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Electricity regulation in Thailand: overview

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OVERVIEW

Electricity market

1. What is the role of the electricity market in your jurisdiction?

Overview

The Electricity Generating Authority of Thailand (EGAT) is responsible for the regulation of:

- Electric power generation.
- Transmission.
- Bulk sale.

EGAT is a state-owned agency under the supervision of the Ministry of Energy. It is the largest power producer in Thailand, owning and operating power plants of different types and sizes that are located in 40 sites across the country, with a total installed capacity of 15,010.13 megawatts. The power generation facilities consist of:

- Three thermal power plants.
- Six combined cycle power plants.
- 22 hydropower plants.
- Eight renewable energy plants.
- One diesel power plant.

EGAT also owns and operates a high-voltage transmission network that covers all of Thailand.

Thailand adopts an enhanced single buyer (ESB) model for its electricity supply industry. Under this model, EGAT purchases bulk electricity from private power producers and neighbouring countries and then sells wholesale electric energy to two main distributing authorities, the Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA), as well as a small number of direct industrial customers and neighbouring utilities.

Recent trends

In December 2016, the government announced that it will continue following Thailand's power development plan for 2015 to 2036 (PDP 2015). The plan forecasts a decline in electricity demand in line with the expected decline in economic growth from 3.94% to 4.41%. PDP 2015 is also aligned with Thailand's energy conservation plan and alternative energy development plan. PDP 2015 was based on three major criteria:

- **Security of national power system.** The PDP aims to be less dependent on natural gas as a power source, with a reduction target of no more than 40% in 2036 from the current 65%. It aims to increase reliance on alternative and renewable energy, clean coal, and electricity imports from neighbouring countries.
- **Ecology.** The PDP aims to increase production of renewable energy to reduce carbon monoxide emissions within 2036 through the implementation of energy conservation measures in four key target groups:
  - industry;
  - business buildings;
  - houses; and
  - the public sector.
- It predicts that this may result in a decrease of electricity demand of 89,672 gigawatt hours (GWh) in 2036.
- **Economy.** The PDP aims to determine an appropriate electricity rate that effectively reflects actual cost, production/transmission/sales systems, and makes the least impact on people's cost of living. It is estimated that the average electricity rate throughout PDP 2015 is at 4.587 Baht per GWh.

2016 also saw the pilot project for solar PV rooftop for self-consumption of 100 MWP for government agencies and agricultural cooperatives. Also, under the FIT program, 67 projects have won the right to sell a total of 281.32 MW of solar power to the national grid for 25 years.

For an overview of FIT, see Question 7.

Regulatory structure

See above, *Overview*.

2. What is the regulatory framework for the electricity sector?

Regulatory framework

The Electricity Generating Authority of Thailand (EGAT) has its own power generation facilities and also purchases from independent power producers and neighboring countries. It is the country's sole system operator, managing and controlling the dispatch of power generation both from its own power plants and from private power plants, via the National Control Centre and five regional control centres. It also owns and operates the national transmission network that includes transmission lines and substations of various high voltage levels, which covers all of Thailand.

Regulatory authorities

See box, *The regulatory authorities*.

ELECTRICITY COMPANIES

3. What are the main companies involved in electricity generation, transmission, distribution and supply?

Generation

The main electricity generating companies are:

- **Electricity Generating Authority of Thailand (EGAT).** EGAT generates, transmits and sells electric energy to the Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA) which distribute and sell electricity to customers.
- **Electricity Generating Public Company Limited (EGCO).** This is involved in the private electricity generation business.
- **Ratchaburi Electricity Generating Holding Public Company Limited.** This is involved in the private electricity generation business.
- **Other independent power producers.** This includes small power producers owning power plants.

Private sector investment in the generation business is actively promoted by the government through bid solicitations for power purchase from large-scale independent power producers (IPPs) and small power producers (SPPs). Under the terms and regulations provided by the Energy Regulatory Commission (ERC), EGAT remains the single buyer of bulk electricity to ensure:

- The best interests of public consumers.
- Energy resource optimisation.
- Fairness to all.

Transmission

See *Question 2, Regulatory framework.*

Distribution

The main distribution companies are:

- MEA.
- PEA.

EGAT is responsible for providing electric energy for all of Thailand by generating, transmitting, and selling electricity to MEA, PEA, a number of direct customers prescribed by law, and neighbouring countries.

Supply

The Thai electricity supply industry is based on a state-owned enhanced single-buyer scheme. EGAT is the single buyer of bulk electricity, under terms and regulations set by the Energy Regulatory Commission (ERC) to ensure the best interests of public consumers, energy resource optimisation, and fairness to all. It sells electricity to:

- MEA for the Bangkok metropolitan area and the provinces of Nonthaburi and Samutprakan.
- PEA for the remaining provinces.
- A number of direct customers prescribed by law, including Siam Cement Group (SCG), Chonlaprathan Cement Company Limited, and HMC Polymers.
- Neighbouring countries.

Unbundling requirements

There is no separation of services and EGAT is responsible for the generation, transmission, distribution, and supply of electricity throughout the country.

Foreign ownership

4. Are there any restrictions concerning the foreign ownership of electricity companies or assets?

Generally, foreign ownership must not exceed 49% of the total shares. However, certain electricity companies have lower thresholds provided in their articles of association (for example, Ratchaburi Electricity Generating Holding Public Company Limited's foreign ownership limit is 25%, and Electricity Generating Public Company Limited's (EGCO) is 44.81%). These limitations on foreign shareholders are prescribed by Thai Law in various industries.

Import and export of electricity

5. To what extent is electricity imported and/or exported?

In January 2017, the Electricity Generating Authority of Thailand (EGAT) purchased 3,577.6 megawatts of electricity from neighbouring countries, accounting for 9.45% of total electricity generated. During this period, EGAT generated 16,385.13 megawatts, of which 39.86% was generated from its own power plants and the remainder purchased from domestic private power plants, independent power producers, and neighbouring countries.

ELECTRICITY GENERATION AND RENEWABLE ENERGY

Sources of electricity generation

6. What are the main sources of electricity generation?

In March 2017, EGAT's share of electricity generation was:

- Natural gas: 33.2% of total generation.
- Lignite: 12.3% of total generation.
- Hydropower: 4.4% of total generation.
- Other (diesel, renewables, etc.): 0.1% of total generation.
- Purchased: 50% of total generation.

7. Are there any government policies, targets or incentives in place to encourage the use of renewable or low carbon energy?

Government policies/incentives

The power development plan (PDP) 2015 focuses on the increase in use of renewable energy and reduction of reliance on natural gas. Electricity capacities from biomass, "clean coal," and nuclear and power imports from neighbouring countries are planned to be increased. Policy makers aim to cut the share of natural gas in total electricity production from the current 64% to between 30% and 40%, while increasing the proportion of renewable energy from the current 8% to between 15% and 20%.

The PDP 2015 also forecasts an increase in the share of coal and lignite to between 20% and 25% from the current 20% by 2036. It aims to increase the capacity of "clean coal" by carbon capture and storage technology (which is currently at 0%). Share of hydro power is targeted at between 15% and 20%, and nuclear power is targeted between 0% and 5%.

The government is currently revising its alternative energy development plan (AEDP 2015) in order to meet these targets.

The AEDP 2015 will be revised according to the following principles:

- Focus on power generation from waste, biomass, and biogas as priorities.
- Allocation of renewable energy generation capacity according to the demand and potential in regions/provinces.

- Solar and wind power to be promoted at a later stage once the cost is competitive with the power generation from liquefied natural gas (LNG).
- Competitive bidding will be employed as a selection process for feed-in tariff (FIT) application instead of first-come, first-serve basis.
- Community energy production will be encouraged to reduce fossil fuel usage.
- Renewable energy consumption will increase from 8% to 20% of final energy consumption by 2036.

In October 2014, the Thai government adopted a new FIT, which replaced the former adder programme. The new FIT will be granted for 20 years, except for power systems fuelled by landfill gas, which will receive support for ten years only. There are varying FIT rates depending on the power plant size and fuel type plant size and varying bonuses are granted for certain systems.

Renewable energy targets

The total current capacity of renewable energy is 9139.65 megawatts, with a 2036 target of 19,635 megawatts. Below are the AEDP targets, which are not legally binding:

- **Waste.** This has a current capacity of 145.28 megawatts and a target of 501 megawatts by 2036.
- **Biomass.** This has a current capacity of 2,814.70 megawatts and a target of 5,570 megawatts by 2036.
- **Biogas.** This has a current capacity of 434.86 megawatts and a target of 3,282 megawatts by 2036.
- **Hydropower.** This has a current capacity of 3,088.52 megawatts and a target of 3,282 megawatts by 2036.
- **Wind.** This has a current capacity of 507.04 megawatts and a target of 3,002 megawatts by 2036.
- **Solar.** This has a current capacity of 2,149.25 megawatts and a target of 6,000 megawatts by 2036.
- **Energy crops.** This does not have any current capacity but has a target capacity of 680 megawatts.

See box, *Renewable energy sources*.

8. What are the main obstacles to the development of renewable energy?

There are no legal or regulatory obstacles to the development of renewable energy.

9. Are there any plans to build new nuclear power stations?

There are currently no formal plans to build new nuclear power stations. However, the power development plan (PDP) 2015 targets a 5% share of nuclear power by 2036.

Authorisation and operating requirements

10. What are the authorisation requirements to construct electricity generation plants?

Local authorities can declare a province as a regulated building area, while other areas will be regulated by default areas and may be subject to land-use and environmental restrictions as governed by the Town and City Planning Act, including amendments and ministerial regulations arising out of this Act. These restrictions vary according to city or town with the purpose of formulating, executing, and enforcing comprehensive city plans to promote, among others:

- Sanitation.
- Convenience.
- Orderliness.
- Attractiveness.
- Utilisation of property.
- Public safety.
- Economic development.
- Social and cultural development.
- Preservation.

For these areas, a building construction permit must be obtained from the Energy Regulatory Commission (ERC). If a building construction permit is required, those involved with the operations must also submit an application for a building certificate to the relevant local government agency.

All "tall buildings" or "extra-large buildings" outside of areas with regulated construction require a building construction permit or must follow the application process under section 39 of the Building Control Act.

A "tall building" is defined in the Building Control Act as a building which a person may live in or inhabit which is at least 23 metres tall from the ground to the roof of the construction or the highest point.

An "extra-large building" is defined in the Building Control Act as a building with a minimum combined area (of all floors) of 10,000 square metres.

Section 39 provides that anyone performing construction, alteration, demolition, or movement of a building may do so without submitting an application to a local official by informing a local authority and undertaking the following:

- Inform a local official and submit the following information and documents:
  - names of those responsible for designing the building holding a professional licence and not included in the circulated list of names (*section 49 bis, Building Control Act*);
  - names of those responsible for designing and calculating the building holding a professional licence and not included in the circulated list of names (*section 49 bis*).
  - name of the supervisor holding a professional licence and not listed in the circulated list of names (section 49 *bis*);
  - copies of the licences;
  - certificates demonstrating that the individuals listed above hold their relevant positions, as well as certifying that the building, alteration, demolition, or moving of the building is correct according to the relevant local laws;
  - blueprints, plans, accompanying designs and relevant calculations of the building operations, alterations, demolition, or moving, which should certify the individuals responsible for designing the building; and
  - the start and finish date of operations.
- Pay costs of reviewing the plans.

Once the applicant has completed this, the local officials will issue a notification of receipt and the applicant may carry out their operations from the date of receiving the receipt.

Alternatively, if an electricity generation plant is to be constructed on an existing industrial estate, a permit to use the land and perform industrial activities must be obtained and a further permit to construct or make alterations to the building must also be obtained.

Section 95 of the Energy Industry Act provides that THB50,000 per megawatt per year must be paid into the Power Development Fund during construction of a plant.

If the plant is to be constructed in an environmental protection area, an environmental impact assessment (EIA) may be required. If the plant does not require an EIA, it must follow the Code of Practice regarding:

- Project preparations.
- Construction.
- Alteration.
- Demolition.

11. Are there any requirements to ensure new power stations are ready for carbon capture and storage (CCS) technology, or requiring a plant to retrofit CCS technology once this is ready?

There are no regulations or requirements concerning carbon capture and storage technology.

12. What are the authorisation and main ongoing requirements to operate electricity generation plants?

Before beginning operations, the licensee must report its scheduled commercial operation date and submit a notification to the local office.

Before construction, the parties involved must submit applications for an energy generation licence, a factory operation licence, and a building construction permit, as relevant (*see Question 8*):

- An electricity generation licence must be obtained for an electricity generation plant to operate. This must be submitted to the Energy Regulatory Commission (ERC) if the plant produces 1,000 volt amps (kVA) or more. Alternatively, an electricity generation licence must be submitted to the Department of Alternative Energy Development and Efficiency if the plant produces between 200 kVA and 1,000 kVA.
- Wind turbines require an energy generation licence from the ERC and must follow Comprehensive Plan regulations and ERC regulations regarding operations. Comprehensive Plan regulations are issued in line with the Comprehensive Plan of the relevant city by the local department.
- For activities not requiring an energy generation licence, the applicant must submit a single line diagram of the system layout, certified by an engineer according to the relevant laws, showing:
  - the power generation system;
  - security or protection; and
  - energy control systems.
- All electricity generation plants must obtain a factory operation licence from the ERC with the following exceptions:
  - energy production through rooftop solar photovoltaic installation at a maximum production of 1,000 kWp; and
  - hydropower energy production.

If the plant is on an industrial estate, it must obtain a permit to use the land and perform industrial activities. The relevant parties must also notify the appropriate authorities at the Department of Industrial Works within 15 days from commencing operations.

All thermal power plants or fuel combustion power plants with an operating capacity of 10 megawatt and all projects in Watershed Class 1 areas (watersheds are classified according to the importance of their protection for purposes of regulating water shortages or floods; Class 1 Watersheds, including 1A and 1B, are the most important of the five classes, which are the most elevated headwaters with the steepest slopes, and are protected by numerous restrictions including those on building regulations and agricultural uses) must also submit an environmental impact assessment (EIA) (*section 46, Enhancement and Conservation of National Environmental Quality Act*). Power plants not mentioned above must follow a code of practice regarding operations, and must submit the results of the Environmental Checklist with all relevant documents to the Energy Regulatory Commission (ERC) as criteria for consideration in issuing an electricity generation licence. If the licensee fails to comply with these regulations or breaches them, this may result in the eventual suspension or withdrawal of the licence.

13. What requirements are there concerning connection of generation to the transmission grid?

Projects regarding the connection of electricity generation to the national transmission grid require an electricity distribution licence or an electricity retail licence.

The Electricity Generating Authority of Thailand (EGAT) is the single buyer of bulk electricity, under terms and regulations set by the Energy Regulatory Commission (ERC) (*see Questions 8 and 10*).

ELECTRICITY TRANSMISSION

Authorisation and operating requirements

14. What are the authorisation requirements to construct electricity transmission networks?

The Electricity Generating Authority of Thailand (EGAT) is responsible for electric power transmission, and is responsible for all of Thailand by transmitting electricity to the Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA), a number of direct customers prescribed by law, and neighbouring countries. It owns and operates the national transmission network which includes transmission lines and substations of various high voltage levels which cover all the country.

All construction of transmission networks is the responsibility of EGAT. EGAT was established by the EGAT Act as an independent electricity authority and is given powers accordingly. It may, however, be controlled by the Prime Minister of Thailand or the Cabinet.

15. What are the authorisation and main ongoing requirements to operate electricity transmission networks?

See above, *Question 14*.

Transmission charges

16. How are the charges and conditions for the transmission of electricity regulated?

See above, *Question 14*.

System balancing

17. How is electricity supply and demand balanced?

Electricity Generating Authority of Thailand (EGAT) is responsible for managing the energy supply and demand in Thailand. In September 1993, EGAT launched the Demand Side Management Programme (DSM) to promote efficient use of electricity and manage demand through voluntary cooperation of consumers and manufacturers. It is normal practice for EGAT to manage demand by increasing the capacity of renewable energy or purchasing energy to meet demand.

For supply, see *Question 3*.

ELECTRICITY DISTRIBUTION

Authorisation and operating requirements

18. What are the authorisation requirements to construct electricity distribution systems?

The Electricity Generating Authority of Thailand (EGAT) is the single buyer of bulk electricity, selling to the Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA), a number of direct consumers prescribed by law, and neighbouring countries.

All construction for electricity distribution systems is the responsibility of EGAT.

19. What are the authorisation and the main ongoing requirements to operate electricity distribution systems?

See above, *Question 18*.

Distribution charges

20. How are the charges and conditions for the distribution of electricity regulated?

See above, *Question 18*.

ELECTRICITY SUPPLY

Authorisation and operating requirements

21. What are the authorisation and the main ongoing requirements to supply electricity to end consumers?

EGAT generates, transmits, and sells electric energy to MEA and PEA, which further distribute and sell electricity to customers. EGAT also sells electric energy to a number of direct consumers prescribed by law.

Trading between generators and suppliers

22. How is electricity trading (between generators and suppliers) regulated?

The Electricity Generating Authority of Thailand (EGAT) is the single buyer of bulk electricity, selling to MEA and PEA, a number of direct consumers prescribed by law, and neighbouring countries. This is regulated by the EGAT Act, including amendments and ministerial regulations arising out of this act.

Electricity price and conditions of sale

23. How is the price for electricity and conditions of sale regulated at the consumer and wholesale level?

Consumer

See above, *Question 18*.

Wholesale

See above, *Question 18*.

Statutory powers

24. Do companies involved in the generation, transmission, distribution or supply of electricity have any statutory powers to undertake work (for example, compulsory purchase powers or street works powers)?

Electricity Generating Authority of Thailand (EGAT) is the sole purchaser of energy from domestic and foreign independent power producers (IPP) and small power producers (SPP) through power purchase agreements (see Question 1, *Overview, and Questions 3 and 7*).

The transmission, distribution and supply of electricity are provided by the government (see *Question 3*).

TAX ISSUES

25. What are the main tax issues arising on electricity generation, distribution, transmission and supply?

For electricity generation other than by the Electricity Generating Authority of Thailand (EGAT), tax incentives are available for projects approved by the Board of Investment (BOI). Incentives include exemptions from import duties on machinery, exemption of corporate income tax, and a 25% deduction of the cost of installation or construction of facilities. The BOI often approves environmentally sustainable forms of electricity generation.

The distribution and bulk sale are currently under the sole control of the EGAT.

Insurance

26. Are there any insurance requirements from the regulatory authority?

There are no insurance requirements from the regulatory authority.

REFORM

27. What reform proposals are there for the regulation of the electricity sector?

There are no present proposals for reform of the regulation of the electricity sector. The power development plan 2015 (PDP 2015) is meant merely as a guideline for any developments.

If there are any future proposals for reform for the regulation on renewable energy, they should be with the support of the alternative energy development plan (AEDP) 2015 to 2036.

THE REGULATORY AUTHORITIES

Ministry of Energy

555/2 Energy Complex Building BVibhavadi-Rangsit Rd. Chatuchak Bangkok 10900 Thailand

W http://energy.go.th/2015/en/ (website maintained by the Ministry of Energy and is current)

Main responsibilities. The Ministry of Energy manages the energy sector in Thailand, including granting energy operating licences and issuing energy pricing regulations.

Department of Alternative Energy Development and Efficiency

Ministry of Energy 17 Rama 1 Rd Kasatsuk Bridge Pathumwan Bangkok 10330 Thailand

W http://weben.dede.go.th (website maintained by the Department of Alternative Energy Development and Efficiency of the Ministry of Energy and is current)

Main responsibilities. Energy efficiency promotion; energy conservation regulation; alternative development of energy uses; energy technology dissemination, and improvement of, and response to, energy demands for better living standards.

Department of Energy Business

Ministry of Energy 555/2 Energy Complex Building B Floor 19th Viphawade Rangsit Road Chatuchak District Bangkok 10900 Thailand

W www.doeb.go.th (website maintained by the Department of Energy Business of the Ministry of Energy and is current)

Main responsibilities. Monitor and supervising the trade, quality, industrial safety, environmental concerns and security on energy business; improving the quality, industrial safety, and environmental for energy business; promoting an education of energy to business persons, consumers, and related persons; serving as the centre of energy information on the nation, and improving personnel's proficiency and capabilities in the organisation to increase expertise in the energy business.

Energy Policy and Planning Office

121/1-2 Phetchaburi 7 Alley Thung Phaya Thai Ratchathewi Bangkok 10400 Thailand

W www.eppo.go.th (website maintained by the Energy Policy and Planning Office of the Ministry of Energy and is current)

Main responsibilities. Recommend energy policies and integrate/review energy management plans of the country; recommend national strategies for energy conservation and alternative energy promotion; recommend measures to solve and prevent oil shortage in both the short and long term; supervise, monitor and evaluate the effectiveness of national energy policy and energy management plans, and administer information and communication technology (ICT) with regard to energy issues of the country.

Energy Regulatory Commission (ERC)

319 19th Floor Chamchuri Square Phayathai Rd. Pathumwan Bangkok 10330 Thailand

W www.erc.or.th (website maintained by the Energy Regulatory Commission of the Ministry of Energy and is current)

Main responsibilities. Ensure the equality and fairness nested between consumers, producers, and other relevant interest groups; oversee the regulations that deal with electricity systems of generation, transmission, distribution, and their system operator; and monitoring energy market conditions by tariff review, licensing, approval of power purchase, dispute settlement and fulfilling its mandate in order to counterbalance each other, to ensure maximum interests of the people and the country.

Electricity Generating Authority of Thailand (EGAT)

53 Charan Sanit Wong Road Bang Kruai Nonthaburi 11130 Thailand

W www.egat.co.th (website maintained by the EGAT and is current)

Main responsibilities. Electric power generation; operation and transmission nationally; engages in energy-related services businesses and expands business and investment in electricity and other energy-related businesses; and selling to MEA and PEA, a number of direct consumers prescribed by law, and neighbouring countries.

Metropolitan Electricity Authority (MEA)

30 Soi Chidlom Pleonchit Road Lumpini Patumwan Bangkok 10330 Thailand

W www.mea.or.th (website maintained by the MEA and is current)

Main responsibilities. Generation, procurement, distribution, and sale of electricity to the public, business, and industrial sectors in the Bangkok metropolitan area and the provinces of Nonthaburi and Samutprakan.

Provincial Electricity Authority (PEA)

200 Ngamwongwan Road Jatujak Bangkok 10900 Thailand

W www.pea.co.th (website maintained by the PEA and is current)

Main responsibilities. Generation, procurement, distribution, and sale of electricity to the public, business, and industrial sectors in 74 provinces with the exception of Bangkok, Nonthaburi and Samutprakan.

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Areas of practice. Commercial transactions and M&A; property; energy and infrastructure; banking and finance; capital markets; bankruptcy and restructuring; anti-corruption.

Recent transactions

- Acting for Shell in relation to a contamination and clean-up issue.
- Advising on greenhouse gas emission targets and carbon trading.

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Areas of practice. Commercial transactions and M&A; energy and infrastructure; banking and finance; capital markets; bankruptcy and restructuring; insurance.

Recent transactions

- Advised a Korean engineering and construction company in its pursuit of a renewable energy opportunity in Thailand, on land acquisition, contracting, permitting, environmental regulatory matters, financing, and construction contracting.
- Assisted a leading power company with contractual issues pertaining to environmental regulatory matters in Thailand.

Languages. Thai, English