



## Electricity Industry Reforms in Thailand: A Historical Review

Supannika Wattana, Deepak Sharma and Ronnakorn Vaiyavuth

**Abstract**— *The Thai Electricity Supply Industry (ESI) has been undergoing reform since the early 1990s. The first stage of reform resulted in the introduction of Independent Power Producers (IPPs) and Small Power Producers (SPPs) programs. This was followed by, in the mid-to-late 1990s, a proposal to introduce a market-oriented reform. This reform program envisaged the separation of generation from transmission and distribution functions; introduction of competition in generation; development of new market-oriented regulatory arrangements, and the privatization of the industry. This reform, argued its proponents, will improve the efficiency of the electricity industry; lower electricity tariffs; improve quality of service; draw private investment into power generation sector; reduce the government's investment burden of financing expensive electricity infrastructure and hence enhance its capacity for investing in other priority programs such as health, education and other social activities. This paper examines the veracity of these arguments. This examination is assisted by a historical review of the evolution of the Thai Electricity Supply Industry (ESI). This review reveals that the above noted arguments are unsupported on the basis of the technological, economic, environmental, social and political realities prevalent in Thailand. This paper further emphasizes the need to clearly identify the 'real' rationale for reform so that an appropriate reform pathway – consonant with socio-political contexts in Thailand – could be selected.*

**Keywords**— Electricity Supply Industry, Historical Review, Reform, Thailand.

### 1. INTRODUCTION

Over the last fifteen years, the Thai Electricity Supply Industry has undergone reform in its structure, ownership and regulation. Prompted by concerns about poor industry performance, the Thai government initiated a process of reform of the electricity industry in the year 1992. The first step in the process was the introduction of Independent Power Producer (IPP) and Small Power Producer (SPP) programs with the aim to meet the growing demand for electricity. This was followed by, in the mid-to-late 1990s, a proposal to introduce a market-oriented reform. The main catalyst for this reform was the East Asian financial crisis of 1997/1998. This reform, argued its proponents, will improve the efficiency of the electricity industry; lower electricity tariffs; improve the quality of service; draw private investment into power generation sector; and reduce the government's investment burden of financing expensive electricity infrastructure and hence enhance its capacity for investing in other priority programs such as health, education and other social activities. This paper examines the veracity of these arguments. This examination is assisted by a historical review of the evolution of the Thai Electricity Supply Industry (ESI). It

starts with the beginning of electricity, through the industry establishment, to the foundation for privatization, the first step of electricity reform and finally a proposal for a market-oriented reform. This paper also emphasizes the need to clearly identify the 'real' rationale for reform so that an appropriate reform pathway – consonant with socio-political contexts in Thailand – could be selected.

### 2. HISTORICAL EVOLUTION OF THE THAI ELECTRICITY INDUSTRY

This section provides a detailed description of the historical evolution of the Thai electricity industry. This description is partitioned into five time periods, from the beginning of electrification in the year 1884, to the year 2006. These time periods signify significant changes in the industry's organizations and institutions. For each time period, analysis is carried out to delineate the influence of social, political and other factors on shaping the electricity industry's organizations and institutions, and to explain the reasons behind electricity reforms in Thailand.

#### 2.1 Early Days (1884-1949)

Electricity was introduced in Thailand, in 1884, during the reign of King Chulalongkorn, by Field Marshal Chao Phraya Surasakdi Montri, after his diplomatic mission to Europe. He first financed, with proceeds from the sale of his inherited land, for 14,400 baht, the purchase of two electric generators and accessories from Britain in order to electrify the army building. When news spread to King Rama V, the general was requested to light up the Royal Grand Palace in Bangkok. The Palace was electrified for the first time on His Majesty's Birthday,

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September 20, 1884. Subsequently, the homes of other Royal Family members were electrified [1]. In 1887, a Danish company gained a concession to run an electric trolley from Bang Kaw Laem to the Royal Palace. The company then expanded into generation of electricity for lighting and set up a permanent generation system using wood fuel [2]. In 1897, this company sold its concession to an American company – Bangkok Electricity Light Syndicate – with a contract that the company had to supply lighting system for all streets and government buildings. However, the firm operated at a loss and later transferred its concession to another Danish company – Siam Electricity Co., Ltd. The office of this company was located at Wat Lieb which later became the head office of the Metropolitan Electricity Authority (MEA).

In 1912, the Electrical Division of the Public Works Department installed another power plant at Sam Sen with 25,500 KW capacity in order to supply power to facilitate the construction of a filtering plant for Sam Sen Water Works and also to distribute surplus power to the public in the northern suburbs of Bangkok. Subsequently, electricity supply in the metropolis was firmly established, with Wat Lieb power plant of Siam Electricity Co., Ltd supplying power for the southern areas of Bangkok and the state run Sam Sen power plant covering the northern areas of the metropolis. When the concession of the private company ended in 1950, the government took over the operation and changed the name to Bangkok Electric Works. In 1958, the government established the Metropolitan Electricity Authority (MEA) by merging Bangkok Electric Works and the Electrical Division of the Public Works Department.

For provincial areas, the government first distributed power supply in Ratchaburi province in 1927 and in Chiang Mai province in 1931. In the early stages, private sector was allowed concessions in power production.

Rural electrification efforts began when government set up a rural electricity division in the Interior Department that built power generating system in the town centre of Nakhon Phanom on the Laos border [3]. The system began generating electricity in 1930. Most of the power plants in those days were small-sized diesel generators and operated only during the night time, thus providing uneven service. Therefore, in order to standardize the power industry in provincial areas, the government established, in 1954, the Provincial Electricity Organization, which, in 1960, became the Provincial Electricity Authority (PEA), to be in charge of power distribution in all parts of the country except in the metropolitan areas.

During this period, there were no common standards for electricity systems – especially the extent to which electricity would be generated in large power plants or by small decentralized systems. The structure of the industry was fragmented. There was decentralized control of the regional/individual power plants. Further, the ownership of the industry was diverse; there were over 200 separate small cooperative, municipal or privately owned utilities [3].

## 2.2 Industry Establishment (1950-1979)

In this period, international agencies and aid programs began to exert considerable influence on Thai economic policy and development programs. An event with unusual significance for Thai economic history was a World Bank advisory mission in 1957 [4]. The mission aimed to study the economic situation of the country and to provide recommendations for the establishment of national economic planning system. The World Bank argued that the Thai government agencies worked without a guiding vision and thus state initiatives were uncoordinated and ineffective [5]. The Bank, therefore, recommended the setting up of a central planning agency to make a continuing study of the nation's economy, and to draw up plans for its development. On the advice of the World Bank, the National Economic Development Board (NEDB) – a key entity with implication for the economy and polity – was established in 1959. In 1972, its name was changed to the National Economic and Social Development Board (NESDB), in order to emphasize the importance of social development in the development process. NESDB was responsible for preparing five-year development plans for the country. These plans have guided the transformation of Thailand from an agricultural to an industrial economy. The underlying philosophy of economic planning in Thailand is commitment to market economy.

The First Development Plan (1961-1965) was essentially a public expenditure program. The principal objective was to encourage economic growth in the private sector through the provision of basic infrastructure facilities in transport, communications, power, social and public services, and agriculture [4]. This first plan initiated the modern era of development. The government shifted its role from dominating the economy through public investment to becoming a facilitator of private companies by providing fundamental infrastructure. Due to limited domestic savings, foreign borrowings by both the public and the private sectors were brought in to fill the gap. Trade deficits and government budget deficits were common phenomena in Thailand during those years. On the advice of and concessionary financing from USAID and the World Bank, work began on a number of large generation projects [6]. Bhumibol was one of the first of numerous World Bank loans to EGAT for building large-scale dams and power plants. Other dams that followed in the 1970s and 1980s had names little known outside Thailand: Sirindhorn, Sirikit, Sri Nakharin, and Kho Laem [7]. In order to receive concessionary financing from the World Bank, Thailand was encouraged to form state-owned electricity companies [6]. For example, EGAT is largely a World Bank creation; in fact, back in the late 1950s, the Bank insisted that the Thai government create an autonomous, independent power agency, which later became EGAT, as a condition for future power loans. The Bank was not only directly responsible for EGAT's formation, it was EGAT's main source of external financing, and thus exercised an important influence in its attention.

In 1968, the Office of Prime Minister issued the

Electricity Generating Authority of Thailand Act, which established the EGAT by merging several regional state-owned generating authorities. By then, the Thai Minister of Interior enacted the Metropolitan Electricity Authority Act and the Provincial Electricity Authority Act, which in effect established the MEA in 1958 and PEA in 1960. A typical structure of the Thai electricity industry was vertically integrated; for example, EGAT was the sole agency responsible for generation and transmission of electricity to the entire nation. The distribution and retail service functions were the responsibility of MEA (in Bangkok, Nonthaburi and Samutprakarn) and PEA (in the provincial cities and the countryside). By 1981, over 50 % of Thai population had access to electricity [3]. In Thailand, electricity was a practical necessity of industrialization as well as played an important role in national ideology, symbolizing a new type of social compact between the state and citizen. In propaganda and popular consciousness alike, images of a society with universal and affordable electricity became important tropes of state-led development; the conjoining of the electrification enterprise to the majesty of the state can be seen in the expression of Thai peasants – *fay laung*, “the King electricity” [8]. The role of electricity in powering Thailand’s industrialization and the rapid expansion of the organizations involved made the three power utilities very strong politically. By the 1970s, these three power utilities were effectively self-regulating with the exception of basic financial requirements set by the Ministry of Finance [9].

As noted above, the three power utilities were strong politically. It is, however, interesting to note that the most powerful player in the electricity industry is EGAT. This is partly because of its location in the government structure (also see Smith, 2003 cited in [10]). Further, EGAT has not only played a major role in central planning for electricity development but EGAT’s political power has enabled it to influence the privatization policy. For instance, EGAT employees have been rather vocal in their opposition to the privatization of state electric utilities. The recent cancellation of the electricity privatization program was attributed by many to the opposition by EGAT union. The multiplicity of the institutional regime for electricity as noted above posed some co-ordination problems. For instance, the responsibility for tariffs, capital project proposals, budgets for submissions to the council of Ministers, annual financial performance, and requests for government equity and loans is shared by several agencies including the Committee for Power Policy and Development, the Budget Bureau, the Tariff Rate Committee, NEADB, Ministry of Finance [11]. Often, these are conflicts and none of the agencies has the overall policy responsibility. Decisions are typically made by a consensus of all the agencies, including the three state electric utilities.

### **2.3 The foundation for privatization (1980-1989)**

During this period, several internal and external factors influenced the further development of the industry and laid the foundations for its privatization. Those factors include high public sector debt in the electricity industry

due to the oil price shocks of the 1970s; decreasing public and international donor funds for electricity as country planners adopted neo-liberal policies that emphasized reduced public sector; rapid economic expansion which subsequently resulted in rapid electricity system expansion; and institutional revolution.

#### *The Oil Price Shocks of the 1970s*

During the period for the Second Plan (1967-1971), there had been a rapid expansion of the electricity system. Much of this expansion was financed by borrowings. Consequently, Thai utilities built up high debt with the energy sector accounting for over 46 % of all foreign loans between 1967 and 1971 [6]. In fact, borrowing had been a key factor in the sector’s strategy to meet the growing energy demands of the Thai economy [11]. But the charged tariff was generally lower than the cost of electricity generation. Furthermore, because of heavy reliance on imported oil, the Thai economy suffered severely from the two oil price shocks of the 1970s. Inevitably, Thai utilities were faced with a substantial debt as a consequence of these two oil shocks. Especially between 1978 and 1981, Thailand’s oil import bill tripled, sparking a debt crisis in which government debt peaked at 39 per cent of GDP [12]. This crisis forced Thailand to undertake a comprehensive economic adjustment program. Thailand took recourse to the IMF and the World Bank to agree on a structural adjustment program and obtain a Structural Adjustment Loan (SAL). Thailand received support from the IMF in the form of Stand-by Agreement in 1981, 1982 and 1985, and from the World Bank through SALs in 1982-83 [13]. The 1981 Stand-by Agreement with the IMF aimed at reducing the public sector deficit and to restore international competitiveness [13]. In 1982-3, Thailand took out structural adjustment loans (SALs) from the World Bank with the conditionality that included increasing energy prices and implementing measures to privatize state-owned enterprises to reduce their colossal debt. However, this first effort to privatize utilities was met with fierce opposition from labour unions of the state electric utilities and independent academics, and finally defeated [6].

#### *Emergence of neo-liberal policies*

In the 1980s, there was a world-wide re-emergence of the neo-liberal ideology. Deregulation, privatization and free trade moved into the mainstream of political thought. Criticism of the Keynesian policies and championing of free markets moved rapidly from a few academic citadels and conservative think tank into concrete policy under the Regan and Thatcher administration [8]. The ideology of reducing the role and intervention of government and relying on the market mechanism has subsequently been widely adopted. The economic policies influenced by neo-liberalism were also adopted by the major international organizations such as the World Bank and the IMF [14]. The role of public international financial institutions was transformed as a result of these policies. Traditionally, they had supported the expansion of generation capacity through large-scale projects as discussed earlier. Under

the new policies, they shifted their traditional emphasis on economic and social goals from assisting country in its infrastructure development to an emphasis on increasing efficiency, expanding the role of private investment and changing the way government managed electricity industry. As a consequence of this, there was a decrease in support funds – previously provided with low interest rates and long repayment periods – from these financial institutions. These external donors began to make their lending conditional to the government opening up its electricity market to private ownership and competition. As noted above, structural adjustment loans (SALs) was one example of the conditional loans from the external donors. Economy-wide liberalization was coordinated through the vehicle of structural adjustment loans (SALs) [8].

#### *Rapid Economic Expansion*

In contrast to the first half of the 1980s, there was a rapid and unexpected economic growth during the period 1987-92. Between 1985 and 1994, Thailand has been one of the fastest growing economies in South-East Asia; its GDP grew at an annual rate of 9.5 percent [15]. This growth primarily resulted from a boom of manufactured exports and the massive inflow of private investment [16]. During the boom period, the annual electricity demand in Thailand increased at the rate of over 10 percent. This rapid growth was brought about by a high rate of urbanization, an aggressive electrification program, a swift expansion in the service and manufacturing industries and a favourable pricing policy which made electricity use more economic than other fuels. This substantially increased demand and caused power shortages. Consequently, the Energy Planning and Policy Office (EPPO) (formerly the National Energy Policy Office of Thailand (NEPO)), allowed EGAT to sign several Power Purchase Agreements (PPAs) with independent power producers (IPPs) with contract terms ranging from 1 to 25 years [17]. In order to attract private investment with ensuring healthy profits and low risk to investors, the government provided generous terms for the PPAs. The PPAs were typically structured as 'take-or-pay' contracts which guaranteed IPPs a minimum purchase, whether the electricity was needed or not.

#### *Institutional Revolution*

In this period, the government was in transition from military dictatorships towards democracy. Before 1973, the central bureaucracy worked under the control of military rule. A catalytic pro-democracy student uprising in 1973 led to the emergence of a new breed of Thai political figures. Thai politics entered to a new phase. Especially during the Tinsulanonda government (1980-1988), the democratization process in Thailand was gradually enhanced by restoring democratic institutions and maintaining a balance between the political differences of the military, the bureaucrats, and the politicians [18]. Economic interests, and the political parties associated with them, became more powerful as the economy developed. Business interests played an increasingly important role in the House of

Representatives. This came in line with the emergence of neo-liberal policies and established the foundations for privatization.

#### *2.4 First step of electricity reform (1990-1997)*

Even though the first attempt to privatize the Thai electricity industry was not successful, domestic and international forces remained strong under the government in the 1990s. These led to the formation of the National Energy Policy Office (NEPO) and the rise of IPP program. The creation of NEPO was viewed as the first effort, after the establishment of EGAT, MEA and PEA, to reorganize the institutions involved in the electricity sector. As noted in section 2.2, several government agencies were involved in the electricity policy settings. The rise of NEPO was intended to transfer all the policy responsibility to one entity (i.e. NEPO). NEPO was formed as secretariat to the newly formed National Energy Policy Council (NEPC), which serves as a direct line to the Prime Minister's Office on energy issues. Starting in the early 1990s, NEPO embarked on an ambitious electricity restructuring effort, the first stage of which was the introduction of Independent Power Producers (IPPs), to be followed by full competition in generation, and eventually retail competition [6].

There were also pressures from the external donors. By the early 1990s, international financial institutions sent strong signals that they would no longer be able to provide the financing to expand electricity capacity in developing countries at projected rates [8]. In order to meet electricity demand, developing countries would have to turn to private sector. During this period, these external donor agencies increased pressure to privatize, for instance, by creating barriers to accessing loans for the electricity sector. For example, in 1993, the World Bank put in place a new electricity lending policy. This policy enunciated new conditions for obtaining loans from the World Bank. These conditions included: the establishment of market-based regulatory regimes, commercialization and corporatization of the electricity sector, foreign ownership, and encouragement for private investment [19].

The continuing pressures from the international financial agencies coming in parallel with the rapid rise of electricity demand created a situation which saw private investment as the best alternative. This coincided with the entry of a surplus of private capital searching for investments with high rate of returns and led the initiation of IPP program. The Small Power Producer (SPP) and Independent Power Producer (IPP) programs appeared to be the first steps of electricity reform in Thailand. A brief chronology of ESI reform in Thailand is presented in Table 1. Much of the focus of this reform was to facilitate private participation in electricity generation in order to mitigate immediate electricity shortages. Since 1992, the government has promoted greater role of the private sector in the power generation business, in the form of both SPP and IPP [17]. The purported aim of this initiative was to help reduce EGAT's investment burden and bring down the overall power generation cost to levels that are lower than the

generation cost in the public sector.

As a result of IPP and SPP programs, the role of the private sector has been increasing. Figure 1 reveals that the proportion of electricity generated by EGAT decreased from 89 per cent of the gross energy generated in Thailand in 1995, to 49 per cent in 2006. During the same period, the proportion of electricity generated by the private sector increased from 11 per cent in 1996 to 51 per cent in 2006.

The reduction in power generation costs, however, could not be achieved as shown in Figure 2. (Note: These calculations are based on the inclusion of capital expenditure, administrative expense, electricity purchase, fuel expenditure and other energy generation expense).

The reasons for this unsuccessful outcome are the following:

- Although the selection process of IPPs was competitive, the benefits of this, however, did not directly pass to the consumers. IPPs competed only to acquire a license to generate electricity and supply it to EGAT with fixed and long-term PPA.
- Consequently, there was no competition to supply electricity at the cheapest possible price to the final consumers. Usually, the PPAs were signed before the projects start and the projected costs of the IPP projects were overestimated to cover risk. This is a common practice among the IPPs, which informally form a cartel to push up the contract price between themselves and EGAT, finally passing down to the consumers.
- Even if the selected IPPs achieved greater technical efficiencies, the benefits of reduced costs were not passed on to the consumers because of the nature of long term contracts.

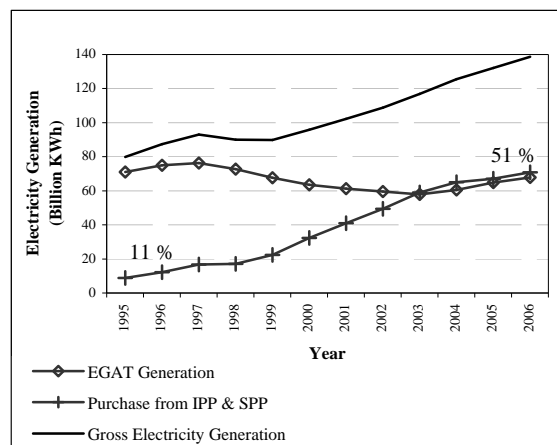
The IPP and SPP programs were viewed by many as indicators of success of electricity reform program because these two programs and partial privatization of EGAT's subsidiary received strong interest from both domestic and foreign investors. This encouraged the government to accelerate the market reform program. In 1996, the government passed a resolution that would allow the separation of generation, transmission, distribution business. However, there was strong opposition from the electric utilities to these moves.

### 2.5 Proposal for market-oriented reform (1998-2006)

Despite this opposition, the pressures to further reform the electricity industry continued. The Asian financial crisis in 1997/1998 was the main catalyst for accelerating the reform process. This crisis made deep impacts on the whole economy of Thailand including the electricity sector. It resulted in the economic slow down and caused significant decline in electricity demand. This created a condition of excess capacity. The drop in electricity demand combining with the extreme depreciation of its currency made the financial condition of the electric utilities rather precarious. On 14 August 1997, the Minister of Finance and the Governor of the Bank of Thailand co-signed the first Letter of Intent (LOI) committing Thailand to the economic adjustment

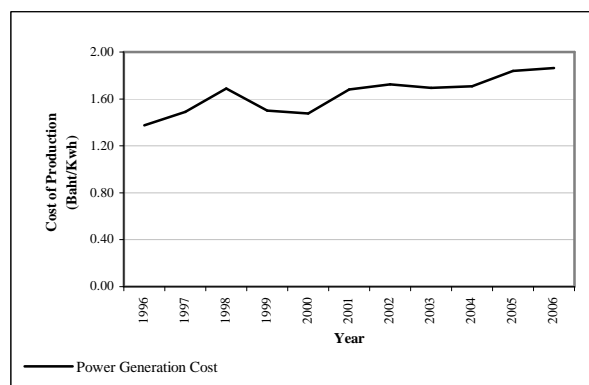
package outlined by the IMF [14]. According to the first LOI, the government agreed to accelerate privatization in key commercial and infrastructure sectors. The financial woes of the state utilities, coming in parallel with the new IMF loan conditions that emphasized privatization of the utilities, gave a new impetus for accelerating the reform process. As a result of this, the government committed to new structural reforms including privatization of state-owned enterprises in conformance with the agreement for international financial loan and to improve liquidity in the electricity sector.

As previously mentioned in section 2.3, a significant program of private sector participation had already been undertaken in the electricity industry, primarily based on extensive use of the IPPs and facilitation of privately owned distributed generation facilities under the SPP program. The next stage of the industry transformation intended to build on the existing model by creating competitive markets across all elements of the industry. The main emphasis of the second step of electricity reform was to provide a market orientation to the electricity industry by introducing competition in electricity supply and providing choice to customers to select their electricity service providers.



Source: [22]

Fig. 1 Electricity Generation and Purchase in Thailand



Source: [23]

Fig. 2 Electricity Cost of Production (at 2002 constant prices)

**Table 1. A brief chronology of ESI reform events in Thailand**

Reform Events	Year
Electricity law amendment Establishment of Electricity Generating Public Co Ltd. (EGCO)	1992
Privatized EGCO – subsidiary company of EGAT	1994
IPP law	1996
EGAT privatization plan (Master Plan)	1998
Approval of the principle of establishment of an independent regulator	1999
Establishment of Ratchaburi Electricity Generating Co Ltd. ( RATCH) Approval of Price-based power pool model Approval of the draft Energy Industry Act	2000
Proposal for New Electricity Supply Arrangement (NESA) model by EPPO Proposal for Partial liberalization, Cost-based power pool, Transitional model to net pool and Electricity Relation Committee's (ERC) model by EGAT	2002
Abandonment of Price-based power pool Approval of Enhanced single buyer (ESB) model	2003
Postponement of privatization	2004
Establishment of Electricity Regulatory Board	2005
Resignation of regulatory committees in Electricity Regulatory Board	2006
Enactment of the Energy Industry Act B.E. 2550	2007
Establishment of Energy Regulatory Board	2008

Sources: Compiled by this paper from various references

In view of the new institutional arrangements, following the creation of NEPO, the establishment of Ministry of Energy (MOE) in 2002 marked a significant institutional change in the electricity industry. As a consequence of this, NEPO was renamed as the Energy Policy and Planning Office (EPPO) and its policy-influencing role was reduced considerably. Previously, EPPO directly reported to the Minister. Under new arrangements, it reports to the Energy Permanent Secretary [6]. In addition, the state electric utilities: EGAT (formerly under the Office of the Prime Minister), and MEA and PEA (formerly under the Minister of Interior), were transferred to the MOE.

The market-oriented reform prompted the undertaking of several studies about the pros and cons of the reform program. Foreign consultants and local institutions were assigned to undertake studies on the ESI restructuring model and privatization of the state electric utilities. These institutions proposed several reform models which could be summarize as follows.

#### *Price-based power pool*

In 2000, the Chuan government approved the introduction of a price-based power pool model. The model was based on the recommendation of a study commissioned by NEPO. According to this study, generation companies would offer competitive bids into a wholesale power pool, while the newly established Independent System Operator (ISO) would be responsible for merit order dispatch, regulated distribution companies would be responsible for power distribution within their areas, and retailing companies would compete in the retailing market. The independent regulator would

regulate the natural monopoly (transmission and distribution sections) and also promote real competition in generation and retailing sections. EGAT, MEA and PEA were recommended to split into separate companies and sell their assets to private sectors.

The change of government, from the Chuan to Thaksin government in 2001, however, delayed the implementation of this proposal [14]. This, argue some, was due to the following reasons.

- Concerns from EGAT officials and independent academics were expressed on price volatility, system reliability and adequacy of supply, abuse of market power, environment and impact on unprofitable customers in rural areas.
- The California power crisis and the implementation of the New Electricity Trading Arrangement to replace the power pool in the UK in 2001 stimulated uncertainty about the merits of introducing a power pool in Thailand.
- EGAT employees were strongly opposed to the plan as they argued that the power pool is a risky and expensive electricity trading system. Moreover, they were concerned about loss of job security and benefits, and loss of employment without adequate unemployment benefits.

Another aspect worth mentioning is that the ideology emphasized market forces were reversed during the tenure of Thaksin government. This also played a role in the downfall of the power pool model. With the aspiration of becoming a regional leader and the hub of ASEAN, Thaksin focused on building a strong domestic



economy by using partial privatization as tools to achieve national aims, for example, expanding Thailand's economic influence in other countries and boosting the Stock Exchange of Thailand (SET). As a result, the government finally dropped this model and turned to emphasize on partial privatization of SOEs. The Plans for preparing EGAT, MEA, and PEA to be corporatized and listed in the Stock Exchange were approved by the State Enterprise Policy Commission (SEPC) on 20 August 2002 [14].

#### *EGAT VS EPPO*

After the power pool model was dropped, the new Thaksin government called for further study on the most appropriate ESI model for Thailand. Several ESI models were proposed by both EPPO and EGAT. In 2002, EPPO proposed New Electricity Supply Arrangement (NESA) which is based on the New Electricity Trading Arrangement (NETA) of the UK. Under the NESA model, the electricity market is fully liberalized in both generating and retailing segments. Bilateral contracts are employed for electricity trading in the liberalized market. During the same time, EGAT proposed the Multiple buyers/Multiple sellers-Partial liberalization (PL) model. In the proposed PL model, the electricity market is partially opened up to allow the large industrial users to purchase power directly from the generators. The proportion of the liberalized market does not exceed 30 per cent of the total electricity demand.

In addition, EGAT appointed two consultant teams to study and recommend a suitable reform structure. A Cost-based power pool was proposed by Kema Consultants and Siam Commercial Bank. Under the cost-based power pool model, all restructuring process is similar to the recommendation of the price-based power pool. The difference is that generators bid at their marginal costs or actual or estimated variable production cost of supply instead of bidding at their willingness to supply. The other model, Transitional model to New Pool, was recommended by the Asian Institution Technology (AIT). In the Transitional model to New Pool model, there are two models recommended for the intermediate and long terms. Under the model for the intermediate term, competition is introduced in generation and separation of generation and transmission is recommended. A System Agent (SAGE) is formed from the remaining units of EGAT after all generating facilities have been separated. SAGE will separate into two bodies, one to operate the power balancing market only and one to operate as a regulated retailer to fulfill the remaining obligation of PPAs. A modified form of IPP arrangement with special PPA is created. In the model for the long term, the proportion of electricity trading through bilateral contracts outside SAGE is expected to grow. SAGE is finally expected to perform a more system balancing role and less electricity trading role under PPA. In the midst of the study period, Electricity Relation Committee (ERC) – a joint management-labour union of EGAT, also proposed the model that claimed to be similar to the model destined to be used in Taiwan. Under the ERC's model, customers are divided into two groups, those in captive market and

those in free market. Transmission access is opened to large industry customers. Negotiation would be used to terminate PPAs of IPPs and SPPs. All new private generations compete to sell in the competitive market. In a free market, there is no pool and no buying or selling mechanism created for the free market.

On 23 December 2002, the MOE, through EPPO, organized a seminar on ESI reform to brainstorm and discuss about the optimal ESI model by comparing the current structure with the models discussed above, particularly in relation to electricity system security, competition, tariff, regulation, quality of service and public share offering. The deliberations at the seminar were, however, unable to develop a consensus on a specific model. Finally, the models proposed by both EPPO and EGAT were dropped by the Thaksin administration because there was no consensus about the ESI model and privatization among EPPO, EGAT, MEA, PEA, the private sectors and academics, resulting mainly from the different incentives of each agent. For example, EGAT, MEA and PEA prefer to stay in a monopolistic manner and support the ESI models that do not allow them to separate. The government would like to unbundled the industry and then privatize the SOEs as fast as possible to promote capital market development without serious consideration on the ESI model.

#### *Enhanced Single Buyer (ESB)*

On 9 September 2003, the Cabinet approved the cancellation of the Cabinet resolution of 25 July 2000 on the ESI reform and the establishment of power pool and assigned the MOE to conduct further study on the ESI model. At this time, it seemed that the future direction for the ESI restructuring model was unclear, however, the Cabinet approved to corporatize the whole EGAT as a public company under Corporatization Law.

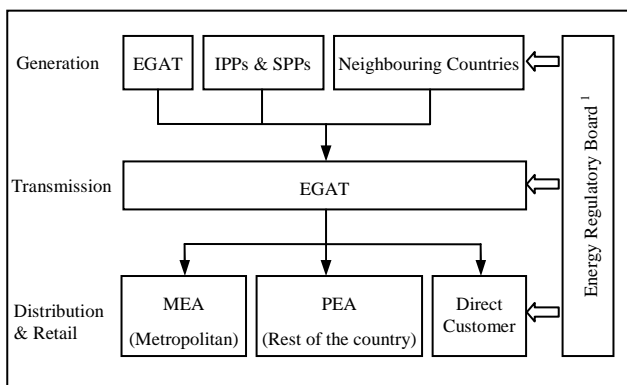
After being tasked by the Cabinet on 9 September 2003, MOE hired Boston Consulting Group (BSG) to conduct a study on strategies for the development of Thailand's energy sector and the power sector efficiency improvement program. This study includes studies on ESI model, the regulatory framework and the tariff mechanism for Thailand. The BSG proposed five alternative ESI structures: Full Competition (FC) model, Competitive Bilateral Contract (CBC) model, Partial Competition (PC) model, Enhanced Single Buyer (ESB) model and Super National Champion (SNC) model. In September 2003, a steering committee was formed to advance strategies for the development of Thailand's energy sector and power sector efficiency improvement program. The committee discussed the reform model proposed by the Boston Consulting Group and agreed that the ESB model was the best alternative that should be adopted not only for ESI restructuring in the foreseeable future, but also to facilitate the process of corporatization and privatization. The ESB model is quite similar to the current ESI model (single buyer model). The ESB model is different from the current model in that there will be an account unbundling of EGAT's generation and transmission businesses, and any new IPPs will have to compete directly against EGAT's generation. Further, thirty per cent of EGAT would be

sold on the stock exchange to raise capital so that the monopoly could stand a better chance against the international competitors at the regional level.

The success, as claimed by the government, of the Petroleum Authority of Thailand (PTT) privatization, in 2001, gave the impetus for accelerating the privatization of state electric utilities without restructuring. Due to the reversal of the economic policy by the Thaksin government, the idea of creating competitive market for electricity was replaced by building EGAT as a *National Champion* by adopting the ESB model. This made the disappearance of choice and competition but instead continued to focus only on privatization of the industry. The initial public offering (IPO) of EGAT, MEA and PEA were scheduled in the first, third, and fourth quarters of 2004, respectively. However, following renewed protests from EGAT and other labour unions, the Thaksin government decided, on 23 February 2004, to put the privatization of EGAT on hold indefinitely.

In early 2005, the Thaksin government was re-elected and the privatization program of state enterprises was revived. EGAT was the first public enterprise to be corporatized in April 2005, and it was scheduled to be listed on the Stock Exchange in October 2005. A group of NGOs and labour unions filed a petition with the Supreme Court a few days before the scheduled listing. On 23 March 2006, the Supreme Court ended the privatization of EGAT by revoking two Royal Decrees that led to its corporatization in 2005. As a consequence of this verdict, EGAT will remain a state enterprise and the plans for its stock market listing were cancelled [24].

With the view to provide effective regulation, the Thaksin government established the interim regulator, namely the Electricity Regulatory Board, on December 1, 2005 [25]. This regulatory board was temporarily established because it was expected that the permanent regulatory authority would be established by the Energy Industry Act.



Note: <sup>1</sup> The Energy Regulatory Board was established in February, 2008

**Fig. 3 Current structure of the Thai electricity industry**

The September 2006 military coup put on hold further changes to the structure of the electricity industry. It also resulted in the resignation of the interim regulators. In December 2007, the government enacted the Energy Industry Act B.E. 2550 which emphasized the establishment of the Energy Regulatory Board and the

Energy Regulatory Office. The Energy Regulatory Board was established on 1 February 2008. This regulatory board is responsible for regulation of the energy sector including electricity and gas. This independent regulatory body is expected to help increase transparency, creditability and public participation in the energy sector decision-making. Figure 3 illustrates the current structure of the Thai electricity industry.

### 3. RATIONALE FOR ELECTRICITY REFORM IN THAILAND

#### 3.1 Purported rationale for a market-oriented reform

As mentioned earlier, a market-oriented reform was proposed for the Thai ESI in 1998 in the form of the Master Plan. The Master Plan provided guidelines, principles, and practices for increasing effective private sector participation in the economy and served as the basic blueprint for this reform. The main underlying principle of this plan was to deregulate the industry wherever possible to increase competition. This reform (emphasis only on privatization plan), argued its proponents, will [26], [27]

- reduce the investment burden of the government as well as the public sector debt;
- improve the economic efficiency of the industry, as measured by decreased costs of production and/or price of service;
- improve quality of service, including enhancing consumer choice;
- complete needed infrastructure investment projects;
- reduce subsidies and loan guarantees to state electric utilities;
- utilize the proceeds from the sale of state electric utilities for reinvestment in the economy and social sector;
- improve and/or expand services;
- create new employment opportunities; and
- enhance government ability to invest in social and public services.

A deeper review, however, reveals that the above noted arguments are unsupportable on the basis of the technological, economic, environmental, social and political realities prevalent in Thailand. The following discussion provides support to this claim.

#### Attract private investment

Attracting private investment is one of the major arguments for reform. Such investment clearly depends on investor confidence in the country's economy which is typically shaped by the political and institutional climate for economic policy, legal system and control of corruption. In Thailand, the constitutions and governance philosophies are combination of the traditional and modern western style [28]. Thai politics have traditionally involved a delicate balancing act between the crown, the army, the bureaucracy and powerful economic interests [29]. Political and legal frameworks are weak. Corruption is widely perceived to be a serious



governance problem. Transparency International's 2007 survey listed Thailand as 84<sup>th</sup> out of the 179 countries surveyed with Corruption Perception Index (CPI) equal to 3.3 (on a zero to 10 scales, with 10 being least corrupt) [30]. The Opacity Factor for Thailand for 2004 was 35 (0 indicates best and 100 indicates worst) [31]. This factor represents the five key dimensions that affect capital market, namely corruption, legal system, economic policies, accounting standards and practices (including corporate governance and information release), regulatory regime [31]. Such climate, therefore, would not inspire much investor confidence. Moreover, the political and policy uncertainties associated with the military coup also have contributed to lowering investor confidence.

#### *Reduction in electricity prices*

The argument that electricity reform would lead to a reduction in electricity prices does not appear to be supportable on the basis of available evidence. According to Sharma [32], 'Electricity generation accounts for nearly two-thirds of the total cost of electricity supply... In a situation of excess capacity, competition in generation has a potential to exert downward pressure on the cost of electricity production'. But electricity system in Thailand still confront with a condition of capacity constrained system. Therefore, it is unclear how the competitive pool would lead to a reduction in electricity prices. In contrast, it seems that the cost of electricity production is likely to be higher as a consequence of environmental concern. In recognition of global warming, there is now pressure for generating electricity from environmentally benign fuels.

Besides, Fathollahzadah and Sharma [31] stated that 'it is widely known that electricity in the ASEAN region is sold at subsidized rates and it is also common knowledge that electricity is priced below its marginal cost in most countries in the region'. In fact, the proponents of reform argued that subsidies should be removed in order to reflect marginal cost of production. Consequently, removal of subsidies clearly could not lower electricity price.

On the question of removal of subsidies, it needs to be viewed in a larger socio-political context. Subsidies provide considerable benefits to consumers who have generally low levels of income and electricity requirements. As a consequence, removal of subsidized electricity to this group of consumers may not only be socially undesirable but politically unfeasible as well [31].

#### *Enhancing consumer choice*

Providing choices to consumer to select their service providers seems to be meaningless when viewed in the context of Thailand where: 10 % of the population remain under the national poverty line of 1386 Baht per person per month, only 1 % in urban but 13 % in rural areas; 84 % of the population live in rural areas and generate income from agriculture-related activities; the distribution of income in the country is highly skewed, with the top 20 percent earning nearly 12 times more income than the bottom 20 percent in the year 2007; the

GINI coefficient (commonly used indicator of economic inequality) for Thailand for 2004 was 0.49 (0 indicates perfect equality and 1 indicates perfect inequality) [33]. It is evident from the above discussion that a majority of the poor live in rural areas where it is uneconomic to extend electricity supply. These people do not have the capacity to exercise choices or even to pay their electricity. Consumer choices, therefore, appear to be insignificant for them.

#### *New employment opportunities*

The electricity market reform, argued its proponents, would lead to create new employment opportunities. This argument appears to be unjustified. It was, in fact, argued by multilateral agencies, international banks and financial institutions that the Thai electricity industry was inefficient. Such inefficiency, it was further argued, resulted from overstaffing, poor management, inefficient operation and uneconomic pricing practices. The expectation that electricity reform would lead to create new employment, therefore, contradicts itself with the causes of electricity reform.

In fact, even in developed countries, for example Australia, which implemented electricity market reform since 1991, a number of people employed in its electricity industry have continued to decline since the onset of reform [34].

#### *Other benefits of electricity reform*

Benefits of reform in terms of improved service, enhancing government capacity for investing in other social and public services do not appear to have any reference point for convincing the possibility of the argument. A belief in the success of electricity reform in other countries (mainly developed countries) and in replicability of such success for Thailand appears to be baseless. The economic, political, social and cultural backgrounds of those countries are significantly different from Thailand. These backgrounds are important for designing reform program because they reflect several dimensions of reform and critically influence the feasibility of reform program and hence the outcomes that could be achieved from them.

The earlier discussion suggests that much of the underlying arguments for reform are untenable. There are inconsistencies between the purported rationale and realities prevalent in Thailand. The discussion further reveals that the planners aim to achieve a rather diverse and wide range of objectives from reform, for example, attracting private investment, improving quality of service, developing capital markets, and ensuring economic prosperity. There does not appear to be any compelling logic behind these objectives. For instance, how the electricity price (currently below marginal cost) could be decreased. The outcomes of this reform, therefore, are unlikely to be desirable.

### **3.2 'Real' rationale for electricity reform**

A historical review of the Thai electricity industry (Section 2) has revealed that the 'real' rationale for electricity reform was different from what are argued by

the proponents of electricity reform (As presented in Section 3.1). The 'real' rationale, it is argued, has its roots in several internal and external developments and influences. For example:

- One major influence behind electricity reform was pressures from the international financial institutions such as the World Bank, IMF and Asian Development Bank. These institutions, especially the World Bank, played a significant role in promoting, strategizing and even compelling electricity reform in Thailand. For example, the structural adjustment loans (SALs) which Thailand took from the World Bank, in 1982-3, came with conditionality that included implementing measures to privatized state-owned enterprises. In fact, it should be evident from the earlier discussion that the World Bank and other international agencies have continuously played an important role in shaping the Thai electricity industry since 1960s.
- Another significant influence for electricity reform arose in the context of major economic crisis, for example, the oil price increases of the 1970s and the Asian Financial Crisis in 1997/8. As discussed above, these crises created opportunities for the international donor agencies to impose new funding conditions on developing countries; resulted in economic-wide reforms – conditions outlined by the donor agencies. For example, market reforms under the Structural Adjustment Loans (SALs) and the Letter of Intent (LOI) by the World Bank and IMF respectively. More interestingly, the undertaking of electricity reform was included in both of these two programs.
- Domestic forces were also important. The process of democratization led to the emergence of new liberal business leaders. Therefore, the political ideology changed in favour of the market. Previously, the government considered electricity as a vital ingredient for social and economic development of the citizens. Accordingly, the government took all responsibility for electricity provision. It resulted in the establishment of vertically-integrated public monopoly structures. Under the market-oriented political leadership, the government created space for the private sector in electricity development. The economic crisis also created a political opportunity for the market-oriented government to implement privatization policy. Privatization appeared to the government as a vehicle of attracting private capital flows to address fiscal crises.
- Allegation by some that self-interest by the ruling elites was also a significant factor behind electricity privatization. Some of the business-oriented politicians with dual roles – as citizens' representatives and as executive directors of companies – played a part in promoting the privatization of the industry. They stood to gain personally from the transfer of public resources to the private sector. The example of this was given

by Palettu [35] in the case of PTT experience.

This review also suggests that the sequence of steps undertaken to reform the electricity industry in Thailand was somewhat out of synchronism. For example, the establishment of the strong, credible, and independent regulatory body should have preceded industry restructure. It seems, however, that the whole program was focused on the industry privatization. Consequently, it appears only the economic dimension of the program received attention and other dimensions were ignored. Since electricity reforms have widespread ramifications which extend into economic, social, environmental, and political spheres of society, the government should put more focus on these ramifications. Reform design, the authors argue, should be based on broader objectives including sector-finance viability, adequate investment in new generation, reliability of supply, equitable access of supply, promotion of social equity, environmental protection and effective regulation. Also, regulatory reform is a prerequisite for the effective implementation of the reform program and for the ongoing governance of the industry. A regulatory process with high degree of transparency, accountability, and provision for public participation would contribute to good governance of the electricity sector. This would help achieve balance between various interest groups, for instance, public, consumers and investors.

#### 4. CONCLUSIONS

This paper describes the historical evolution of the Thai electricity industry with emphasis on the internal and external forces that have shaped such evolution. It then examines the veracity of purported rationale for electricity reform in Thailand. A review of the Thai electricity reform reveals that the purported rationale for a market-oriented reform is unsupportable on the basis of the technological, economic, environmental, social and political realities prevalent in Thailand. This is because the socio-economic realities in Thailand are not conducive to the undertaking of market reform as proposed. These realities include macroeconomic conditions, its power system, its political situation, the size of country and the capacity of its domestic financial market and institutions. This paper also recommends that regulatory reform should be undertaken prior to structural reform.

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