

THAILAND

THAILAND'S ENERGY INDUSTRY

Industry Overview



Energy Market Overview

Market Overview

The **Energy Regulatory Commission (ERC)** is responsible for regulating the generation, transmission, and distribution of electricity in Thailand. Three state-owned utilities dominate the market:

- Electricity Generating Authority of Thailand (**EGAT**)
- Metropolitan Electricity Authority (**MEA**); and
- Provincial Electricity Authority (**PEA**)

The EGAT is responsible for the regulation of generation, transmission, and bulk sale of electric power. It is a state-owned agency which is under the supervision of the Ministry of Energy, being the largest power producer in Thailand. It owns and operates power plants across the country, and along with generating its own electricity, the EGAT purchases electricity from the following groups:

- Independent power producers (**IPPs**) and
- Small power producers (**SPPs**).



Three major groups exist as to the private sector players in the power generating sector, which are as follows:

- Independent Power Producers (**IPPs**);
- Small Power Producers (**SPPs**);
- Very Small Power Producers (**VSPPs**).

Renewable Energy Industry

Natural gas and coal (including lignite) still form the bulk of Thailand's electricity generation, but in 2021 renewable energy composed 11% of the total.

This is a significant increase from 2% in 2011. In 2021, 33% of Thailand's renewable energy came from biomass generation and 25% from solar energy. This increase and production rates align with Thailand's Power Development Plan 2018-37 (PDP 2018).

The shift in energy usage is due to advancements in electricity generation technology, policy change, and public demand. The years ahead promise new growth opportunities in the renewable energy sector.

Challenges & Obstacles

The primary challenges faced by the renewable energy sector are high cost and a continuing need for technological development. Currently, most renewable energy technologies in Thailand are imported, with only a minor portion produced domestically. Further expansion depends on:

- Utilization of the entire value chain of bioenergy produced domestically;
- Development of solar PV and wind power generation technologies;
- Adoption of local expertise in solar thermal technologies; and
- Expansion of electrical vehicle (EV) manufacturing capacity in Thailand.

Outlook

Thai renewable electricity producers are expected to see continuous growth. This growth is due to increasing public demand and government investment. Domestic renewable electricity demand is expected to continue to grow alongside the economy, and PDP 2018 Rev. 1 introduced initiatives to expand generation capacity and increase investment in new power plants.

The Prime Minister pledged that the country would reach carbon neutrality by 2050 and reach net-zero greenhouse gas emission by 2065. Continued development in the renewable energy sector is a crucial part of these plans.

Companies

The primary electricity generating entities are:

- **EGAT** generates, transmits, and sells electric energy to MEA and PEA. MEA and PEA then distribute and sell electricity to consumers. Electricity Generating Public Company Limited (EGCO) is involved in the private electricity generation business;
- **Ratchaburi Electricity Generating Holding Public Company Limited** is involved in the private electricity generation business; and other independent power producers include small power producers that own and operate power plants.

The Thai Government actively promotes private sector investment in renewable electricity generation through bid solicitations for power purchases from SPPs and large-scale IPPs. The ERC regulates SPPs and IPPs.

Transmission

The EGAT is the sole operator of Thailand's electricity transmission system.

Distribution

The primary distribution companies are:

- Metropolitan Electricity Authority (**MEA**) which distributes electricity in the Bangkok metropolitan area and the Nonthaburi and Samut Prakan provinces; and
- Provincial Electricity Authority (**PEA**) which distributes electricity to the remaining provinces.

Supply

The EGAT is the single buyer of bulk electricity in Thailand. It complies with the terms and regulations set by the ERC to ensure the best interests of consumers, fairness to all, and energy resource optimization. It sells electricity to:

- The MEA;
- The PEA;
- A number of direct customers as prescribed by law; and
- Neighboring Countries

Foreign Ownership

Under Thai law, when Thai shareholders own 50% or more of a company's capital, it is considered a Thai company. A company is classified as foreign when 50% or more of its capital is owned by foreign nationals. Foreign companies are subject to additional restrictions under the Foreign Business Act (**FBA**)

The FBA generally governs foreign business investment in Thailand. The FBA classifies 43 types of businesses subject to foreign investment restrictions. Those businesses are listed in Annexes 1, 2, and 3 as follows:

- **Annex 1** includes businesses that are closed to foreign investment.
- **Annex 2** includes businesses that are open to foreign investment but may only conduct business with permission from the Minister of Commerce (with the statutory number of Thai shareholders and directors, and approval of the Cabinet).
- **Annex 3** includes those businesses open to foreign investment that may conduct business with a license issued by the Department of Business Development (DBD) and approval from the Foreign Business Operations Committee.

The generation and sale of electricity are considered manufacturing activities and are not subject to FBA restrictions. Therefore, a foreign shareholder may hold up to 100% of a company's shares without receiving approval under the FBA; however, the **Land Code** stipulates that non-Thai companies cannot own land in Thailand. Therefore, to own land for company use, majority foreign-owned companies must apply for an investment promotion certificate with the Thailand Board of Investment (**BOI**).

Companies should have all relevant government authorizations and a signed Power Purchase Agreement (PPA) before receiving the BOI's investment promotion certificate.

Status Quo.

Current Market Trends

Energy Transition

Thailand has rapidly adopted new technologies to improve energy stability. The main policies driving these developments are the Power Development Plan (PDP) 2018 and the Solar Power Plan — Public Solar Project. The Public Solar Project's key objective is to increase renewable energy consumption via household energy generation. Improving energy stability requires an efficient, sufficient, and sustainable electricity supply. PDP 2018 aims to facilitate the adoption of smart grids in Thailand through the Smart Grid Development Master Plan (2015-2036) and Smart Grid Action Plan (2017-2021).

A specific way the PDP 2018 initiative has expanded electricity generation capacity and increased investment in new power plants is by extending the Small Power Producers (SPPs) co-generation contracts. Increased investment is expected in IPPs, SPPs, and VSPPs due to the expiration of the contracts during 2016-2025.

Thailand's power generation sector is expected to grow steadily, supported by growing demand and government investment support. The PDP 2018 rev.1 along with the extension of existing SPP cogeneration contracts will help to increase generation capacity and investment in new power plants in the near term.

Effect of the COVID-19 Pandemic

The COVID-19 pandemic has significantly influenced the global economy and the energy sector in Thailand. Therefore, the Ministry of Energy is introducing long-term measures in order to promote both the public and private energy sectors. The goal of these measures is to assist companies align their business models with the BCG economic policy (Bioeconomy, Circular economy, and Green economy) by developing sustainable economic models.

Regional Perspective

Thailand has an abundance of energy resources including solar, wind, hydropower, biomass, and biogas. Energy production using fossil fuel sources is anticipated to be greatly reduced to near zero over the next 20 years and replaced by local renewable energy.

Competitive Landscape

The PDP 2018 rev. 1 is expected to play a significant role in Thailand's energy future making renewable electricity more accessible to the public whilst simultaneously reducing environmental impacts. Additionally, foreign companies have the potential to play major roles as technology and service suppliers.

International companies active in the market include First Solar (U.S.), Gamesa (Spain), GE Renewable Energy (U.S.), Siemens (German), Suntech (China), and Trina Solar (China). Currently, all have signed contracts to do business in Thailand or have existing business in Thailand.

Outlook

A promising future is expected for private- sector electricity generators with the upcoming economic recovery and increased investment (supported by the government by PDP 2018) altogether improving the sector.

Total domestic electricity consumption is anticipated to rise, driven by economic recovery. Thereby also increasing demand for electricity in both the business and industrial sectors. Demand in the household sector is also expected to continuously grow, influenced by the post-pandemic shift to working from home.

Energy industry competition is anticipated to grow due to the additional investment incentivization promoted by the PDP2018 provisions. In addition, changes in government policies will encourage the private sector to further contribute to energy production. Thereby enabling competitors in the private sector to sell electricity directly to one another, leading consumers to act as the producers and retailers (or as so-called 'prosumers').

Regulatory Structure

Policy Objectives

Under the Thailand 4.0 framework, the government has emphasized the importance of transitioning to renewable energy sources. To this end, the National Energy Policy Council (NEPC) and the Cabinet approved Thailand's **Power Development** Plan for 2018 to 2037 (PDP 2018). The Plan aims to foster energy efficiency and bring energy security to Thailand. The PDP includes energy conservation plans to ensure sufficient electricity to sustain

national consumption. Methods include increasing power capacity and renewable energy generation.

Similarly, the **Alternative Energy Development Plan** and its revision emphasize the necessity of supporting renewable and alternative energy sources. The aim is to increase renewables to 30% of Thailand's final energy consumption by 2036. This is consistent with goals outlined in PDP 2018 and the Thailand 4.0 economic development plan.

The **Energy Efficiency Development Plan** addresses Thailand's energy concerns. It focuses on power security, economy, and ecology. The Plan sets targets to reduce energy intensity, final energy consumption, and crude oil reliance. The **Gas Plan 2018–2037** aims to improve Thailand's infrastructure to facilitate the more efficient and sustainable use of natural gas. Increased efficiency will help meet Thailand's energy needs and increase competition within the industry

Regulatory Authorities

Thailand's Ministry of Energy – The Ministry of Energy oversees the Thai energy sector. It has a range of regulatory duties, including issuing energy pricing regulations and granting energy generation operating licenses.

Department of Mineral Fuels (DMF) – The DMF promotes energy acquisition by facilitating energy resource exploration and development, both in Thailand and internationally. It also regulates the exploration and production of petroleum. The Petroleum Committee, as established under the Petroleum Act, also oversees such exploration and production.

Department of Alternative Energy Development and Efficiency (DEDE) – The DEDE is responsible for promoting energy efficiency and conservation and implementing regulations to improve the response to energy demands. The aim is to meet these objectives through increased alternative energy availability and technological advances.

Department of Energy Business – The Department of Energy Business monitors the quality, trade, environmental concerns, and security of energy businesses. It also promotes and provides energy education to consumers, businesses, and related persons.

Energy Policy and Planning Office (EPPO) – The EPPO recommends national energy policies and strategies for energy conservation and reviews Thailand's energy management plans.

Energy Regulatory Commission (ERC) – The ERC regulates electricity generation, transmission, and distribution in Thailand, and monitors the energy

market via tariff review, approval of power purchases, licensing, and dispute settlement.

Electricity Generating Authority of Thailand (EGAT) – The EGAT serves as both the producer and single buyer of electricity in Thailand. It buys electricity from private power producers, including Small Power Producers (SPPs) and Independent Power Producers (IPPs). The EGAT also regulates the generation, transmission, and bulk sale of electric power.

Metropolitan Electricity Authority (MEA) and the **Provincial Electricity Authority (PEA)** – The MEA and PEA are responsible for electricity generation, procurement, and distribution. They also oversee the sale of electricity to the public, businesses, and industrial sectors in Thailand.

Regulatory Framework

Legislation

The **Energy Industry Act B.E. 2550** (2007) is the primary source of legislation governing the electricity generation sector. This Act established the ERC and invested in it the right to regulate the expropriation of private property for licensees.

In addition, the **Electricity Generating Authority of Thailand Act, B.E. 2511** (1968) granted EGAT the authority to regulate the sector in accordance with its objectives. EGAT's regulatory power primarily extends to the purchase of electricity from independent producers and efficient operation of the electricity transmission network. The Act also granted EGAT the authority to expropriate private property for the construction of electricity transmission lines, hydroelectricity facilities, thermal power plants, and nuclear power plants. This authority includes permission to demolish obstacles in the path of transmission lines.

BOI Incentives

The **Thailand Board of Investment (BOI)** offers a range of fiscal and non fiscal incentives for projects meeting national development objectives.

Fiscal incentives include exemption from or reduction of import duties on machinery and raw materials and exemption from corporate income tax for up to eight years, as well as tax incentives for dividends payable to shareholders. The tax holiday ceiling is limited to 100% of the total investment and the cost of land and working capital are excluded; however, if 75% of the total energy used to generate electricity is from a renewable energy source, the business qualifies for a tax holiday without a ceiling. Further tax incentives include deductions on transportation electricity, water and project's infrastructure installation costs.

Non-fiscal incentives include the right to hire foreign experts and technicians without the statutory constraints of minimum registered capital, 4:1 ratio between Thai and foreign employees, and limitation on the number of foreign employees. The BOI further provides for an express procedure for visa and e-work permit via its "One Stop Service Center". Businesses also benefit from the streamlined remittance of foreign currency. Renewable energy projects may also be 100% foreign-owned, and BOI-promoted foreign companies have the option to own land in Thailand.

Carbon Credits

Renewable energy plants in Thailand may qualify for Certified Emission Reductions (CERs), or carbon credits. The Thailand Greenhouse Gas Organization's (TGO) approval is required to receive CERs for projects in Thailand. The TGO considers various factors when considering eligible renewable energy projects. Projects are categorized according to four major characteristics:

- Natural resources and environment;
- Social;
- Economic;
- Development and technology transfer projects.

Power Purchase Agreements

Negotiating a Power Purchase Agreement (PPA) is a crucial step establishing a renewable energy plant. A PPA is an agreement between the energy producer and energy buyer that sets the price for a specified period.

In Thailand, EGAT is usually the energy buyer. Terms in a PPA vary depending on the type of energy production plant. However, for any plant, crucial terms of the agreement relate to capacity, payment, and minimum output.

The *force majeure* clause is of particular importance. Force majeure refers to the contractual clause which exempts a party from natural and unavoidable catastrophes and the effect it may have on the ability to complete a party's obligations. It is fundamental that the force majeure clause is composed with an eye toward the unpredictable. Additionally, the clause must be consistent across all agreements with a given plant.

Engineering, Procurement, and Construction Agreements

When executing renewable energy agreements, engineering, procurement, and construction are frequently considered simultaneously. This drafting approach has several benefits. The plant owner only needs to negotiate a single contract, and the contractor is responsible for coordinating with subcontractors and suppliers.

Some energy production plants take a more unbundled approach. In these circumstances, the plant owner negotiates agreements with each subcontractor and supplier. The potential risks to such an approach are frequently higher. However, the plant owner has more control over the negotiation and agreement terms.

Reform

The Government of Thailand and Ministry of Energy are considering new policy initiatives to increase private participation in the energy industry. Current plans are to promote the household generation and storage of electricity. Excess electricity would be sold to the state and diverted into the national grid. Ideally, the private sector will lead developments in renewable energy and innovation.

Legal Requirements by Function

Electricity Generation and Renewable Energy

Incentives and Regulations

The PDP 2018 focuses on increasing the use of renewable energy and reducing reliance on high-emission fuels. This plan outlines specific objectives to reduce the amount of electricity produced from coal and reduce carbon dioxide emissions as per the Paris Agreement.

On May 6th, 2022, the Government of Thailand adopted new Feed-In Tariffs (FIT). Renewable energy producers will benefit from this change for 20 years, while power systems fueled by landfill gas emissions will only benefit for ten years. FIT rates vary depending on power plant size and the type of fuel used. Producers will benefit from additional bonuses as well.

Notes:

(1) Projects in the three southern border provinces (i.e., Yala, Pattani, and Narathiwat) and the four districts in Songkla (i.e., Jana, Thepa, Sabayoi, and Nathavee) will be granted a FIT Premium rate of THB 0.5 per kWh throughout the term.

(2) Partial firm agreements for ground-mounted solar panels and energy storage system (Solar + BESS) must not exceed 90 MW.

(3) The following restrictions are placed on the purchase process:

- Between 9.01 and 16.00 - electrical power is generated for supply and purchase by the electricity authority at 100% of the proposed capacity outlined in the Power Purchase Agreement (PPA).
- Between 18.01 and 6.00 - The electrical energy generated during the day is stored. Within these 12 hours, the electricity authority shall pull energy from storage for two hours at 60% capacity as outlined in the PPA. The purchase period ends at the end of those two hours.
- Between 6.01 and 9.00 and 16.01 and 18.00, electrical power shall be generated for supply and purchase by the electricity authority at a rate no more than 100% of the proposed capacity outlined in the PPA.

In May 2019, the ERC announced the following:

- Regulations governing Purchase of Power from Solar Rooftop Power Generation for Public Sector;
- Notifications governing Purchase of Power from Solar Rooftop Power Generation for Public Sector Household User Type.

In April 2020, the ERC announced the Regulation governing Purchase of Power from Very Small Power Producers with respect to Community-Based Power Projects.

Authorization and Operating Requirements

The following authorizations are generally required for the construction and operation of electricity generation plants:

- An electricity generation license, issued by the ERC;
- A controlled energy production license;
- A building construction permit; and
- A factory operations license.

Depending on the specific nature of the project, the operator will also need to obtain various additional authorizations, licenses, and permits.

The following authorization and requirements apply:

- An electricity generation license must be obtained if the plant has a total capacity of 1,000 kW or more;
- Wind turbine facilities must follow comprehensive plan and ERC regulations in addition to obtaining an electricity generation license;

For activities that do not require an energy generation license, the applicant must submit a single-line diagram of the system layout certified by an engineer according to the relevant laws. The diagram should include the following:

- The power generation system
- Security or protection systems; and
- Energy control systems.

According to the ERC Regulations on Measures for Prevention, Correction and Monitoring of Environmental Impact Respecting Those Exempted from Preparation of Environmental Impact Assessment under the Law on Enhancement and Preservation of Quality of Environment B.E. 2555, an applicant is exempt from preparing an environmental impact assessment if they have management practices that respect safety, local communities, and the environment. However, the applicant must submit an environmental checklist and provide documents or evidence (if any) to the ERC to prove such facts.

A factory operations license is required for all electricity generation plans with the following exceptions:

- Energy production through rooftop solar photovoltaic installations with production equal to or less than 1,000 kWh;
- Wind farm power plants; and
- Hydropower energy production

A permit is required for the operation of plants located in industrial areas to use land and perform activities. They must notify the Department of Industrial Works within 15 days of the start of operations.

Licenses must report their scheduled commercial operation date and submit a notification to the local office before commencing operation.

Electricity Transmission

Authorization and Operating Requirements

The EGAT owns and operates the national transmission network and is responsible for the construction of all networks. It is the sole entity authorized to operate electricity transmission networks in Thailand. However, other private entities can be licensed as well.

Transmission Charges

Since EGAT is the sole entity authorized to transmit electricity throughout Thailand, they are responsible for network expansion, maintenance and replacement of transmission equipment, and the management of internal transmission charges.

System Balancing

Thailand's current approach to managing electricity supply and demand is through centralized planning at the ministerial level. The Ministry of Energy, particularly the Energy Planning and Policy Office, is responsible for forecasting future energy demand. The EGAT, MEA, and PEA, in coordination with the Ministry of Energy, strategize ways to increase Thailand's installed capacity.

Electricity Distribution

Authorization and Operating Requirements

The MEA and PEA are the major distributors of electricity in Thailand. However, private operators can obtain licenses from the ERC to become electricity distributors. An application must include the following:

- A copy of the applicant's contracts relating to industry operations;
- Copies of customer PPAs
- A detailed plan for the acquisition or distribution of electricity; and
- The number of power consumers, kWh consumed by each consumer per month, maximum power demand per month, and kWh sales.

Electricity distribution system operators must obtain an electricity distribution license. They are subject to several obligations outlined in ERC and relevant government bodies' regulations.

Distribution Charges

The ERC has the authority to issue regulations to protect consumers under the Energy Industry Act. Many of these regulations relate to the maintenance and operation of the Power Development Fund (PDF). The PDF is funded through mandatory contributions by licensees operating within the energy industry.

Electricity Supply

Trade between Generators and Suppliers

Private sector electricity generators preferentially sell electricity to the EGAT, MEA, or PEA under PPAs. These PPAs outline the terms and conditions of electricity trading.

Electricity Prices and Conditions of Sale

a) Consumer

The ERC assures consumer protection by maintaining the PDF. The PDF disburses funds when a natural disaster occurs or when electricity generators or distributors overcharge consumers.

b) Wholesale

PPAs between private producers and government utilities fix the wholesale price of electricity. These PPAs are signed at the commencement of a power project and are generally non-negotiable.

Oil & Gas

Market Overview

Under the **Gas Plan 2018–2037**, the required procurement of liquefied natural gas (LNG) has been decreased. The plan aims to procure natural gas to meet national demands through the founding of an LNG terminal in southern Thailand. Thailand's demand for LNG is expected to reach 30 million tons per annum (MTPA) by 2037, and the country has set an objective to become the LNG hub for ASEAN.

Legal Overview

Oil and Gas Exploration

Petroleum concessions, under the supervision of the DMF, grant the right to explore for crude oil with a high petroleum percentage and produce petroleum. Under Thai law, the ownership of oil and gas belongs to the government. Hence, pursuant to the Petroleum Act, no person may explore petroleum resources without a concession agreement, production sharing contract, or a service contract.

Bidding for DMF petroleum concessions is only permitted for those with production sharing contracts (PSCs). The bidding process must comply with the

requirements outlined in the Ministerial Regulation Re: Rules, Procedures and Conditions for Applying for and Receiving Production Sharing Contracts B.E.2561 (2018). In addition, bidders should use the template contract provided in the Ministerial Regulation Prescribing the Form for Production Sharing Contracts B.E. 2561 (2018).

Facility Construction

Environmental impact assessments are required for constructing facilities and must be submitted by concessionaires. Oil and gas operators should maintain the relevant codes of practice (COP) which outline the minimum standards sanctioned by the National Environmental Board to mitigate the operations' environmental impact.

Operating Requirements

The Petroleum Act and its subsidiary regulations define the restrictions and requirements for petroleum exploration or production. The primary regulatory body DMF is responsible for overseeing operations and receiving reports required pursuant to relevant laws.

Operators must comply with the specific terms of the concession agreement. Moreover, there are several environmental codes and checklists that oil and gas exploration and production operations must comply with. These codes vary depending on differences in operational activities and site of exploration (onshore or offshore).

Decommissioning

The concessionaire is responsible for decommissioning, excluding exceptional circumstances. During the decommission process to apply for the concession, the concessionaire is required to submit a decommission plan. The decommission plan must include related environmental assessment reports and proposed decommissioning costs audited by an authorized third party who is qualified under the director general of the DMF and the Government Gazette. The concessionaire is obligated to carry out the decommissioning according to the approved plan.

Oil and Gas Distribution

Generally, the Petroleum Act authorizes the concessionaire to distribute petroleum so long as the action complies with the act. However, the term of the concession determines the specific requirements regarding distribution.

Consequences of Non-Compliance

Failure to meet the requirements outlined in the concession agreement and provisions of the Petroleum Act can result in several penalties. Such penalties include, but are not limited to, imprisonment, fines, and termination of the concession

agreement. Oil and gas exploration is strictly prohibited without the concession agreement as oil and gas belong to the Thai Government. Oil and gas operators are subject to additional regulations concerning quality criteria, including appearance, gas vapor recovery, and storage.

Coal

Market Overview

According to the NEP framework, introduced by the Ministry of Energy, the amount of coal used for electricity production will be reduced and eventually phased out. Subsequently, EGAT announced that the Mae Moh coal mine in Lampang, the last coal-fired power plant, will close in 30 years.

Legal Overview

Government Energy Policy

Under PDP 2018 rev. 1, electricity generation from coal-based sources will decrease. Renewable energy production will increase to compensate.

Regulations for Coal Power Projects

Incentives

The BOI grants fiscal and non-fiscal incentives to encourage electricity production via clean coal technology; however, the incentives for coal power plants are significantly lower than those granted to renewable energy projects.

Requirements and Procedures for Project Initiation

Initiating a coal power project requires obtaining a license per the Energy Industry Act B.E. 2550 (2007) and PPA with the ERC. Specific requirements vary depending on the type of license desired. A factory license under the Factory Act B.E. 2535 (1992) and a license to generate controlled power under the Energy Conservation Promotion Act B.E. 2535 (1992) are also required. These licenses apply if the amount of electricity generated exceeds the specified capacity. Additionally, some projects may be required to undergo an Environmental and Health Impact Assessment (EHIA). Applicable provisions of the Building Control Act B. E. 2522(1979) and Enhancement and Conservation of the National Environmental Quality Act B.E. 2535 (1992) should also be taken into consideration.

Consequences of Non-Compliance

Failure to meet these requirements may result in the revocation of the power plant's license. If the producer continues to operate the power plant without a license they may face imprisonment, fines, or both under the Energy Industry Act B.E. 2550 (2007).

Solar

Market Overview

Thailand plans to significantly increase its capacity for solar energy production. Several hydropower/floating solar hybrid projects have been introduced for installation on existing hydropower plants and dams.

Legal Overview

Incentives

There are several incentives available to renewable energy producers. This includes exemptions from normal IPPs or SSPs requirements, including licenses and requirements regarding environmental impact assessment; however, a power producer exempt from the above requirements should submit an environmental checklist and any documents and evidence along with its application to the ERC.

The BOI introduced several tax incentives in 2020 for investment in the manufacture of parts and equipment for solar power and renewable power generation.

In 2020, the MEA raised the purchase price on electricity in the Bangkok, Nonthaburi, and Samut Prakan districts for ten years. The intent was to encourage households to install solar panels and generate their own electricity. Moreover, factory licenses from the ERC are not required for rooftop solar installations with a maximum production of 1,000 kWh.

Requirements and Procedures for Project Initiation

Electricity is procured through power purchase agreements (PPA) upon successful application. The specific requirements for the application process differ depending on license type. The license type varies depending on the fuel type, size, capacity, and other factors.

Private, commercial PPAs are also available; however, power producers must obtain specific licenses and permission to fulfill the reporting requirements to

conduct electricity generation. Off-grid solar power producers are not required to obtain a power producer license; however, they are subject to other regulations.

Operating Requirements

Power operators must obtain a license from the ERC to operate. Power plants must comply with building control laws, zoning requirements, and laws regarding the development and support of power by the ERC. They are also required to comply with several environmental impact assessments.

The ERC requests the relevant regulatory bodies for opinions when considering applicants. The specific requirements differ depending on the power plant's capacity, the source of electricity production, and whether the power producer is on- or off-grid according to ERC regulations. Some smaller power plants may be exempt from the license requirement for energy businesses.

Consequences of Non-Compliance

An inability to meet the requirements stipulated in the PPA may result in the ERC conducting a post-COD (commercial operation date) audit, followed by a formal warning. Ultimately, the ERC has the authority and discretion to revoke the power plant's license. Operating without the requisite licenses may lead to penalties under the Energy Industry Act B.E. 2550 (2007), including imprisonment and fines.

Wind

Market Overview

The BESS wind energy battery storage pilot project was launched in 2020 in the Pak Phanang district in Thailand. The BESS project involves storing wind generated power in 1.88 MWh batteries. These batteries can then power the national transmission grid and increase the reliability and stability of renewable energy production with wind turbines.

Legal Overview

Incentives

The BOI grants general tax and non-tax incentives to encourage renewable energy generation. Additionally, wind power producers are not required to have an ERC factory license. Other requirements, such as zoning restrictions, building control laws, and environmental impact regulations, still apply.

Requirements and Procedures for Project Initiation

Initiating a project requires a license application and PPA with the ERC. Power producers acting under a PPA are subject to licensing and those reporting requirements outlined in the Energy Industry Act B.E. 2550 (2007), the Building Control Act, and the Enhancement and Conservation of the National Environmental Quality Act B.E. 2535 (1992).

Operating Requirements

Under the Energy Industry Act B.E. 2550 (2007), a power producer may only operate electricity generation businesses if they have acquired the necessary licenses or are exempt. In case the producer is exempt, they are subject to reporting requirements. Power producers are also subject to Codes of Practice (COP) that include operating standards, environmental and safety obligations.

Consequences of Non-Compliance

If a power producer fails to comply with operational requirements, the ERC may conduct a post-COD audit. If non-compliance continues, the ERC can revoke the producer's operating license and terminate the PPA. The Announcement of the Office of The Energy Regulatory Commission regarding the Distance to the Location of the Wind Power Project and the Size of Installed Production Capacity for Wind Power Generation Business Operators is an important source of wind power regulation.

Hydropower

Market Overview

Most hydropower development occurs on a state level. Several hydropower dam projects are in the development stage for construction in different areas of Thailand. There can be significant long-term fluctuations in electricity output due to the varying levels of rainfall.

Legal Overview

Incentives

The EGAT is the primary hydropower producer in Thailand. As a result, there is little room for incentivizing the operation of hydropower plants by independent or non-government owned power producers.

Project Construction

The EGAT initiates, funds, and operates the majority of hydropower projects in Thailand; however, non-governmental entities can be involved in hydropower projects through service agreements for construction, repairs, and improvements.

Consequences of Non-Compliance

The ERC has the duty and authority to penalize power producers' non-compliance and to inspect and revoke PPAs where applicable.

Biomass & Biogas

Market Overview

The PDP 2018 Rev. 1 prioritizes the Energy for All project, establishing community power plants using biomass and biogas derived from community enterprises. Regulations were issued in March 2021, outlining the ERC's pilot project to procure electricity from community power plants. By September 2021, 43 Very Small Power Producers (VSPPs) had been selected for the project. These projects are scheduled to receive a COD by the end of November 2024.

Legal Overview

Incentives

The EGAT aims to procure electricity from VSPPs, benefitting from Feed- In Tariffs (FIT) for power producers using biomass and biogas. Hybrid power plants are also eligible. This is another element of EGAT's Energy for All project.

Requirements and Procedures for Project Initiation

Under the current community power plant pilot project, requirements vary depending on the size, electricity production capacity, and project location.

Additionally, applicant VSPPs must be 90% owned by a non-governmental entity. 10% of ownership and benefits should be allocated to the community enterprise or community enterprise network that provides the project with fuel.

Operating Requirements

Biomass and biogas power producers must comply with all relevant environmental quality regulations. This is in addition to complying with the Energy Industry Act B.E. 2550 (2007), building control laws, zoning restrictions, and the PPA's terms.

Consequences of Non-Compliance

The ERC may inspect and revoke a power plant's operating license for failure to comply with any requirement or regulation. Continuing to operate without the required license may result in imprisonment, fines, or both under the Energy Industry Act B.E. 2550 (2007).

Environmental Policies

Market Overview

Under the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 (1992), the National Environment Board and Ministry of Natural Resources and Environment prescribe the categories of industrial projects subject to regulation and approval by the Office of Natural Resources and Environmental Policy and Planning. Generally, electricity production plants must submit an environmental impact assessment (EIA). Although power plants are exempt from the EIA requirement, they may be required to submit an environmental and safety assessment. All power plants should comply with the relevant Codes of Practice (COP).

The National Environmental Quality Act B.E. 2535 (1992) provides that, regardless of willfulness or negligence, the owner or possessor of the source of pollution is liable to pay compensation or damages for leakage or dispersion of pollutants causing damage to people or property. Any person committing an unlawful act or omission that results in the destruction, loss, or damage to natural resources owned by the state or the public domain is also liable for compensation.

The Bio-Circular-Green Economic Model

The BCG economic model was conceptualized in Thailand to form a part of the Thailand 4.0 policy as a way to expedite economic and social development. The model integrates bioeconomy, circular economy and green economy and is rooted in Thailand's strengths in agriculture and its natural resources, diversity and geography. The model aims to assist the nation in transforming into a value-based and innovation-driven economy. Thailand's BCG conforms with the UN sustainable Development Goals (SDGs) in ensuring the conservation and sustainable use of biodiversity and protection of natural resources and the ecosystem.

The BCG model has become particularly relevant following the pandemic, with Thailand focusing on the model to enable sustainable recovery from COVID-19 and that effects that the pandemic has had on the economy and the nation. The model will

bring together government, private sector, academia and society collectively to implement the principles, with the vision of building back a healthier, greener, more sustainable and inclusive economy in the wake of the pandemic.

BCG encompasses bioeconomy as the production of renewable biological resources and their conversion into value added products, circular economy as the reuse and recycling of resources and green economy as keeping economy, society and the environment in harmony, resulting in sustainable development.

The Office of National Higher Education, Science, Research and Innovation Policy Council has described each area of the BCG Model as a 'pyramid', with each pyramid representing the supply chain in that industry. The idea is that the largest groups of producers resemble the base of the pyramid, with the higher levels demanding more specific or sophisticated technology that only few producers have the capacity to implement. The BCG model sees the 'base' of the pyramid, moving up by adding value to their products, essentially, strengthening the capacity of local communities and allowing the use of new technologies and driving forward the bio, circular and green economy.

Measures to Support Carbon Reduction

In a meeting on 6 September 2021, the BOI approved several measures in an effort to support carbon reduction in the country. Three overarching measures were approved, including: (i) incentives aimed at encouraging companies to reduce greenhouse gas emissions; (ii) an upgraded scheme to support Thailand's production of electric vehicles; and (iii) measures to mitigate the effects of COVID-19 and to support local vaccine development.

The approved measures to encourage greenhouse gas reduction are aimed at encouraging investments that will reduce Thailand's impact on the environment, support sustainable development, and participate in the development of the BCG model. The BCG model has been given priority status by the Thai government, to lead the post COVID-19 recovery in this area.

The promotion measures include:

-A 3-year tax holiday for investments in machinery upgrades aimed at reducing greenhouse gas emissions. This incentive is offered in addition to the previously existing productivity enhancement scheme. It is expected that the measure will assist Thailand's commitment to reducing greenhouse gas emissions.

-A new promotion category for natural gas separation plants. If these plants are using the CCUS technologies, they will also be offered an 8-year corporate income tax exemption.

BOI Drives Eco-Friendly Investments

The Board of Investment has, as of November 2021, adjusted a number of measures to lead eco-friendly investments.

One of the measures is designed to encourage the implementation of Carbon Capture, Utilization, and Storage (CCUS) technologies for industrial use. CCUS technology is an important emissions reduction technology that a business can apply to energy systems. CCUS technology includes a suite of technologies that capture CO₂ from large point sources including power generation or industrial facilities that use either fossil fuels or biomass for fuels. The CO₂ can be captured and stored onsite or transported by pipeline, ship, rail, or truck, to be used or injected in deep geological formations, which permanently store the CO₂.

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AL COMMERCIO
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