



Thailand



Photo: Bloomberg

Because of the economic crisis in the year 1997, an electricity demand fluctuation in Thailand surfaced. As per records, the average growth of peak power demand was 6.3 percent per annum (highest of 8.8 percent in 2000, and lowest of 2.6 percent in 2006) while the average growth of electricity energy demand was 6.5 percent per year (highest of 7.8 percent in 2000, and lowest of 5.3 percent in 2006). As of the end of the year 2007, the peak power demand was 22,568 MW, higher than the previous year's by 7.2 percent. Electricity energy demand increased 3.5 percent over the prior year to 146,925 GWh.

In addition, from 2000 to 2007, Thailand's power system had an average load factor of 75

percent, which is expected to be maintained.

Future Power Demand Growth

Thailand's power requirement is rising to maintain its economic progress. The Thailand load forecast subcommittee has issued the electricity demand forecast on March 2007, based mainly on the assumption of the growth of gross domestic product (GDP) as well as governmental policies like promotion of purchasing electricity from small power producers (SPPs) and very small power producers (VSPPs), and promotion of demand side management (DSM) programs.

According to changes in the country's economic and energy situations, the electricity

PROFILE

Capital	Bangkok	Installed Capacity	28,530.3 MW
Area	513,115 km ²	Population Electrified	9%
Population	66 million	Main Voltages (kV)	500, 230, 165, 69, 33, 22
GDP	US\$ 133,857.05 million	Natural Resources	lignite, natural gas, bunker oil
Currency	Baht		

demand forecast as of March 2007 required revising. Subsequently, the revision of September 2007 was officially delivered and used. To serve and support the country's economic growth target, it is anticipated that in the next fifteen years (2007 – 2021), the peak power demand of the country will grow at an average rate of 5.68 percent while the electricity energy demand will grow at the rate of 5.71 percent on average, reaching 48,958 MW in peak demand and 319,722 GWh in energy demand by the year 2021. With an expected annual average GDP growth rate of 5.4 percent, the power development planning period of 2007 – 2021 with an average energy-to-GDP elasticity translates as a ratio of 1.1.

Although Thailand's electricity demand is growing at a decelerating rate with the economic slowdown and the climate change, the government keeps trying to stimulate the economy, and that will directly affect the country's growth of power demand.

Power Development Plan

The fifteen-year Thailand Power Development Plan (PDP) 2007 - 2021 is used for arranging the country's overall plan of power plant construction in meeting future power demand, in accordance with the governmental energy policies, power system reliability and availability, environmental concerns for sustainable development. Based on the criterion of maintaining a system reliability level by keeping system reserve margin to be not less than 15 percent, to serve the peak power demand within the next fifteen years forecasted to increase from 22,586 MW in the year 2007 to 37,383 MW in the year 2016 and further to 48,958 MW by the year 2021, with an average reserve margin of 19.3 percent, a total additional capacity of around 38,000 MW is required.

As the intention of the government on promoting private sector participation in the power generation industry, the new power projects will be not only provided by EGAT, but also by private power producers as IPPs and SPPs. For the IPPs power projects as of the year 2015, the successful bidders have already been selected and under negotiation of the power purchase agreement. However, a new round of solicitation for an additional power purchase



Photo: Bloomberg

from IPPs for the following years will be later announced.

From the year 2008 to 2010, the power projects about 6,600 MW are under construction comprising approximately 3,200 MW of EGAT power projects – of this amount, 81.7 MW belongs to renewable energy projects, 2,100 MW of IPPs power projects, 300 MW of SPPs power projects, and 920 MW of the power purchased projects from neighboring countries. The following years 2011 – 2021, additional capacity is projected as shown in the following Table 2.

The projected additional capacity over the next fifteen years planning horizon includes: 13,400 MW of natural gas and LNG, 4,640 MW of imported coal, 4,000 MW of nuclear power, 81.7 MW of renewable energy, 1,769 MW of SPPs cogeneration/renewable energy, and 14,144 MW of power imported from Lao PDR.

Electricity Consumption

In the year 2007, Thailand electricity consumption totalled 133,278 GWh, with a slight increase rate of 4.31 percent over the year 2006. The largest customer was industrial sector accounted

for 64,643 GWh or 48.50 percent of the total electricity consumption of the country, followed by commercial or business sector of 33,304 GWh or 24.99 percent, residential sector of 27,938 GWh or 20.96 percent, and others sector of 7,393 GWh or 5.55 percent.

Compared to the year 2006, the growth rate of electricity consumption of industrial sector and residential sector slightly increased at a lower rate of 3.54 percent and 4.07 percent respectively while commercial sector and others sector grew with the consumption growth rate of 5.22 percent and 7.98 percent respectively.

In accordance with the governmental policies on stimulating Thai economy and promoting energy efficiency and energy saving, the total electricity consumption is anticipated to increase by 8.79 percent to reach 144,914 GWh by the year 2008; and additionally, the total electricity consumption would probably increase to be around a double by the year 2021.

Electrification

To serve remote rural areas with electricity, several programs for development are being planned and implemented. Those projects include grid extensions, micro and mini hydropower projects, stand-alone solar power, and stand-alone diesel engine generators. At the end of 2007, the village electrification rate was 98.1 percent, while the household electrification rate was 84.9 percent. However, it is expected that this figure will be gradually improved in accordance with the country's power system development, including transmission and distribution systems expansions.

Renewable Energy

To reduce the country's dependence to fossil fuels, and to promote the environmental friendly energy resources, the indigenous resources as renewable energy resources are promoted and encouraged by the government. The government has targeted to hit 8 percent of renewable energy share in the total energy uses by the year 2011. To facilitate and to achieve the target, several strategies, such as BOI incentives, research and development supports, Renewable Portfolio Standard (RPS) programs, and adder

cost incentives, have been applied. Of the target 8 percent, 1.3 percent has been allocated for the electricity generation activities, 4.8 percent for heat generation activities, and 1.9 percent for the use of ethanol and bio-diesel.

For 1.3 percent, the target of electricity capacity was set at 3,276 MW, with the existing of 1,621 MW, RPS program of 80 MW, and the remaining allocated for the generating capacity by adder cost incentive program. Additionally, for the new governmental energy policies, as of April 2008, renewable energy target was set to 12 percent. Under the current Power Development Plan (PDP) 2007 – 2021, the RPS program which requires five percent of new power capacities from renewable energy has been taken into consideration. EGAT has an RPS obligation of 140 MW for development of 2,800 MW fossil-fired power plants completed by the year 2010. To meet the RPS obligation, EGAT planned to develop renewable energy projects of 81.7 MW; and around 60 MW will be covered by the power purchased from the renewable energy fuelled SPPs through bidding process.

EGAT's own renewable energy projects consists of 78.7 MW of six small hydropower projects to be developed downstream of the irrigation dams of the Royal Irrigation Department, one MW of solar cell power project, and two MW of wind power projects. Furthermore, the adder cost incentive mechanism can also be applied for the SPPs using renewable energy in order to support the government's renewable energy promotion. As of the year 2007, the renewable energy contributed only one percent of total installed generating capacity. The installed generating capacity of renewable energy in EGAT power system totalled 288 MW. Of this amount, 1.03 MW or 0.4 percent was generated by EGAT, and 287 MW or 99.6 percent was purchased from SPPs using renewable energy – the actual installed capacity of SPPs using renewable energy was around 415 MW and the remaining of 128 MW was sold to their direct customers nearby the power plants.

The indigenous renewable energy resources of the country include solar energy, wind energy, bagasse, rice husk and wood residue, black liquor, oil palm residue, and municipal solid waste.

Energy Supply by EGAT's System year 2007		
Power Plant	Energy	
	GWh	%
Energy of EGAT		
Hydro	7,960.62	5.42
Thermal	32,146.46	21.88
Combined Cycle	24,762.91	16.86
Gas Turbine	901.32	0.61
Diesel	1.22	
Renewable Energy	2.64	0.00180
TOTAL	65,775.17	44.77
EGAT Purchase		
Neighbouring Countries supply		
LAO - NAM NGUM & XESET	267.98	0.18
-THEUN HINBOUN	1,489.25	1.01
- HOUAY - HO	473.18	0.32
TNB	2,260.47	1.54
Total	4,490.88	3.05
Local Supply		
REGCO(Rayong)	3,895.08	2.65
KEGCO (Khanom)	6,006.34	4.09
IPT	4,742.07	3.23
Tri Energy	5,402.93	3.68
RGCO	19,905.48	13.55
Glow IPP	5,175.34	3.52
EPEC	2,582.82	1.76
BLCP	10,155.69	6.91
GPG	4,300.96	2.93
RGCO POWER	66.72	0.05
SPP	14,404.31	9.80
DEDP (Khiri Dharn)	21.70	0.01
TOTAL	76,659.44	52.18
Grand Total	146,925.49	100.00
	System Control and operation Division	