THAI ENERGY DEVELOPMENT PLAN during the Eight National Economic and Social Development Plan (1997-2001)

Introduction

This document is prepared in pursuance of the Eighth National Economic and Social Development Plan (1997-2001), which was promulgated on 1 October 1996, and the Cabinet resolution of 4 October 1996 approving the **Manual on the Implementation of the Eighth National Plan**, which is aimed to be the framework for ministries, bureaus and departments concerned in developing their respective operational plans in conformity with the strategies stipulated in the Eighth National Plan.

The National Energy Policy Office (NEPO), being a national policy making mechanism for energy, is therefore responsible for the follow-up on the implementation of the Manual by coordinating the formulation of an operational framework to be a guideline for individual energy-related agencies and to be incorporated into their respective operational plans. In this regard, NEPO and energy-related agencies have jointly established the energy operational plan during the Eighth National Plan with clearly specified targets, strategies, planning and measures related to energy to be used as a framework for the development of workplans and energy-related projects of each concerned agency so as to ensure the unity of the work in the energy sector. At the same time, the framework shall be used by NEPO in monitoring and regulating the work of concerned agencies so that the specified targets could be successfully accomplished.

This document on *"Strategies for the Energy Development during the Eighth National Economic and Social Development Plan (1997-2001)"*, being a part of the above-mentioned energy operational plan during the Eighth National Plan, was approved by the National Energy Policy Council on 30 July 1997.

Energy Policy and Planning Division
National Energy Policy Office
Office of the Prime Minister
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Strategies for the Energy Development during the Eight National Economic and Social Development Plan (1997-2001)

In order to develop the international competitiveness of the country, a sufficient supply of energy to meet the demand in various economic activities is essential since energy is a crucial fundamental production factor. The supply of energy must be at reasonable prices with sufficiently high quality consistent with consumers' requirements. At the same time, production activities must utilize energy in an efficient and economical manner. In order to achieve such energy development objectives, the following targets of the energy development during the Eighth National Economic and Social Development Plan period have been established:

1. Targets of Energy Development

1.1 Increase commercial primary energy production at an annual growth rate of 5.0 per cent during the Eighth National Plan period.

1.2 Maintain the growth rate of the domestic primary commercial energy consumption at a similar level to the growth rate of the gross domestic product during the Eighth National Plan period.

1.3 Maintain the level of energy import dependence at below 75 per cent by the year 2001.

1.4 Set targets for domestic production of natural gas (excluding those in the Malaysia-Thailand Joint Development Area: JDA), crude oil, condensate and coal/lignite as follows:

	1996	2001

Natural gas (million cubic feet/day)	1,270	2,424
Condensate (barrels/day)	35,700	68,500
Crude oil (barrels/day)	26,500	28,050
Coal/lignite (million tons/year)	21.3	21.9
- for electricity generation	16.4	14.4
- for industrial use	4.9	7.5

1.5 Set targets for energy import as follows:

	2001
Power purchase from new projects (megawatt)	
- The Lao People's Democratic Republic (Lao PDR)	313
- Malaysia (purchase/exchange)	300
Natural gas (million cubic feet/day)	
- The Union of Myanmar	729
- Thailand-Malaysia JDA resources	503

1.6 Increase the electricity generating capacity by power plants of the Electricity Generating Authority of Thailand during the Eighth National Plan period by 6,200 megawatts; purchase power from Independent Power Producers (IPP), totaling 4,120 megawatts, and from Small Power Producers (SPP) using non-conventional energy or cogeneration system totaling 2,500 megawatts.

1.7 Reduction of power consumption through demand side management measures by 1,400 megawatts during the Eighth National Plan period, and reduction of energy consumption through the implementation of the Energy Conservation Promotion Act of approximately one million tons per year of crude oil equivalence by the end of the Eighth National Plan period.

1.8 Establish the reliability standard of the power system as follows:

(1) Reserve capacity of the power system at no less than 20-25 per cent of the maximum power demand by the end of the Eighth National Plan period.

(2) System average interruption frequency index (SAIFI):

Unit: Frequencies/year/user	**1996**	**2001**
Within the MEA service areas		
Permanent Outage	5.42	3.72
- Industrial areas	5.60	4.47
- Urban and commercial areas	4.71	3.23
- Rural areas	8.47	5.81
Within the PEA service areas		
Permanent outage	19.10	17.50
- Industrial areas	5.20	4.40
- Urban and commercial areas	13.90	12.70
- Rural areas	20.10	18.30

(3) System average interruption duration index (SAIDI):

Unit: minutes/year/user	**1996**	**2001**
Within the MEA service areas		
Permanent outage	132.93	99.65
- Industrial areas	153.94	115.40
- Urban and commercial areas	113.89	85.38
- Rural areas	240.84	180.54
Within the PEA service areas		
Permanent outage	1,719.00	1,050.00
- Industrial areas	208.00	132.00
- Urban and commercial areas	1,042.50	635.00
- Rural areas	1,869.30	1,152.90

1.9 Limit emission of sulfur dioxide from commercial energy consumption to the following levels:

Unit: Thousand tons	**1996**	**2001**
Vehicles	59	20
Electricity generation	677	205
Industry and others	246	330
TOTAL	982	555

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2. Strategies for Energy Sector Development

In order to efficiently achieve the above-mentioned targets, the following strategies for energy sector development during the Eighth National Plan have been established:

2.1 Provide an adequate amount of energy to satisfy demand at reasonable prices while ensuring quality and security of supply as follows:

2.1.1 *Speed up exploration and development of petroleum and coal resources*.

- Promote and encourage the exploration and development of domestic petroleum resources, and encourage the application of petroleum information and modern technology so that the petroleum exploration and development of the country would be more efficient.
- Speed up petroleum resource development under the Malaysia-Thailand Joint Authority as stipulated in the Malaysia-Thailand Joint Authority Act, B.E. 2533 (1990) to encourage exploration and development of natural gas in the Joint Development Area.
- Speed up exploration for additional coal resources to ensure adequate primary energy reserves for future use by improving and amending rules and regulations which hinder coal development, particularly by amending the Minerals Act to enable a more efficient and systematic development of coal resources. Besides, immediate consideration should be given to concession granting to the private sector to develop coal mines initially explored by the Department of Mineral Resources, and the application of modern technology should be encouraged so that utilization of coal in electricity generation and in the industrial sector would cause the minimal impacts towards the environment, for example, coal slurry, coal gasification or coke production and by-product utilization.
- Accelerate the feasibility study for developing the oil shale resource at Mae Sod Basin, Tak province.

2.1.2 *Speed up negotiations and energy development with neighboring countries.*

- Speed up negotiations and finalize power purchase agreements of up to 3,000 megawatts from projects in the Lao PDR as agreed in the Memorandum of Understanding between the two countries.
- Develop and improve interconnection of the transmission systems between Thailand and neighboring countries, especially the six countries in the Mekong Basin sub-regional group, in order to create mutual economic benefits and reliability of the power system.
- Encourage joint feasibility studies of hydropower projects in the Mekong Basin, Salawin Basin and other basin in neighboring countries as well as encourage investors/ governments of those countries to submit their proposals for power sale to Thailand. Serious consideration and negotiations should be made so that power purchase agreements could be agreed upon.
- Negotiate with the governments of Vietnam and Cambodia to determine the maritime boundary line in the contiguous or overlapping zones in the Gulf of Thailand and/or to seek common benefits from petroleum resources.
- Negotiate and find a conclusion on further purchase of natural gas from the Union of Myanmar, for example, from the Yetagun field, and ensure that the natural gas import project from the Union of Myanmar proceeds in line with the established schedule.
- Negotiate with Malaysia on the purchase of electricity and/or natural gas.
- Negotiate with Indonesia on the purchase of natural gas from Natuna field.

2.1.3 *Consider the feasibilities and determine regulatory framework* for the use of nuclear energy for electricity generation and speed up energy procurement from foreign sources, in particular that of liquefied natural gas (LNG), orimulsion and coal, to ensure sufficient supply of energy to satisfy the domestic demand. This will help to diversify both sources and types of fuels and ensure competitive prices of fuels.

2.1.4 *Encourage the Thai energy companies to enter into joint ventures on energy development abroad*, which will help enhance the country's energy supply security.

2.1.5 *Invest to increase reserve capacity for power generation* and improve the power transmission and distribution system to ensure reliability of the power system, especially in industrial areas and new economic zones in various regions, as well as speed up relocation of electrical cables underground, particularly in the Bangkok Metropolis and major urban centers in other regions. In this regard, the electricity utilities are to coordinate and cooperate closely with city planning units to ensure that the relocation of integrated public infrastructure is complied with city plans.

2.1.6 *Establish the customer-service quality standards of the electricity supply industry*, which will be a criterion in providing services and in evaluating the performance of the three electricity utilities, by providing incentives for the utilities to improve their service quality and imposing penalties in case of non-compliance.

2.2 Promote efficient and economical use of energy

Efficient and economical use of energy will help reduce not only investment requirements in energy supply but also fuel costs in various production processes. Consequently, efficient use of energy will increase the country's competitiveness in the international arena. In this regard, basic policy measures to be implemented are pricing measures which will induce efficient use of energy; provision of additional incentives, raising of the general public's awareness, and compulsory measures. These can be elaborated as follows:

2.2.1 *Revise the petroleum pricing structure* so that it truly reflects the economic costs of supply, and maintain the current price setting mechanism which allows prices to fluctuate according to the market forces and competition, without political intervention, in order to encourage efficient and economical use of energy.

2.2.2 *Improve the electricity tariff for both retail and wholesale levels* so that the tariff could reflect the actual supply costs, and be transparent and flexible, and that the tariff determination mechanism could actually be depoliticised. At the same time, an incentive system will be created for the electricity utilities to improve their operational efficiency, and customer-service quality, whereas promotion of the demand side management and increase of the private sector role have to be intensified.

2.2.3 *Set guidelines in determining prices of natural gas and pipeline tariff*, and develop a clear and transparent regulatory system. In this respect, the gas pipeline system shall be a public utility and gas purchase shall reflect commitments on quantity, actual costs, cost of alternative energy, and quality in order to provide assurance among natural gas producers and consumers. Incentives should also be provided for natural gas distributors to improve their efficiency.

2.2.4 *Speed up the implementation of the Demand Side Management program* and the energy conservation program to be implemented under the framework of the Energy Conservation Promotion Act, B.E. 2535 (1992), particularly in the following:

- To utilize the Energy Conservation Promotion Fund in providing incentives to energy conservation projects.
- To speed up the implementation of energy conservation program in designated factories and buildings.
- To promote extensive utilization of renewable energy with low impacts on the environment, and promote efficient use of energy in rural production activities.
- To promote research and development in areas related to energy technology and energy conservation, including the application of research and development work to factories, buildings and households.
- To develop human resources and promote co-operation between the government and the private sectors in order to ensure efficient implementation of the energy conservation plan.

2.2.5 *Speed up the establishment of the testing standards* and the minimum energy efficiency standards of electrical appliances and equipment, as well as the energy efficiency labeling system, and promote production of energy efficient appliances and equipment or materials which are used in energy conservation activities.

2.2.6 *Promote the establishment of the Energy Efficiency Technology Information Center in major urban centers* where energy conservation equipment and appliances can be demonstrated and where the local general public and interested individuals can have access to energy-related information.

2.2.7 *Implement public relations work* to raise the general public's awareness in energy conservation and to continuously create good attitude towards energy conservation among each target group.

2.3 Promote competition in energy supply industry and increase private sector role

The increase of competition in energy supply industry and the promotion of a greater private sector role will lead to efficient utilization, procurement and distribution of energy as well as a reduction in investment burden of the government. This will also enhance capital market development and savings mobilization from the private sector, and enable the public to participate in energy development. This could be achieved through the following measures:

2.3.1 ***Petroleum***

- Restructure and privatize the Petroleum Authority of Thailand (PTT) in order to increase its efficiency and flexibility which will enable it to compete with the private sector thereby creating a more efficient and competitive petroleum market. To attain this, the oil business and gas pipeline business

of the PTT should be transformed into subsidiary companies of the PTT, with the PTT initially holding all shares; later a portion of the shares of the subsidiaries shall be made available to the general public by listing appropriate portions in the stock market.
- Introduce third party access into the PTT's natural gas pipeline system and, in the long run, make the system a common carrier in order to allow the gas pipeline system to provide transportation services to other gas traders and allow direct gas sale between gas producers and gas users. Moreover, the role of the private sector in the pipeline business should be expanded, particularly in the sub-system of the main natural gas pipeline system.
- Continue to promote free and fair competition in the refined oil market from the previous National Plan period, for instance, liberalization of investment in domestic petroleum refining capacity and ensuring fair criteria for all petroleum refining operators, increasing the number of service stations together with an increase in number of brand names, reducing monopoly of the PTT in the sale of petroleum to government agencies. In addition, procedures for license granting for new service stations should be speeded up, and rules and regulations for setting up service stations should be amended to be in line with current economic and social conditions and technological development so as to encourage greater dispersion of service stations in rural areas and to reduce operating costs of service stations in urban areas where land prices are expensive.
- Promote free and fair competition at every stage in the liquefied petroleum gas (LPG) market, particularly by lifting control on LPG imports, reducing subsidy for domestic LPG producers, and planning for the eventual deregulation of LPG prices.
- Encourage foreign and Thai investors to engage in joint ventures on the projects in the Southern Seaboard Area, for instance, refineries, storage terminals, distribution terminals and other infrastructure.
- Improve the efficiency of oil and LPG distribution systems in order to lower oil distribution costs in the long run by dispersing oil and LPG distribution centers away from Bangkok as well as considering the extension of the existing oil pipeline network to the northern and the northeastern regions of Thailand.

2.3.2 ***Electricity***

- Accelerate the implementation of power purchase from Independent Power Producers (IPP) under the first round of solicitation and from Small Power Producers (SPP), and issue power purchase solicitation for the subsequent rounds.
- Restructure and privatize the electricity supply industry in order to increase competition and efficiency, as well as improve organizational structure and administration of the state-owned electricity utilities in order to commercialize and to increase efficiency in their operations, investment, and personnel development. In the medium term, the power transmission system shall be made neutral towards power purchasing from various producers; in the long term, the power transmission and distribution systems shall become a common carrier and power producers shall be allowed to directly sell electricity to certain categories of consumers by paying fairly regulated transmission and distribution wheeling charges.

2.4 Prevent and solve environmental problems resulting from energy development and utilization, as well as improve safety of energy-related activities

2.4.1 Study the feasibility on the extension of the mandatory requirement for sale of fuel oil *grades 1 - 4* (with no more than 2.0% of sulfur content) and *grade 5* (with no more than 0.5% of sulfur content), which currently covers not only the Bangkok Metropolis and Samut Prakarn province, to other provinces where industrial factories are located, e.g. Chachoengsao, Samut Sakon and Pathum Thani. Consider the appropriateness to further lowering the sulfur content in fuel oil according to the severity of the air pollution problem in Bangkok, Samut Prakarn and other provinces where a large number of industrial factories are located.

2.4.2 Advance the date for the mandatory sale of the low sulfur diesel oil with 0.05% by weight of sulfur to 1 January 1999 in order to correspond with the vehicle emission standards to be enforced. Consider further improvement of quality specifications of gasoline and high speed diesel in order to reduce pollution, e.g. the reduction of sulfur content in gasoline, the increase of cetane number and the decrease of specific gravity in diesel.

2.4.3 Control and monitor the storage and disposal of lube oil residue and used lube oils, and promote investment in technically sound recycling system for used lube oil.

2.4.4 Install vapor recovery systems in oil depots, oil trucks and petroleum service stations in the Bangkok Metropolis and major urban centers.

2.4.5 Promote substitution of fuel oil by clean fuels, such as natural gas and LPG, in power plants and in industrial factories, in particular in the areas where a large number of industrial factories are located, as well as speed up the application of natural gas in commercial vehicles in order to reduce air pollution, especially in the Bangkok Metropolitan area.

2.4.6 Improve the standards and regulations on safety in energy transportation, storage and utilization, in particular oil trucks, oil tankers, and LPG utilization, and ensure strict enforcement of such standards and regulations.

2.4.7 Encourage garbage disposal projects which yield energy as a by-product in order to reduce environmental problems in large communities.

2.5 Develop Legislation related to energy and energy administration mechanism

2.5.1 Accelerate the proclamation of the Oil Control Act, B.E. ... to replace the Oil Storage Act, B.E. 2474 (1931) which is obsolete, and amend the Fuel Oil Act, B.E. 2521 (1978) which has already been approved by the cabinet.

2.5.2 Amend the Revolutionary Decree No. 28, legislation and regulations related to LPG to ensure that the LPG business would be safe, organized and fair for all parties.

2.5.3 Consider the appropriateness of establishing an *Independent Regulatory Body* to independently regulate energy-related activities in order to provide assurance for investors and at the same time to ensure fairness for energy consumers.

Energy Policy and Planning Division
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