

Chapter 2

CURRENT STRUCTURE OF MALAYSIA POWER INDUSTRY

2.1 Evolution of the Electricity Supply Industry

Electricity first came to Malaysia in 1894 when a local entrepreneur by the name of Thamboosamy Pillai and a mining tycoon, Loke Yew pumped water from their Selangor tin mine using an electric generator. In 1990, the Raub Australian Gold Mining Company established the first power station on the Rempam River to supply electricity for mining operations and the community nearby.

Public electricity swiftly followed, with Penang recording the first public supply of electricity in the region in 1904. With the growth in demand for electricity, the government of the Federal Malay States (FMS) established the Central Electricity Board to act as adviser to all power-related projects. In 1965, the board was renamed as the National Electricity Board (NEB) and began to purchase all privately owned electrical utilities and subsequently became the monopoly operator in Peninsular Malaysia.

Since the formation of the FMS, Sabah and Sarawak have retained their own power generation and transmission utilities; separate from Peninsular Malaysia. Currently, electricity is provided by state-owned operators, Sabah Electricity Board (SEB) and Sarawak Electricity Supply Corporation (SESCO).

The electricity supply industry in Malaysia is governed by the Electricity Supply Act 1990. The Act provides for licensees to generate, transmit and distribute electricity in the country. The Act is administered by the Department of Electricity Supply under the Ministry of Energy, Telecommunications and Multimedia.

In order to promote competition and improve efficiency and productivity in the electricity sector, the government has implemented a privatisation policy in the energy sector. In 1990, with the enactment of the electricity Supply Act 1990, the former NEB was corporatised. The corporatised utility was privatised in 1992 with the government owning 75% of it. However, the erratic performance of the stock has caused the government to back away from its previous plan of offering the rest of the company on the stock exchange.

The corporatisation and the eventual privatisation of NEB into the present TNB paves the way for privatisation in the power sector. To-date, fourteen (14) independent power producers (IPPs) have been licensed. However, despite the process of privatisation, TNB is likely to remain the dominant player in the country's energy sector in the years to come.⁴

2.2 Regulatory Framework and Policy Formulation

Prior to privatisation, NEB was responsible for the planning of infrastructure requirements in the power sector in Peninsular Malaysia and the Electrical Inspectorate Department (EID) was responsible for licensing of private generators and ensuring the safety of electrical installations and equipment. However, EID was abolished and superseded by the Department of Electricity Supply (DES) with the introduction of the Electricity Supply Act 1990. The new DES, takes over the duties and scope of EID and regulating the industry in both Peninsular and Sabah. In Sarawak, SESCO continues its role by the Sarawak Electricity Supply Ordinance 1992.

The Economic Planning Unit (EPU) of the Prime Minister's Department is responsible for formulating privatization and energy policies, selects, evaluates and approves IPPs. Khazanah Holdings of Malaysia, an investment holding arm

⁴ "Electricity Supply Industry in Malaysia," (2000 Edition), Department of Electricity and Gas Supply Malaysia), pp1.

of the Ministry of Finance (MOF), with a special "golden share", is the controlling shareholder of TNB. The Ministry of Energy, Communications and Multimedia (MECM) is responsible for co-ordination and implementation of energy policies. The Prime Minister and his Cabinet oversee the whole power supply industry and decides on important issues such as privatization and tariff.

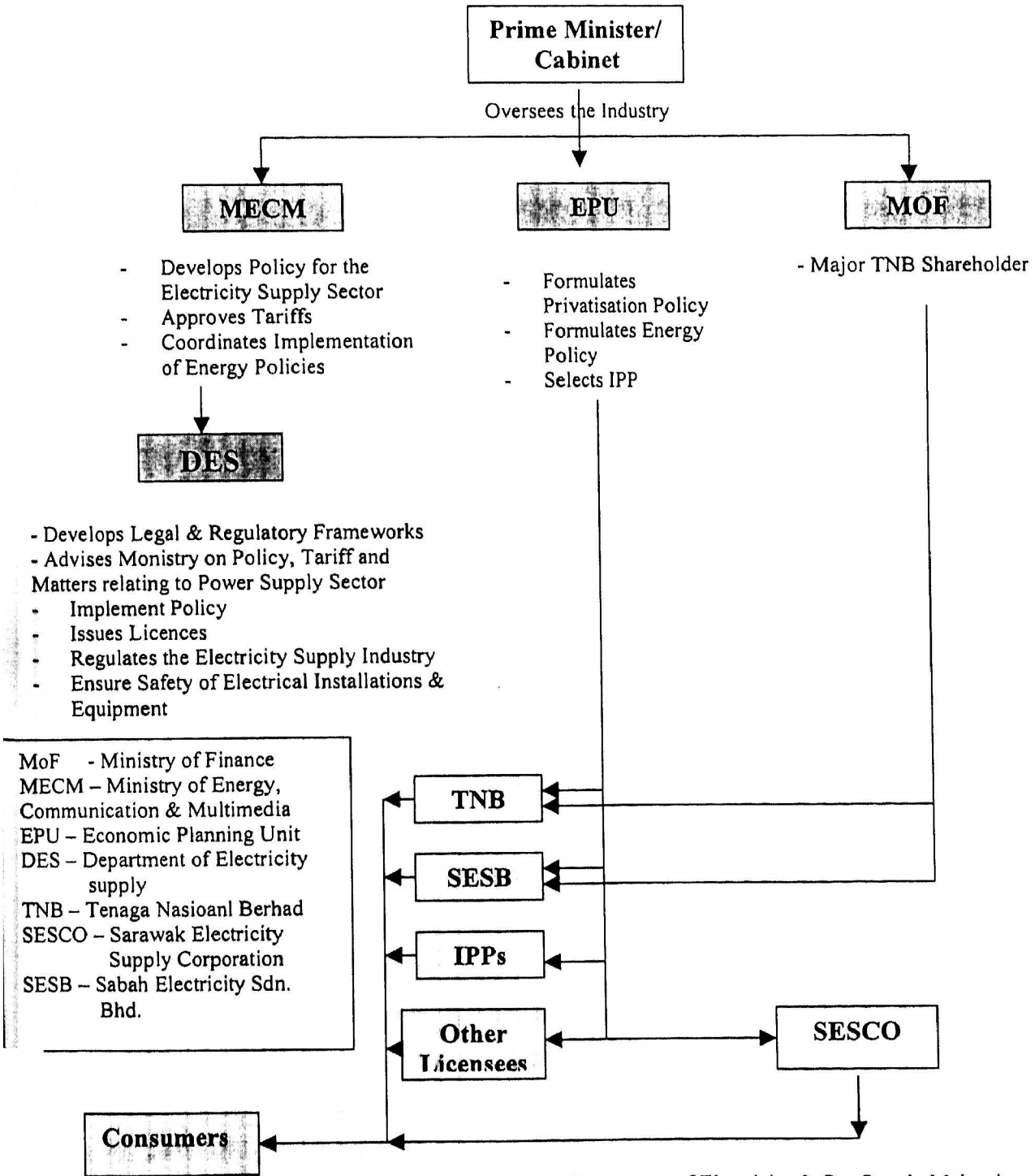
Inter Agency Planning Group (IAGP), which was formed in 1993 takes the task of forecasting and planning new infrastructure capacities in the power sector. IAPG's representatives are from EPU, DES, MECM, MOF, the utilities, the Ministry of International Trade and Industry (MITI) and the other co-opted government authorities like the Department of Environment.

The Electricity Supply Planning Committee was formed under MECM in 1997 to monitor and review the supply and demand situation regularly. This is to ensure adequate power supply with optimum level in the country. Minister of Energy, Communications and Multimedia chaired the committee that represented by DES, EPU, MITI, MECM and the utilities. The committee advises the government regarding all issues affecting power supply industry and planting up requirements.⁵

Figure 2.1 shows the relationship between policy formulating agencies and regulating bodies.

⁵ "Electricity Supply Industry in Malaysia," (2000 Edition), Department of Electricity and Gas Supply Malaysia), pp2.

Figure 2.1
Relationship between Policy Formulating Agencies
and Regulating Bodies



Source: Department of Electricity & Gas Supply Malaysia

2.3 Current Power Industry Structure

2.3.1 Overview

Malaysia's three utilities, Tenaga Nasional Berhad (TNB), Sabah Electricity Board (SEB) and the Sarawak Electricity Supply Corp. are under the jurisdiction of the Electricity Supply, a division of the Ministry of Energy, Communications and Multimedia. Prior to 1999, TNB, SEB and SESCO were vertically integrated utilities, responsible for generation, transmission, distribution and supply of electricity in the Peninsular, Sabah and Sarawak respectively. However, in April 1997, the Energy Minister announced TNB's restructuring.

Since Sept. 1, 1997, TNB has been responsible for only transmission and distribution functions. TNB begun to sell-off its generation assets while a new company, Tenaga Nasional Generation (TNG), was formed to be responsible for TNB's generation assets and sold bulk power to TNB. TNG also acts as IPP and launched its first 2000 MW IPP project in Lumut, Perak through its subsidiary company, TNB Janamanjung.

In January 1997, the government awarded Northern Utility Resources (NUR) a license to generate, distribute and sell electricity to industrial customers in the Kulim High Tech Park (KHTP). This is the first license granted in Malaysia that allows private companies to participate in the power distribution. This move is a part of the restructuring plans for Malaysia's electricity industry and it undercuts utilities' monopoly in distribution sector.

In the 3rd quarter of 1998, a grid system management division was established. The establishment indicates creation of an Independent Grid System Operator (IGSO) by 2000, which will manage the transmission and distribution system. This is part of government's plan to separate electricity generation from transmission and distribution. Although TNB will still own the transmission assets

at this time, eventually the government may allow the private sector to have a stake in the IGSO. IGSO will be responsible for forecasting and planning expansions and also purchasing of electricity from IPPs through a competitive pricing structure rather than relying solely on power purchase agreements.

In the 2nd quarter of 1998, TNB, Petronas and Sabah state government agreed to invest \$US 394 million in SEB for the next seven years as a move for SEB to position itself towards greater access to public capital. Under this investment, TNB holds 60% of SEB whereas Petronas and Sabah state-owned government each holds 20%.

Currently, SESCO is still enjoying a monopoly in both generation and distribution. But eventually SESCO will follow TNB's steps in opening up its generation and distribution sectors to private companies.⁶

2.3.2 Generation Profile

Malaysia's total installed capacity is about 12,630 MW while TNB owns about 7,500 MW. TNB has about 5 million consumers and about 92% of the population are connected to the electric grid. Peak demand is about 7, 100 MW with estimated annual load growth of between 10% to 15%.

The government estimates Malaysia will need 16,500 MW by 2005 and 40,000 MW by 2020. However, short-term needs of power have been filled by projects that had already applied for and received IPP licenses that were awarded to private companies by the government. All new capacity after 2005 will be available for private sectors through competitive bidding.⁷

⁶ "Electricity Supply Industry in Malaysia," (2000 Edition), Department of Electricity and Gas Supply Malaysia), pp10.

⁷"Generation Development in Malaysia," (January 12, 2001), The New Straits Times

2.3.3 Transmission System

The transmission system, known as the National Grid, covers the whole of Peninsular Malaysia. It spans 12,400 km and operates mainly at 132kV and 275kV, connecting TNB and the IPP stations to load centres. The National Grid is interconnected with the transmission system of the Electricity Generating Authority of Thailand in the north and Singapore Power Ltd in the south. The rapid growth in electricity demand has resulted in TNB installing a 500kV line as the new backbone. This project is intended to provide more reliable, higher quality supply and comprises of two phases. Phase one covering northern Peninsular and runs from Port Klang to Gurun. Phase two covers the southern Peninsular from Pasir Gudang to Yong Peng. TNB had also installed two 14km circuits of 275kV submarine cable and reinforced the 275kV transmission network in the northern areas and Kuala Lumpur transmission network.

TNB's Distribution Engineering Department is undertaking various activities to upgrade service quality, reduce the number and duration of breakdowns and upgrade system efficiency. Facilities such as a Distribution Automation System, the Supervisory Control and the Geographical Information System are to be installed.

In Sabah, SEB's transmission system comprises 497km of 132kV lines and 116km of 66kV power lines. It has 18 transmission substations with 953MVA capacity. In terms of distribution, there are 8,285km of overhead lines and 1,554km of underground cables. It has 2,866 distribution substations of 1,049 MVA capacity.

In Sarawak, a total of \$104 million was spent in 1995 on extensions and reinforcement of electricity supply systems. Among other projects, the reinforcements included the Kuching 132kV outer ring, the 275kV transmission

line from Bintulu to Miri, and the general improvement to the distribution network.⁸

2.3.4 Fuel Profile

In earlier days, the generation depends heavily on oil as a source of energy. However, revised energy strategy has diversified the energy supply by using other resources such as gas, hydro, coal or solar. By 2000, many of the newly constructed power plants or 70% of installed capacity are gas-fired. This again prompted the government to implement new policy limiting the use of natural gas for the generation after 2000. It is expected that under the new policy, hydroelectric will replace natural gas as the primary energy source.⁹

Estimated fuel reserves in Malaysia are as follows:

Hydro: Total hydro resources in Malaysia are 29,000 MW, with a potential energy of 123 billion kWh annually. Sarawak has more than 70% of the total resources and this untapped hydro potential could potentially be developed and transmitted through submarine cables to Peninsular Malaysia.

Gas: Current level of natural production is 3 billion cubic feet/day, but it is projected to grow to 5 billion cubic feet/day in 2001. Malaysia has gas reserves of 80.9 trillion cubic feet and could last an estimated of 40 years. Currently, Petronas is studying to develop a trans-Asian gas pipelines.

⁸ Information from TNB Generation Sdn. Bhd (July 2001)

⁹ International Private Power Quarterly Report (2001), " Malaysia's Private Power Status," Second Quarter, pp91.

Oil: Malaysia has estimated oil reserves of 3 billion barrels and could last more than 15 years at current levels of consumption.

Coal: Malaysia has an estimated 8.5 million tons of coal and 311 million tons of lignite and brown coal reserves.