Tilleke & Gibbins

ENERGY LAW in Southeast Asia

CAMBODIA • LAOS • MYANMAR • THAILAND • VIETNAM

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FROM THE MANAGING PARTNERS OF TILLEKE & GIBBINS

Since its founding in 1890, Tilleke & Gibbins has helped companies and individuals from around the world understand the legal environment for doing business in Southeast Asia—first in Thailand and then also in Vietnam and elsewhere in the region. The firm has researched and advised on countless client questions and legal developments, and has been at the forefront of preparing country-specific and regional legal guides to help readers navigate the sometimes complex regulatory environments in Southeast Asia.

In *Energy Law in Southeast Asia*, we focus on the energy industry and the laws and procedures that govern its activities in the region. The chapters were compiled by Tilleke & Gibbins attorneys on the firm's regional Energy Industry Team, which has grown in recent years to include some of the region's leading energy attorneys and staff, now in place throughout our various office locations.

The guide includes one chapter for each country where we offer full legal services—Cambodia, Laos, Myanmar, Thailand, and Vietnam. Each chapter in turn addresses eight key areas for a range of actors in the energy sector.

We know that one volume of material cannot easily address all the legal needs and questions in a practice group. To that end, we expect to update *Energy Law In Southeast Asia* on a regular basis, along with our other publications.

We are excited to present this to you and we hope it provides guidance and direction to those who are looking to understand energy regulations in the region. Our Energy Industry Team is always ready to go into greater detail on any particular areas of interest or specific legal issues. Please do not hesitate to contact them with any questions or requests.

Thank you.


Darani Vachanavuttivong and Tiziana Sucharitkul
Managing Partners

INTRODUCTION

The past several years have presented new and unique challenges. From epidemics, to travel restrictions, to supply chain disruptions and energy-related reactions, sometimes all at the same time, and we have all had to adjust to a new status quo. The energy industry has felt these impacts acutely, and as the industry seeks to meet the current challenges and move forward toward a more sustainable future, it is helpful to take stock of where things stand and where they might be headed in the coming years.

Perhaps the most important part of this review and planning process is understanding the legal and regulatory environment surrounding energy industry activities. *Energy Law in Southeast Asia* by the Tilleke & Gibbins Energy Industry Team seeks to fill this need in the context of our jurisdictions.

With offices throughout Southeast Asia, Tilleke & Gibbins offers highly trained legal experts with years of experience advising and working with the most innovative players in the industry. Our team knows very well that even among the tightly knit member nations of ASEAN, there is often a healthy divergence in energy laws and practices. We look at this abundance and multiplicity of laws as beneficial and offering business opportunity, and we aim to help clients, potential clients, and the legal community in general achieve a reasonable and informed understanding of the established laws and regulatory procedures surrounding energy projects in the region.

Each chapter of *Energy Law in Southeast Asia* takes the reader through the essential information surrounding energy and environmental regulations in general and the specific laws and practices for the major areas of energy projects—both in terms of the current energy mix and the sources taking on a larger role as we transition toward a lower-carbon future. These chapter subsections are:

- Regulatory Structure
- Oil and Gas
- Coal
- Solar
- Wind
- Hydropower
- Biomass and Biogas
- Environmental Regulations

In providing this legal overview of major areas across the spectrum of energy projects in Southeast Asia, we have sought to create a resource for all involved in the energy industry, regardless of their specific area of interest or the different obstacles or challenges they seek to resolve.

The specialists on the Tilleke & Gibbins Energy Industry Team together have over 200 years of accumulated energy experience. Spread throughout Tilleke & Gibbins' offices in Southeast Asia, they function both as an integrated regional team to advise multinational enterprises on their regional energy project portfolios, and as experts for investors and companies looking to focus their activities on a single

country. *Energy Law in Southeast Asia* is the first time that their expertise has been brought together in a single publicly available volume.

We hope you enjoy reading the inaugural edition of this publication and welcome any questions or comments.

Supasit and Joe
Chairs, Tilleke & Gibbins Energy Industry Team

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CAMBODIA

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1. Regulatory Structure

Regulatory Authorities

In Cambodia, the regulatory framework for the energy sector is set out in the Electricity Law of 2001, which delegates certain responsibilities to the Ministry of Mines and Energy (MME) and the Electricity Authority of Cambodia (EAC), an entity created under the Electricity Law.

The MME is broadly tasked with setting and administering government policies, strategies and planning in the power sector. EAC, on the other hand, is responsible for ensuring the provision of services and ensuring that electricity is provided in an efficient, sustainable, and transparent manner. Importantly, the EAC is responsible for issuing licenses for the supply of electricity and setting tariff rates.

Certain laws further delegate responsibilities for certain forms of energy production. The MME manages all activities in the petroleum sector pursuant to the Law on Management of Petroleum and Petroleum Products. For hydropower, the Ministry of Water Resources and Meteorology plays a role, alongside the Ministry of Mines and Energy and the Electricity Authority of Cambodia.

The Ministry of Environment is responsible for regulating environmental issues, including environmental impact assessments for all types of energy projects.

The Council for the Development of Cambodia is empowered to grant investment incentives for projects related to "green energy" and for other socioeconomic development sectors, which may broadly include the energy sector.

Lastly, Cambodia's Council of Ministers may need to provide their approval of any Qualified Investment Project (QIP) of at least USD 50 million if the project has a negative impact on the environment or involves an infrastructure concession.

Energy Policies

The Power Development Plan of the MME includes the most important energy policies for Cambodia. In addition, the National Policy on Rural Electrification, the Basic Energy Plan, the Energy Efficiency and Conservation Master Plan of Cambodia, the (draft) Renewable Energy Policy Plan, and various other policies influence the energy sector.

Beyond that, policies not exclusively focused on energy have an effect on the government's decision-making in relation to energy. For example, the Cambodia Industrial Development Policy 2015–2025 has various sections dedicated to energy in relation to industry, including energy access and energy investment priorities. Another example is the National Policy on Green Growth, which addresses energy management principles, clean energy technology, access to renewable energy, energy efficiency for buildings, and many other green growth policies.

List of Major Laws and Regulations

- Law on Investment
- Law on Concessions
- Electricity Law (and its amendments)
- Law on Environmental Protection and Natural Resource Management ("Environment Law")
- Law on the Management of Petroleum and Petroleum Products ("Petroleum Law")
- Law on Water Resource Management ("Water Law")
- Law on Forestry
- Law on Natural Protected Areas
- Sub-Decree on the Environmental Impact Assessment Process ("EIA Sub-Decree")
- Sub-Decree on the Organization & Functioning of the Council for the Development of Cambodia
- Regulations on the General Conditions for Electricity Supply (and its amendments)
- Regulations on the General Principles for Regulating the Electricity Tariff
- Regulations on the General Conditions for Connecting Solar PV Generation Sources ("Solar Regulations")
- Prakas (ministerial regulation) on the Classification of Environmental Impact Assessments of Development Projects
- Prakas (ministerial regulation) on the Implementation of the Plan of Decreasing the Price of Electricity for Consumers and the Plan of Reform of the Electricity Payment of Consumers for the Years of 2020 and 2021 ("2020 Tariff")
- Decision on the Determination of the Price of Electricity for Consumers Purchasing Electricity from the Sub Station and Station from the National Grid or Private Suppliers for the Year of 2021 ("2021 Tariff")

Energy Project Investment

Under Cambodia's Law on Investment, investments that have the potential for socioeconomic development, which may include power plant projects, can apply for Qualified Investment Project (QIP) status for their project with the Council for the Development of Cambodia.

A QIP project may select from two options for investment incentives.

Option 1:

- Exemption from tax on income from three to nine years from first income;
- Reduced tax on income for six additional years;
- Exemption from prepayment of income tax;
- Exemption from paying minimum tax with an independent audit report; and
- Export exemption.

Option 2:

- Accelerated depreciation;

- Increased offsets of up to 200% for qualifying expenses from three years to nine years;
- Exemption from prepayment of income tax;
- Exemption from paying minimum tax with an independent audit report; and
- Export exemption.

In addition, QIPs under both of the above options may be able to obtain import duty, special tax and valued-added-tax exemptions on imports.

Approvals and Licensing for Power Projects

Large-scale power projects must be approved by the MME and licensed by the EAC if they are to generate electricity for the national grid (i.e., power-generating projects that intend to sell or distribute power to others).

Large-scale power projects also usually have a project implementation agreement (or memorandum of understanding) that sets out the investment and business conditions of the project. If the project is approved, a letter will be issued by the MME.

At this stage, the developer of the project may also consider applying for Qualified Investment Project status to receive the incentives discussed in the previous section.

The project may then apply for an electricity generation license from the EAC. The application will be (partially) published, to allow for public comment on the proposed project.

In issuing licenses under which projects may legally operate in Cambodia, the EAC takes into account the government's long-term energy policies, which are formulated by the MME. These policies include the Power Development Plan, which is designed to ensure the provision of sufficient electricity for Cambodia. Any large-scale project must either fit into the existing plan or receive approval and subsequent inclusion in the plan.

The Electricity Law allows licensed large-scale power projects to generate and sell power, either to the grid operator Électricité du Cambodge (EDC), a state-owned electricity company that is jointly owned by the MME and the Ministry of Economy and Finance, or to a licensee. A third option is to sell directly to consumers, but this requires additional approval from the EAC and EDC. This is rarely granted in practice, but there is precedent for doing so in relation to biomass and biogas.

The EAC will review the application and inspect the proposed site for the project. After these steps, and liaising with the applicant on the application, approval will be provided for the project.

A PPA with the EDC or a licensee governs the sale of any electricity generated by the project. The PPA requires approval by the EAC, and the EAC will not grant a generation license unless there is a PPA in place.

The EAC licensing documents refer to the PPA, which forms an integral part of the licensing conditions. For example, the license's validity is pegged to the PPA's term of validity. The EAC publishes approved licenses on its website.

Large-scale power projects are also likely to need an initial environmental impact assessment (IEIA), and an environmental impact assessment (EIA), prior to construction. The developer may hire a consultant to conduct the assessments in line with Cambodian law, and then submit them to the Ministry of Environment for its approval.

Lastly, the project developer must apply for the required constructions permits, which are issued by the Ministry of Land Management, Urban Planning and Construction. Generally, the required permits include a construction permit, a permit to open the construction site, and a closing permit for the construction site.

Operating Requirements

A generation license sets conditions that the project must follow during its operations. All EAC licenses are made public, and typically state that the licensee must:

- comply with Cambodian law (highlighting the Electricity Law and the Environment Law);
- comply with orders from the EAC;
- comply with the terms of the PPA with the EDC;
- provide the EAC with its annual financial statements;
- provide the EAC with sufficient information to monitor compliance;
- pay license fees;
- comply with the Grid Code issued by the EAC; and
- ensure the health and safety of employees.

In addition, the license typically:

- confirms the licensee's right to generate power through the generation facilities as fixed by the license;
- sets conditions on the generation operations (e.g., planning any outages with EDC, ensuring the generation system is up to date, providing the EAC with plans to maintain the level and quality of generation); and
- sets conditions on the business (e.g., requesting EAC approval to acquire, associate itself, or own shares in any other electricity business, expand fixed facilities, amend the PPA, or securitize the project).

Violating any conditions of the license may result in its revocation.

2. Oil and Gas

Market Overview and Development

Several oil and gas fields have been identified in Cambodia, but so far commercial exploitation has been minimal.

In late 2020, Cambodia's first off-shore oil field, Block A, started production. However, due to the low output of the oil field and financial issues with the operator of Block A, the operator was forced into liquidation in June 2021, which led to the cessation of all commercial activities at the field.

Despite this setback, the Cambodian government will likely seek a new development partner for its oil fields, as it remains committed to its goal of becoming a crude oil exporter. This commitment is underlined by the 2019 adoption of a new law that regulates oil resources and their extraction (the Law on the Management of Petroleum and Petroleum Products), which overhauled the legal framework in place since 1991. With this new framework in place, Cambodia is ready to enter into the next phase in oil and gas exploitation.

Legal Overview

Exploration

Anyone engaging in the upstream activities of exploration, development, and production of petroleum (which broadly includes both oil and gas) must seek prior authorization from and enter into a petroleum agreement (PA) with the Ministry of Mines and Energy (MME), which will in turn seek the prime minister's approval before entering into the PA.

Only a locally established entity, or a foreign entity with a branch office or local subsidiary, may enter into a PA, upon which they are defined as a "petroleum contractor" (i.e., an operator).

Prospecting

Prospecting requires authorization from the MME but does not require a PA. The Petroleum Law allows "any person or legal entity" to apply for the right to conduct prospecting activities and does not prohibit foreign entities from doing so. However, commercial registration laws will likely require registration for prolonged prospecting activities in Cambodia.

The Petroleum Law defines prospecting as "an exploration with a purpose to initially determine a potential petroleum geology, without any rights to development and production." However, the Petroleum Law does grant a legal entity that has permission to prospect the nonexclusive right to apply for a PA over a potential block it identifies.

The MME is expected to issue a prakas (ministerial regulation) detailing the conditions and procedures for granting prospecting authorization in the near future.

Exploration

The Petroleum Law defines exploration as "the study of geology, lithology, geophysics, geochemistry, topography and engineering geology, and exploratory well, appraisal well, and other operations using any facilities [for petroleum activities] for the purposes of exploration [of the petroleum resources]."

Exploration requires authorization by the MME and a PA with the MME, as noted above. A petroleum contractor may explore the contracted area for up to seven years, with an optional extension for up to three years. If the maximum exploration period lapses without the petroleum contractor being able to enter into the development stage, the MME may terminate the PA.

If a petroleum contractor discovers petroleum resources (commercially viable or otherwise), it must notify the MME of the findings. To then proceed with the development and production stage, the petroleum contractor must request an in-principle approval from the MME and the prime minister.

If the petroleum contractor does not complete the development activities and therefore is not ready for production within five years of receiving the authorization, the petroleum contractor relinquishes the full contract area to the MME, which may terminate the PA.

The government is expected to issue further implementing regulations clarifying the Petroleum Law and its exploration-related obligations.

Construction of Facilities

While construction of facilities is not regulated under the Petroleum Law, petroleum contractors must maximize their use of domestic labor, goods, and services in their activities—including the construction of facilities.

In addition, the PA must set out minimum work obligations, and the petroleum contractor must provide a "plan for the development and production of petroleum" under the PA, meaning that indirectly, proposed facilities for development and production require the MME's approval.

In general, the MME and the prime minister have broad discretion in approving and entering into a PA, and therefore may set further requirements for facility construction, including in the exploration stage and in consideration of what will happen to the facilities after production, or in case exploration fails to uncover commercially viable resources.

Furthermore, operators must follow other applicable laws and regulations regarding construction, permitting, and environmental protection. For example, all projects in the petroleum sector require an environmental impact assessment.

Operating Requirements

The Petroleum Law lists the minimum requirements of a PA, and the PA sets out the main operating requirements. These include minimum work obligations, determination of transfer-receiving point for the produced petroleum, term, obligations to provide petroleum for domestic needs, obligations after cessation of petroleum operations, environmental restoration duties, and general rules regarding safety, security, and the environment.

Some of the main requirements are highlighted below:

- The maximum term of a PA is 30 years, with one optional extension of up to 15 years. This term is divided into two periods: the exploration period, and the development and production period. The exploration period is limited to seven years, with one possible extension of up to three years. If the petroleum contractor exceeds these terms for exploration, the MME may terminate the PA, with the petroleum contractor losing all its rights to the contract area.
- A maximum of two petroleum blocks can be awarded to one petroleum contractor (although a parent company could establish multiple separate entities).
- The MME determines the blocks, based on geological conditions. The MME may require two petroleum contractors to conduct joint operations under certain scenarios under the Petroleum Law, such as when a petroleum resource within a block is not commercially viable for a single contractor.

- A petroleum contractor must maintain insurance covering its activities, including for equipment and facilities, environmental damage, and other circumstances in accordance with international best practices and as recognized by the MME.
- Article 20 of the petroleum law further lists "important obligations" that a Petroleum Contractor is required to comply with. Broadly, these various requirements cover compliance with standards, protection of the social and natural environment, decommissioning plans, health and safety (both employees and the public), hiring and social obligations, and reporting requirements.
- Petroleum contractors may farm-in or farm-out certain obligations under the PA, and they may ask the MME for approval to securitize or assign the PA, or make changes in control.
- A petroleum contractor engaging in upstream activities (i.e., prospecting, exploration, development, or production) must register a separate legal entity if it wants to conduct downstream activities (i.e., processing, transport, storage, or trading).
- A PA can be suspended or terminated if the petroleum contractor cannot fulfill its obligations under the agreement. In general, parties should use the PA to clearly spell out all aspects of the Petroleum Law that still require further legislation. This will help avoid disputes regarding those issues.

Decommissioning

Decommissioning is not rigorously regulated under the Petroleum Law, which states that the PA must include provisions on the post-operation stage, including decommissioning and environmental rehabilitation plans. However, the Petroleum Law does not yet set out any specific requirements, nor does it provide any clear standard terms.

Under the PA, the petroleum contractor must develop an environmental protection plan during the course of operations and during the decommissioning phase. If failing to adopt such a plan results in any environmental damage, the petroleum contractor is subject to a fine (in Cambodian riel) of between KHR 400 million and KHR 2 billion (approximately USD 100,000–500,000).

Future delegated legislation is expected to give more details on mechanisms to ensure that petroleum contractors satisfy their decommissioning commitments.

Oil and Gas Price Structure

The PA is structured as a production sharing agreement with the government.

The Petroleum Law sets out that the government will retain a set royalty prior to allowing the petroleum contractor to recover costs and allocate profits. The government also shares in the profits, as per the Petroleum Law. The procedures, rules, and valuations used for determining both the royalty and the profit sharing arrangement will be provided for in delegated legislation. Until then, parties are free to negotiate these when negotiating the PA. (The most recent royalty rate was reportedly 12.5% of the total value of the petroleum production.)

Distribution of Oil and Gas

Distribution is regarded as a downstream activity under the Petroleum Law, and specifically falls under the definition of "trading," which includes the supply, distribution, sale, export, and import of petroleum and petroleum products. However, the sale and export of petroleum in accordance with a PA will not be viewed as a separate downstream activity that requires additional licensing under the Petroleum Law. Therefore, if a separate entity receives the petroleum and intends to export it, this separate entity must be licensed for these activities in accordance with the Petroleum Law.

Conducting any downstream activities, such as processing, transportation, storage, or trading of petroleum and petroleum products, requires establishment of a separate entity (even for existing petroleum contractors involved in upstream activities), a license or permit from the MME, a certificate of technical safety for any facilities it constructs for the downstream activities, and appropriate insurance.

Further regulations on distribution and other downstream activities are also expected to be issued under the Petroleum Law.

Enforcement and Compliance Mechanisms

The MME may assign petroleum inspectors, who will act in accordance with the Criminal Procedure Code to investigate violations and monitor compliance with the Petroleum Law. Further implementing regulations will detail the enforcement measures that a petroleum inspector may take, but the Petroleum Law itself provides that complaints against such measures may be filed with the MME within 30 working days of the measure being taken. The MME will provide a decision on the complaint within 45 working days of receiving the complaint. If the complainant is not satisfied with the decision of MME, it may file a legal action at the court within 30 days of the MME decision.

3. Coal

Market Overview and Government Policy

Coal is an important part of Cambodia's domestic energy production and will likely remain so for another decade.

In 2020, coal fired power plants were the single largest source of domestically produced energy in Cambodia—over 45% of all energy produced in Cambodia, according to the 2020 Annual Report on the energy sector, prepared by the Electricity Authority of Cambodia (EAC) and the Ministry of Mines and Energy (MME). In addition to three coal-fired power plants already in operation, this report further indicated that five additional power-purchase-agreements (PPA) had been signed for new coal-fired power plants in various stages of development. These five new coal-fired power plants will add another 4,065 MW of capacity once they are brought online.

However, Cambodia's energy minister stated in November 2021 that Cambodia will not build any new coal-fired power plants aside from those already approved. Therefore, over the long term, coal is likely to represent a diminishing source of electricity for Cambodia.

Legal Overview

Approvals and Licensing

Large-scale coal power projects require approval from the MME and typically a generation license from the EAC, as well as a power-purchase agreement (PPA) with the state-owned electricity company Électricité du Cambodge (EDC). Large-scale power projects also typically require environmental impact assessments, which are overseen by the Ministry of Environment, and various construction permits from the Ministry of Land Management, Urban Planning and Construction. All these requirements are detailed in the first section of this chapter.

Operating Requirements

A generation license, including for coal, typically details the licensee's right to generate power and sets out a number of service conditions relating to topics such as generation operations, compliance with business conditions and regulations, and employee health and safety. Violating any conditions of the license may lead to its revocation.

Enforcement and Compliance Mechanisms

A generation license generally provides that the license may be revoked by the EAC if the license fees are not paid, if the licensee commits a breach of the licensing conditions (and does not rectify the breach upon EAC order), or upon the EAC's initiative if there are grounds to do so.

The EAC may also consider any complaints, including by consumers and licensees, and render a decision. Entities may appeal any final decision of the EAC (including those made on the basis of licensing conditions) through the courts within three months of the decision.

Licensees must provide access to the EAC and its employees to inspect equipment and facilities to monitor compliance. If the EAC finds any violations, and its order for compliance is ignored, it may issue sanctions such as fines, revoke the license, or file a complaint in court.

If allowed by the applicable license, the EAC can mediate in other types of disputes, such as those between license holders.

4. Solar

Industry Overview and Development

Since the government enacted the Solar Regulations in 2018 and updated the applicable electricity tariffs, many companies have begun exploring the possibilities of rooftop solar for industrial users. Local companies largely want to cut their own energy costs, and foreign investors want to invest in rooftop solar systems for consumers, such as via a leasing model.

In addition, there has been a major push from the government to construct and commission new large-scale solar power projects, functioning as power plants, in an effort to diversify Cambodia's energy portfolio and to include more renewables.

Lastly, the government relaxed restrictions on consumer use of grid-connected solar systems, via the 2020 Tariff and the 2021 Tariff. Previously, the Solar Regulations limited grid-connected rooftop solar to big and bulk consumers only. Under the 2021 Tariff, certain categories of medium consumers (i.e., industry, agriculture, trade, and administration) were also allowed to use grid-connected solar systems and produce solar energy for their own consumption. Residential users, on the other hand, are not permitted to be connected to the grid while using solar power.
In light of Cambodia's improving framework for solar energy, several international and regional players are eyeing Cambodia as the next solar destination, either to invest in existing projects or to set up their own projects.

However, the solar industry and consumers are still advocating for an improved regulatory framework for rooftop solar so that projects will be commercially viable in light of Cambodia's regulatory and tariff structure, which makes rooftop solar projects difficult to navigate.

Legal Overview

Incentives

Under Cambodia's new Law on Investment, developers of large-scale solar projects (and other investments in green energy) can apply for Qualified Investment Project (QIP) status for their projects with the Counsel for the Development of Cambodia.

In addition, the government is incentivizing the use of solar power in rural areas by providing subsidies for solar home systems via the Rural Electrification Fund.

Potential future incentives for the solar industry

The Cambodian government has been working for several years on a draft Environment and Natural Resources Code. When adopted, it will have a major impact on Cambodia's regulatory framework, and the latest publicly available draft of the code provides rights and incentives that are very promising to the solar energy sector. These include the following:

- A right for all companies and consumers using solar energy to connect to the national grid;
- A requirement to develop regulations on net metering;
- Establishment of a one-year pilot for a feed-in-tariff system offering a fixed rate for solar energy fed into the grid; and
- Up to 20% reduction in profit taxes for any company generating at least 20% of its own energy through sustainable sources.

Potential for Solar Power Projects

Cambodia has great potential for solar power, given its high average of sun hours and solar irradiation per day (almost six peak sunlight hours a day, and an average solar irradiation of 5.0 kWh per square meter per day during the dry season[1]).

[1] Paul Millar, SEA Globe, October 31, 2019 (https://southeastasiaglobe.com/how-solar-can-shore-up-cambodias-energy-needs/)

Solar power projects are generally classified as rooftop solar projects for self-consumption, or large-scale solar projects that contribute to the national grid.

Rooftop Solar Projects

Since the adoption of the Solar Regulations in 2018, the legal framework for rooftop solar has vastly improved because the new regulations expressly permit industrial users of a certain size to use solar systems while connected to the grid, as well as the applicable tariff structure. This has encouraged a steady rise in solar rooftop projects.

The main potential for rooftop solar lies in the industrial sector (with a focus on the garment industry) and in special economic zones. Given the thresholds under the Solar Regulations and the tariff rules, medium and large consumers of electricity have the most potential to benefit from rooftop solar. In addition, large factories with have ample roof space have good potential, as no land acquisition or lease is required to install the solar systems.

However, the rooftop solar industry is challenged by the tariff rates and capacity charges that rooftop solar users must pay while connected to the grid, and limitations on the size of rooftop solar systems, which may negate the economic viability of some rooftop solar projects.

Large-Scale Solar Projects

Cambodia has great potential for large-scale solar power projects that contribute to the national grid as Cambodia seeks to balance its energy production portfolio, particularly after droughts reduced the effectiveness of hydropower facilities, and to meet international commitments on reducing greenhouse gases. In recent years, Électricité du Cambodge (EDC), the state-owned electricity company, has opened bidding on a number of projects to supply solar power to the national grid.

The main potential for such projects lies in the provinces surrounding urban areas, where land is generally more affordable than in the urban areas itself. In addition, projects with floating solar panels on bodies of water appear to be a success in Cambodia.

Requirements and Procedures for Initiating a Project

As detailed earlier, electricity in Cambodia may not be generated for sale without a license from the Energy Authority of Cambodia (EAC), and all generated electricity under a license must typically be sold to the EDC, or a licensee, via a power purchase agreement.

Rooftop Solar

Generation of electricity for one's own consumption must generally be done completely off-grid. The solar system cannot have a grid connection, directly or indirectly. Anyone using an off-grid solar system is responsible for the system itself, and is not further regulated under the Solar Regulations. However, medium consumers in four sectors—industry, agriculture, trade, and administration—may connect their solar system to their own grid-connected electricity system, as may all types of big and bulk consumers.

The electricity regulations define these consumers as follows:

- Bulk consumer: Consumers purchasing electricity at high voltage, directly from the grid substation or from a high voltage power line.
- Big consumer**:** Consumers purchasing electricity at medium voltage, directly from the grid substation with a medium voltage meter, or directly connected to the grid of a supplier with a medium voltage meter and a transformer (if any).
- Medium consumer: Low-voltage electricity purchasers consuming more than 90 amp, 3 pole electricity from a low-voltage outlet, directly purchasing the energy via a transformer distribution with a low-voltage meter. Medium consumers can receive electricity supplied up to 275 kVA.

Tariffs for Rooftop Solar

For consumers that use a grid-connected solar power system, a special solar tariff applies. For bulk consumers, the solar tariff of the 2020 Tariff applies, while for eligible big and medium consumers, the 2021 Tariff will apply. Both tariffs apply a capacity charge, which is based on the contracted electricity capacity, and an energy charge based on actual use.

The maximum synchronized capacity of a grid-connected solar system should not exceed 50% of the contract load (the expected electricity capacity in the electricity supply agreement), which in turn must be at least 200% of the capacity from the grid-connected solar system. Noncompliance is subject to a fine at double the rate of the capacity charge.

Applying for Rooftop Solar Authorization

Eligible consumers who wish to use a grid-connected solar system must request permission from EDC before connecting to the grid. Applicants must submit information on the planned solar system, and the system must meet the technical standards in the Solar Regulations.

If permission is granted, the solar system must be constructed and ready for use within a year, or the permission will lapse.

A final mandatory inspection of the solar system is conducted by EDC, which then will issue an approval letter. The consumer will then sign a new electricity supply agreement with EDC or its local licensee, which includes the new applicable tariff.

The solar system may then legally operate while connected to the grid, without the need for further approvals or renewals of approval.

Approvals and Licensing for Large-Scale Solar Projects

Large-scale power projects (including solar) that generate electricity for the national grid require approval from the Ministry of Mines and Energy (MME), and a license from the Energy Authority of Cambodia (EAC). Various environmental impact assessments and construction permits are also typically needed. See the first section of the Cambodia chapter for more details.

Operating Requirements

Rooftop Solar

Once a grid-connected rooftop solar project is approved by the EDC, it requires no further approvals or renewals. However, the technical standards in the Solar Regulations must be maintained during the operation of the system.

All electricity generated by the project must be consumed by the consumer, and consumers must program inverters not to feed electricity into the grid. In addition, the consumer must install and maintain suitable meters, or pay for EDC or the licensee to install these.

If a system violates the Solar Regulations, the consumer will be notified, followed by disconnection after seven days if the violation remains in place. In addition, fines may apply to violations.

Large-scale Solar Projects

All solar systems, including large-scale systems, must maintain the technical standards in the Solar Regulations during the operation of the system.

Furthermore, a generation license typically details the licensee's right to generate power and sets out a number of service conditions relating to topics such as generation operations, compliance with business conditions and regulations, and employee health and safety. Violating any conditions of the license may eventually result in its revocation.

Enforcement and Compliance Mechanisms

A generation license generally may be revoked by the EAC if the license fees are not paid, if the licensee commits a breach of the licensing conditions (and does not rectify the breach upon EAC order), or upon the EAC's initiative if there are grounds to do so.

Furthermore, the EAC may receive and consider any complaints, including by consumers and licensees, and render a decision on the complaint, in accordance with the applicable laws and regulations. The EAC's final decision on a matter can be appealed through the courts within three months of the decision. This includes any EAC decision made on the basis of licensing conditions.

Licensees must allow the EAC and its employees to monitor compliance by inspecting equipment and facilities. If required, the EAC may order compliance in case it finds any violations, and if this order is ignored, it may issue sanctions such as fines, revoke the license, or file a complaint in court.

If the applicable license allows it, the EAC can also mediate in other types of disputes, such as those between license holders.

5. Wind

Industry Overview and Development

At present, there are no large-scale wind farms in Cambodia.

The state-owned electricity company Électricite du Cambodge (EDC) has announced its interest in developing a wind power project after feasibility studies revealed wind power potential in Mondulkiri and Kampot Provinces.

In Kampot Province, EDC intends to partner with a French energy firm to build 10 wind turbines (amounting to 80 MW) atop Bokor Mountain. In Mondulkiri Province, a Chinese/Cambodian consortium has reportedly completed feasibility studies for a 100 MW wind farm, comprising up to 40 wind turbines.

Potential for wind power projects

At the moment, opportunities for wind power remain largely unexplored, although they are known to be viable and there is potential for development in the future.

The government has stated in the past that wind energy has potential in the country, noting in a 2011 report by the MME that wind speeds at ground level in Cambodia reached an average of five meters per second—just meeting the threshold for economic viability of standard wind turbines.

Lastly, the *Phnom Penh Post*, a well-known English-language newspaper in Cambodia, reported in June 2021 that a recent study identified seven potential windy zones that could contribute up to 1,185MW of power to Cambodia's energy portfolio by 2030.

Legal Overview

Incentives

There are no incentives expressly dedicated to wind energy. However, under Cambodia's new Law on Investment, investments in green energy, which would likely include wind farms, can apply for Qualified Investment Project (QIP) status for their projects with the Counsel for the Development of Cambodia. Benefits for QIPs are detailed at the beginning of this chapter.

Requirements and Procedures for Initiating a Project

While there are no regulations specifically targeting wind power in the country, some current regulations—especially those already tested in the solar sector—are expected to apply equally to the wind energy sector.

Another potential regulatory limitation imposed on wind power specifically is Cambodia's legal provisions against nuisance, outlined in the Civil Code. As wind turbines cause noise pollution, there may be grounds for suits against wind farms that are seen as a nuisance to neighbors. While no such case has been filed in Cambodia, similar arguments have been made against wind energy projects in other jurisdictions.

There are no wind farms in Cambodia currently, but the requirements for initiating a project (e.g., approvals, licensing, etc.) would presumably be similar to those for other types of energy projects. In summary, the steps include approval from the MME, licensing from the EAC, and a power purchase agreement with EDC. The approval and licensing requirements for initiating a project are further detailed in the initial section of this chapter.

A large-scale project will also likely need environmental impact assessments, overseen by the Ministry of Environment, and various construction permits from the Ministry of Land Management, Urban Planning and Construction.

Operating Requirements

Like other power projects, wind power projects must observe the EAC license conditions, which address issues such as generation operations, compliance with business conditions and regulations, and employee health and safety. Given the potential for wind power projects to affect the landscape or cause nuisance, an EAC license for wind power might also include conditions related to these matters. Violating any conditions of the license may result in the revocation of the license.

Enforcement and Compliance Mechanisms

A generation license may be revoked by the EAC if the license fees are not paid, if the licensee commits a breach of the licensing conditions (and does not rectify the breach upon EAC order), or upon the EAC's initiative if there are grounds to do so.

The EAC may also consider any complaints, including by consumers and licensees, and render a decision. Entities may appeal any final decision of the EAC (including those made on the basis of licensing conditions) through the courts within three months of the decision.

Licensees must provide access to the EAC and its employees to equipment and facilities so that it can monitor compliance. If the EAC finds a violation and their order for compliance is ignored, it may issue sanctions such as fines, revoke the license, or file a complaint in court.

If the applicable licenses allow it, the EAC can mediate in other types of disputes, for example between the holder of an electricity generation license, and a distribution license.

6. Hydropower

Industry Overview and Development

Cambodia relies heavily on hydropower for its electricity. The ten hydropower plants in operation in 2020 supplied over 40% of the country's total power, according to the 2020 Annual Report on the energy sector prepared by the Electricity Authority of Cambodia (EAC) and the Ministry of Mines and Energy (MME).

However, a series of droughts that caused power outages across the country prompted the government to rethink its reliance on hydropower. Reportedly, the government is considering focusing on other power sources, although it did approve two hydropower projects in 2020, totaling 550 MW.

The government has further stated in the press that, for the next decade or so, no hydropower plants will be constructed on the Mekong River in Cambodia, although they did not rule out new hydropower projects on its tributaries.

Generally, hydropower has been perceived as having a negative effect on the environment, in addition to the significant impacts these projects can have on communities living in the area. Many members of civil society therefore oppose any new hydropower projects and suggest solar and wind as better alternatives environmentally and socially.

Legal Overview

Incentives

There are no incentives expressly dedicated to hydropower sector. However, under Cambodia's new Law on Investment, investments in green energy, which would likely include hydropower facilities, can apply for Qualified Investment Project (QIP) status with the Counsel for the Development of Cambodia (CDC). The QIP incentives are outlined in the beginning of this chapter.

Project Construction

Typically, hydropower requires various approvals prior to starting construction on the project, given the average size of a hydropower project and the required investment.

Hydropower projects do typically apply for QIP status with the CDC as discussed above. The CDC must request approval from Cambodia's Council of Ministers if the project requires an investment of over USD 50 million, if the project has a negative impact on the environment, or involves an infrastructure concession, including a build-operate-transfer project. Hydropower projects typically meet these thresholds.

As the project will affect waterways, it must obtain a water-use license from the Ministry of Water Resources and Meteorology, as required by the Water Law.

Lastly, approval from the MME and licensing from the EAC are necessary, as is a PPA governing the sale of electricity generated by the project. These requirements are detailed in the first section of this chapter, which also covers large power projects' likely need for environmental impact assessments and various construction permits.

Operating Requirements

The generation license from the EAC includes a set of conditions that the project must follow during its operations. In general these cover topics such as generation operations, compliance with business conditions and regulations, and employee health and safety. These are listed in further detail in the first section of this chapter. Violating any conditions of the license may eventually result in the revocation of the license.

Enforcement and Compliance Mechanisms

In general, the EAC may revoke a license if fees are not paid, if the licensee breaches any of the licensing conditions (and does not rectify the breach in accordance with the EAC's order), or upon the EAC's initiative if there are grounds to do so.

The EAC may also consider any complaints, including by consumers and licensees, and render a decision. Entities may appeal any final decision of the EAC (including those made on the basis of licensing conditions) through the courts within three months of the decision.

Licensees must open their equipment and facilities to inspection by the EAC so that it can monitor compliance. If the EAC finds any violations and its order for compliance is ignored, it may issue sanctions such as fines, revoke a license, or file a complaint in court.

If the applicable license allows it, the EAC can mediate in other types of disputes, such as those between license holders.

7. Biomass and Biogas

Industry Overview and Development

Farmers and rural households use small-scale bio-digesters that produce biogas. These operate off-grid and are mainly used for cooking or other purposes—usually not for generating electricity.

The 2020 annual report on the energy sector, prepared by the Electricity Authority of Cambodia (EAC) and the Ministry of Mines and Energy (MME), identifies four licensees (five plants) that utilize biomass and biogas to generate electricity (for example, by using rice husks). However, these plants only contributed 0.76% of the total electricity generated in Cambodia in 2020.

Interestingly, one of the rice husk biomass plants was a pilot project that was considered successful. This pilot may lead to a potential USD 3.7 million dollar biomass plant, combined with solar, to be constructed near Phnom Penh. The project aims to launch in 2021.

Legal Overview

Incentives

There are no incentives expressly dedicated to biomass and biogas projects, but investments in green energy can apply for Qualified Investment Project (QIP) status and its attendant incentives, as detailed in the opening section of this chapter.

Requirements and Procedures for Initiating a Project

While there are no regulations specifically targeting biomass and biogas, some current regulations—especially those already tested in the solar sector—are expected to apply equally to biomass and biogas.
Cambodia's general laws and regulations (including approvals and licensing requirements) for power projects would also apply to biomass and biogas electricity generation projects, especially in the case of large-scale projects. These are detailed in the first part of this chapter.

Operating Requirements

A biomass or biogas project that needs a generation license must comply with the various operating conditions set out in the license. These include issues such as generation operations, compliance with business conditions and regulations, and employee health and safety. Violating any conditions of the license may result in its revocation.

Enforcement and Compliance Mechanisms

In general, the EAC can revoke a license if the license fees are not paid, if the licensee commits a breach of the licensing conditions (and does not rectify the breach in accordance with an EAC order), or upon the EAC's initiative if there are grounds to do so.

The EAC may also consider any complaints, including by consumers and licensees, and render a decision. Entities may appeal any final decision of the EAC through the courts within three months of the date of the EAC decision.

Licensees must allow the EAC and its employees to monitor compliance by inspecting equipment and facilities. If the EAC finds any violations and its order for compliance is ignored, it may issue sanctions such as fines, revoke a license, or file a complaint in court.

If the applicable license allows it, the EAC can mediate in other types of disputes, such as those between license holders.

8. Environmental Regulations

Environmental Impact Assessments

The Environmental Law requires almost all energy-related projects to obtain an initial environmental impact assessment (IEIA) and an environmental impact assessment (EIA). The EIA Sub-Decree (together with implementing regulations) sets out the required procedures and content of an EIA.

Projects must prepare an environment management plan (EMP) and suggest measures to mitigate environmental damage.

The laws further require the Ministry of Environment to evaluate and review any EIA with other relevant ministries—for the energy sector, the Ministry of Mines and Energy (MME), and potentially the Ministry of Water Resources and Meteorology. For certain projects, the EIA must be reviewed by the Council for the Development of Cambodia.

The Ministry of Environment is responsible, under the EIA Sub-Decree and the Environmental Law, for monitoring projects and ensuring that projects act in compliance with the findings of the EIA and the EMP.

Clearance and development activities within core zones or conservation zones (as defined under the law) are prohibited by the Law on Natural Protected Areas, and an EIA is necessary for development activities within or adjacent to protected areas.

The Law on Forestry requires an EIA in any area deemed to fall under the Law on Forestry, and adds that a Social Impact Assessment is also required.

The MME may require a preliminary socioeconomic, risk-level, and environmental impact assessment from operators in the oil and gas sector before they ae allowed to exploit an oil field.

Disclosure and Public Participation

Under the EIA Sub-Decree, the process of an EIA must include "public participation in the implementation of the process and take into account their [i.e., the public's] input and suggestions in the process of project approval." In addition, during the electricity generation licensing application process with the EAC, a public consultation must take place with the relevant stakeholders. Licenses for electricity generation are published online, including any licensing conditions.

The Petroleum Law provides that the MME "may inform the public," but no public consultation is required under the law. One could argue that the constitution of Cambodia does require authorities to facilitate public participation if initiated by citizens, as it enshrines the right to participate in "the political, economic, social and cultural life" of the country.

The Law on Forestry requires public participation during an EIA, and generally "to ensure public participation in any government decision that has the potential for heavy impact on concerned general citizens, livelihoods of local communities and forest resources."

Environmental Damage

Generally, licensees must take responsibility for any damages caused by their operations. This can be assumed to include clean-up costs, environmental restoration expenses, and damage to property. Violations of licensing conditions are usually met by penalties such as fines and license revocations. However, the laws often include references to damages as being part of a potential penalty, or meaning that a penalty does not preclude possible damages awards.

Operators in the oil and gas sector are specifically required to obtain insurance against environmental damages.

LAOS

Dino Santaniello ● Niti Muangkote

1. Regulatory Structure

Regulatory Authorities

The Ministry of Energy and Mines (MEM) has primary responsibility for the power sector in Laos, with jurisdiction over energy policy and an advisory role in the government's energy strategy. The MEM also oversees the activities of state-owned enterprises involved in the energy sector, notably Électricité du Laos (EDL), EDL-Generation Public Company, and its solar subsidiary, EDL-Gen Solar.

The MEM comprises ten departments: the Departments of (1) Inspection, (2) Mining Management, (3) Energy Management, (4) Organization and Personnel, (5) Energy Business, (7) Geology and Minerals, (8) Energy Policy and Planning, (9) Law, and (10) Planning and Cooperation. Two institutions comprise the MEM, which are the Institute of Energy and Mines Research, and the Institute of Renewable Energy Promotion.

The MEM's Department of Energy Business (DEB) is the main agency that deals with private investment in the energy sector in Laos. Its responsibilities include:

- Reviewing investment proposals, the economic and financial benefits that a project may bring to the society, and technical feasibility studies;
- Coordinating and negotiating memorandums of understanding and project development agreements, and reporting to the line authorities for their signing consideration;
- Participating in the negotiation of power purchase agreements (PPAs), financing documents, documents pertaining to obligations towards environmental and society obligations.
- Performing financial analysis on project feasibility studies to establish levies, taxes, returns-on-investment, and debt arrangements for commercial lenders; and
- Implementing project agreements and monitoring and enforcing compliance with relevant legislation.

The Lao authorities formally approve the development of an energy project through a concession agreement, which is reviewed and negotiated with the MEM. However, EDL assumes responsibility for the negotiation and preparation of PPAs.

The administrative authority who authorizes an energy project depends on the size of the project. According to the Law on Electricity, the chief of the municipality or the mayor of the city can approve projects referred by the Office of Energy and Mines, as instructed by the Department of Energy and Mines, if the project is below 100 kilovolts (kV) in size or involves the resettlement of fewer than 20 families.

The governor of the province may approve 100–5,000 kV energy projects proposed by the Department for Energy and Mines, as instructed by the MEM, but if the project involves the resettlement of more than 20 families, the Standing Committee of the Provincial Assembly must approve the project.

The Lao government has approval authority over MEM-proposed energy projects between 5,000 kV and 100 megawatts (MW), while government-proposed projects above 100 MW can only be approved by the Standing Committee of the National Assembly.

Likewise, if a project involves a reservoir covering an area of more than 10,000 hectares or involves the resettlement of more than 100 families, the Standing Committee of the National Assembly must consider and approve of the project, as proposed by the government.

Besides the MEM, departments in the Ministry of Planning and Investment (MPI) also play a central role because most energy projects are considered concessionary projects or activities. Accordingly, the MPI receives the applications and requests for granting permits and approvals for the development of energy projects in Laos, and is party to related project development agreements and concession agreements.

Energy Policies

Laos has identified the energy sector as a key driver of economic growth and poverty alleviation, which is crucial to the country's ambition to exit the United Nations' list of least developed countries by 2026. The energy sector is seen as providing electricity for the sustainable growth of the industrial sector, and furthering electrification of rural areas with affordable energy. This feat may be achieved not only through large investment projects, such as large hydropower plants, but also through support for smaller hydropower plant projects (less than 15MW), or solar projects, which can be achieved at a local level and involve less scrutiny and bureaucratic procedure than larger projects.

At the regional level, according to the Report on the Eighth Five-Year Energy and Mining Development Plan (2016–2020) and the Ninth Five-Year Energy and Mining Development Plan (2021–2025), Laos endeavors to become the "Battery of Southeast Asia," exporting most of its energy to neighboring countries and playing a key role within the ASEAN bloc. For instance, Laos has already signed agreements to export 5,000 MW to Vietnam, 3,000 MW to Cambodia, 500 MW to Myanmar, and 300 MW to Malaysia. In 2020, the report noted that the country was capable of exporting 6,500 MW, and anticipated Laos being able to export 5,000 MW more in the next five years, bringing the total to 11,000 MW.

Natural resources are abundant in Laos. The Lao Environment Outlook issued by the Ministry of Natural Resources and Environment (MNRE) in 2011 estimated that 35% of all water in the Mekong River originates from watersheds within Laos. Most of the government's energy policies thus revolve around the production of energy from hydropower plants.

At the same time, Laos also seeks to diversify its sources of energy to avoid making its energy policies solely dependent on hydropower. The Renewable Energy Development Strategy in Lao PDR, issued in 2011, which set the national targets for renewable energy up to 2025, as well as a longer-term vision, stated that the country expects to be able to provide 30% of its total energy consumption from renewable energy sources (not including energy generated by dams and hydropower plants producing more than 15MW). The report stated that of this 30%, 10% will be biofuel, 15% will be electricity (e.g., wind, solar), and 5% will be thermo-energy.

Biofuels are to be used to decrease dependency on imported fossil fuels. The demand for fuel is unlikely to decrease in the coming years, and it will remain a necessary source of energy for the development of the country. Accordingly, Laos aims to incentivize farmers, as well as Lao and foreign investors, to produce biofuel, primarily for domestic consumption, and endeavors to cover 10 percent of the transport fuel demand with biofuel. In parallel, the country aims to increase the deployment of biofuel technology in rural areas.

As for solar energy, few projects are currently in operation, but there has been an increase in interest from foreign and local investors, and solar technology is favored by local authorities as a strong candidate to support energy needs during the dry season, when water may not be plentiful enough to run some hydropower plants. (According to MNRE estimates, 80% of the water flow in Laos occurs during the rainy season.) Similarly, the government's Rural Electrification Master Plan states that solar energy may be used to provide electricity in remote areas not connected to the national electricity grid.

The few solar plants in Laos have mostly been developed by state-owned enterprises and generate only a small amount of electricity, but a 1,200MW floating solar farm—the largest in the world—is slated for the coming years, and organizations such as the Asian Development Bank have stated that installing floating solar panels on hydropower and irrigation reservoirs is an effective strategy for deploying solar power throughout the country.

The Renewable Energy Development Strategy in Lao PDR also addresses wind power. It points out the necessity of developing a legal framework for wind energy in order to incentivize private investment in the wind sector. Until such a dedicated legal framework is developed, the authorities are expected to apply the general framework on electricity projects, or the practices relevant to hydropower plants, to the wind sector. The Renewable Energy Development Strategy in Lao PDR does, however, state an aim to generate around 50 MW of wind power by 2025, and in 2020 a 600 MW wind project was approved by authorities, with new investors joining the project in 2021.

As for biogas and biomass, the Renewable Energy Development Strategy in Lao PDR sees the technology as being primarily useful for reducing the importation of liquefied petroleum and the use of firewood, charcoal, and electricity for heating and cooking. To date, this type of energy has not been used to support industrial growth of the country. However, it may provide immediate solutions for remote areas, which may rely on this type of energy for heating purposes.

List of Major Laws and Regulations

- Law on Electricity No. 19/NA, dated April 9, 2017
- Presidential Ordinance on the Royalty Rate of Natural Resources No. 001/OP, dated December 15, 2015
- Decree on the Endorsement of the Utilization of the Energy Policy of the Lao PDR No. 392/GOV, dated July 2020
- Decree on the Endorsement of the List of Controlled and Concession Activities in Lao PDR No. 03/PMO, dated January 10, 2019 ("Decree on Concession Activities")
- Law on Minerals No. 31/NA, dated November 3, 2017
- Law on Construction No. 5/NA, dated November 26, 2009

- Law on Standards No. 49/NA, dated July 18, 2014
- Decree on Petroleum Business No. 331/PMO, dated October 27, 2017
- Law on the Processing Industry No. 48/NA, dated December 27, 2013
- Law on Investment Promotion No. 14/NA, dated November 14, 2017
- Law on Enterprise No. 46/NA, dated December 23, 2013
- Civil Code No. 55/NA, dated December 6, 2018
- Penal Code No. 26/NA, dated May 17, 2017
- Law on Income Tax No. 67/NA, dated June 18, 2019
- Recommendations on Tax and Customs Duties on Investment Incentives for Import Master List of Enterprise No. 01, dated January 2, 2019 ("Recommendations No. 01")
- The Instructions on the Promotion of Investment Incentives concerning State Land Rental and Concession Fees No. 0760/MPI, dated May 14, 2021.
- Law on Environmental Protection No. 29/NA, December 18, 2012
- Law on Land No. 70/NA, dated June 21, 2019
- Law on Water and Water Resources No. 23/NA, dated May 11, 2017
- Decree on Biofuel no.410/GO, dated November 10, 2016
- Instructions on the Environmental Assessment No. 8029/MONRE, dated December 17, 2013
- Decree on Environmental Impact Assessment No. 21/GO dated January 31, 2019
- Decree on Public Private Partnership No. 624/GO, dated December 21, 2020

Energy Project Investment

Laos provides incentives for investment in the promoted sectors defined in the Law on Investment Promotion, which include the development of environmentally friendly technology, natural resources, and energy. A power plant of any sort would be deemed part of this promoted sector, and would thus be eligible for the following tax and customs duty exemptions:

- Import duty exemption and 0% value-added tax on the import of materials and equipment that may not be procured or produced in Laos in the form of fixed assets, and machinery and vehicles directly used for production (including solar panels and inverters). However, the import of fuel, gas, lubricant, administrative vehicles, and other materials must comply with relevant laws.
- Import and export duty exemption, as well as 0% value-added tax on raw materials, equipment, and parts to be used in production for export.
- 0% value-added tax on domestic raw materials (besides natural resources) used for the production of finished and semi-finished products for export.

In addition, projects in promoted sectors receive benefits and incentives in accordance with their location in one of three different types of promoted zones:

- Zone 1: Zones with particularly high levels of poverty, zones in remote areas, and zones without adequate infrastructure to support and facilitate investments;
- Zone 2: Zones that have good socioeconomic infrastructure to support and facilitate investment; and

- Zone 3: Special economic zones (SEZs).

Profit-tax exemptions of 4 to 15 years are available depending on the zone in which a promoted company sets up its operations (not including activities within SEZs, which adhere to the regulations specific to that SEZ).

Additional incentives may be negotiated on a case-by-case basis through a concession agreement. However, incentives not expressly provided in law require the agreement of the National Assembly.

Initiating an Energy Project

There are generally four milestones to complete in initiating a project: the memorandum of understanding (MOU), the project development agreement (PDA), the concession agreement, and the power purchase agreement (PPA).

Once a project developer is selected and confirmed, there will be negotiations for an MOU between the developer and the local authorities. The MOU sets out the intention of both parties to proceed with further studies on the viability of the project, including a feasibility study and an environmental and social impact assessment. At this stage, it is not normally necessary to incorporate a legal entity. The project developer may simply set up a representative office to supervise the implementation of the MOU with the local authorities.

Next comes the execution of a PDA, under which the project studies begun under the terms of the MOU can be finalized. In addition, the negotiation of the tariff agreement and negotiations for the PPA can begin. It is at this stage that a legal entity needs to be incorporated to develop the project. This must take place prior to the execution of a concession agreement, which must be signed by the locally established legal entity that will develop the project. The PDA is valid for a period of 18 months and can be renewed once for a further six months.

In Laos, energy projects are seen as concessionary projects. The concession agreement will address various issues, such as the rental fee for the land concession, tax incentives, and the rights and obligations of the project developer and the local authorities. The concession agreement will be valid for a maximum of 50 years and can be renewed.

The PPA, which is between the project company and EDL, sets the conditions and value of the electricity that is to be sold to EDL (either to be used domestically or exported).

2. Oil and Gas

Market Overview and Development

There is no upstream oil and gas sector to speak of in Laos. While there has been some investment—such as from the International Finance Corporation—for resource exploration, no oil or gas reserves have yet been found in the country. Laos remains heavily dependent of its neighbors (mainly Thailand and Vietnam) for petroleum products, which are used primarily for transport and in the industrial sector. In order to reduce its reliance on transportation fuel, the authorities have

encouraged the country's first commercial oil refinery, which was realized through a joint venture between Lao and Chinese investors.

Legal Overview

Exploration

The Law on Minerals details requirements for exploration of crude oil and gas, which would typically be considered a concessionary project and would follow the same process as for mining, including assessment of the sustainability of a site.

The Decree on Concession Activities sets out some basic criteria for concessionaires, which must be financially sound entities with experience in the oil and gas or mining industries. Investors looking to explore oil and gas potential must submit a proposal to the Department of Geology in the MNRE. The authorities will give their formal approval in a memorandum of understanding (MOU) allowing the investor to come to Laos to study and analyze the surface of the site. Once the study and analysis have concluded, the investor will be asked to send a proposal to the Ministry of Planning and Investment, or a related department, in order to negotiate a concession agreement for the survey and exploration of the land. Prior to concluding the concession agreement, the investor must set up a legal entity in Laos, for which the following documents are required:

- Application form provided by the authorities;
- Detailed plan for the project, certified by a legal representative of the company;
- Detailed explanation of the expertise and experience of the company;
- License or business registration certificate of the company;
- Map of the project location (global positioning data on the concession area);
- Technical data on the project;
- Documents about the primary data collection, collected at the time of the MOU;
- Supporting letters from financial institutions or banks (if any); and
- Any other related documents.

Once the concession rights are secured, the investor must obtain the relevant business operating license from the MNRE. This requires the submission of an "operation plan" consisting of three phases: prospecting, exploration, and a preliminary feasibility study of the project's environmental and social impact and economic effectiveness.

Construction of Facilities

The construction of facilities in the oil and gas sector does not specifically fall under the scope of the Law on Minerals or any other legislation, so it is regulated under the Law on Construction, the Law on Processing Industry, and the Law on Standards.

The Law on Industrial Processing applies to the construction of a factory with machinery of at least 10 horsepower or 7.46 kV, or at least 10 employees, in order to produce, assemble, repair, fix, or process new items. The person or entity looking to construct such a facility must have an enterprise registration certificate (ERC), which shows the legal entity's incorporation in Laos. A business operating license will be necessary in order to run the facility.

The workforce must be primarily Laotian. However, for important projects, the local authorities have discretion over this, and may be willing to approve importing qualified labor in order to ensure the construction can be completed as planned.

Important projects must also have a report on the feasibility study of the construction project. The report must include a study on environmental, social, and health impacts of the construction project. A construction permit is also necessary, and the design of the factory must be approved by the local authorities. Once the construction permit has been approved, safety measures must be instituted to protect and preserve the environment during the construction.

Operating Requirements

The Law on Industrial Processing sets out a series of broad obligations that operators must observe. One of these is the obligation to create a management unit to be in charge of safety, hygiene, the environment, and any disasters that may occur in the facility. All serious accidents must be reported specially to the relevant authorities, including the governmental agency relating to the industry and commerce. Factories must also:

- Operate according to the technical standards and their business operating license;
- Protect worker safety and implement labor policies such as social welfare provision;
- Fulfill their tax obligations and pay official fees fully and on time;
- Liaise with the local administration regarding facility operations in relation to issues such as preserving peace, orderliness, and the environment; and
- Report any temporary or indefinite stoppage of its activities, or liquidation, to local authorities.

Decommissioning

There are also no laws or regulations that specifically address decommissioning of oil and gas projects. Under the Law on Environmental Protection, investors in projects that have an impact on the social or natural environment must amend, restore, and compensate for any damage caused. This provision could include decommissioning obligations. It uses broad language and does not define some terms, such as "impact" on the environment, so as is common in Laos, the authorities have broad leeway for interpreting the law, for example by requiring the investors to restore the project site to its original state. These issues should be anticipated and clarified in the concession or other relevant agreement with the government.

The Law on Environmental Protection also requires investors to provide a monetary security deposit for the protection and preservation of the environment. The deposit will only be returned upon the completion of all conditions stipulated under the applicable investment agreement (such as a concession agreement).

Oil and Gas Price Structure

A sliding scale for government royalties is laid out in the Presidential Ordinance on the Royalty Rate of Natural Resources. The ordinance does not include an oil and gas price structure, which must be negotiated contractually with the local government and detailed in the concession agreement between the investor and the local authorities.

Distribution of Oil and Gas

The Decree on Petroleum Business applies to businesses involved in importation, exportation, production, refining, or distribution of oil and gas, and to gas stations and petrol services in general. These businesses must obtain an ERC and the relevant business operating license from the Ministry of Industry and Commerce.

In addition, importers and exporters of petroleum products must have:

- Registered capital (in Lao kip) of at least LAK 150 billion (approx. USD 14 million) and working capital of at least LAK 60 billion (approx. USD 5.54 million);
- Storage capacity for more than five million liters of fuel;
- A company trademark registered with the relevant authorities;
- At least 20 fuel transportation vehicles;
- A domestic fuel distributor;
- A fuel quality laboratory that is registered with the Ministry of Technology and Communications; and
- At least 30 personnel who have passed the fuel business training hosted by the relevant authorities.

Once in possession of an ERC, petroleum business operators must seek an environment certificate and a construction permit in relation to the fuel storage depot that must be constructed. Importers and exporters must ensure fuel reserves lasting at least 21 days in the event of a fuel shortage, and they must be able to import a certain amount of petroleum, as set out by the relevant authorities, in addition to purchasing an insurance policy covering their business.

Enforcement and Compliance Mechanisms

The local authorities have broad authority to monitor and inspect a facility at any time, according to the Law on Environmental Protection and the Law on Industry. In such cases, the inspectors must act in accordance with the Criminal Procedure Code. While no publicly available regulation provides information on the range of fines or other penalties that may be imposed on operators found to be in violation, the Penal Code provides a broad range of sanctions for operators that contravene their obligations toward safety or environmental protection.

3. Coal

Market Overview

The coal market is relatively limited in Laos. According to the summary of the 8th Five-Year Energy and Mining Development Plan (2016–2020) and the 9th Five-Year Energy and Mining Development Plan (2021–2025), dated June 24, 2020, only one of Laos' 78 power projects already in operation is a coal power plant: the Hongsa power plant, with a capacity of 1,878MW, which belongs to Thai investors along with a state-owned enterprise.

According to the Decree on the Endorsement of the Utilization of the Energy Policy of the Lao PDR No. 392/GOV, between 2000 and 2018, coal-fired electricity made up 3.6% of the country's total

energy consumption. The decree further details that in 2018, the consumption represented a total of 112.3 KTOE (kilotonnes of oil equivalent). Industrial uses—mostly anthracite for the cement industry—accounted for 79 KTOE, and the rest (33.3 KTOE) was production of electricity using lignite.

Coal in Government Energy Policy

According to the latest Energy and Mining Development Plan, five coal energy projects that have signed memorandums of understanding are awaiting construction, suggesting that the government is likely to rely on coal energy for the foreseeable future. According to the Decree on the Endorsement of the Utilization of the Energy Policy of the Lao PDR, the Lao government anticipates that by 2025, the need for coal power will jump to 189 KTOE and reach approximately 257.2 KTOE by 2030.

Local Public and Social Perceptions of Coal Power

The Hongsa coal power plant plays an important part of the local economy of Xayabouly Province, where it is located. Accordingly, the perception among the population is rather positive, given the economic impact that it represents. However, environmental concerns also arise from the use of such energy, which explains why there are relatively few announcements or projects relating to coal energy in Laos. However, coal projects will probably still be on the government's agenda for years to come. The Decree on the Endorsement of the Utilization of the Energy Policy of the Lao PDR does not seem to impose any restrictions on such investments. However, the government has also promoted "clean coal" technology and insists that coal energy must be respectful of the environment at all stages—processing the coal and before, during, and after combustion.

Regulations Most Relevant to Coal Power Projects

There are no incentives specific to coal projects, and there is no standalone legal framework relating to coal projects. The incentives available are thus the same as those for other types of energy projects, and development of coal energy projects is subject to the general requirements for initiating energy projects in Laos. As detailed in the first section of the Laos chapter, this consists of four key milestones: the memorandum of understanding (MOU), the project development agreement (PDA), the concession agreement, and the power purchase agreement (PPA).

4. Solar

Industry Overview and Development

Solar power in Laos has primarily been used for the electrification of remote parts of the country, particularly in areas not connected to the national electricity grid. Despite the large-scale commercial application of solar power being in its infancy, solar power has played an important role in the electrification of off-grid areas.

The development of solar projects has mainly consisted of government-led projects around the capital, Vientiane, including pilot projects in February 2017 (3 MW), August 2017 (7 MW), and May 2018 (22 MW). Given the mountainous geography of Laos, there are inherent challenges to deploying conventional ground-mounted solar panels. However, the mountainous areas are where solar radiance is most powerful, so floating solar panels on reservoirs used for hydropower

generation and irrigation is being considered by international organizations—such the Asian Development Bank and other development partners—as a potential option for increasing the deployment of solar power in Laos. Recently, the Lao authorities approved the development of a 1,200 MW floating solar farm on the Nam Ngeum 1 Dam in Xaysombon. An agreement has also been signed for the development of a 240 MW floating solar project in Kahmmouane Province. These types of projects are also attractive to the government and the private sector because they present very low risks of environmental impact or population resettlement, both of which are often major obstacles to the achievement of energy project.

Legal Overview

Incentives

As detailed in the first section of this chapter, power projects (including solar) are eligible for various investment promotion in Laos. Of the items eligible for duty exemptions and 0% value-added tax, solar panels and inverters would be considered as machinery used for production and would thus qualify for the incentive.

Potential for Solar Power Projects

Laos has good irradiation levels. However, the mountainous topography of the country limits the feasibility of installing large-scale solar power systems. The potential capacity of solar energy is estimated to be around 3.5–3.8 kilowatt-hours per square meter per day, and the overall technical potential for the country is estimated at 11 terawatt-hours per year. In the Renewable Energy Development Strategy in Lao PDR, published in 2011, solar energy was seen as playing an important role in achieving government objectives of providing energy services to off-grid and remote areas, stimulating private sector investment, and improving energy efficiency in households and commercial buildings. However, as noted above, the authorities now also favor the development of large solar projects on existing reservoirs.

Requirements and Procedures for Initiating a Project

There is no legal framework in Laos that creates specific requirements and procedures for initiating a solar project. The procedures may differ from those detailed in the first section of this chapter if the project developer is selected via a bidding process, or if the developer submits an unsolicited proposal for a solar project to the Lao authorities.

Operating Requirements

Energy projects must comply with the operating requirements provided under the PPA and the concession agreement. The breadth and content of the requirements vary depending on the size of the project.

Enforcement and Compliance Mechanisms

The Penal Code imposes sanctions, including fines and imprisonment, on any person who causes environmental damage. These obligations toward the environment are also mentioned in a specific chapter of the Law on Investment Promotion. In this regard, the authorities have broad powers to punish infringers, including fines and the withdrawal of the relevant license. Beyond this, project

developers must comply with the Law on Investment Promotion and specific laws and regulations regarding concession projects.

5. Wind

Industry Overview and Development

There are not yet any significant wind power projects in the country, but this should soon change with the ongoing development of a 600 MW wind project in southern Laos.

Legal overview

Incentives

There are no specific incentives with respect to wind projects. The incentives available are the same as those for all power projects, as outlined in the first section of this chapter.

Potential for Wind Power Projects

Laos has considerable wind power potential, particularly in mountainous areas of the country close to the border with Vietnam, and 20% of the country's land mass has average wind speeds above 6 meters per second. While some estimates put the country's capturable wind potential at 3,000–3,500 MW, the true potential for the technology is unknown, as there have been few feasibility studies.

The Renewable Energy Development Strategy in Lao PDR, which covers the 2011–2025 period, sets a 73 MW target for wind power. However, the 600 MW project will be the country's first wind power project, and it is set to be operational by 2025.

Requirements and Procedures for Initiating a Project

The requirements and procedures for initiating a wind project follow the same general process as other power projects, as explained in the initial section of this chapter.

Operating Requirements

Energy projects must comply with the operating requirements provided under the PPA and the concession agreement. The breadth and content of the requirements vary depending on the size of the project.

Enforcement/Compliance Mechanisms

The Penal Code imposes sanctions, including fines and imprisonment, on any person that causes environmental damage. These obligations towards the environment are also mentioned in a specific chapter of the Law on Investment Promotion. In this regard, the authorities have broad powers to punish infringers, including fines and withdrawal of the relevant license. Beyond this, the project developers must comply with the Law on Investment Promotion and specific laws and regulations regarding concession projects.

6. Hydropower

Industry Overview and Development

Hydropower is without a doubt the most important energy source in Laos and generates much of the country's energy. The potential for large-scale hydropower has been estimated to be around 26,000 MW, while small-scale power plants of less than 15MW add a further estimated 2,000 MW. However, the large-scale use of hydropower is not without its problems. According to the Report on the Eighth Five-Year Energy and Mining Development Plan (2016–2020) and the Ninth Five-Year Energy and Mining Development Plan (2021–2025), which was issued in June 2020, there were 78 hydropower projects in Laos already in operation, amounting to 7,738MW.

Laos meets most of its domestic energy demands (for users with access to the grid) through its hydropower resources, allowing it to export the unused energy to other countries in the region, notably Thailand, Vietnam, Cambodia, Singapore, and China. The high potential of hydropower development in Laos is thus at the center of the government's socioeconomic development planning and economic reform efforts.

Legal Overview

Incentives

The incentives available for hydropower projects are the same as those for other power projects, explained above.

Project Construction

In 2018, the MEM issued the Guidelines on Operating and Managing Lao Electric Power Technical Standards and Safety Rule for Operation and Maintenance, which were devised with the support of the Japan International Cooperation Agency (JICA) and further amended that same year with the assistance of the World Bank and Entura, a consultancy firm. These guidelines set out the procedures and requirements for the planning and design, construction, and operation stages of power projects in Laos, so as to comply with the Lao Electric Power Technical Standards, which govern electricity activities in the country in line with international best practices.

Also in 2018, the MEM, with the support of the World Bank, issued the Dam Safety Guidelines, which include provisions on training, documentation, emergency action plans, geological and geotechnical standards, instrumentation and monitoring, quality management, reservoir impoundment, and surveillance. The Lao government expects project developers to comply with these guidelines during the construction stage.

During the construction stage, the project developer must also prepare an emergency action plan (EAP) at least 60 days before starting construction. The EAP must include:

- Information on actions the project developer will take to avert, moderate, or alleviate problems at the dam and in relation to any unusual conditions;
- Information on actions the project developer will take, in coordination with emergency management authorities, in response to incidents or emergencies related to the dam;

- Information on procedures the project developer will follow to issue early warning and notification messages to emergency management authorities and downstream inhabitants at risk;
- Inundation maps to help the project developer and emergency management authorities identify critical infrastructure and at-risk populated sites that may require protective measures, warnings, and evacuation planning; and
- Delineation of duties and responsibilities of all involved in managing an incident or emergency and the coordination of the responsible parties. A duties and responsibilities schedule must be prepared in consultation with the government and other authorities in the local area who would be involved in an emergency response, and the schedule must be approved by the MEM.

The contents of the EAP should be commensurate with the level of the project's risks, which may vary depending on its location and size. Accordingly, a high-risk project may have an extensive and detailed EAP, while a low-risk project may have a simpler EAP. The authority in charge of reviewing the EAP (which depends on the size of the project) and will do so within 60 working days.

Similarly, prior to construction the project developer must prepare a quality control and assurance plan to be reviewed by the relevant authority of the Ministry of Energy and Mines, in accordance with the terms of the concession agreement.

Construction can proceed upon confirmation that the electrical facilities and the documents conform to the technical standards, approval of the basic design, and issuance of an environmental certificate from the MNRE. At this stage, the project developer must also submit a construction schedule.

Any modifications to the original layout or design during the construction stage must be approved by the relevant authorities.

Operating Requirements

In their operations, project developers must observe the Guidelines on Operating and Managing Lao Electric Power, the Technical Standards and Safety Rules for Operation and Maintenance, and the Dam Safety Guidelines. Projects must also comply with the operating requirements provided under the PPA and the concession agreement. The breadth and content of these requirements vary depending on the size of the project.

Enforcement and Compliance Mechanisms

The Penal Code imposes sanctions, including fines and imprisonment, on any person that causes environmental damage. These obligations towards the environment are also mentioned in a specific chapter of the Law on Investment Promotion. In this regard, the authorities have broad powers to punish infringers, including fines and withdrawal of the relevant license. Beyond this, the project developers must comply with the Law on Investment Promotion and specific laws and regulations regarding concession projects.

7. Biomass and Biogas

Industry Overview and Development

The agricultural bent of the Lao economy could be a significant factor in the development biomass energy in Laos. In its Renewable Energy Development Strategy, the government estimated that biogas production from livestock could be around 216 MTOE (million tonnes of oil equivalent), while it was estimated that agroforestry waste could generate around 500 MTOE.

The potential for generating biomass energy from agricultural waste products—such as rice straw and husks, sawdust, and corn cobs—in Laos is high. The theoretical potential of energy generation from agricultural waste is estimated to be 6,400 gigawatt hours, with over 70% of this deriving from rice residues. Biomass is currently only used at the household level, with more than 80% of the population relying on biomass energy, especially for cooking. Biomass is also used in small-scale rural industrial production (e.g., alcohol production and tobacco processing).

The estimated potential of energy generation from biogas and solid waste resources is around 313 MW and 216 MW, respectively. Laos also has the potential to produce biofuel from oily crops, such as jatropha, oil palm, and soybean. The production of these crops is driven largely by the government's targets for biofuel expansion.

Legal overview

Incentives

The incentives available for biomass and biofuel projects are the same as those for other energy projects, explained in the first section of this chapter.

Requirements and Procedures for Initiating a Project

The requirements and procedures for initiating a project follow the same general process as other energy. Please see the first section of this chapter for details.

Operating Requirements

Energy projects must comply with the operating requirements provided under the PPA and the concession agreement. The breadth and content of the requirements vary depending on the size of the project.

Enforcement and Compliance Mechanisms

The Penal Code imposes sanctions, including fines and imprisonment, on any person that causes environmental damage. These obligations towards the environment are also mentioned in a specific chapter of the Law on Investment Promotion. In this regard, the authorities have broad powers to punish infringers, including fines and withdrawal of the relevant license. Beyond this, project developers must comply with the Law on Investment Promotion and specific laws and regulations regarding concession projects.

8. Environmental Regulations

All energy projects in Laos must comply with environmental protection requirements, and developers must ensure that the project does not harm the environment. Environmental impact assessments (EIAs) are mandatory for all projects. According to Lao law, only a basic preliminary EIA is needed for projects that are expected to have limited social and environmental impacts, but projects that are expected to have severe social and environmental impacts must have a comprehensive EIA. If an activity or project is not designated by law or regulations as having a limited or severe environmental impact, an assessment must be made on a case-by-case basis.

In addition to the EIA, developers must assess the economic impact of the project and conduct a feasibility study. They are also required to collect data (e.g., on the environment and local communities) for analysis in an assessment report that includes multiple development options and lists the advantages and disadvantages of each. The data analysis must be certified by the relevant government agency.

The Decree on Environmental Impact Assessment provides that members of the public must also be given an opportunity to participate in the assessment process, such as through meetings at the village level (villages being an administrative zone smaller than a district). The EIA report must be presented at these meetings and shared with those who may be affected by the project. The opinions expressed must be recorded in the meeting minutes.

Preliminary EIA reports are reviewed by authorities of the province in which the project will be developed. Comprehensive EIA reports must be reviewed centrally (e.g., by a government ministry).

After an EIA report is submitted, the views of various stakeholders, including government agencies and local residents, are solicited in an online consultation process enabled by the relevant authorities. The authorities will then collect technical analyses and expert opinions based on an inspection of the project site. Depending on the complexity of the project and any cross-border implications (e.g., a hydropower project that could affect other countries), the authorities may request the input of foreign experts. The project developer may be asked to revise the EIA at any time during this process.

After the EIA report is approved, the developer receives an environmental certificate, which is valid for the duration of the project (although a management and monitoring plan must be revised and approved every two to five years, depending on the project). For projects that require a comprehensive EIA, the conditions for obtaining an environmental certificate may be more onerous. For instance, the developer may be ordered to pay a deposit to cover damages and rehabilitation if the project causes any adverse effects.

Violating these environmental provisions may lead to the suspension or withdrawal of the environmental certificate, which will in turn result in the suspensions or closure of the project.
In addition, the Penal Code includes a wide range of provisions covering persons that cause pollution of the air or water, and imposes sanctions, ranging from fines to imprisonment.

MYANMAR

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1. Regulatory Structure

Regulatory Authorities

The Ministry of Electricity and Energy (MOEE) is the main ministry responsible for regulating the oil and gas sector in Myanmar. More specifically, the following departments and entities play vital roles in Myanmar's oil and gas sector.

- **Oil and Gas Planning Department (OGPD).** The OGPD's main responsibilities are to cooperate on drafting and implementing energy policies, drafting energy related legislation, monitoring offshore and onshore activities permitted by the Myanmar Investment Commission (MIC), international coordinating for energy sector development.
- **Petroleum Products Regulatory Department (PPRD).** The PPRD is mainly responsible for inspection of petroleum products, retail licensing and monitoring.
- **Myanmar Oil and Gas Enterprise (MOGE).** The main functions of the MOGE are supervising production sharing contracts (PSCs) and cooperation with foreign oil & gas companies, assisting to get license extension and land lease permission of foreign oil & gas companies from MIC, supervising downstream, upstream and development of oil fields.
- **Myanmar Petrochemical Enterprise (MPE).** This state-owned downstream petroleum enterprise within the MOEE consists of three refineries, five fertilizer factories, and three liquefied petroleum gas plants.

Energy Policies

The Myanmar Energy Master Plan and the Myanmar National Electrification Plan (NEP) aims to ensure energy security for the sustainable economic development of the country, and to provide an affordable and reliable energy supply to all residents, especially those living in remote areas that are currently without electricity. The NEP sets a target of providing electricity to 100% of Myanmar households by 2030. Furthermore, the plan is to provide 47% sustainable power in 2020, 76% in 2025 and 100% in 2030. The MOEE has a 2030 plan of relying on hydropower for 57% of electricity needs, coal for 30%, and non-hydro renewables excluding solar for 8%, and with solar at 5%.

A significant change in the energy sector came when new electricity tariffs were announced in July 2019. For many years the electricity tariff has remained fixed, and highly subsidized by the government. This has created a reluctance by foreign investors because of the unwillingness of the Myanmar government to agree to bankable tariffs. However, in July 2019 the Myanmar government announced new, progressive tariffs, whereby users of the highest amounts pay the most.

List of Major Laws and Regulations

Ministry of Electricity and Energy

- Electricity Law (2014)
- Electricity Rules (2015)

- Petroleum and Petroleum Product Law (2017)
- Petroleum Act (India Act XXX, 1934) (Repealed)
- Oilfields Act (1919)
- Waterpower Act (1927)
- Board of Yangon City Electric Power Supply Law (2015)
- Petroleum Hand-dug Well Law (2017)
- Oilfields Act (1918)
- Oilfields Rules (1936)
- Petroleum Rules (1937)
- Oilfields (Labour and Welfare) Act (1951)
- Petroleum Resources (Development, Regulation) Act (1957)
- Law Amending the Petroleum Resources (Development, Regulation) Act (1969)
- Myanmar Petroleum Concession Rules (1962)

Ministry of Natural Resources and Environmental Conservation

- Forestry Law Myanmar (2018)
- Environmental conservation law (2012)
- Forest Rules (1995)
- Myanmar Mines Law (1994)
- Mines Law Amendments (2015)
- Myanmar Mines Rules (1996)
- Myanmar Pearl Law (1995)
- Myanmar Pearl Law Amendments (2018)
- Myanmar Pearl Rules (2000)
- Myanmar Gems Law (2019)
- Protection of Wildlife and Protected Areas Law (1994)

2. Oil and Gas

Market Overview and Development

The oil and gas sector has attracted more than USD 22 billion in foreign direct investment (FDI) from 154 permitted foreign enterprises, amounting to approximately 30% of Myanmar's FDI. This does not meet the total energy demands of Myanmar, due to large quantities of natural gas being exported to Thailand and China under contracts with developers.

There are 53 inland blocks operating and 51 offshore (including 24 deep sea) blocks with 18 in operation. These blocks have been granted to various oil majors, such as Total, Petronas, Eni, Shell, Woodside, and PTTEP. The major offshore gas projects are the Yadana, Yetagon, Shwe, and Zawtika Projects, with 75% of the gas being exported to Thailand or China.

There remains a substantial amount of uncertainty about Myanmar's potential oil and gas reserves. The Ministry of Electricity and Energy estimates 16.6 trillion cubic feet of proven onshore and offshore gas reserves, but further exploration may reveal greater reserves.

Recently, PTTOR and Brighter Energy have partnered in the building of a jetty and oil storage terminal that will be the largest oil terminal in Myanmar, with a capacity of 1 million barrels of oil and 4,500 tonnes of LPG.

Downstream

The downstream sector remains largely undeveloped. There are just two oil refineries in the country—in Thanlyin, Yangon Region, and Chauk, Magwe Region, built in the 1950's and 1960's—both of which are state-owned. Myanma Petrochemical Enterprise (MPE) is overseeing a modern oil refinery project in Mann, Magwe Region, under a PPP with an international company, but capacity remains extremely limited and investment opportunities great.

LPG

LPG consumption in Myanmar is approximately 100,000 tonnes annually. Some of this is manufactured at state-owned factories at Minbu, Nyaung Don, and Kyun Chaung; however, their capacity is limited. In 2017, the government leased an LPG jetty, terminal, and storage facility in the Thanlyin refinery in Yangon Region to Parami Energy to increase capacity. In 2019, Elite Petrochemical Co. opened an LPG terminal at Thilawa SEZ. There are plans to construct an LPG jetty in the Dawei SEZ in the future.

Legal overview

Exploration

Oil and gas operators eligible to explore at potential or designated fields, after signing a production sharing contract (PSC), may commence exploration according to the terms of the contract. The typical period for onshore exploration is three years from the effective date and can be extended and additional two years plus one more year as a final extension. For shallow or deep water offshore blocks, the exploration period is also three years from the effective date, but the two available extension periods are limited to one year each.

Construction of Facilities

Oil and gas operators must cooperate with the OGPD, MOGE, and MIC as required by the PSC and related legislation.

Operating Requirements

Oil and gas operators must cooperate with OGPD, MOGE and MIC as required by the PSC and related legislation.

Decommissioning

Myanmar has no laws and regulations specifically on oil and gas decommissioning, but there is legislation governing oil and gas exploration and production:

- Oilfields Act 1918
- Oilfield Rules 1936
- Oilfields (Labour and Welfare) Act 1951
- Petroleum Resources (Development, Regulation) Act 1957
- Law Amending the Petroleum Resources (Development, Regulation) Act 1969
- Myanmar Petroleum Concession Rules 1962

The rules issued under the Petroleum Resources (Development, Regulation) Act, also provide guidance on how to restore oil fields, both onshore and offshore, after the end of an oil field's life span. The draft Law on Petroleum Exploration, Appraisal and Production is currently under consideration by the Myanmar parliament. If enacted, this will repeal the Petroleum Resources (Development, Regulation) Act, and issues of retroactive application will certainly arise as operators and interest owners examine the impacts of new regulations on an existing issue.

The draft Law on Petroleum Exploration, Appraisal and Production also covers requirements for reporting and approval before decommissioning, the reporting time frame, restoration of decommissioning oil field, and liabilities and costs of decommissioning. However, rules and regulations as well as procedures would have to follow passage of the law to provide details on proper compliance by oil and gas operators regarding their decommissioning obligations.

Apart from the legislation mentioned above, the Environmental Conservation Law requires the conducting of an environmental impact assessment (EIA) for the following:

- Offshore and onshore oil and gas production projects (all sizes);
- Drilling and production activities;
- Offshore pipeline operations,
- Offshore transportation;
- Compressor stations and storage facilities;
- Ancillary support operations; and
- Decommissioning.

Operators must prepare and implement an appropriate environmental management plan in respect of the EIA.

Besides government-owned oil fields, other onshore and offshore oil and gas fields operated by foreign investment started production in 1998, especially offshore, and it is possible these oil fields will not start being decommissioned until 2028, when the 30-year PSCs expire. The original PSCs contained limited to no language on decommissioning. As a result, there is a lack of clear written legal or contractual provisions on this issue—an issue that is coming into clearer focus as fields approach the end of their production period. It may well be that the draft Law on Petroleum Exploration, Appraisal and Production and its regulations attempt to address the absence of prior regulation in this regard. This may result in an industry challenge or claims of unenforceability due to unconstitutional or improper retroactive legal application.

Oil and Gas Price Structure

Up to 2010, the state-owned enterprise Myanmar Petroleum Products Enterprises (MPPE) carried out retail and wholesale distribution of petroleum products under the Ministry of Energy. At the end of that year, the military government sold almost all of the petrol stations under MPPE just before the handover of power to the civilian government in 2011. Since then, fuel prices in Myanmar have floated in accordance with global oil prices and exchange rates.

Distribution of Oil and Gas

Up to 2010, the state-owned enterprise Myanmar Petroleum Products Enterprises (MPPE) was responsible for marketing and distribution of petroleum products in Myanmar, and was carrying out the retail and wholesale distribution of petroleum products under the Ministry of Energy in Myanmar. As mentioned above, the military government sold almost all of the petrol stations under MPPE just before the handover of power to the civilian government in 2011. Since then, MPPE operated storage facilities and sells and distributes petroleum products through main and secondary fuel terminals, where most oil and gas distribution is then handled by the private sector. In June 2020, MPPE's name was changed to the Petroleum Products Regulatory Department, and its functions include regulatory work and the sale and distribution of petroleum products to government departments.

Enforcement and Compliance Mechanisms

Oil and gas operators must cooperate with the OGPD, MOGE, and MIC under related oil and gas legislations and investment law, as well as environmental legislation supervised by the Environmental Conservation Department of the Ministry of Natural Resources and Environmental Conservation.

3. Coal

Market Overview

Myanmar currently operates only one coal-fired power plant—at Tigyit, located 40 kilometers southeast of Kalaw Township in Shan State—which was built with the support of Chinese experts in 2004–2005. The installed capacity of the plant is 120 MW, but the actual output is lower due to inadequate maintenance and environmental issues. Although Myanmar has planned new coal-fired plants, none of them have been built yet.

Coal in Government Energy Policy

According to various scenarios under Myanmar's Energy Master Plan 2015, coal-fired power plants will make up from 10% to 34% of the country's installed power capacity by 2030. However, as noted above, no new coal-fired power plants have been able proceed yet; this is because of public criticism and objections.

Local Public and Social Perceptions of Coal Power

Civil society organizations (CSOs), environmental NGOs, and communities in targeted areas have spoken out against the potential water and air pollution the coal plants would cause, and point out

that coal waste would be located close to residential areas. There are also a number of social issues causing concern, including possible acquisition of farmland and related loss of income, poor compensation, absence of related legislation, and insufficient healthcare for residents near the power plant.

Regulations Most Relevant to Coal Power Projects

As a member of the Association of Southeast Asian Nations (ASEAN), Myanmar is party to the ASEAN Plan of Action for Energy Cooperation and the Asian Forum on Coal. In 2000, Myanmar formed a national committee for AFOC, chaired by the country's deputy minister for mines. The overall objectives of the committee are to increase regional cooperation in and exchange of clean technologies.

As for legislation, Myanmar has not yet introduced any regulations specific to coal power, instead depending upon environmental conservation legislation such as EIA/SIA procedures, environmental management planning (EMP), and the National Environmental Quality (Emission) Guidelines under the country's Environmental Conservation Law.

4. Solar

Industry Overview and Development

Until recently solar power plant development was limited. However, in 2020 the MOEE launched a 1-gigawatt tender for bids for solar plants at 61 sites in Myanmar. These were eventually mostly won by Chinese consortia or companies, such as Sungrow, China Machinery Engineering Corp, a consortium formed by China's State Power Investment Corporation Limited (SPIC) and local company Khaing Long Gems, Chinese solar manufacturers Longi and GGL Systems, German developer Ib Vogt, and Myanmar's Gold Energy. These projects appear to have been deferred or entirely disrupted due to intervening conditions, but had they proceeded would likely have revolutionized solar power production in Myanmar.

Legal Overview

Incentives

Under MIC Notification 13/2017, solar power is a promoted sector, which makes solar power companies eligible to apply for discretionary tax incentives. These may include a 3–7 year income tax holiday (depending on the location of the project) and import duty exemptions on equipment.

Potential for Solar Power Projects

Myanmar has enormous potential—an estimated 51,973 terawatt-hours per year—for solar power, particularly in the country's dry zones.

Requirements and Procedures for Initiating a Project

A project company must have an endorsement from the Myanmar Investment Commission in order to obtain a long lease of the relevant land (50 + 10 + 10 years) and apply for tax incentives. Projects may also require a license from either the Ministry of Electricity and Energy or the regional

administrative authority, depending on the size of the project. An EIA is an essential requirement for all projects.

Operating Requirements

Projects in operation must comply with the terms of the MIC endorsement and the power purchase agreement (PPA).

Enforcement and Compliance Mechanisms

Breaching the terms of the MIC permit could result in its cancellation, which means the project would be terminated.

Breaching the terms of the PPA could result in penalties, legal proceedings, and ultimately project termination.

5. Wind

Industry Overview and Development

There are currently no wind power plants in Myanmar. The MOEE has conducted feasibility studies in Tanintharyi Region and Mon, Kayah, Kayin, and Shan States in cooperation with the Thailand-based company Gunkul Engineering, and in Rakhine State and Ayeyawady and Yangon Regions with Singapore-based Asia Ecoenergy Development and a locally owned company, Primus Advanced Technologies Ltd. In addition, feasibility studies in Chin and Rakhine States and Ayeyawady Region were also conducted with China Three Gorges Corporation.

Legal Overview

Incentives

Under MIC Notification 13/2017, wind power is a promoted sector and wind power companies are therefore eligible to apply for discretionary tax incentives, such as a 3–7 year income tax holiday (depending on the location of the project) and import duty exemptions on equipment.

Potential for Wind Power Projects

The theoretical generation potential of wind power could be as much as 365.1 terawatt-hours (TWH) per year, and wind power projects can potentially be developed in Chin, Kayah, Kayin, Mon, Rakhine, and Shan States, as well as Ayeyarwaddy, Tanintharyi, and Yangon Regions.

Requirements and Procedures for Initiating a Project

Wind-power projects require an endorsement from the Myanmar Investment Commission in order to obtain a long lease (50 + 10 + 10 years) of the relevant land and to apply for tax incentives. Also required is a license from either the MOEE or the regional administrative authority, depending on the size of the project. An EIA is essential.

Operating Requirements

All projects must comply with the terms of the MIC endorsement and the PPA.

Enforcement and Compliance Mechanisms

Breach of the terms of the MIC permit could result in cancellation of the MIC permit—which would effectively terminate the project. Breach of the terms of the PPA could result in penalties, legal proceedings, and ultimately project termination.

6. Hydropower

Industry Overview and Development

The ADB has calculated that Myanmar has significant hydropower potential, and the country already has an installed capacity of 100,000 MW contributing around 10% of Myanmar's power needs. The government has identified 41 potential locations for development of new hydropower projects. One of the potential issues with hydropower in the country is that during the dry season a heavy reliance on hydropower might lead to shortages in power supply. The government's plan is that by 2030 Myanmar will reduce its reliance on hydropower. In relation to hydropower, there have been significant social and environmental issues raised, and public protests have cause the delay of two major hydropower projects.

Legal overview

Incentives

Hydropower is not a promoted sector and is therefore not eligible for tax incentives.

Project Construction

Hydropower project companies must obtain a permit or endorsement (depending on the project size) from the Myanmar Investment Commission in order to obtain a long lease (50 + 10 + 10 years) of the relevant land. In addition a license would be required from either the Ministry of Electricity and Energy or the regional administrative authority, depending on the size of the project. An EIA is again an essential requirement.

Operating Requirements

Projects must comply with the terms of the MIC endorsement or permit and the PPA.

Enforcement and Compliance Mechanisms

Breach of the terms of the MIC permit could result in its cancellation—which would effectively terminate the project. Breach of the terms of the PPA could result in penalties, legal proceedings, and ultimately project termination.

7. Biomass and Biogas

Industry Overview and Development

Biomass accounts for around 64% of energy consumption in Myanmar, making it the largest energy sector. Most biomass use is by households in rural areas. Use ranges from coconut leaves, rice husks, to fuel wood. It has been estimated that the oil equivalent of available biomass in Myanmar is over 18 million tons. In addition, each year Myanmar produces 4.44 million tons of rice husks, 1 million tons of sawdust, and vast quantities of manure, all of which could be used to produce biogas.

Legal Overview

Incentives

Biomass and biogas power is not a promoted sector, so these projects are not eligible for tax incentives.

Requirements and Procedures for Initiating a Project

Biomass and biogas power project companies must obtain a permit from the Myanmar Investment Commission in order to obtain a long lease of the relevant land. In addition, a license is required from either the Ministry of Electricity and Energy or the regional administrative authority, depending on the size of the project. An EIA is again an essential requirement.

Operating Requirements

Projects must comply with the terms of the MIC permit, the PPA, and the environmental management planning (EMP), and also need to follow the National Environmental Quality (Emission) Guidelines (2015) of the Ministry of Natural Resources and Environmental Conservation in case the project has a total rated heat input capacity above 50 MW thermal input with reference to high heating value basis.

Enforcement and Compliance Mechanisms

Breach of the terms of the MIC permit could result in its cancellation—which would effectively terminate the project. Breach of the terms of the PPA could result in penalties, legal proceedings, and ultimately project termination.

8. Environmental Regulations

Under the Environmental Conservation Law of Myanmar 2012, Environmental Conservation Rules 2014, and EIA Procedures 2015, different type of economic activities require different types of environmental assessment—that is, some activities require an EIA, some require an initial environmental examination (IEE), and some require environmental management planning (EMP).

Under the EIA Procedures 2015, and EIA is required for all sizes of onshore and offshore oil and gas activities (such as seismic surveys, exploration drillings, production drilling and production activities, petroleum refineries or natural gas refineries, natural gas processing plants, natural gas liquefaction plants, oil or natural gas terminals etc.).

The objectives of the EIA are to systematically study the potential impact a project may have on the physical, human, biological, social, and socio-economic environment. The EIA process consists of first conducting all required investigations, public consultations, and participation processes. Next, the project owner discloses the EIA Report to civil society, people affected by the project, local communities, and other concerned stakeholders. The Environmental Conservation Department will make the EIA report publicly available before any decision.

THAILAND

Supasit Boonsanong ● Joseph Tomkiewicz ● Charuwan Charoonchitsathian

1. Regulatory Structure

Regulatory Authorities

Thailand's Ministry of Energy oversees the energy sector in the country, and is responsible for a broad range of regulatory duties, including granting energy operating licenses and issuing energy-pricing regulations.

Other important regulatory authorities include the following:

- Department of Mineral Fuels (DMF) – Promotes and accelerates energy procurement by facilitating energy resource exploration and development in Thailand and abroad, and regulates petroleum exploration and production. The DMF regulates petroleum exploration and production under the supervision of the Petroleum Committee, as established under the Petroleum Act.
- Department of Alternative Energy Development and Efficiency (DEDE) – Responsible for the promotion and regulation of energy efficiency and conservation, and aims to improve and respond to energy demands for better living standards through alternative energy and technological advances.
- Department of Energy Business – Monitors and supervises the trade, quality, industrial safety, environmental concerns, and security of energy business, and provides and promotes energy education to businesses, consumers, and related persons.
- Energy Policy and Planning Office (EPPO) – Recommends national energy strategies and policies for energy conservation, and reviews the country's energy management plans.
- Energy Regulatory Commission (ERC) – Regulates the generation, transmission, and distribution of electricity in Thailand, and monitors the energy market through tariff review, licensing, approval of power purchase, and dispute settlement.
- Electricity Generating Authority of Thailand (EGAT) – Acts as both the producer and the single buyer of electricity from private power producers, including independent power producers (IPPs) and small power producers (SPPs). EGAT also regulates electric power generation, transmission, and bulk sale.
- Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA) – Responsible for the generation, procurement, distribution, and sale of electricity to the public, businesses, and industrial sectors in the Bangkok metropolitan area and the provinces of Nonthaburi and Samut Prakan, and to the 74 other provinces in Thailand, respectively.

Energy Policies

The Power Development Plan 2018–2037 and its revision (PDP 2018) form the crux of energy policies for Thailand. The PDP 2018 outlines the procurement of sufficient electricity to match national consumption by methods such as increasing power capacity, particularly in the increase of renewable energy and energy conservation plans.

Similarly, the Alternative Energy Development Plan and its revision focuses on the support of renewable and alternative energy resources while remaining aligned with the goals of the PDP 2018 and the goals of the "Thailand 4.0" economic development vision that seeks to make Thailand into a high-income country. The Energy Efficiency Development Plan, meanwhile, aims at addressing the country's energy issues by focusing on power security, economy, and ecology—most notably by improving energy efficiency, including the construction of green buildings and implementation of grid efficiency and integrity (e.g., through the use of smart grids).

The Gas Plan 2018–2037 covers the exploration, production, and procurement of petroleum and natural gas.

List of Major Laws and Regulations

- Petroleum Act B.E. 2514 (1971)
- Petroleum Authority of Thailand Act B.E. 2521 (1978)
- National Energy Policy Council Act B.E. 2535 (1992)
- Energy Industry Act B.E. 2550 (2007)
- Energy Development and Promotion Act B.E. 2535 (1992)
- Electricity Generating Authority of Thailand Act B.E. 2511 (1968)
- Factory Act B.E. 2542 (1999)
- Building Control Act B.E. 2522 (1979)
- Metropolitan Electricity Authority Act B.E. 2501 (1958)

Key Websites

The Thai version of official ministry and state agency websites will generally have more comprehensive information available and the most updated regulations and announcements; however, most official websites will have an English page with limited information.

- Electricity Generating Authority of Thailand (EGAT)
- Energy Policy and Planning Office (EPPO)
- Energy Regulatory Commission (ERC)
- Department of Alternative Energy Development and Efficiency (DEDE)
- Department of Energy Business (DOEB)
- Department of Mineral Fuels (DMF)
- Metropolitan Electricity Authority (MEA)
- Provincial Electricity Authority (PEA)
- Thailand Board of Investment (BOI)

2. Oil and Gas

Market Overview and Development

Thailand's first LNG-receiving terminal officially began operations in September 2011, while PTT's LNG plant expansion was completed in 2017. Under the Gas Plan 2018–2037, due to output from

the concessions of the Bongkot and Erawan gas fields, the required procurement of LNG has been decreased from 34 million tons per year to 26 million tons per year. The plan also includes the preparation of an LNG terminal in southern Thailand within 2027, and aims to procure natural gas to meet national demands via an onshore pipe network from 2020 onwards.

Based on reports published by the Ministry of Energy, 2020 saw a decrease in production of crude oil by over 19% within the country. A similar decrease was reported in the exploration and production of natural gas, with in-country exploration and production dropping by approximately 11%.

In 2020, the DMF announced that it would open its highly anticipated 23rd round of bidding for petroleum exploration and production concessions for the Gulf of Thailand, with signing scheduled to commence in January 2021. However, the date for the round of bidding was delayed and will be re-established after the COVID-19 situation has been alleviated and international travel returns to normal. The global pandemic has also severely impeded the country's import and export of oil and gas.

Legal Overview

Exploration

The right to explore for and produce petroleum is granted by petroleum concessions, which are under the supervision of the DMF. Under Thai law, subsurface mineral resources such as oil and gas belong to the government, and no person may explore petroleum resources without a concession agreement, production sharing contract, or a service contract, as per the Petroleum Act. Each type of agreement has its own fees and requirements, and has model agreement forms that can be referred to.

Bidding for the DMF petroleum concessions is only available for production sharing contracts (PSCs). The bidding process must comply with the requirements set out in the Ministerial Regulation Re: Rules, Procedures and Conditions for Applying for and Receiving Production Sharing Contracts B.E. 2561 (2018), and bidders are to use the template contract for PSCs provided in the Ministerial Regulation Prescribing the Form for Production Sharing Contracts BE. 2561 (2018).

Construction of Facilities

In addition to complying with the terms of the concession agreements, concessionaires are required to prepare and submit environmental impact assessments. Oil and gas operators are also required to maintain the relevant codes of practice (COP), which serve as a mechanism for mitigating and overseeing the environmental impact of operations, and lay out minimum standards as approved by the National Environment Board.

Operating Requirements

Petroleum exploration or production operations must comply with the restrictions and requirements of the Petroleum Act and its subsidiary regulations. Under the Petroleum Act, title of the extracted mineral resources belongs to the licensee or contractor.

The DMF is the main regulatory body responsible for overseeing operations and receiving reports required under the relevant laws. In addition, operators must comply with the specific terms of the concession agreement under which they have been permitted to operate. Moreover, there are a number of environmental codes and checklists that oil and gas exploration and production must comply with, depending upon the specific activities and whether exploration is onshore or offshore.

Decommissioning

Generally, the concessionaire is responsible for decommissioning. When applying for the concession, the concessionaire must submit a decommissioning plan that includes the proposed decommissioning cost and related environmental assessment reports. The plan and cost estimates must be audited by an authorized third party based on qualifications prescribed by the director-general of the DMF and published in the *Government Gazette*. The concessionaire's initial security deposit will be set to cover the proposed decommissioning cost.

The decommissioning of a project may be triggered before the concession period ends if the concessionaire does not use the installations continuously for over a year, or if the concession reserves are less than 40% of the sum of the accumulated petroleum production and the petroleum reserves.

The two main legal instruments governing oil and gas decommissioning obligations in Thailand are (1) the relevant petroleum concession agreement as it relates to the current form of the production sharing contract (PSC), and (2) sections 80/1 and 80/2 of the Thailand Petroleum Act amended in 2007, which apply to both the concessionaire and the PSC contractor, and assign decommissioning responsibility to the concessionaire, authorize the director-general of the DMF to issue decommissioning regulations, and require the concessionaire to provide a security deposit guaranteeing its financial responsibility for the decommissioning.

If the concessionaire fails to deposit the full security amount on time, a surcharge of two percent per month will be added to the amount due. If the security and surcharge within a further 30 days, the concession may be revoked altogether.

The concessionaire must carry out the decommissioning in accordance with the approved plan mentioned above. If it doesn't—for example, by causing a potentially damaging delay, the director-general may designate another person to continue the decommissioning work on behalf of or jointly with the concessionaire, using the concessionaire's security (plus any resulting shortfall, which will also be the concessionaire's responsibility).

Oil and Gas Price Structure

Export sales are made at a "free-on-board" posted price fixed by the concessionaire or PSC contractor and agreed to by the government. Domestic sales, in the absence of regular exports, are made at price not exceeding that of imported crude oil. Otherwise, they are made at the average export price as realized by all concessionaires.

From time to time, the government prescribes prices for the retail sale of petroleum products. Following the economic fallout of the COVID-19 pandemic, the Ministry of Energy implemented

various initiatives including caps, price cuts, and subsidies in an effort to maintain affordable oil prices.

Distribution of Oil and Gas

Generally, the Petroleum Act ensures that the concessionaire maintains the right to distribution of petroleum once it has been extracted. However, the specific requirements regarding distribution will depend on the terms of the concession. Under the Petroleum Act, the concessionaire has the right to sell and distribute the energy it produces, so long as the distribution complies with the Petroleum Act.

Enforcement and Compliance Mechanisms

Failure to meet the requirements under the concession agreement and the provisions of the Petroleum Act can result in various penalties, including but not limited to imprisonment and fines, as well as the expiration of the concession agreement.

Without a concession (or other endorsed) agreement, oil and gas exploration in Thailand is strictly prohibited, as the title of petroleum resources belongs to the government.

In addition to the general list of major regulations provided above, specific regulations that oil and gas operators need to comply with include the following:

- Fuel Trade Act, B.E. 2542 (1999)
- Fuel Trade Act, B.E. 2550 (2007)
- Act on Offenses Relating to Offshore Petroleum Production Places B.E. 2530 (1987)
- Notification of the Department of Energy Business Re: Specification for Appearance and Quality of Engine Oils B.E. 2562 (2019)
- Notification of the Ministry of Energy Re : Determination of Areas to be installed with Vapour Recovery System (No.2) B.E. 2550 (2007)
- Ministerial Regulations Fuel Oil Vapour Recovery B.E. 2550
- Ministerial Regulations Fuel Oil Storage Premises, B.E. 2551 (2008)
- Notification of the Department of Energy Business Re : Specification for Appearance and Quality of Engine Oil B.E. 2559 (2016)
- Notification of the Department of Energy Business Re: Specification for Appearance and Quality of Engine Oil B.E. 2558 (2015)
- Notification of the Department of Energy Business Re: Specification for Appearance and Quality of Engine Oils B.E. 2554 (2011)

3. Coal

Market Overview

In Thailand, there are 27 coal (hard coal and lignite) power plants currently in operation, belonging to both the private sector and EGAT. In August 2021, the Ministry of Energy introduced a National Energy Plan framework that embraces cleaner energy in a bid to reduce pollution and achieve net

carbon neutrality by 2070, which has subsequently been reduced through nonbinding commitments. The framework includes coal reduction and phase-out plans. In line with this, EGAT announced that the Mae Moh coal mine in Lampang will be closed in 30 years. The Ministry of Energy has also revealed that Mae Moh coal power plant (replacing the previous units 8-9) will be the last coal-fired power plant constructed by the government.

Coal in Government Energy Policy

Under the first revision to the PDP 2018, electricity generation from coal-based sources is set to decrease by 1% compared to the previous PDP, with the different replaced by renewable energy. The plan also noted that as coal-based power plants currently face strong opposition from local communities, they might be put on hold, delayed, or reworked into projects that generate electricity from more environmentally friendly fuel.

However, it might not be feasible to completely eliminate coal power from Thailand. To keep up with rising demand for electricity, Thailand is likely to remain dependent on electricity generation from coal-based sources.

Local Public and Social Perceptions of Coal Power

In Thailand, there is some negative opinion of coal-based power plants as they are viewed as the least clean method of power generation. In July 2021, EGAT announced that it had decided to withdraw two proposed coal-fired power plants in southern Thailand (an 870 MW coal-fired plant in Krabi and 2.2GW coal-fired plant in Songkhla) due to strong opposition from the local communities and the NGOs, and will instead build more environmentally friendly gas-fired complex power plants.

Regulations for Coal Power Projects

Incentives

General tax and non-tax incentives are granted by the Board of Investment (BOI) to encourage the production of electricity via clean coal technology. Nevertheless, tax incentives for coal power plants are significantly lower than tax incentives granted for production of electricity via renewable resources.

Requirements and Procedures for Initiating a Project

Initiating a project requires an application for a license under the Energy Industry Act B.E. 2550 (2007) and PPA with the ERC. The specific requirements for the application process vary depending on the type of license, which is based on the type of fuel, size, capacity and other factors.

In addition, a factory license under the Factory Act B.E. 2535 (1992) is needed, and a license to generate controlled power under the Energy Conservation Promotion Act B.E. 2535 (1992) is also required if the amount of electricity generated will exceed the specified capacity. Some projects are also required to undergo an EHIA, which includes a public hearing and public involvement in the process.

Finally, certain provisions of the Building Control Act B. E. 2522 (1979) and the Enhancement and Conservation of the National Environmental Quality Act B.E. 2535 (1992), may also be relevant to coal power projects and should be taken into consideration.

Enforcement and Compliance Mechanisms

In response to suspected noncompliance with operational requirements, the ERC may inspect the power producer and may revoke the power plant's license. Continuing to operate the power plant without a license may result in imprisonment, fines, or both under the Energy Industry Act B.E. 2550 (2007).

4. Solar

Industry Overview and Development

With the global shift from natural gas to solar energy, Thailand has identified investment in renewable energy as a priority for the country. The national energy demand is expected to grow 39 percent over the next nine years, and Thailand aims to derive at least 25 percent of national usage from renewable sources, including significant increases in capacity from solar energy production.

The Thai government has also initiated a number of hydropower-floating solar hybrid projects, introducing floating solar farms to be located at existing dams and hydropower plants. In 2019, Thailand announced its intention to build a 45 MW hydropower-floating solar hybrid project at Sirindhorn Dam in Ubon Ratchathani Province. However, these projects are currently only government-run.

In the private sphere, rooftop solar is also growing in popularity in Thailand. Owners of factories, buildings, and residences are installing self-financed solar rooftops to produce their own electric power to cut back on expenses. Some commercial or industrial rooftop owners (especially factories in industrial parks) are also entering into long-term service contracts with solar service providers to maintain solar panels on their premises.

Legal overview

Incentives

Generally, there are several incentives available to producers of renewable energy. This includes exemptions from requirements normally applicable to IPPs or SPPs applying for electricity procurement with the ERC, including licenses and environmental impact assessment requirements. However, an exempted power producer must prepare and submit an environmental checklist in support of its application, and must provide documents and evidence (if any) to the ERC.

During 2020, the Thai Board of Investment (BOI) also introduced a number of tax incentives for investment in both renewable power generation and the manufacture of parts or equipment for solar power. These incentives include, but are not limited to tax holidays and exemptions on selected import duties.

In 2020, the MEA also encouraged households to install solar panels and generate their own electricity by raising the purchase price (in Thai baht) from THB 1.68 per unit to THB 2.20 per unit for 10 years in Bangkok, Nonthaburi, and Samut Prakan. In addition, rooftop solar installations with a maximum production of 1,000 kWH do not need a factory license from the ERC to operate.

Potential for Solar Power Projects

In May 2019, the ERC announced the Regulation Governing the Purchase of Power from Solar Rooftop Power Generation for the Public Sector and the Notification Governing the Purchase of Power from Solar Rooftop Power Generation for Public Sector Household Users. The MEA and the PEA will buy solar power from private household users at up to a national maximum of 100 MW at THB 1.68 per kWh.

Requirements and Procedures for Initiating a Project

Electricity is procured via a power purchase agreement (PPA); operators that successfully apply for a PPA are licensed by the ERC. The specific requirements for the application process vary depending on the type of license, which is based on the type of fuel, size, capacity and other factors.

Private, commercial PPAs are also available; however, power producers still need to obtain the necessary licenses and permissions and fulfil reporting requirements in order to carry out electricity business.

Standalone, off-grid solar power producers are not required to obtain a power producer license, but they remain subject to other requirements.

Operating Requirements

In order to operate, power operators must first obtain a license from the ERC. Power plants must also comply with zoning requirements, building control laws, and laws regarding the development and support of power by the ERC. Power plants are also required to comply with a number of environmental impact assessments. In its consideration of applicants, the ERC requests opinions from the relevant regulatory bodies.

The specific requirements vary based on the capacity of the power plant, 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 energy business license.

Enforcement and Compliance Mechanisms

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

Specific regulations relevant to the solar energy industry include the following:

- Energy Conservation Promotion Act, B.E. 2535 (1992)
- Ministerial Regulation Prescribing Qualifications, Duties And The Number Of Energy Managers, B.E. 2552 (2009)
- Ministerial Regulation Prescribing Energy Management Standards, Criteria And Procedures In Controlled Factories And Controlled Building, B.E. 2552 (2009)
- Regulation of the Energy Regulatory Commission on the Code of Conduct of the Commission Members and Competent Officials (No. 2) B.E. 2555 (2012)
- Royal Decree on the Remuneration and Expenses in Performing Duties and Other Benefits of the Chairman and Members of the Energy Regulatory Commission B.E. 2551 (2008)
- Regulation of the Energy Regulatory Commission on Meeting Attendance Allowances for the Provincial Land and Property Price Examination Committees and the Land and Property Price Survey and Inspection Working Groups B.E. 2552 (2009)
- Regulation of the Energy Regulatory Commission on the Salary and Special Allowance of the Secretary-General of the Office of the Energy Regulatory Commission B.E. 2552 (2009)
- Regulation of the Energy Regulatory Commission on Procurement of the Office of the Energy Regulatory Commission B.E. 2553 (2010)
- Regulation of the Energy Regulatory Commission on Granting Power of Attorney by the Secretary-General of the Office of the Energy Regulatory Commission to a Third Person to Perform Specific Duties on his Behalf B.E. 2555 (2012)
- Regulation of the Energy Regulatory Commission on Acquiring Electricity 34 from Independent Power Producers B.E. 2555 (2012)
- Regulation of the Energy Regulatory Commission on the Purchase of 36 Electricity from Solar PV Rooftop Electricity Generation B.E. 2556 (2013)

5. Wind

Industry Overview and Development

In 2020 the BESS wind energy battery storage pilot project—the first private sector initiative in Thailand of its kind—was launched in Pak Panang district in southern Thailand. The aim of the BESS project involves a 1.88 MWh battery energy storage system in order to store excess energy from wind power generation, which can then be sold into the grid later and increase the reliability and stability of renewable energy production by dealing with intermittency problems of electricity generation by wind turbine.

Legal Overview

Incentives

In addition to general tax and non-tax incentives provided by the BOI to encourage the production of electricity via renewable resources, renewable energy projects such as wind power producers do not require a factory license in order to operate under the ERC. However, other requirements such as building control laws, zoning restrictions, and environmental impact regulations still apply.

Potential for Wind Power Projects

Under the first revision to the PDP 2018, electricity procurement for wind power is to take place from 2022 to 2024 at 90 MW per year. However, there have been no recent solicitations for wind PPA applications, and there is no indication of a future schedule for open bids or scheduled commercial operation date for private operators.

Requirements and Procedures for Initiating a Project

Initiating a project requires an application for license and PPA with the ERC. Power producers acting under the PPA will be subject to licensing and/or reporting requirements as under the Energy Industry Act B.E. 2550 (2007), as well as relevant provisions of 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 business if they have acquired the necessary license, or if they are exempt and are subject to reporting requirements. Power producers are also subject to codes of practice (COP) which detail the minimum standards by which they must operate under, including obligations regarding the environment and safety.

Enforcement and Compliance Mechanisms

In the event of noncompliance with operational requirements, the ERC may inspect the power producer in a post-COD audit. If the noncompliance continues, the ERC can revoke the power producer's license to operate and remain party to the PPA.

An important regulation for wind power operators to follow is the Announcement of the Office of 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.

6. Hydropower

Industry Overview and Development

The majority of development in hydropower is on a state level, as expected from a sector of electricity power production largely handled by government-owned bodies. Several hydropower dam projects are planned in various areas of Thailand, as well as improvement projects to the Srinagarind Dam in Kanchanaburi Province, operating at 360MW, with a scheduled commercial operation date (COD) of 2021. EGAT is also planning a 45 MW project that combines floating solar farms with hydropower at the Sirindhorn Dam in Ubon Ratchathani Province.

However, long-term fluctuations in electricity output can be significant. For example, the Energy Policy and Planning Office reported that as of November 2020, hydropower electricity production had decreased by 44.1%, partly due to the amount of rainfall during the year.

Legal Overview

Incentives

While incentives exist generally for renewable energy power producers, hydropower in Thailand is largely operated by EGAT and there is very little room for incentivized operation of hydropower by independent, non-government owned power producers.

Project construction

The vast majority of hydropower projects are initiated, funded, run and operated by EGAT. However, service agreements for the construction, repairs and improvements, including provision of equipment, are options for non-governmental entities to be involved in hydropower projects. Project construction often faces environmental challenges, as many potential locations for hydropower plants are within Thai national parks and other protected land.

Operating requirements

See above.

Enforcement and Compliance Mechanisms

In principle, the ERC has the authority and duty to enforce penalties against non-compliance of requirements by power producers, and to inspect and revoke PPAs where applicable.

Some key legislation relevant to hydropower projects includes the following:

- Water Resources Act, B.E. 2561 (2018)
- State Irrigation Act, B.E. 2485 (1942)
- Energy Conservation Promotion Act, B.E. 2535 (1992)
- Enhancement and Conservation of National Environmental Quality Act (No. 2) B.E. 2561 (2018)

7. Biomass and Biogas

Industry Overview and Development

The first revision to the PDP 2018, approved in 2020, delays a planned biomass power plant in southern Thailand from 2021 to 2022–2023, due to delays and changes in the target power producers to smaller power producers.

The revision also prioritized the Energy for All project in initiating community power plants using biomass and biogas provided by community enterprises. The ERC's pilot project to procure electricity from community power plants was largely delayed due to the COVID-19 outbreak; however, the regulation outlining the pilot project to procure electricity from community power plants was issued in March 2021, and in September 2021 it was disclosed the 43 very small power producers (VSPPs) had been selected for the energy procurement program. These projects are scheduled to achieve a COD within November 2024.

Legal Overview

Incentives

As part of the Energy for All project initiated by EGAT, EGAT is aiming to procure electricity from VSPPs via feed in tariff (FIT) for power producers using biomass and biogas, as well as hybrid power plants (using a combination of biomass, biogas, and solar energy). Applicant VSPPs are joint ventures between community enterprise groups and private investors, and they must comply with various project-specific requirements and restrictions.

Requirements and Procedures for Initiating a Project

The initiation of biomass and biogas projects will depend largely on the availability of the government's projects. The requirements will vary depending on the size, electricity production capacity, and even the location of the project.

For the current community power plant pilot project, applicant VSPPs had to be 90% owned by a non-governmental entity, with 10% of ownership and benefits allocated to a community enterprise or community enterprise network that provides the project with fuel, among several other requirements.

Operating Requirements

In addition to meeting the operating requirements under the Energy Industry Act B.E. 2550 (2007), other applicable building control laws, zoning restrictions, and the relevant regulations and terms of the PPA, biomass and biogas power producers must comply with the relevant environmental quality regulations.

Enforcement and Compliance Mechanisms

In the event of non-compliance with any of the necessary requirements, the ERC may perform an inspection and may revoke the power plant's license, without which continued operation may result in imprisonment, fines, or both under the Energy Industry Act B.E. 2550 (2007).

Two important regulations specific to biogas and biomass power projects include the following:

- National Energy Policy Office and Danish Cooperation for Environment and Development, - Investigation of Pricing Incentives in a Renewable Energy Strategy B.E. (2541) (1998)
- Ministerial Regulations, Department of Energy, Business Division, Ministry of Energy B.E. (2562) (2019)

8. Environmental Regulations

Under the Enhancement and Conservation of National Environmental Quality Act B.E. 2535 (1992), the Ministry of Natural Resources and Environment, in conjunction with the National Environment Board, prescribes 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) as part of the requirements to receive approval to operate. In addition, all power plants are required to comply with the relevant COP.

Even if a power plant is exempted from requiring an EIA, it may still be required to submit an environmental and safety assessment (ESA) or to comply with the relevant codes of practice (COP). Smaller solar farms, for instance, are subject to specific "mini-COP" designed to match the low production of such projects.

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

Some of the laws with environmental provisions most relevant to the energy industry include the following:

- Industrial Estate Authority of Thailand Act, B.E. 2522 (1979)
- Factory Act, B.E. 2535 (1992)
- Enhancement and Conservation of National Environmental Quality Act, B.E. 2535 (1992)

VIETNAM

Vinh Quoc Nguyen ● Hai Thanh Nguyen

1. Regulatory Structure

Regulatory Authorities

The energy sector in Vietnam is mainly managed by the government through the Ministry of Industry and Trade and provincial people's committees.

Energy Policies

Generally, the goals and priorities in Vietnam's energy policies are provided under Decision No. 1264/QD-TTg of the Prime Minister dated October 1, 2019. This established the current national power development plan (PDP), "PDP VIII for 2021–2030, with a Vision Toward 2045." The key objectives of PDP VIII include:

- encouraging the participation of all economic entities—especially private economic enterprises—in electricity development;
- prioritizing the development of electricity sources using renewable energy;
- encouraging the development of a modern, smart power grid in Vietnam; and
- establishing grid links with neighboring countries.

List of Major Laws and Regulations

There are three main laws governing energy industry activities in Vietnam:

- Law on Electricity, passed in 2004 and amended in 2012 and 2018;
- Law on Petroleum, passed in 1993 and amended in 2000, 2008, and 2018; and
- Law on Environmental Protection, passed in 2017.

Supporting these laws are additional enabling and subordinate legislation, including a number of decrees, decisions, and circulars that provide more detailed regulations, procedures, restrictions, penalties, and other relevant issues. In addition, the Schedule of Specific Commitments in Services of Vietnam to the World Trade Organization (WTO), which was enacted in 2007, contains general provisions on the forms of commercial presence, ownership, and business lines relevant to foreign investors in the energy industry in Vietnam.

2. Oil and Gas

Market Overview and Development

Upstream business (i.e., exploration and production) has been the main force in Vietnam's oil and gas industry. Recently, oil and gas production from offshore has attracted investments from various investors; for example, Vietnam is currently working with ExxonMobil to develop the Blue Whale gas field off the country's central coast, which has an estimated reserve of 150 billion cubic meters. Such foreign investments are expected to provide a wide range of interesting business opportunities in the upstream market. These include offshore oil and gas equipment and services, such as seismic

research, maritime vessels, pipes, maintenance services, deep water drilling and production technologies, and subsea technology.

In addition, thanks to the enlargement projects of numerous refineries (e.g., the Dung Quat refinery), the refining volume has been increasing considerably over the years, requiring an increase in the capacity of oil and gas refinery, storage, and transportation. Therefore, the midstream (i.e., transportation) and downstream (i.e., processing and distribution) segments are expected to grow, which will create many opportunities for investors, such as providing equipment and services for refineries and LNG terminals, including construction engineering and dredging.

Legal Overview

Exploration

Both Vietnamese and foreign investors may conduct petroleum exploration activities on the basis of a petroleum contract or some other agreement signed with the Vietnam Oil and Gas Group (PetroVietnam or PVN) or with the government of Vietnam in accordance with the Law on Petroleum and other relevant laws. Any organization or individual wishing to enter into a petroleum contract must do so through a tendering process in accordance with the relevant tendering regulations issued by the government. In accordance with the decree governing this process, bidders must satisfy a number of conditions, which vary depending on whether the tenderer is an individual or a juristic person (note, however, that so far no individual has ever joined a bid). The eligibility requirements are as follows:

Juristic persons

- Registered for establishment and operation in accordance with the law of the country where the tenderer is currently operating;
- Not in the process of dissolution and not declared legally bankrupt or insolvent;
- Not within a period of prohibition from participation in tendering;
- In possession of adequate financial and technical capacity and specialized experience in the sector of exploration and production of petroleum; and
- Participated or currently participating in a minimum of two contracts for exploration and production of petroleum.

Individuals

- Have full capacity for civil acts pursuant to the law of the country of citizenship;
- Not currently subject to investigation for criminal liability;
- Not within a period of prohibition from participation in tendering;
- In possession of adequate financial and technical capacity and specialized experience in the sector of exploration and production of petroleum; and
- Participated or currently participating in at least two contracts for exploration of petroleum.

Any prospective tenderer not satisfying the condition of participating in at least two contracts for exploration of petroleum must form a consortium or partnership with an organization or individual with this experience.

Construction of Facilities

Successful bidders are permitted to install, operate, and maintain fixed installations and equipment servicing petroleum operations, and construct and use transport routes, pipelines, and warehouses to transport or store petroleum. However, the Law on Petroleum stipulates that ownership of these installations and equipment belongs to the government from the date agreed upon by the parties to the relevant petroleum contract.

Operating Requirements

A decree on implementation of the Law on Petroleum requires investors to prepare an annual work program and budget for each phase in accordance with the commitments in the petroleum contract, addressing duration, work items, finances, and the planned use of personnel, and send the program to PVN for approval in accordance with the provisions in the petroleum contract.

Investors must commit to the training and preferential employment of Vietnamese personnel and the use of Vietnamese services, and they must also apply Vietnam's standards and technical specifications (and international standards recognized for application in Vietnam) regarding safety, environmental protection and relevant technical and technological matters.

It is further necessary to purchase insurance for structures, equipment and facilities supporting the petroleum operation; insurance against environmental loss and damage; third-party civil liability insurance; personal insurance; and other insurance as required by Vietnamese law and generally accepted in international petroleum industry practice.

Decommissioning

Oil and gas decommissioning obligations in Vietnam are primarily regulated through the Law on Petroleum and its implementing and guiding legal documents. The decision with the most detailed guidance on decommissioning assigns petroleum operators responsibility for formulating (and complying with) a plan for a cleanup of facilities, equipment, and structures servicing its operations when the project ends or is abandoned, or when it can no longer ensure safety for people and the environment. This clean-up plan must be submitted for approval to the Ministry of Industry and Trade (MOIT) within nine months of the start of commercial exploitation or within one year of the project first being put into operation.

The clean-up plan must ensure public safety, environmental protection, restoration of natural resources, and traffic safety. Among its basic contents, the clean-up plan should include a list and detailed descriptions of the facilities, equipment, and structures that need to be cleaned up; a schedule, solutions, and technical plans for conducting the clean-up; a plan for waste management and control of marine environmental pollution and a plan for preventing or responding to any environmental incident; and the total expenses of the clean-up. To ensure the clean-up plan has sufficient funding, a financial guarantee fund is to be set up within one year of the first extraction of the oil or gas flow, and must be in place prior to termination of field production or the petroleum

contract. Within nine months of the conclusion of the clean-up, petroleum operators are to submit a clean-up completion report to the MOIT.

Oil and Gas Price Structure

The price of crude oil and natural gas depends on several structural factors such as cost recovery for prospecting, exploring and exploiting oil and gas, and tax regimes for upstream activities (e.g., royalties and corporate income tax).

Distribution of Oil and Gas

Vietnam's WTO commitments did not include a promise to open the processed and crude oil distribution market to foreign investors. The regulations are designed to ensure energy security and prevent the domestic petrol distribution system from being controlled by foreign parties, and to ensure continuous supply of petroleum products.

Enforcement and Compliance Mechanisms

Penalties for administrative violations in the petroleum sector were updated in a decree issued in April 2020. This decree stipulates penalties for administrative violations in the petroleum sector, and in the petrol, oil, and gas trading sector. The maximum fine (in Vietnamese dong) in the sector of exploration and production of petroleum is VND 1 billion (approx. USD 43,000) for an individual and VND 2 billion (approx. USD 86,000) for an organization. In addition, depending on the nature and severity of the violation, the violator may be subject to environmental sanctions (e.g., for breaches of regulations regarding an oil spill response) or criminal penalties in more severe cases.

3. Coal

Market Overview

Vietnam relies heavily on coal-fired power generation to satisfy high electricity demand. According to EVN's 2021 annual report, coal-fired power was still the largest energy source for electricity generation in Vietnam in 2020, accounting for more than 31% of the nation's total installed capacity. Although coal-fired power projects represent a major contribution to the national energy grid, these projects are revealing their harmful impact on the environment (e.g., carbon emissions). Thus, in recent years, the government has been actively developing sustainable energy sources and working toward gradually reducing coal-fired power.

Coal in Government Energy Policy

According to the latest draft Decision of the Prime Minister on Approval for PDP VIII, the capacity of coal-fired power will be reduced from 31.1% of total installed capacity in 2020 to about 28.2% to 28.9% by 2025, slightly increased to about 28.3% to 31.2% by 2030, and then significantly reduced to about 15.4% to 19.4% by 2045. From 2021 to 2030, no new coal-fired power plants will be built (other than those already under construction and under investment which are put into operation from 2021 to 2025). Projects that have been approved under the amended PDP VII but were objected to by local communities or have failed to meet development standards (e.g., not feasible project locations) are recommended to be suspended.

At the 2021 United Nations Climate Change Conference of the Parties (COP26), Vietnam joined other countries in committing to phase out coal-fired power and stop construction of more coal-fired power plants by 2040.

Local Public and Social Perceptions of Coal Power

The implementation of coal-fired power projects is facing much criticism due to its negative impact on the environment. The development of coal-fired power projects (e.g., Vinh Tan, Duyen Hai, and Mong Duong) has led to the emergence of environmental pollution like ash and fine dust, which present health concerns for people in the surrounding areas. New coal-fired power projects will not be licensed in some provinces (e.g., Quang Ninh). However, some people believe that it is still necessary to develop coal-fired power, arguing that renewable energy will not be able to replace traditional energy sources for the next few decades due to its lower capacity and high investment costs.

Regulations Most Relevant to Coal Power Projects

Like other electricity generation projects in Vietnam, a coal-fired power project can only be developed if it has been included in the power development plan approved by the prime minister. That is, a coal-fired power project that is not included in the power development plan can only be implemented after the investor has applied for the addition of its project to the plan, and the request has been accepted. Foreign investors may own up to 100% of equity in coal-fired power projects in Vietnam.

In theory, a coal-fired power project in Vietnam can be implemented as either an independent power project by using the same general investment pathway as all other types of investment in Vietnam, or a build-operate-transfer (BOT) project. In practice, most foreign investment takes the form of BOT projects, because the BOT model offers investors more protection than the independent power project model. (For instance, government guarantees and undertakings are normally issued for BOT projects.) BOT projects are subject to the special regime under the Law on Public-Private Partnership Investment, which took effect on January 1, 2021. While bidding is not required for independent power projects, investors in BOT projects, in general, must be selected through a bidding process.

At a high level, the implementation of a coal-fired power project may be developed through the following key stages:

1. Project preparation, such as preparation and evaluation of the pre-feasibility study report; and obtaining a decision on inclusion in the power development master plan, an investment policy decision, and an enterprise registration certificate;
2. Preparing for construction, such as obtaining a construction permit and a PPA;
3. Construction; and
4. Operation.

In short, a complicated approval process is required for investors to invest in coal-fired power projects in Vietnam.

4. Solar

Industry Overview and Development

Solar electricity generation will play a major role in helping Vietnam achieve its ambitious targets of producing 43% of its energy mix from renewables by 2050, as expressed in its 2015 renewable energy development plan. The percentage of solar power production in proportion to the country's total production of power was targeted by the plan to reach 0.5% by 2020, around 6% by 2030, and around 20% by 2050. In this context, a significant number of solar projects have been undertaken in Vietnam over the years. According to the state owned grid operator Vietnam Electricity (EVN), as of December 25, 2020, there were 83,000 rooftop solar projects connected to the power system for a total installed capacity of nearly 4,700 MWp. The total power generation output to the grid from rooftop solar projects has reached more than 1.13 billion kWh.

Legal Overview

Incentives

EVN (or its authorized member unit) has the obligation to purchase all on-grid solar power produced for a period of 20 years from the date of commencement of commercial operation. However, this commitment has not been always been faithfully honored because the high number of investors in the central and southern parts of Vietnam has sometimes overloaded the national grid. After a 2020 decision concerning solar power projects, rooftop solar power systems are now allowed to sell part or all of the electricity produced not only to EVN but also to other purchasers.

Further incentives for solar power projects in Vietnam include zero import duty for materials used to form the fixed assets of a renewable energy project, and for materials and semi-products that are unavailable in the domestic market; corporate income tax exemption or reduction; and land rental exemption or reduction.

Potential for Solar Power Projects

Vietnam has huge potential for solar power. In particular, the country has many favorable natural conditions to develop solar projects, especially in the central and southern parts of the country. In addition, the growing demand for electricity has helped the country to establish itself as a renewable energy investment destination. Further, over the years, the authorities have introduced numerous policies and regulations to encourage and support the development of solar power projects in Vietnam.

Requirements and Procedures for Initiating a Project

A solar power project can only be developed in Vietnam if it has been included in the power development plan approved by the prime minister. That is to say, a solar power project that is not included in the power development plan will only be implemented after the investor has applied for the addition of its project to the plan, and the request has been accepted. In addition, construction of a solar power plant may only commence when the project owner has done the following: (1) had a solar radiation potential assessment, (2) satisfied all construction conditions pursuant to the relevant laws, (3) signed a power purchase agreement (PPA), and (4) signed a grid-connection agreement with a power distribution or transmission entity.

There is no generally applicable limitation on foreign ownership in the renewable energy sector. Foreign investors may own up to 100% of equity in renewable energy power projects in Vietnam.

The implementation of the solar power project may be developed through four key stages:

1. Project preparation, such as obtaining a decision on inclusion in the power development master plan, investment registration certificate, and enterprise registration certificate;
2. Preparing for construction, such as obtaining a land use rights certificate, environmental impact assessment approval, construction permit, and PPA;
3. Construction; and
4. Operation.

Operating Requirements

For a solar power plant to enter operation, an electricity operating license must be obtained from the MOIT, the Electricity Regulatory Authority of Vietnam (ERAV), or the relevant provincial people's committee, depending on the scale, location, and strategic importance of the power plant.

Enforcement and Compliance Mechanisms

Non-compliance with the regulations on electricity, depending on the nature and severity of the violation, may be subject to administrative sanctions, or criminal penalties in more severe cases. For administrative sanctions, the remedies may include a warning, fines, confiscation of material evidence and facilities used to commit the breach, suspension of business activities and seizure of the associated gains, and other measures.

5. Wind

Industry Overview and Development

EVN has reported that wind energy currently accounts for a small share of Vietnam's total electricity output. Nevertheless, the government has set specific targets to promote it and has issued a number of regulations aimed at clarifying the legal framework and incentives for the development of wind projects, including a competitive feed-in tariff (FIT). Particularly, wind power production has been targeted to reach 2.7% of total power production by 2030, and 5% by 2050.

Legal overview

Incentives

As with solar electricity, EVN has an obligation to purchase all on-grid wind power produced in the 20 years following the date of commencement of commercial operations, with provision for extension. Investors can also benefit from zero import duty for materials used to form the fixed assets of a renewable energy project, and for materials and semi-products that are unavailable in the domestic market; corporate income tax exemption or reduction; and land rental exemption or reduction.

Since November 1, 2018, the FIT for utility wind power projects has been USD 0.098 per kWh for offshore projects and USD 0.085 per kWh for onshore projects. These rates apply to new wind power plants (or the relevant parts of them) that achieve a commercial operation date (COD) before November 1, 2021, in which case the FIT will stand for 20 years from the COD, and to existing wind power plants that were generating power before November 1, 2018, in which case the FIT will stand for the remaining term of the relevant PPA.

Potential for Wind Power Projects

As with solar projects, Vietnam's potential to develop and generate wind power projects is substantial, with natural conditions suitable for wind power particularly in the south and south-central regions. In addition, the country is blessed with a long coastline, much of which has a relatively shallow seabed, allowing for offshore wind installations. However, despite these promising resources, the renewable energy market is still very limited in size, with few wind power projects in operation. The government hopes to change this situation with a legal framework encouraging the development of wind power projects in Vietnam.

Requirements and Procedures for Initiating a Project

Similar to a solar power project, a wind power project must be included in the power development plan in order to be initiated. Likewise, the construction of a wind power plant may also only commence when the project owner has (1) had wind measurement assessment conducted for at least 12 consecutive months, (2) satisfied all construction conditions pursuant to the relevant laws, (3) signed a power purchase agreement (PPA), and (4) signed a grid-connection agreement with a power distribution or transmission entity.

The implementation of a wind power project can also be classified into four development stages. For details, please see the above section on solar power.

Operating Requirements

To be put into operation, wind power projects are required to obtain an electricity operating license from the MOIT, the ERAV, or the relevant provincial people's committee, depending on the scale of the power plant.

Enforcement and Compliance Mechanisms

Non-compliance with the regulations on electricity may be subject to administrative sanctions, or criminal penalties in more severe cases, depending on the nature and severity of the violation. Administrative sanctions may include a warning, fines, confiscation of material evidence and facilities used to commit the breach, suspension of business activities and seizure of the associated gains, and other measures.

6. Hydropower

Industry Overview and Development

Vietnam has been reliant on hydropower to generate electricity for many years. According to EVN's 2018 annual report, hydropower was still the primary source of electricity generation in Vietnam,

accounting for more than 35% of total generation in 2018. Although hydropower projects represent a significant contribution to the national energy grid, such projects are gradually revealing their negative consequences on the environment and society, such as the loss of forests, decline of alluvium, and incidents such as flash-flood release. Thus, during recent years, despite development of hydropower sources still being among the targets, the government has been looking for alternative power generation sources, and the country will aim to gradually reduce its dependence on hydropower.

Legal Overview

Incentives

The avoided-cost tariff (ACT) mechanism, which applies to grid-connected small hydropower plants with an installed capacity of up to 30 MW, enables these plants to sell electricity to EVN with flexible pricing by time of day (i.e., peak, normal, or off-peak hours), by season, by region, and by year.

Project Construction

Investment in construction of hydropower projects must ensure compliance with the hydropower master plan issued by the MOIT. If a project is under the hydropower master plan but not yet included in the power development master plan or not in accordance with the power development master plan, the authorities permitting investment must consult the MOIT on the compatibility of the project with the power development master plan before considering investment approval.

In addition, there are eligibility requirements for who can invest in a hydropower project. Such an investor must be an enterprise established in Vietnam and be in the business of investment in the construction of hydropower projects, must have sufficient financial capacity to implement the project, and may not be an investor in a project that is delayed by more than 12 months (unless an official extension or suspension has been issued).

The investor must also have an implementation plan for hydropower project construction investment. This plan should include a schedule for initiation of construction, operation of the generator, and completion of the work. It must also be consistent with the power development plan approved by the authority, and the situation and conditions of economic and social development at the time of planning the project, electricity system load and electricity grid works in the relevant local area.

Operating Requirements

An electricity operating license will be required to operate. Another key operating requirement is that investors must comply with the technical procedures and regulations on operation of electricity plants and electricity grids. In addition, investors must comply with the regulations on safety of hydroelectric dams and operation of reservoirs.

Enforcement and Compliance Mechanisms

As described in the wind and solar sections above, failing to comply with the regulations on electricity may incur administrative sanctions, or even criminal penalties in severe cases, depending on the nature and severity of the violation. Administrative sanctions may include a warning, fines,

confiscation of material evidence and facilities used to commit the breach, suspension of business activities and seizure of the associated gains, and other measures.

7. Biomass and Biogas

Industry Overview and Development

While the practicality and scalability of biogas power remain in the research phase in Vietnam—with no particular mechanism yet in place for encouraging the development of biogas power—biomass energy has been the focus of some activity.

Although biomass feedstock of agricultural origin, ranging from sugarcane bagasse to rice husks and stalks, is abundant, biomass as a source of renewable energy is still very limited in Vietnam, with few biomass power projects in operation. Local news reports have cited MOIT confirmation that there are approximately 10 combined heat and power biomass power projects operating in Vietnam with a total capacity of 350 MW. In order to make biomass power projects more attractive for investors, the government has issued regulations aimed at clarifying the legal framework and incentives for the development of biomass projects, including the introduction of a new competitive FIT.

Legal Overview

Incentives

The FIT for biomass power projects has seen significant adjustments recently. The biomass power price applied for co-generation heat power projects is now 1,634 VND/kWh, equivalent to USD 0.0703 per kWh (up from USD 0.058 per kWh); the biomass power price for other types of biomass projects is VND 1,968/kWh, equivalent to USD 0.0847/kWh. However, the tariff will be calculated at the applicable central exchange rate of VND to USD at the time of payment and does not include value-added tax (VAT). This welcome increase of the FIT should help expand biomass energy generation in Vietnam.

Requirements and Procedures for Initiating a Project

A biomass power project must be included in the power development master plan in order to be developed. Moreover, the main equipment of a biomass power project must satisfy technical regulations, and the power quality of a biomass power project must satisfy the technical regulations regarding voltage, frequency and other requirements regarding operation of the national power system.

The implementation of a biomass power project follows the same four-stage development process as set out above for solar power.

Operating Requirements

To be put into operation, a biomass energy project must obtain an electricity operating license from the MOIT, the ERAV, or the relevant provincial people's committee, depending on the scale of the power plant. The power seller is responsible for investing in, installing, operating and maintaining power-metering equipment, transmission lines and booster transformer stations (if needed)

between the seller's power plant, the connection point, and the grid of the power purchaser. The seller must also arrange for inspection, calibration and testing of power-metering equipment correctly in accordance with the Law on Measurement.

Enforcement and Compliance Mechanisms

The compliance mechanisms for a biomass project are similar to those described earlier. Non-compliance with the regulations on electricity may be subject to administrative sanctions, or criminal penalties in more severe cases, depending on the nature and severity of the violation. Administrative sanctions may include a warning, fines, confiscation of material evidence and facilities used to commit the breach, suspension of business activities and seizure of the associated gains, and other measures.

8. Environmental Regulations

In general, development of a renewable energy project must comply with the provisions of the Law on Environmental Protection and its guiding legislation.

This law stipulates that an environmental impact assessment report (EIAR) is required in the preparatory stage of the project if a renewable energy project

- is subject to a decision on investment policy under the authority of the National Assembly, the Government and the Prime Minister;
- uses land parcels situated in wildlife sanctuaries, national parks, historical-cultural monuments, world heritage sites, biosphere reserves, or listed scenic beauty areas; or
- may cause adverse impact on the environment (e.g., having an area over 200 hectares of land).

The owner or developer of such a project is responsible for conducting and producing the EIAR on its own or by hiring an advisory organization to carry out the EIAR and take statutory responsibility for the conclusive results.

Depending on the nature and scale of a renewable energy project, the Ministry of Natural Resources and Environment, another ministries or quasi-ministerial agency, or relevant provincial people's committee will have the authority to evaluate and approve the EIAR. The law sets the timeframe for the authorities to review the EIAR at 20 days from the date of receipt of the complete and valid file. However, in practice the process usually takes much longer—from several months to a year or more, depending on the nature and complexity of each case.

Failure to obtain EIAR approval may subject the project owner to a fine of up to VND 400 million (approx. USD 17,542) and suspension of project operations for 6–12 months—and the project owner will still then be required to obtain an EIAR.

A renewable energy project that is not subject to an environmental impact assessment still needs to prepare and obtain approval of its "environmental protection plan" (EPP) from the authority (e.g., the environmental protection agency affiliated with the provincial or district-level people's committee). The law states that within 10 days of receiving the EPP, the authorities will approve and

certify its registration. If registration of the EPP is refused, the authority will issue a written notification providing the reasons for refusal.

After the EIAR or EPP is approved, the owner or developer of the project must apply the measures for environmental protection under the approved EIAR or EPP, and the applicable environmental laws and regulations.

If an environmental emergency occurs at any time, all operations must be suspended, remedial measures must be taken, and the project owner must promptly notify the people's committee of the commune or district where the project is carried out, or the environmental protection agency affiliated with the provincial people's committee as well as the relevant authorities.

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