of Finance.

PTT, with few minor exceptions, acts as the sole purchaser, transporter and distributor of natural gas in Thailand. PTT purchases all indigenous gas from the producers, including its subsidiary PTT Exploration and Production (PTTEP), and transmits this through its pipeline system to consumers. Its network of pipelines in Thailand currently stretches 3100km, linking all commercial offshore gas fields to EGAT's power plants, its own five gas separation plants (GSPs) as well as some 200 industrial users. Many of the industrial users are petrochemical companies and gas distribution companies in which PTT owns a controlling share.

In the petroleum sector, the company holds a majority equity share in several refineries whose production capacity contribute to more than 80% of the economy's total refinery capacity. It is also the largest player in retail distribution (petrol stations), international trading activities and the downstream petrochemical industry.

Limited private participation in pipeline construction (at the distribution level) has been introduced with the establishment of PTT Natural Gas Distribution Company (PTTNGD), a joint venture pipeline owned 49% by PTT and the balance by private investors. However, there is no mandatory third party access to PTT's gas transmission pipelines network, and so there is no competition in the distribution market. Certain power plants construct their own pipelines to connect to PTT's.

On the demand side, EGAT is by far the largest consumer of natural gas in Thailand. Although Figure 18.2 shows its gas consumption share is only 32%, the government-owned electricity generating enterprise holds a major equity share in many of the independent power producers (IPPs). As a result, sales to EGAT's group of electricity generating plants accounts for roughly half of Thailand's total natural gas supply.

The second largest group of customers is the gas separation plants, all of which belong to PTT. The third largest group are the small independent power producers (SPPs). These power producers supply electricity to EGAT's grid at a predetermined price. As for industrial customers, whose number totalled roughly 240 in 2009, many are downstream petrochemical companies affiliated with the PTT. All PTT contracts, whether with suppliers or consumers, are on a long-term (25–30 years) take or pay basis.

To conclude, there is little market competition in the vertical structure of the natural gas industry. Exploration and production where foreign players maintain a majority share in the market may be an exception. Although PTTEP's market share in exploration is roughly 25% in terms of sales, the company also holds equity shares that range from 5% to 40% in many of the exploration projects undertaken by its main competitor, Chevron.

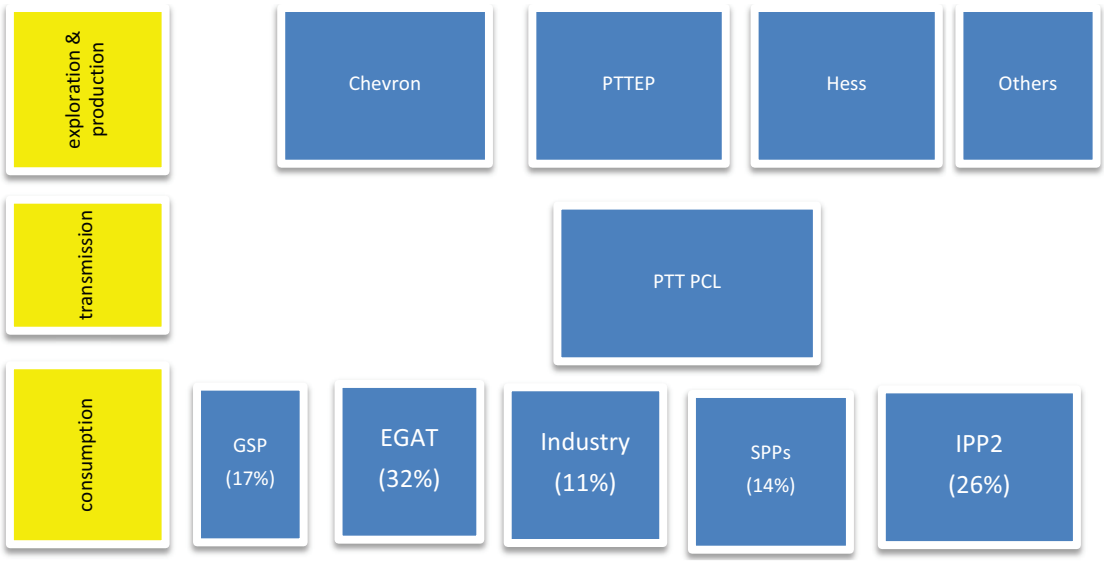

Figure 18.2: The current structure of the Thai gas industry.

18.2.2 Foreign commercial presence

The presence of foreign operators in the Thai gas industry has been confined to the exploration and production of natural gas. The Petroleum Act 1971 and the Energy Industry Act 2007 are the two main laws governing the gas industry. However, foreign investment issues are dealt with by the Foreign Business Act 1999. The foreign equity share is not restricted for businesses related to the production of tangible products. But foreign equity is limited to a minority portion for service businesses. Hence, foreign companies that seek to operate gas transmission, trading and distribution services are required to seek a joint venture with a local partner.

The employment of foreigners in Thailand is governed by an Act entitled the Working of Aliens Act BE2521 (1978). Generally, when considering whether to allow a foreign worker to enter the economy to work, the Department of Employment will consider whether the opening can be filled by a Thai, whether the foreign worker is qualified and whether the job fits the need of Thailand. Moreover, all foreign and Thai companies are required at all times to observe the 4:1 ratio of the number of Thai to foreign employees according to the Order of Immigration Office No. 110/2546 (2003). This may pose a problem for companies that require highly specialised staff to undertake work before production that will require local workers. The Board of Investment is able to waive this restriction. Promoted companies are allowed to bring in skilled workers and professionals. Gas exploration and production businesses are not among the list of promoted companies, unlike their downstream gas transmission and petrochemical counterparts.

18.2.3 Cross-border competition

While there is cross-border supply of natural gas both through pipelines and in the form of LNG, cross-border competition in natural gas is not established. Presently, there are several

joint development gas exploration and production projects between PTT and its counterparts in neighbouring economies such as Myanmar, Malaysia and Cambodia (Figure 18.3).

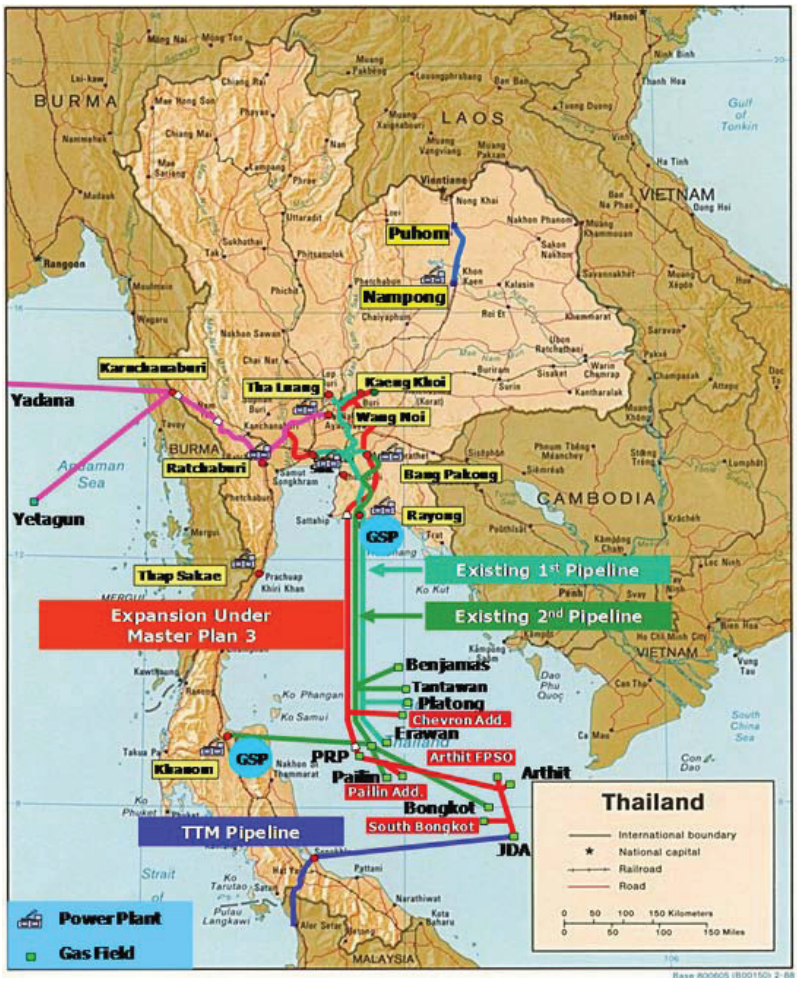

Figure 18.3: Thailand's regional natural gas pipeline network and its neighbours. (Source: PTT)

Pipelines connect offshore gas fields to electricity generation plants or gas liquefaction, condensation or separation plants mainly to serve Thailand's domestic demand.

The cross-border pipeline network between Burma and Thailand includes the Yadana–Ratchaburi pipeline (completed 1999) and the Yetagun–Ratchaburi pipeline (completed September 2000). On the horizon are projects to deliver gas to Malaysia and Thailand from the Malaysia–Thailand Joint Development Area.

Work to develop a regional natural gas market has been in progress for over a decade. ASEAN's proposal for a 'Trans-ASEAN Gas Pipeline' and APEC's concept of an 'Asian Gas Grid' both recognise natural gas' superior fuel qualities and the logic of linking ASEAN's natural gas production centres with markets in neighbouring economies. Both concepts are designed to catalyse cross-border linkages connecting national gas grids. According to Sovacool (2009), the establishment of national gas grids faces three challenges. Firstly, Lao PDR, Myanmar and Cambodia are poorer economies with vast reserves of natural resources relative to Thailand, which is perceived to be a much more advanced economy with a large demand for energy. Thus, the flow of energy within the region is likely to be one way. Secondly, the energy business in the region remains dominated by government enterprises – PTT (Thailand), Petronas (Malaysia) and Pertamina (Indonesia). Competition

that would undermine the status of each of these enterprises may be resisted by their government owners in order to protect national assets. Thirdly, the planned integrated natural gas pipeline is estimated to require an investment totalling USD16 billion to construct the additional 5600km of pipeline needed to connect centres of demand in the region. It is unlikely that private investors would be willing to inject capital into a project of such a scale, given that there is a lack of certainty concerning the pricing, that regulatory regimes are yet to be harmonized across borders and that gas market structures may continue to accommodate single-buyer regimes.

Competition from compressed LNG is conceivable, especially since Indonesia and Malaysia are among the five largest worldwide exporters of LNG. Indeed, to secure its gas supply, besides developing new gas fields in joint cooperation with neighbouring economies, Thailand has come to rely increasingly on imported LNG. PTT has undertaken to construct Thailand's first LNG terminal (in Rayong in the northern industrial zone on the eastern coast). The facility includes a tank terminal, a jetty and a 5 million ton storage facility that will be enlarged to accommodate 10 million tons in a second phase. The terminal is scheduled to start operating in 2011. However, in the absence of third party access to PTT's pipeline, there is unlikely to be any competition in the import of LNG.

18.3 GOVERNMENT POLICY

Greacen (2005) categorises the Thai government's policy towards the development of the domestic energy market into three distinct periods – the 'Nationalist Era' (1950–90), the 'Neo-liberal Era' (1990–2000) and the 'National Champion Era' (2001–05), the time of his presentation.

The Nationalist Era saw the establishment of government-owned utilities that were self-regulating monopolies based on the cost-plus price regulatory scheme. PTT was established in 1978.

The Neo-liberal Era was a period during which the government was dominated by technocrats whose concerns were focused mainly on introducing greater competition into utility markets monopolised by government enterprises. During the period, some EGAT power plants were spun off to become listed companies on the stock market. IPPs and SPPs were introduced to foster private competition in the power generation market. The National Energy Policy Office (NEPO)[2] floated the idea of creating a 'power pool' in 2000. A draft law on the rules governing the power pool was also proposed in the following year.

Although no reform took place in the gas industry during this era, the Ministry of Finance introduced a comprehensive plan for government enterprise reform. It proposed restructuring, liberalisation and regulation of the markets in which government enterprises dominated – telecommunications, transport and energy (gas, oil and power). This 'Master Plan for State Enterprise Reform 1998' offered a clear direction for developing the gas industry (Figure 18.4).

The competitive market model described in the plan contained two key reforms: the separation of the transmission network from production and trade functions and third party access. The separation of PTT's gas transmission pipeline function, either by accounting or legal methods, from its gas trading business was a pre-condition to promoting competition.

[2] The office is currently known as the Energy Policy and Planning (EPPO), Ministry of Energy.

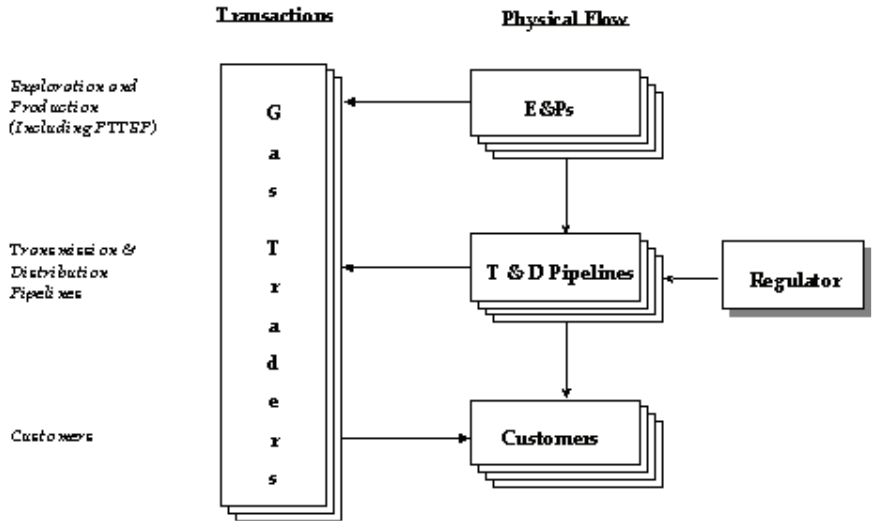

Figure 18.4: Future gas industry structure as perceived in 1998. (Source: Master Plan for State Enterprise Reform 1998, http://www.mof.go.th/sepc/sepcfn2.htm)

Full legal separation by a corporatised entity would not only facilitate competition in the production, trade and distribution of gas but would also allow more transparent and efficient regulation of the industry.

The establishment of third party access to gas transmission pipelines is a means of facilitating the development of competition in gas supply. The provision of access to these facilities by third parties on fair terms and conditions would allow consumers to purchase gas from upstream producers or continue to purchase the bundled service of gas transmission and supply from the pipeline owner.

'Special Purpose Pipelines' were proposed in the plan of 1998. Developers of new pipelines were to be granted a franchise under terms that would have allowed them to negotiate use of the pipeline with a limited number of customers. Under this approach, the broad framework for access would be well defined but the actual terms and conditions (such as tariffs) would be set by negotiation. This would have allowed a level of commercial control on the part of the owner, which may have led to an abuse of this position in terms of monopolistic pricing of the transmission service. To balance these matters, a dispute resolution process would have been necessary to address disputes arising from the negotiation process, with recourse to a predefined means of arbitration.

The Neo-liberal Era ended in 2000 and was replaced, under a new government, by the 'national champion model'. PTT was listed on the stock market in 2001 so that public funding could be mobilised to facilitate the planned expansion of the enterprise. However, the government retained a majority equity share: only 49% of the equity was floated.

Under the national champion strategy, privatisation took place without any of the market reform envisioned in the 1998 master plan. There was no separation of the monopolistic gas transmission business from the potentially competitive trading and distribution businesses and an independent energy regulatory body was not immediately established. Privatised operations conferred some benefits on the company, but without the introduction of competition these were not likely to be passed to consumers. As a listed company, for example, it was able to mobilise private capital to finance its expansion while its commitments to shareholders provided it with a framework to respond to community or government expectations about the services it might provide.

PTT shares sold out in 77 seconds. The price of the share went from THB35 at its IPO in November 2001 to THB183 at the end of 2003. The share price went up 70% in a single month when the government approved the proposed THB100 billion gas transmission pipeline plan with a guaranteed rate of return at 16% (Greacen & Greacen 2004). PTT now contributes 48.7% of the Thai Stock Exchange's total value (Nikomborirak & Sirikarn 2009).

A landmark court case decision in which the Supreme Court ruled against the privatisation of EGAT prompted the same group of NGOs to try to revisit the case of PTT. In August 2006 the Federation of Consumers and its affiliated organisations filed lawsuits, petitioning for the two Royal Decrees pertinent to the privatisation to be revoked and the company re-nationalised. In December 2007 the Administrative Court delivered a verdict that fell short of delisting the company, but required it to transfer all land acquired through expropriation and all assets (i.e., gas pipelines) attached therewith to the Ministry of Finance (PTT website, 2007). In practice, PTT continues to operate these pipelines as if they were its own but it does not have legal ownership of these particular pipelines and it has to pay the Ministry of Finance an annual access fee calculated as a fixed percentage of its total transmission revenue (this is 10–30% depending on the size of the revenue).

Corporate governance in the government-owned enterprises remains an issue. The National Anti-Corruption Commission is proposing a ban on government officials becoming directors in government-owned enterprises due to the conflict of roles. Members of Parliament and Senators raised concerns in Parliament about this conflict of roles among directors of government-owned enterprises. These issues may also limit the scope for further reform.

The National Champion Era came to an end in 2006 when the government originally elected in 2001 was replaced. During the period from September 2006 to February 2008 the Neo-liberal Era was revived. The Energy Industry Act, which established a fully fledged energy regulatory body, was passed in 2007. But the time span of that government was too short to implement the reform. A new government was elected in 2008 but there has been no further policy change since that time.

18.4 THE REGULATORY REGIME

18.4.1 The institution

The gas industry in Thailand is governed by two major laws; the Petroleum Act 1971 stipulates rules concerning the extraction and production of natural gas and the Energy Industry Act 2007 prescribes rules on the transmission of natural gas, compression of gas into liquid form, distribution of gas and wholesale and retail sale of gas. The Petroleum Act assigns the regulatory power to the Electricity Policy and Planning Office (EPPO) in the Ministry of Energy, which also oversees energy policy work. The Energy Industry Act established a regulatory body, the Electricity Regulatory Commission (ERC), for the gas and electricity generation industry. Regulations governing the petroleum industry and the exploration for and production of fossil fuel (including gas) were not included in this law. This was to preserve the Ministry of Energy's regulatory role, set out in the Petroleum Act.

Section 9 (6) of the Energy Industry Act stipulates that the Minister of Energy is responsible for setting the quality and standard of energy services. Section 64 similarly grants the Minister (with approval from the National Energy Policy Commission) the authority to set policy and guidelines with regard to the pricing of energy services. As a result the ERC applies the form of regulation (rate of return regulation or price cap) chosen by EPPO, but

decides on the actual tariff within that method. The ERC was granted the power of whether to allow the service provider to pass on certain costs to consumers. For example, it refused to allow PTT to pass on costs incurred from the destruction of its offshore gas exploration platform near the Oceania Islands.

It is interesting to compare the ERC's regulatory power with that of its telecommunications counterpart, the National Telecommunication Commission (NTC), which was established by the Telecommunications Act in 2001. The NTC's broad regulatory power and financial independence guarantee its autonomy. This is partly due to the fact that, unlike the NTC, the independence of the energy regulator was not mandated in the constitution. However, issues of accountability and transparency of the NTC remain, and need to be balanced with independence (Nikomborirak & Cheevasittiyanon 2009).

18.4.2 Regulatory rules

The key features of the existing regulatory regime governing the structure of the natural gas market, the access to the market and the tariff regulation are discussed below.

There are no legal restrictions on the structure of gas undertakings (no vertical separation requirement). PTT and its subsidiaries are engaged in the entire gas supply chain from exploration, production and transmission through to trade, import and distribution to retail.

There are no legal restrictions on new entries into any of the natural gas business subsectors, including the importation of LNG. However, PTT's monopoly in transmission, and hence the buying and selling of gas, amount to barriers to entry. As there is not yet third party access to PTT's proprietary transmission network and no third party access to its gas terminal facilities, entry is practically impossible.

While the market oriented reforms have not been adopted, there is an extensive system of price regulation, at least for natural gas. While some of its parameters could be debated (for example, the rates of return on investment built into the formulas), the regulatory system covers the key areas where there is a risk of the application of monopoly power over prices.

The wholesale gas price comprises the wellhead gas price, a marketing margin, the transmission tariff and the distribution tariff. These components are determined as follows:

- The wellhead gas price is specified in the gas purchase contract signed between the producer and PTT. It is normally indexed with the price of fuel oil, the exchange rate, and the consumer and producer price index. The price for natural gas produced from the Gulf of Thailand is roughly USD2 per million BTU, one-half the price of that in the USA and one-third of that in Japan where it is in the ranges of USD5–6 (Energy website n.d.). Gas procured from joint development with neighbouring Malaysia and Myanmar is slightly more expensive at USD2.3–2.75. Significantly lower wellhead gas prices are common for less mature gas fields.
- The marketing margin is regulated by the EPPO. The current rate of the pooled gas price (the weighted average price of gas purchased from various production sources) is 1.75% for sales to IPPs and EGAT and 9.33% for SPPs. The higher margin reflects the higher risks that PTT has to bear as SPP contracts are shorter (5 years vs 20–25 years) and allow an SPP to switch from one source of energy to another, depending on the price level. For example, an SPP may choose to use LPG instead of natural gas. However, the rate is currently being revised downward as statistics show that SPPs

rarely exercise the option. Hence, the risk involved with the contract may have been overestimated. But since 1999 a cap of THB2.15 (which translates into less than 1% considering the current price of natural gas) has been imposed.

- The transmission tariff is set by EPPO with approval from the Minister of Energy. The tariff is uniform for all gas customers. The current tariff is made up of the demand charge (TD) component to cover fixed costs and CPI - X for the commodity charge (TC) to cover variable costs. The rate of return on capital used for the demand charge is 18% for older pipelines and 12% for new pipelines (pipelines installed after 2007). The x value used in the price cap has always been 2%; the cap is revised every 5 years or when a new investment qualifies for a revision of the capital allowance.
- The distribution tariff is unregulated. PTT negotiates a price with its customers.

In contrast to the cost-based approach to pricing natural gas, the wholesale price of LPG has been capped since 2006 at USD330 per ton compared with USD550–700 per ton for imported LPG. The government pays the difference between the import price and the capped price: this gap has increased since 2004 when those prices were about the same and the gap is now around THB9/kg. This system also discourages PTT from manufacturing LPG as the government only subsidises imported LPG. The production of domestic LPG is 350 000 tons per month, which is not enough for the likely increase in demand, resulting at present in 74 000 tons of LPG being imported monthly. The additional 1-year extension of the LPG price cap will be a burden for the Oil Fund since it will require a subsidy of THB740 million per month (USD22.42 million) for imported LPG (EPPO n.d.)

Similarly, the price of NGV has been capped since January 2007 at USD258 per ton, while the global price is roughly USD424 per ton. Originally, the regulated price was to be adjusted upward gradually under a laddering model so that it would reflect actual costs by 2014. Governments have chosen to postpone these increases.[3]

Unlike the case of domestic production of LPG, however, PTT is promptly compensated for the NGV it produces. Thus, there is no shortage of domestic supply as in the case of LPG. EPPO estimated that maintaining a price cap on NGV will cost taxpayers roughly USD9 million per month. LPG demand has been increasing so the cost of the subsidy may increase.[4] Another issue in meeting this demand is that the controlled price leaves no room for a distribution margin which reduces the incentive to open new stations.

18.5 THE PERFORMANCE OF THE THAI GAS INDUSTRY AND PTT

How has this regulatory model performed in terms of the development of the gas market and the players involved? Broadly, the results of this assessment show a strong growth in the capacity of the distribution system, but questions remain about the level of gas prices compared to those in the rest of the world.

18.5.1 The Thai gas industry

The demand for and supply of natural gas in Thailand expanded at a very high rate from 1986 to 1999 when large reserves of natural gas were discovered in the Gulf of Siam (Table 18.1).

[3] For example, http://www.siamdailynews.com/2009/09/29/govt-to-pin-prices-of-lpg-ngv-ft-until-aug-2010/.
[4] http://www.bangkokpost.com/breakingnews/156365/ptt-ngv-usage-soars.

Table 18.1: Gas supply and demand growth, 1986–2009 as calculated from data provided by EPPO.

Average per period	Supply	Demand
1986–94	15.23	15.23
1995–99	12.54	12.55
2000–04	3.06	14.2
2005–09	6.55	5.77

Domestic supply was able to keep up with demand until the end of the 20th century. During 2000–04 demand outpaced supply as there was no new investment in new transmission pipeline capacity. However, when the ownership issues were clarified, in 2006–07 PTT was able to mobilise capital from the equity market to expand its transmission pipeline network by connecting new offshore gas fields to its onshore gas separation plants and its onshore gas fields to various power plants (Figure 18.5). As a result, the growth in domestic gas supply during 2005–09 exceeded that of demand such that the volume of imported gas fell (Figure 18.1).

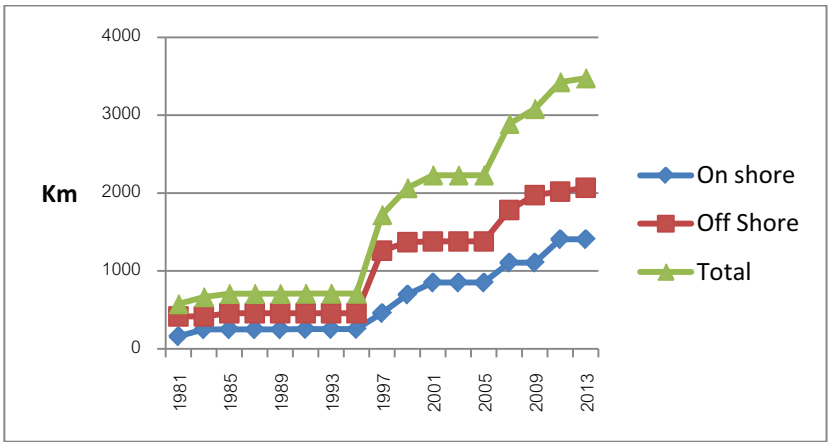

Figure 18.5: The length of natural gas pipeline, 1981–2012. (Source: PTT Annual Report 2009. History of Gas Transmission. *www.pttplc.com/Files/Document/Pdf/Gas/Gas_en2.pdf*, pipelines investment plan).

The natural gas industry, therefore, has undergone relatively healthy growth in terms of supply. PTT has been effective in seeking and developing new sources of natural gas supply overseas and investing in transmission capacity. The relatively high allowable rate of return on investment (internal rate of return on equity of 18%) is above the risk-adjusted rate for capital borrowing in the market place. These conditions have provided the incentives for PTT to expand its transmission pipeline network to facilitate growth in domestic gas supply. Earnings before interest and tax (EBIT) as a proportion of net sales for the gas operation has been higher than that in the petroleum and petrochemical businesses, which operate in more competitive markets (Figure 18.6).

PTT has performed well to meet the rapid growth of domestic demand for gas. The enterprise has also been one of the most efficient among its government-owned peers. A study by Hunt and Mantajit (2005) found that the pre-privatisation PTT was relatively efficient when compared with its counterparts in Japan, UK and Malaysia. The company was therefore able to take good advantage of access to direct financing once it became a listed company.

18.5.2 Gas prices

The price of natural gas depends on the wellhead prices plus the various margins. As noted above, the wellhead price is relatively low in Thailand. Lower wellhead gas prices due to lower cost of production and proximity of gas supply to demand also allowed the retail price of

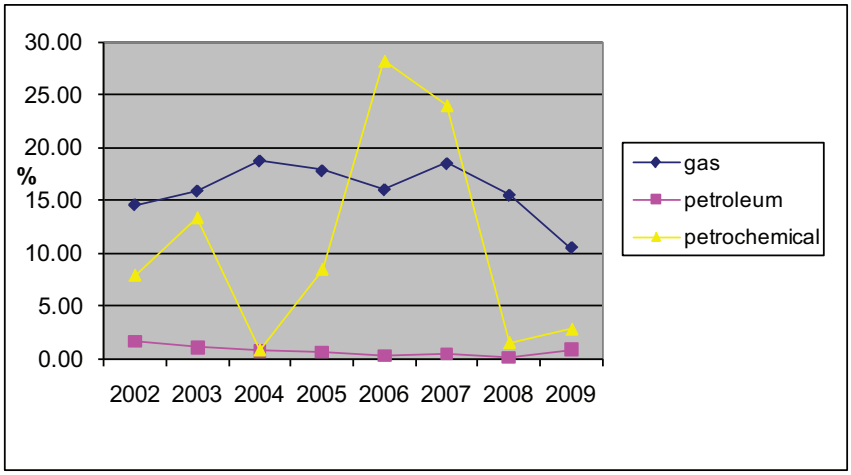

Figure 18.6: PTT's EBIT/net sales ratio, 2002–09. (Source: PTT annual reports)

natural gas to be lower than that prevailing in other economies that do not have their own gas supplies, while also allowing PTT to retain its margins. According to the study by Asia Pacific Energy Research Centre (2003), retail natural gas prices in Thailand have always been well below those of Chinese Taipei, Korea or Japan. Meanwhile NGV users enjoy subsidised retail tariffs.

18.5.3 Gas quality

According to Laoonual et al (2007), Thailand did not have a quality standard of natural gas like that established by the California Air Resource Board (CARB), the 'clean air agency' of California. The quality of NGV produced varied widely depending on the particular gas field. Natural gas from onshore fields in northeastern Thailand on average contains 76% methane and 13% carbon dioxide, while that from offshore fields in Myanmar contains 72.4% methane, 6.2% carbon dioxide and 16% nitrogen. According to the CARB, natural gas traded must have a combined carbon dioxide and nitrogen component not exceeding 1.4% and a methane number not less than 80 (except in some locations which have a minimum of 73). In standards found in other economies, the carbon dioxide component is usually required to remain below 3%. Hence, the quality of natural gas in Thailand, in particular that from the onshore fields in the eastern region, is below the international standard. NGV in Thailand may not be cleaner than LPG or gasoline in the absence of proper separation of carbon dioxide from the raw gas supply. In July 2009 the Department of Energy Business established a standard for natural gas to be used for NGV, but these standards are still inferior to the international ones.

18.6 CONCLUSION

The case of gas in Thailand illustrates a number of aspects of structural reform. These include the forces which cause an extensive reform strategy to shift and evolve in the process of implementation. At the same time, this case illustrates that a reform plan which is less extensive than originally conceived can have significant effects. Thailand's gas sector also illustrates a situation common in the region of energy prices below world market levels – substantial energy subsidies. As energy prices rise, this policy, however, may not be sustainable for fiscal reasons, and the forces which might emerge in Thailand may also be important in other economies.

The sequence of events was that a 1998 master plan laid out the reform of the gas sector in Thailand. This included the separation of production and transmission and the introduction of competition at all stages. The government entity, PTT, would be corporatised and privatised. An independent regulator would be established. This plan was overtaken, however, by a change of government in 2001 and its adoption of a strategy of focusing on the promotion of national champions, which involved more emphasis on development of some key enterprises to contribute to a wider set of policy goals than on competition in the marketplace. A minority share of PTT was sold to private owners but other elements of market reform were not adopted. More recently, and following another change of government in 2006, a regulatory agency has been established with extensive systems of cost-based regulation at least for natural gas. Other elements of the market reform agenda have still not been implemented.

One of the significant consequences of this reform package has been rapid growth in the capacity of the gas system. Since its listing in 2001, PTT has grown rapidly and performed well to meet the rapid growth in domestic demand for natural gas by its constant search for and development of new sources of gas in neighbouring economies and expansion of transmission capacity accordingly. Its rapid infrastructure roll out was a response to the relatively generous allowable rate of return for its transmission tariff.

Meanwhile, because of a large domestic and regional gas supply and a government subsidy at the wellhead level gas prices have remained relatively low. This approach to pricing involves distortions in consumption decisions. The low prices are not a reflection of competition in distribution and transmission, which remains absent.

The two current issues are therefore pricing and the lack of competition in distribution and transmission. Competition could be introduced, and the steps to doing so include:

- requiring PTT to divest its equity share in many of upstream and downstream gas businesses and to allow third party access to the transmission pipelines; and
- enforcing the competition law, which is important in a market that is so highly concentrated – PTT's current immunity from the Trade Competition Act 1999 would be abolished in that case.

On the other main issue of pricing, there are no significant forces for further reform either from within the sector or from its customers. PTT's main customers are power plants and its own gas separation plants. Although fewer than 300 customers are industrial users, many of them are petrochemical plants and natural gas distribution companies also affiliated with PTT. PTT's integrated operations and its control of the critical infrastructure reduce the incentives for it to maximise throughput in order to earn its target rate of return. Meanwhile, the retail price of NGV and the wholesale price of LPG are controlled at a rate well below cost. Thus, consumers enjoy low gas prices and have less interest in reforms of gas policy.

However, because of the fiscal consequences of the current policy package this situation may not be sustainable. A source of pressure for reform may be that the local gas supply is running out and PTT will have to import an increasing volume of more expensive LNG from distant places. For now, government import subsidies have sheltered consumers from rising costs but the pressure for reform could mount if fiscal pressures cause these subsidies to be abolished. But because LPG is used in many households for cooking, a change of policy involves political risks, despite the fiscal implications of the lack of reform.

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