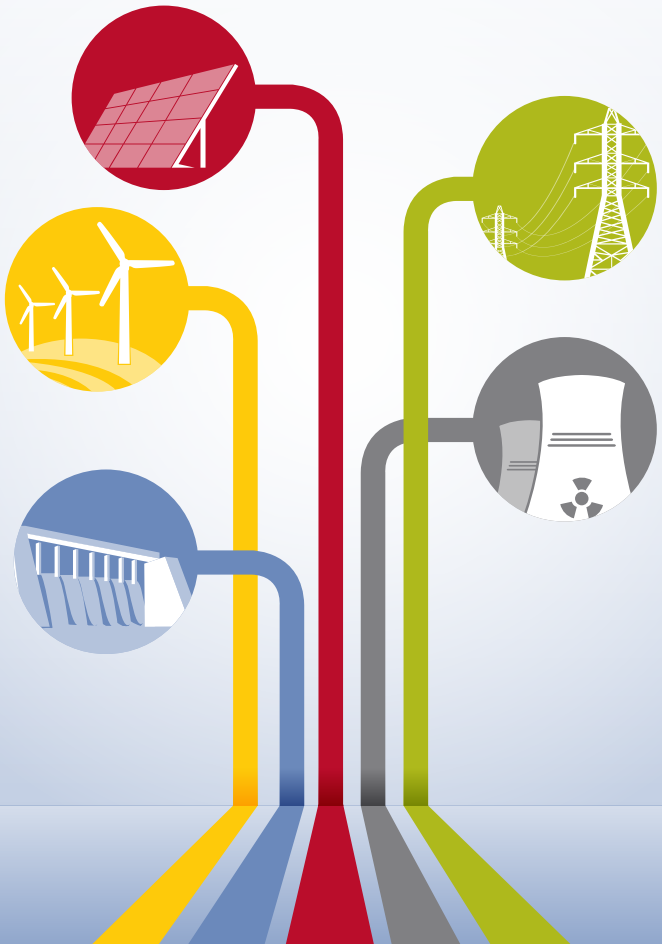
BAKER & MCKENZIE

SNAPSHOTS

OF KEY ASIA PACIFIC POWER MARKETS 2016



Preface

I am delighted to present to you the S*napshots of Key Asia Pacific Power Markets*, in which we provide an overview of the electric power sector in 11 major and developing economies in the region.

This booklet grew out of our 2014 Asia Pacific Power Academy in which we undertook a series of workshops and presentations on power project development and financing for colleagues and clients.

In this 2016 edition, we include a summary of new changes in power regulations and policies, opportunities for foreign investors, changes impacting power project development and recent examples of major power transactions.

Each individual "snapshot" has been prepared by Baker & McKenzie lawyers practicing in and advising on electric power matters in that jurisdiction and is based on an ongoing and wide familiarity with that market.

We hope you find this publication a useful resource and that it helps you in framing the material issues and trends relating to investment in the power sector in these countries.

I encourage you to contact us if you have any questions. Please refer to the key contacts section at the end of this booklet.

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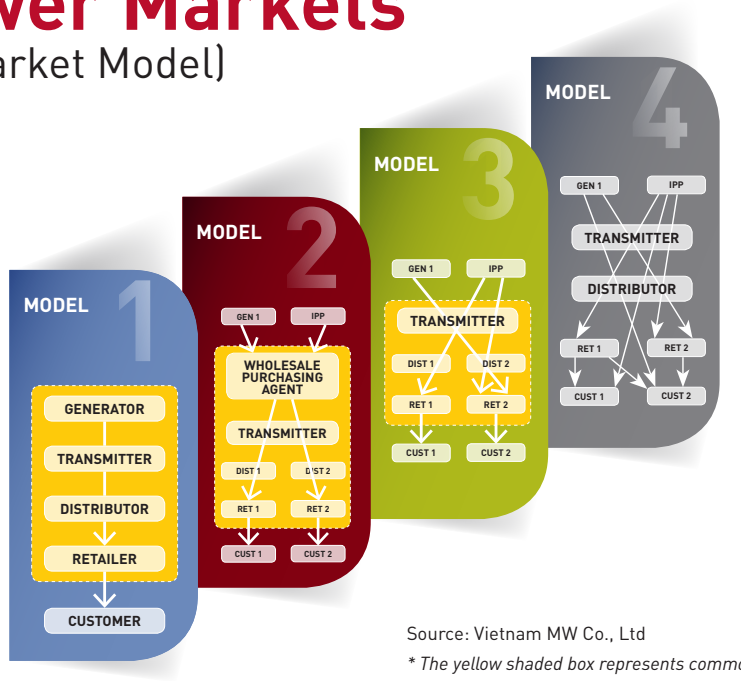
First edition: November 2014

Snapshots of Key Asia Pacific Power Markets

(by Market Model)



Source: Vietnam MW Co., Ltd

** The yellow shaded box represents common ownership.*

MARKET MODEL 1

Most regulated model where generation, transmission, distribution and retail of electricity are conducted by the same entity, often a government monopoly or a regional monopoly by a public utility.

MARKET MODEL 2

Less regulated model where the private entities can generate and sell electricity to a central government–owned utility through a power purchase agreement. The government utility will transmit to regional government/publicly owned distributors and retailers who will provide electricity within its local market.

MARKET MODEL 3

Further deregulated model where private generators and IPPs can sell electricity to a central government–owned transmitter or a regional government/publicly owned distributor or retailer who will provide electricity within its local market.

MARKET MODEL 4

Deregulated model where generation, transmission, distribution and retail are conducted by separate entities, often being private or shifting toward privatization, and are freely traded.

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Australia

Installed capacity:
56,863 MW[1] + 4,900 MW off-grid capacity
Market Model:
Model 4

New changes in power regulations and policies

There have been a number of very significant regulatory and policy developments in 2015:

- Australia's Renewable Energy Target (**RET**) was revised in June 2015 from 41,000 GWh to 33,000 GWh of renewable energy by 2020. The revised RET means approximately 23.5% of Australia's electricity generation must come from renewable sources by 2020.
- Australia's carbon pricing scheme was abolished in July 2015 and replaced by an Emissions Reduction Fund (**ERF**). The ERF is a AUD2.55 billion reverse auction fund that allocates funding to projects that will reduce Australia's carbon emissions. Two rounds of auctions have been held in 2015, with 92.8 million tonnes of carbon abatement having been purchased. The next stage in the ERF will involve setting of emissions baselines for large emitters including stationary energy.
- The federal government released its Energy White Paper in April 2015. This white paper is an important policy document that sets out the government's approach to energy over the coming years. The key themes were increasing competition, increasing energy productivity and investing in Australia's energy future. It has been criticized for its lack of acknowledgement of the impacts of climate change on Australia's electricity future.
- The NSW government committed to privatizing its electricity distribution network ("poles-and-wires") following the March 2015 NSW elections. Queensland's proposal to similarly privatize its network was put on hold as a result of the outcome of the Queensland elections in early 2015.

Recent examples of major power transactions

- The NSW government recently finalized the following:
  - → sale of Macquarie Generation's coal-fired assets to AGL Energy for USD1.5 billion; and
  - → sale of the 667 MW Colongra gas-fired power station to Snowy Hydro for USD190 million.
- The ACT Government's 200 MW wind farm auction was completed, with three projects receiving 20-year feed-in tariffs. The successful project developers are now seeking to implement and begin to operate the projects.
- A number of major LNG projects have recently come on line in Queensland, including BG Group's USD20.4 billion Curtis Island project in May 2015.

New opportunities for foreign investors

- **NSW poles-and-wires privatization:** The NSW Government will offer 99-year leases of entities that operate 49% of NSW's electricity distribution infrastructure. It is expected the government will raise AUD20 billion from the privatization.
- **Stronger renewables policy settings:** Nationally, the revised RET requires approximately 6,000 MW of new renewable energy capacity to be built by 2020. It is predicted between 30 and 50 major projects need to be built in the next five years, requiring AUD40 billion in new investment. At the state/territory level, Victoria has released its Renewable Energy Roadmap (20% renewables target by 2020); NSW has a strong investment-focused Renewable Energy Action Plan; Queensland has committed to a 50% renewable energy target by 2030; the ACT has 100% renewable energy target by 2025; and South Australia has released a strategy paper aiming for AUD10 billion in low carbon generation investment by 2025. CEFC (debt financing) and ARENA (grants) have also been retained and will continue to facilitate renewable energy investments.
- **ACT Wind Auction II:** In August 2015 the ACT Government announced its second wind farm auction, due before the end of 2015 and expected to be approximately 200 MW of wind-generated capacity. Parties bid in a "reverse auction," with the government awarding FiTs to successful projects.
- **LNG in Queensland:** Queensland has opened up a further 11,000 sq km for new LNG exploration tenders in the southwest of the state.
- **Decentralized and embedded generation:** Rooftop solar is growing rapidly in Australia. Demand has historically been from the residential sector; however, the commercial sector is showing increasing interest. It is further expected that there will be a rapid uptake of battery storage in Australia as these technologies progress.
- IFM Investors is looking to sell its interest in Pacific Hydro for approximately AUD2 billion. Australian assets make up about 40% of Pacific Hydro's global earnings. Various parties are reported to be preparing bids.

Recent changes that impact power project development

There are a number of recent changes and trends that could impact power project development by foreign investors:

- **Decentralized generation:** The Australian Energy Regulator now provides guidance on how prospective rooftop solar providers can obtain exemptions from license requirements.
- **Electricity demand and capacity issues:** Demand has been steadily falling in Australia for a number of years with pressures including increasing electricity prices, improved energy efficiency, significant uptake of rooftop solar and the exit of some major energy users. In light of the falling demand and excess capacity issues, the NEM has forecast that 4,550 MW of capacity is intended to be withdrawn by 2022.[2]
- **Pricing and metering reforms:** Regulators are looking at how the pricing and metering regulatory frameworks may be reformed to help consumers improve their electricity efficiency.
- **General investor matters:** The falling Australian dollar (against the US dollar) means projects in Australia have become relatively cheaper in 2015 for foreign investors. Australia's current foreign legislation will be replaced with new legislation in December 2015.

1 This figure is the aggregate capacity of the National Electricity Market (NEM) and the South West Interconnected Systems (SWIS). The NEM consists of Queensland, NSW, Victoria, South Australia and Tasmania and has a capacity of 51,363 MW. The SWIS covers southern Western Australia and has a capacity of approximately 5,500 MW.

2 Note: "Withdrawal" does not separately identify those units/stations for which there are plans to return it to the market in the future.

Australia

Installed capacity:
56,863 MW + 4,900 MW off-grid capacity
Market Model:
Model 4

Electricity market trend for the near future

Investment in the near future will be largely in renewables, predominantly in wind and solar. Any investment in baseload power likely to be gas.

General trends include the following:

- Electricity demand is expected to plateau (rather than fall) this year, due mainly to LNG projects coming in and population growth. Demand had been falling in the last few years mainly due to increased electricity prices, improved energy efficiency, significant uptake in rooftop solar and the exit of some major energy users (e.g., the closure of a number of aluminium smelters);
- Certain jurisdictions are undertaking or considering privatization of aspects of their electricity networks.
- A number of existing large coal-fired power stations have been decommissioned (or mothballed) recently, and a number of coal and gas project proposals have been withdrawn; and
- Significant investment in LNG export terminals, particularly in Queensland (although there are currently restrictive regulatory arrangements for gas exploration).

Requirements for public bidding for greenfield projects

Generally, there are no requirements, as generation in most states/territories has been privatized.

Main issues for foreign investors

- **Complexity of regulatory environment:** Australia's energy market is highly regulated and is (unusually within the Asia Pacific region) a merchant market with little vertical integration of power utilities; and
- **FIRB notification or approval:** generally not an issue (and required to respond within regulated timeframe).

Issues that face both local and foreign investors include the following:

- **Regulatory risk:** e.g., changes to rebates and feed-in tariffs, uncertain future of the CEFC and ARENA;
- **Financial barriers to investment:** challenge in obtaining a power purchase agreement (**PPA**), which is critical for funding. Currently limited or expensive project financing available; and
- **Decreasing demand in electricity:** there has been a decrease in electricity demand in Australia's eastern states for the past few years.

Typical hurdles for a power project developer

- Lack of available finance, due to excess capacity and falling electricity demand;
- **Ability to obtain a PPA:** difficult to negotiate a PPA with the integrated retailers that dominate the market;
- **Project planning and development:** recently there have been changes in some states that limit areas where wind projects can be developed, and also regulatory changes in some states that limit ability to undertake exploration for gas. There has been some community opposition to wind farm developments in parts of Australia; and
- **Grid connection:** grid access can be a significant cost or barrier.

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

Key local players

- integrated retailers and generators (e.g., AGL, Origin Energy, ERM Power);
- large thermal generator owners and operators (e.g., Stanwell Corporation, Synergy); and
- renewable energy generators (e.g., SnowyHydro, HydroTasmania, Infigen Energy).

Key foreign investors

- integrated retailers (e.g., EnergyAustralia, GDF Suez);
- large thermal generator owners and operators (e.g., RATCH Australia);
- renewable energy project developers (e.g., Neoen, Fotowatio Renewable Ventures, Union Fenosa Wind Australia and Tesla); and
- turbine manufacturers and developers (e.g., GE, Siemens, Goldwind).

SNAPSHOTS
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2016

India

Installed capacity:
278,733.62 MW
(108,107.67 MW, 39% private)
Market Model:
Model 3[1]

New changes in power regulations and policies

- The government of India has announced a renewable power production target of 175,000 MW by 2022, consisting of 100,000 MW from solar power, 60,000 MW from wind, 10,000 MW from biomass and 5,000 MW from small hydro.
- Under the Coal Mines (Special Provisions) Ordinance 2014, in 2015 the government conducted three rounds of auctions for the reallocation of coal blocks following the ruling of the Supreme Court of India that previous allocations between 1993 and 2010 were illegal. So far, 34 coal blocks have been auctioned, while the rest have been given to public sector companies such as NTPC Ltd and Steel Authority of India Ltd (SAIL). The Environment Ministry has permitted the transfer of environmental clearances granted to prior allottees to the new allottees without the need for a new approval request.
- The government is working on creating a mechanism to address stranded gas-based generation in 2016 and 2017 by the provision of subsidies for the import of liquefied natural gas.
- Investments of about USD35 billion are proposed to improve the transmission sector to address chronic transmission and distribution losses and aggregate technical and commercial losses, which were 23.04% and 25.38% respectively in 2013. Of the total investment amount, USD19 billion will be contributed by the state-owned Power Grid Corporation of India.

Recent examples of major power transactions

Conventional power:

- Jaiprakash Power Ventures Ltd (JPVL) agreed to sell two hydropower projects in Himachal Pradesh to JSW Energy for about USD1.5 billion.
- JSW Energy reportedly has agreed to acquire the 500 MW Bina Thermal Power from Jaiprakash Power Ventures for about USD528 million.

Renewable power:

- SunEdison signed a definitive agreement to acquire Continuum Wind Energy, Singapore, with over 242 MW of operating wind assets and 170 MW of assets under construction.
- Enel Green Power acquired a majority stake in wind and solar operator BLP Energy for approximately EUR30 million. BLP claims 772 MW of wind power projects in operation or at various stages of development.
- Japan's SoftBank announced plans to invest USD20 billion in 20 GW of solar energy projects in India, together with India's Bharti Enterprises and Taiwan's Foxconn Technology Group.
- SunEdison Inc. plans to invest USD15 billion in India by 2022 to develop solar and wind projects with a total capacity of 15 GW. SunEdison has also agreed to invest about USD2 billion in a joint venture with the Adani Group to manufacture solar power equipment.

New opportunities for foreign investors

- Foreign direct investment in the Indian power sector was approximately USD9.7 billion from April 2000 to May 2015.

  Investment opportunities for foreign investors are mostly expected to be in the renewable energy field as the government has announced a renewable power production target of 175,000 MW by 2022, consisting of 100,000 MW from solar power; 60,000 MW from wind; 10,000 MW from biomass and 5,000 MW from small hydro.

Recent changes that impact power project development

- Other than the push for renewable energy production, there have not been any recent changes of significance that have materially impacted power project development in India.
- The state electricity distribution companies have about USD39 billion in losses. Their financial health remains a critical concern.
- Investors continue to look for certainty of regulation (tax policy, electricity regulation, etc.), stable fiscal and monetary policies, and a predictable legal framework respectful of commercial practices and contracts.

1 India displays the characteristics of Model 3 as a predominantly single-buyer model. Under India's federal structure, intra-state distribution companies are owned and regulated by several states rather than on a unitary basis by the Central Government of India.

SNAPSHOTS
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2016

India

Installed capacity:
278,733.62 MW
(108,107.67 MW, 39% private)
Market Model:
Model 3[1]

Electricity market trend for the near future

Electricity demand growth is expected to be 10 to 12% per year until 2017.

The target for power capacity addition during the 12th Plan period (up to 2017) is 88,000 MW. The country added 12,510.4 MW in 2014 to 2015 (until 15 January 2015).

However, a significant amount of capacity is stranded owing to the non-availability of gas. Currently, India's gas-based capacity is about 27,123 MW, with 14,305 MW being stranded (i.e., operating at zero plant load factor or **PLF**) with the remainder operating at approximately 30% PLF.

Requirements for public bidding for greenfield projects

The central government, through the Power Finance Corporation, has established a program for the development of ultra mega power projects (UMPP), each delivering 4000 MW, located at coal pits or on the coast.

Four UMPPs have been awarded (three to Reliance Power and one to Tata Power); there are 12 others in the pipeline. The government has announced plans to auction five new UMPPs.

Power procurement by state entities goes through a process of competitive bidding on tariff (except for hydro and renewables). There are two cases:

Case 1 contemplates an open bid where the developer has to select the fuel, location and technology of the proposed project. The developer is also responsible for obtaining all relevant approvals.

Case 2 involves bidding on the basis of a fuel and location specified by the procuring entity. Government support is to be provided in obtaining the necessary clearances and approvals and fuel supply.

Main issues for foreign investors

Foreign Direct Investment up to 100% is permitted in the power sector, under the automatic foreign investment route, for the following:

- generation and transmission of electric energy produced in hydro electric, coal/lignite-based thermal, oil- based thermal and gas-based thermal power plants
- renewable/non-conventional energy generation and distribution
- distribution of elective energy to households, industrial, commercial and other users
- power trading

The main issues for foreign investors are essentially the same as those for Indian developers: cost of funds, credit-worthy power purchasers, land acquisition and fuel supply.

Typical hurdles for a power project developer

The key problems hindering the growth of the power sector in India include cost recovery, land acquisition, fuel, environment and forest clearances.

Most state power purchasers (discoms in unbundled states and SEBs in states that have not unbundled) have poor credit owing to large losses and high debt (although a few are profitable). Tariffs are politically sensitive, as are subsidies and other cost-related power supply arrangements.

In addition, the average transmission and distribution losses (T&D) exceed 25% of total power generation compared to less than 15% for developing economies. The T&D losses are due to substantial energy sold at low voltage, sparsely distributed loads over large rural areas, inadequate investment in distribution system, improper billing and high pilferage. Gencos have little control.

Distribution companies (about 95% of the distribution network are state boards) also conduct regular load shedding and intentional blackouts in certain areas to manage demand.

Coal is the most common fuel but is in very short supply domestically. Imports are feasible but expensive, and they upset the power purchase agreements and tariffs that were designed around cheaper, domestic coal.

Gas is comparatively expensive to deliver to generators in India, primarily due to infrastructure constraints.

Barriers to entry are high in the transmission and distribution segments, which are largely state monopolies.

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

Government bodies:

Central institutions like National Thermal Power Corporation Limited (NTPC) and the State Electricity Boards (SEBs) continue to dominate the power sector in India. NTPC is India's largest power producer. Power Grid Corporation of India is the single largest transmission utility in India.

Local companies:

Reports indicate that Adani Power is now India's largest integrated power company with gross power generation capacity of 8,620 MW.

Tata Power is also a significant market participant with a rival claim to being India's largest private producer, with 8,623 MW.

Reliance Power claims 6,000 MW of operational power generation assets.

Foreign companies:

India has only two foreign players operating power plants: AES of the US and China Light and Power (CLP). AES maintains a plant in Odisha. CLP is focused on renewable energy projects.

1 India displays the characteristics of Model 3 as a predominantly single-buyer model. Under India's federal structure, intra-state distribution companies are owned and regulated by several states rather than on a unitary basis by the Central Government of India.

Indonesia

Installed capacity:
53,535 MW (electrification ratio of 86.39%)
Market Model:
Model 2[1]

New changes in power regulations and policies

- In April 2015, the President announced a plan to develop 35,000 MW of new electricity generation projects until 2019. This plan is also a part of the PLN's 2015-2024 Power Supply Business Plan. For this program, PLN will build power plants to produce around 10,000 MW of electricity. The remaining capacity will be offered to independent power producers. Moreover, these projects are estimated to require aggregate investments of more than IDR1,100 trillion (around USD78 billion).
- The new Geothermal Law was issued in September 2014 to replace the 2003 Geothermal Law. Under the new law, geothermal activities are no longer classified as "mining activities" and can be conducted in conservation forest area. The new law also recentralizes the authority over licensing for geothermal power generation to the Minister of Energy and Mineral Resources (**MEMR**). In June 2014, the government also issued a revision to the geothermal pricing regime. The new regulation reverts to a geographically based tariff regime, but this time enhanced with an added dimension of the timing of achieving the commercial operation date.
- The Second Fast Track Power Program, which was introduced in 2010 and was set to expire on 31 December 2014, has been extended until 31 December 2019. The program consists of power plants with renewable energy, i.e., geothermal and hydro power plants, as well as coal-fired power plants with more efficient technology and gas-fired power plants. The government also extended the regulation on the business viability guarantee letter to support the Second Fast Track Power Program.
- In 2015, the MEMR issued Regulation No. 3 of 2015 on direct selection and direct appointment process by PLN. The regulation provides ceiling benchmark tariffs for the same projects.

  At the same time, the MEMR also issued a new regulation on power wheeling, which allows power suppliers with franchise areas to cooperate with each other for electricity supply in their respective areas without tender. It also regulates the procedures for leases of transmission and distribution lines.
- On 29 June 2015, the MEMR issued a new feed-in-tariff regulation for mini hydro power projects (having capacity of up to 10 MW). The previous regulation, which featured rupiah-based tariffs, has been criticized by the industry as having been set too low. The new regulation sets the tariffs in US dollar terms and generally increases the tariff levels. PLN is also preparing a new model PPA for mini-hydro projects. Although tariff is set out in US dollars, payment of the invoice is in Indonesian rupiah.

Recent examples of major power transactions

- **Rajamandala 1x47MW hydro power project** - This is the first major power project in Indonesia in recent years to successfully raise international limited recourse project financing without the Government of Indonesia providing a business viability guarantee. The guarantee for this project was provided by the Multilateral Investment Guarantee Agency (**MIGA**). Sponsors of the project are Kansai Electric Power Co. and PT Indonesia Power (a subsidiary of PLN).
- **Samas 50 MW wind power plant** - PPA was executed in May 2015. This is the first PPA for a wind farm power plant in Indonesia.
- **Sumsel-10 1x600MW mine mouth coal-fired power project** - This project will be the largest mine-mouth project in Indonesia and it is implemented using the public private partnership scheme.
- **Hasang 3x13MW run-of-river hydro power project** in North Sumatra, Indonesia. The PPA was signed on 19 August 2015.

New opportunities for foreign investors

Since taking office in 2014, President Joko Widodo has announced very ambitious greenfield infrastructure plans for Indonesia, including in the power sector.

- The introduction of the 35,000 MW Program and the extension of the Second Fast Track Program will provide a lot of opportunities for IPP developers, especially foreign investors. PLN has also announced plans to procure more gas-fired power plants.
- The government has taken steps to encourage the development of power plants using renewable resources (e.g., geothermal, wind farm and hydro).

Recent changes that impact power project development

- In June 2015, Bank Indonesia, the central bank, issued a new regulation requiring the mandatory use of rupiah in transactions (with payments in cash and non-cash) conducted in the territory of Indonesia. The regulation states that "strategic infrastructure projects" may be exempted from the requirement if approved by Bank Indonesia. However, until this date it is still not clear how this exemption can be obtained. Pending the issuance of further guidelines from Bank Indonesia and the MEMR, tariffs for PPAs and other project documents (e.g., onshore EPC contract) must be paid in rupiah although the price might be indexed to the USD - rupiah exchange rate.
- On 15 July 2015, the President issued a new regulation providing a central government guarantee for infrastructure financing. This guarantee can be granted to international development finance institutions (i.e., multilateral and bilateral foreign financial institutions such as JBIC, ADB and the World Bank) with respect to loans (i) made by those institutions to "eligible borrowers" in the form of state-owned enterprises and the state-owned infrastructure financing company (PT Sarana Multi Infrastruktur), and (ii) which are for the funding of "qualified infrastructure projects."
- Land acquisition issues remain one of the major obstacles in infrastructure development. The newly issued Presidential Regulation No. 71 of 2012, which is an implementing regulation of the Land Acquisition Law, allows and facilitates direct land procurement by private entities. However, private entities will act as "proxies" of the relevant government institution or BUMN.
- In March 2015, the President issued a new regulation on public private partnership (**PPP**). The new regulation introduces some key changes to PPP implementation rules in Indonesia, including the inclusion of new types of infrastructure that can be developed through a PPP scheme, the introduction of a direct appointment mechanism and expanding the types of investment return schemes that can be adopted in structuring PPP projects. Specifically in the power sector, the PPP scheme now can also be used to develop power substations, in addition to power plants and power transmission infrastructure.
- On 9 September 2015, the Minister of Finance issued a new regulation on debt to equity ratio (**DER**) for companies to calculate income tax. Under the new regulation, the maximum allowable DER for income tax purposes is 4 to 1. This new rule will become effective on 1 January 2016 and is not applicable for companies engaging in the infrastructure sector. However, the regulation does not provide further criteria or explanation on what is meant by "companies engaging in the infrastructure sector."
- In April 2015, the government issued a new regulation on income tax facility. The income tax facility is available for new projects as well as expansions of existing projects. The facilities are available for power generation projects with a minimum investment value of IDR30 billion or a minimum of 100 employees.

1 State-owned PLN responsible for generation, transmission and distribution. PLN also purchases electricity from IPPs and surplus power from captive power producers.

Indonesia

Installed capacity:
53,535 MW (electrification ratio of 86.39%)
Market Model:
Model 2

Electricity market trend for the near future

The PLN Business Plan indicates that up to 2024, approximately 63.7% of generation will be from coal, 19.2% natural gas (including LNG), 9% geothermal, 6.6% hydro, and 1.5% oil and other fuel.

Indonesia is one of the world's largest coal exporters and has substantial coal reserves that enable it to support the development of mine mouth power projects. The recent regulatory development indicates that the government encourages the development of mine-mouth power projects.

The government also issued a new regulation on direct selection and direct appointment process for PLN. The regulation provides a simplified and shorter direct appointment and direct selection process and ceiling benchmark tariffs for the purchase of power from mine-mouth power plants, coal-fired power plants, gas power plants and hydro power plants.

Indonesia also has potential reserves for the development of geothermal and hydro power projects. The government also recently increased the feed-in-tariff for mini hydro projects and issued a new geothermal law.

A new regulation for power wheeling was also issued in 2015.

Requirements for public bidding for greenfield projects

PLN holds and organizes competitive public bidding.

Only in certain circumstances may a power project be undertaken without a public bidding, including:

- power projects using renewable energy source or local energy source (e.g., mine mouth and marginal gas)
- local electricity system in crisis or in the state of emergency; or
- capacity expansion of already operating power projects

Main issues for foreign investors

- PLN has relied upon government subsidies to partially cover the gap between costs and revenues.
- Government guarantee is generally not available.
- Foreign EPC limitations exist where certain types or capacity of power project can only be undertaken by EPC companies established in Indonesia.
- Local content requirements for the provision of goods and services to power projects must meet a certain level of local content.

Typical hurdles for a power project developer

- Land acquisition can potentially cause delay in financial close and project completion, mostly due to the land price issue.
- Sponsors' agreement prevents a change in the shareholders of the project company until at least 5 years after COD, restricting a party from immediately exiting the project.
- Forestry license could take years to obtain due to a complex bureaucratic system in the Ministry of Forestry.

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

The main player is PLN, being the state utility company responsible for generation, transmission and distribution of power in Indonesia.

Active foreign investors in power generation are mainly Japanese (Mitsubishi, Marubeni, Sumitomo, Mitsui, J-power, Itochu, Kyushu Electric) and Korean (Korea Midland Power, Kepco, Posco and Samtan).

The rest are European (GDF-Suez), American (Chevron), Australian (Origin Energy), Indian (Tata Power, Madhucon) and Chinese (China Huadian).

Other potential investors such as EGCO and Ratchaburi Electricity (Thailand), Malakoff (Malaysia), Électricité de France (France), Daelim and YPP Corp. (Korea), Steag (Germany), Jindal and Lanco Infratech (India), CMEC, Sinohydro, Shanghai Electric (China), Gas Natural Fenosa and Abener Energia (Spain) also indicated their interests in power projects in Indonesia by participating in pre-qualification process and/or bids for power projects.

Japan

Installed capacity:
287,000 MW
Market Model:
Model 1 moving toward Model 4

New changes in power regulations and policies

- The Renewable Energy feed-in tariff (FIT) program introduced in July 2012 has led to a boom in commercial-scale solar projects. This has caused problems for utilities to connect all proposed solar projects. New measures enabling more utilities to impose unlimited curtailment on new projects without compensation were therefore introduced in January 2015 which have resulted in a slowdown in the growth of new solar projects.
- In April 2015, a new organization named the Organization of Cross-regional Coordination of Transmission Operators (OCCTO) was established to coordinate cross-regional electricity transmission as part of a three-step electricity market reform process. Full retail liberalization is expected in 2016 and unbundling of the transmission sector is expected by 2020.
- In July 2015 a government panel officially accepted a new proposed energy mix for 2030. The proposal aims to increase the share of nuclear power to close to the pre-Fukushima level (20-22%) and to double the share of renewable energy to 22-24%

Recent examples of major power transactions

- More mega solar power plants are being built. A number of plants over 100 MW in size were scheduled to start operation in late 2015 and construction of one plant over 400 MW was planned to start in late 2015.
- Increasing numbers of coal-fired power plants are being built. During 2015, more than 40 plants were reported to be planned for construction.
- In April 2015, Tokyo Electric Power (TEPCO) and Chubu Electric Power announced the establishment of a new joint venture company JERA, which will procure LNG for both power companies and is expected to be one of the largest LNG buyers in the world. JERA will also own most of the overseas power assets of the two utilities, making it a significant player in the international power market.

New opportunities for foreign investors

- Foreign investors can develop commercial-scale solar projects by acquiring project approvals granted in the first three years of the FIT program and by taking such projects through to construction and operation. Numerous foreign companies are now actively pursuing solar power projects in Japan and construction of various foreign-owned large-scale solar projects is now in progress.
- Foreign investors can also develop biomass, geothermal and other renewable energy projects. The FIT rates set for these renewable energy sources are expected to be maintained at a rate favorable enough to attract investors.
- The regional monopoly currently enjoyed by Japanese utilities will be abolished in 2016, resulting in the opening up of a market worth 7.5 trillion yen. Both local and foreign investors will be able to enter the electricity retail market in 2016. Various foreign electricity retailers and generators are reported to be seeking opportunities in the Japanese power market including in partnership with Japanese companies.

Recent changes that impact power project development

- Local banks were traditionally reluctant to finance foreign-sponsored power projects. However, a number of foreign-sponsored large solar projects have now secured project financing from local banks. This trend is expected to continue in the coming years.
- The new FIT regulations implemented in January 2015 allow utilities to impose unlimited curtailment on new projects without compensation in certain designated regions, including Hokkaido, Tohoku and Kyushu. As a result, the development and financing of solar power projects in these regions has become more difficult.
- OCCTO, the new organization established as the first step of the electricity market reform, is planning to increase the capacity of cross-regional electricity transmission. These measures may facilitate more renewable energy project development in various regions. In August 2015, OCCTO announced its plans to increase the capacity of the frequency converter station in Shizuoka, which is the intersection point of the two frequency regions in Japan.
- Cultural and language barriers undermining successful business practices continue to exist in Japan. However, Japan is taking steps to change into a more friendly place for foreign visitors in preparation for its hosting of the upcoming 2020 Olympics. This cultural change may facilitate foreign investors in doing business in Japan.

Japan

Installed capacity:
287,000 MW
Market Model:
Model 1 moving toward Model 4

Electricity market trend for the near future

- With the favorable FIT in place, renewable energy projects will be further developed.
- New entrants will come into the Japanese power market as a result of the electricity market reform measures.
- New conventional power baseload power facilities will be constructed to compensate for the continued closedown of nuclear facilities.
- Participation by foreign investors in the Japanese electricity market will further expand.

Requirements for public bidding for greenfield projects

- Several public tenders for new conventional power plants are currently underway pursuant to the 2012 guidelines introduced by the Japanese government to require local utilities to hold public tenders when building thermal power plants with new or replacement capacity of 1 MW or more.
- In August 2015, TEPCO announced the winning bidder for its five thermal power plant projects. This public tender was the second tender for TEPCO following the one in 2012. TEPCO plans to conduct additional tenders in the near future.

Typical hurdles for a power project developer

- Various land issues have confronted renewable energy projects, which include:
  (a) tight controls on agricultural land that generally forbid them from being used for electricity projects;
  (b) restrictions against development of forest land, including on the total percentage of tree areas that may be cut to develop the land; and
  (c) difficulty in finding large areas of vacant land due to Japan's high population density, mountainous terrain and existing intensive use of non-mountain areas.
- Renewable energy projects located some distance from the grid often face the issues of high cost and time delays due to the need to construct transmission lines for connecting with the grid.
- Renewable energy projects in the Hokkaido region are facing bottlenecks due to lack of electricity demand, limited transmission capacity to the mainland battery and curtailment requirements.
- New IPPs often face challenges in acquiring suitable sites and environmental permission (including proposed new strict controls on coal-fired plants).

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

Key local players:

- 10 regional utilities and J-Power
- Some IPPs (e.g., Marubeni)
- EPC contractors in both conventional and renewable power such as Sumitomo, Mitsubishi, Hitachi, Mitsui, Sharp etc.
- Sharp, Kyocera, Panasonic, etc. as manufacturers of solar modules
- Various new local renewable energy entrants building commercial-scale solar plants

Foreign investors include numerous foreign renewable energy developers such as Pacifico, Gestamp Solar, Sun Edison and others, module suppliers such as Trina, Yingli and Canadian Solar, foreign investment funds and foreign EPC contractors.

Lao PDR

Installed capacity:
3,200 MW
Market Model:
Model 2[2]

New changes in power regulations and policies

There has been *no significant change* in the regulations. However, a number of small developments in the energy policies and regulations of Lao PDR have been put in place to ensure that the power industry (particularly the hydropower sector) is sustainable in the longer term.

- The Centre for Regulatory Impact Assessment for Draft Legislation was established to assess the impact of draft legislations on the private sector prior to official enactment.
- The government is aiming to improve and expand transmission networks to facilitate growth and integration of the power sector among ASEAN countries via power exchange programs. Transmission lines connecting central Lao PDR to the southern provinces are expected to be completed by early 2016.[2]
- The Minister of Energy and Mines announced the government is aiming for 95% of households to have access to electricity by the year 2020 (from 89% currently).

Recent examples of major power transactions

- Xayaburi Hydroelectric Power Project
  - → One of the Mekong cascade hydropower projects, with maximum capacity of 1,260 MW.
  - → Project was suspended in 2012 due to heavy criticisms from environmental groups. Work has resumed and as of August 2015, actual accumulated work progress is 49%.
  - → Project is developed by Xayaburi Power Company Limited, a subsidiary of the Thai construction company Ch. Karnchang Public Company Limited, at an estimated USD3.8 billion.
- Don Sahong Dam
  - → In September 2015, government approved concession agreement for the Don Sahong Dam (260 MW) with Malaysian developer Mega First Corporation Berhad.[3]
  - → The project has yet to be approved by the Mekong River Commission, an intergovernmental body made up of Thailand, Cambodia, Laos and Vietnam supervising development along Southeast Asia's main waterway.[4]
  - → Construction is expected to begin end of 2015.

New opportunities for foreign investors

Up until July 2015, the government of Lao PDR approved domestic and foreign companies to invest in 357 hydropower projects with a total generating capacity of 26,147 MW. Local and central governments signed MOUs aiming to achieve the goal of having 45 more completed hydropower projects by end of 2019. Other investment opportunities are still broadly available to foreign investors.

- The government is actively trying to pursue its plan to become the major source of power supply to the ASEAN Power Grid (Battery of Asia) and still targeting to increase the installed capacity from 3,200 MW currently to 12,500 MW by 2020.
- Open policy for foreign investors
- Other than its hydropower sector, Lao PDR also possesses high potential for biofuels production. Although access to electricity is on the rise, energy use in the country is still mainly in the form of traditional fuels (use of biomass such as wood and charcoal).[5]
- Lao PDR also has abundant coal reserves estimated to be sufficient to cover domestic demand for coal (mainly used in cement industry). Conversely, it is worth noting that Lao PDR does not have adequate amount of petroleum reserves. All petroleum products need to be imported (currently 70% from Thailand and 30% from Vietnam).

Recent changes that impact power project development

- The government has recently demonstrated its commitment in setting standardized procedures concerning the development, implementation and monitoring of hydropower projects.
  - → The Ministry of Energy and Mines has received financing from the World Bank to service the cost of technical assistance for capacity building in the hydropower and mining sectors and fees for consulting services. Consulting firms were invited to indicate their interest in providing consulting services (legal, technical, financial and environmental advisory) to the agencies of the Lao PDR Government. Products stemming from such consultations may potentially have a major impact on the hydropower IPP process and thus shall be closely monitored by investors.
- Due to increased experience in developing power projects and the growing pressure from the public and NGOs, the Lao PDR Government is enforcing environmental requirements more strictly. Examples are as follows:
  - → Employment of foreign experts to study the impact on certain species of animals prior to approving projects.
  - → Impose a requirement for developers to conduct thorough environmental study to cover environmental impact on nearby rivers and canals rather than just the main water source.

1 In Laos, (a) majority of generators are privatized (IPP, which usually required to co-invest with investment arms of the state [e.g., Electricite du Laos and Lao Holding State Enterprise]); (b) the state is the purchasing agent that solely purchases electricity from the generators; and (c) transmission, distribution assets and retail businesses are owned by the state (Electricite du Laos)
2 Department of Energy Policy and Planning, Ministry of Energy and Mines, Lao P.D.R., 2015
3 The Diplomat (September 2015), available at http://thediplomat.com/2015/09/laos-officially-approves-controversial-dam-project/
4 Open Development, Mekong (October 2015), available at https://opendevelopmentmekong.net/ngos-push-for-postponement-of-don-sahong-dam-on-mekong/#!/story=post-905010&loc=13.9529784,105.9582884,7
5 International Energy Agency (2014), available at https://www.iea.org/media/technologyplatform/workshops/southeastasiabioenergy2014/Laos.pdf

Lao PDR

Installed capacity:
3,200 MW
Market Model:
Model 2

Electricity market trend for the near future

- Future investment trends are likely to be predominantly hydropower. In August 2015 , the Lao Government approved 357 hydropower development projects with an estimated generating capacity of 26,147 MW (and approximately 115,118 million KW per hour).
- The Lao Government has entered into MoUs with various local and central governments to develop 45 more hydropower projects by 2019. This will result in 74 hydropower projects (with a total generating capacity of 10,000 MW per year and production capacity of approximately 50,000 KW per hour) by the year 2019.

Requirements for public bidding for greenfield projects

Lao government does not do public bidding. Applications are sent to the competent governmental agency, which will be considered on case-by-case basis.

Main issues for foreign investors

- Limited access to relevant official regulations and inconsistency of publications by different governmental agencies; no centralized system
- Limited precedents on enforcement of security interest
- Vagueness of regulations: Majority of the laws and regulations are drafted with sophisticated language, making regulatory framework unclear and difficult to interpret. This issue persists despite the establishment of the Centre for Regulatory Impact Assessment for Draft Legislation, whose main mission is to assess the impact of draft legislation on the private sector.

Typical hurdles for a power project developer

- Relocation of inhabitants from the project site (especially for hydropower projects, which require large areas of land)
- Opposition from environmentalists: Mekong River is environmentally important as it provides a range of wetland habitats and is one of the world's largest inland fisheries.
- Agreement with riparian countries: In 1995, Laos, Thailand, Cambodia and Vietnam established the Mekong River Commission (MRC) to assist with management and coordinated use of the Mekong's resources. An example is the Xayaboury project in which USD200 million worth of additional costs were incurred by the Lao Government and developers to comply with MRC recommendations.[6]

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

- EGAT International Co., Ltd (Thai)
- Electricity Generating Public Company Limited (EGCO) (Thai)
- Ch. Karnchang (Thai), through subsidiary CK Power Public Company Limited
- Ratchburi Electricity Co.(RATCH) (Thai)
- China International Water and Electric Corporation (China)
- Sinohydro (China)
- Vietnam-Lao Power Joint Stock Co. (VLPC) (Vietnam)

6 Department of Energy Policy and Planning, Ministry of Energy and Mines, Lao P.D.R., 2015

Malaysia

Installed capacity:
25,987 MW[1]
Market Model:
Model 2[2]

New changes in power regulations and policies

- Following the introduction of the 11th Malaysia Plan,[3] one of the key focus areas is pursuing green growth for sustainability and resilience. These include exploring new renewable energy (**RE**) resources (e.g., geothermal) and enhancing the capacity and capability of human capital in the RE sector.
- The Malaysian government is committed to rationalizing energy subsidies. The move toward market-based energy pricing will also continue to supplement these efforts.
- The revisions to the feed-in-tariff degression rates in relation to biomass, biogas and solar photovoltaic, which was proposed in 2014, also became effective as of January 2015. The purpose of the revision is to make RE more attractive to developers and reflect the lower technology cost.

Recent examples of major power transactions

- IPP Project 4A (1,000 to1,400 MW gas-fired plant) being directly awarded to the consortium of Tenaga Nasional Berhad (TNB) and SIPP Energy
- IPP Project 4B (2,000 MW gas-fired plant) being directly awarded to 1Malaysia Development Berhad (1MDB)
- The sale of 1MDB's stake in Project 3B to TNB. Project 3B was originally awarded to the consortium of 1MDB and Mitsui & Co. via an open tender process and marks the first involvement of a foreign investor in a Malaysian IPP project.

New opportunities for foreign investors

- The RE sector is steadily growing with new feed-in-tariff (FiT) capacity quotas being issued twice a year. However, there is a 49% equity restriction for foreign investors under the FiT regime.
- The government is studying the impact of using nuclear fuel as a fuel source. If viable, there will be a need for foreign companies with nuclear expertise and capabilities in the development of a nuclear plant.
- The Sarawak State Government is increasing its efforts to harness the state's abundant hydropower potential and plans to construct several dams.
- Green Technology Fund Scheme – A MYR3.5 billion fund to improve supply and utilization of green technology.
- The Malaysian government is thinking of introducing utility-scale quota auctions for solar projects as it seeks to develop up to 200 MW of solar farms annually beginning 2016.

Recent changes that impact power project development

There have not been many changes to the power sector but those which could notably impact power project development by foreign investors include:

- Foreign equity restrictions for large IPP projects appear to have been relaxed whereby foreign investors appear to be able to own up to 49% equity in the IPP company instead of 30% previously.
- The Green Technology Fund Scheme has been extended from 31 December 2015 to 31 December 2017.
- The government is committed to increase the development and usage of renewable energy and will release 100MW capacity a year for net metering energy. Net energy metering allows self-consumption of electricity generated by solar photovoltaic system users, while selling the excess energy to utility companies and this may interest foreign investors who have operations in Malaysia which rely on large usage of electricity (i.e. factory, plant) as a way to minimize costs.

1 As at end 2014, Peninsular Malaysia = 21, 060 MW, Sabah = 1, 404MW and Sarawak = 3, 523 MW.
2 Only the generation sector is open to IPPs.
3 The Malaysia Plan is an economic development plan for the country which is revised every five years.

Malaysia

Installed capacity:
25,987 MW
Market Model:
Model 2

Electricity market trend for the near future

The trend is shifting to renewable energy, particularly solar. As of January 2014, the installed capacity for renewable energy is approximately 163 MW with a total of over 500 MW of approved but not yet installed capacity under the feed-in-tariff system. The renewable energy target for Malaysia is 11% of the power mix or roughly 2,080 MW by the year 2020.

In addition to solar, the Malaysian government is considering including geothermal energy as renewable energy eligible for the feed-in-tariff system but this has yet to be finalized.

Requirements for public bidding for greenfield projects

The main requirement for public bidding is local participation. Recent IPP tenders have only allowed for less than 49% equity shareholding by foreign entities in the IPP.

Main issues for foreign investors

- Restrictions on land ownership for foreign entities, i.e., part foreign-owned IPPs need to use a lease.
- 49% restriction on foreign equity ownership for IPPs.
- Risk allocation, especially political force majeure risks and inflation protections, can be a challenge for some foreign expert credit agencies.
- Uncertainty in the way the Malaysian energy market regulator (i.e., Suruhanjaya Tenaga) awards tender bids, e.g., not always based on lowest tariff; awards via direct negotiation and not open tender has recently been seen.

Typical hurdles for a power project developer

- There is no meaningful change in law protection for power projects in Malaysia.
- There is no or very little room to negotiate on the Power Purchase Agreement with TNB.
- For coal-fired power plants, TNB is the offtaker as well as the coal supplier via its subsidiary. Higher cost of third-party coal supply is not guaranteed pass-through.
- Challenging (but likely still possible) to obtain financing from international banks or foreign export credit agencies due to decrease in protection for financiers as compared to other jurisdiction, i.e., no meaningful change in law protection, no direct agreements between financiers and construction and O&M companies. That said, obtaining financing locally, either through loans or the debt market, for power projects is relatively easy in Malaysia.

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

Key local players:

- TNB
- Malakoff
- 1MDB

Key foreign players:

- Mitsui & Co.
- SunEdison – solar project developer and components manufacturer
- First Solar – solar components manufacturer

Myanmar

Installed capacity:
4,800 MW
Market Model:
Model 2[1]

New changes in power regulations and policies

Since 2012 Myanmar has taken a number of steps to liberalize its economy and open itself as a destination for international investors. With a current electrification ratio of approximately 33%, Myanmar has an ambitious target of achieving 100% by 2030 and is developing its regulatory framework to help it achieve its goal.

- A new Electricity Law was enacted in 2014. It distinguishes between generation, transmission and distribution and allows participation in these activities subject to approvals. Authority to approve small-scale and mid-size projects not part of the national grid has been devolved to the states and regions. The implementing rules have not yet been promulgated.
- The new Electricity Law established the Electricity Regulatory Commission (ERC), whose role will include formulating policy, preparing tariffs, advising the Ministry, setting standards and performing inspections.
- Myanmar is receiving multi-lateral support with the ADB assisting in developing a framework for competitive bidding. The World Bank is funding a study on electricity tariffs and the International Finance Corporation has supported a recent IPP project which included the introduction of a modern PPA.

Recent examples of major power transactions

- Sembcorp's successful bid to operate and develop a 225 MW gas-fired IPP in Myingyan. The bids were called for by Myanmar Electric Power Enterprise and the process was supervised by the IFC.
- Sumitomo Corporation won a bid to construct a 50 MW gas-fired power plant in the newly established Thilawa Special Economic Zone.
- Mitsui & Co acquired a 44% stake in Navigat's Myanmar subsidiary operating a 50 MW gas-fired plant.
- Myanmar Electric Power Enterprise has commenced the bidding process for short-term 5-year PPAs for Yangon (200 MW) and Mingyan (75 MW).

New opportunities for foreign investors

Myanmar estimates that by 2030, electricity demand will be between 9,100 and 14,542 MW, requiring up to 23,600 MW of installed capacity (the relatively high reserve capacity is due to hydro, which depletes during the dry season, accounting for approximately 70% of electricity mix). There will be significant opportunities for investors to construct and operate new power plants, installing temporary power generation facilities, extending and improving the distribution network and providing off-grid or mini-grid solutions.

- With over 100 GW of hydro potential, there are significant opportunities to invest in hydro power plants.
- More gas pipelines are being installed around Yangon toward the special economic zones and industrial areas, helping address the difficulty of sourcing fuel.
- Additional temporary power generation facilities are needed before large power projects become operational.
- New special economic and industrial zones are being developed, requiring significant additional capacity.

Recent changes that impact power project development

- Environmental standards are becoming more stringent, requiring more thorough environmental impact assessments. There is strong opposition to coal and large-scale hydro, making it more difficult to get such projects off the ground.
- State and regional governments can license projects generating less than 30 MW and not connected to the national grid. The draft new investment law devolves some of its powers to the states and regions as well to approve such projects.
- The national election held on 8 November 2015 was completed peacefully, with the NLD (Aung San Su Kyi-led) Party procuring a simple majority in Parliament. A new president and Cabinet will not likely be in place until March 2016. It remains to be seen whether and what changes there will be in government policy after that.

1 Majority are state-owned producers but trends are leaning toward more IPPs. Distribution is conducted by state-owned Myanmar Electric Power Enterprise (MEPE). Under the draft Electricity Law, permission for large-scale power distribution may be granted by the Ministry of Electric Power, although it is not known when this draft will become law

Myanmar

Installed capacity:
4,800 MW
Market Model:
Model 2

Electricity market trend for the near future

Myanmar has a population of around 53 million, with an electrification ratio of around 33%. There is enormous potential for growth in the market. Current installed capacity is approximately 4,800 MW.

The new Electricity Law came into force in 2014, devolving more authority for small- and medium-scale power projects to the states with MEPE still being the main contact point for large-scale IPP projects. In addition, the Myanmar Special Economic Zones Law 2014 (SEZ Law) is intended to encourage major projects in certain areas of Myanmar, with a wide range of investment incentives, quite apart from those already available for other parts of Myanmar under the Foreign Investment Law 2012 (FIL). These may prove to be an added attraction.

Overall, the trend is likely to be inbound foreign investment in power generation, which has already begun. There are also additional foreign-funded investments in power distribution projects.

Requirements for public bidding for greenfield projects

No legal requirement for public bidding; however, bidding process is becoming more frequent, e.g., bidding for the Mingyan power station supported by the World Bank's recent tender process for short term gas power solutions won by Aggreko.

It is still possible to approach MEPE and negotiate projects on a bilateral basis.

Main issues for foreign investors

- US citizens may not deal with people or entities (or entities controlled by them) who are on the "SDN list" maintained by the US Treasury.
- Many foreign investors also consider the reputational impact of dealing with SDNs.
- Legal framework still uncertain and developing.
- Regulatory framework weak
- Less predictable
- Sovereign and general credit risks impact financing
- Financial system underdeveloped
- Difficulties in taking and enforcing security
- Standardized PPAs used
- Community resistance against hydro and coal projects

Typical hurdles for a power project developer

- Process of obtaining permits to generate electricity is somewhat opaque and may delay the process.
- Obtaining financing may be difficult.
- Obtaining Central Bank approval for loans can be time consuming.
- A major Environmental Impact Assessment Report approved by the Ministry of Environmental Conservation and Forestry is required, a process that may take 6 months to one year.
- Skilled labor is difficult to find.

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

In terms of state involvement, the main players are the Hydropower Generation Enterprise (HPGE) (hydro and coal); the MEPE (gas-fired projects and electricity grid); and the Yangon Electricity Supply Corporation (YESC) (distribution in Yangon region)

In terms of foreign investors, 41% of electricity is produced from foreign direct investment. Significant players include:

- Hydro power projects: Shweli River Projects – 3 projects: Shweli 1 (600 MW) built by Sinohydro Bureau 14 [Chinese]; Shweli 2 (460 MW) built by Sinohydro Bureau 15; and Shweli 3 (360 MW) built by Sino Hydro Bureau 14
- Yeywa Dam (790 MW) built by a Chinese consortium and funded by China Exim Bank.
- Gas-fired projects: Toyo-Thai (100 MW) (Thailand)
- APR Energy (100 MW) (USA)
- Asiatech Energy (230 MW) (Singapore)
- Thailand's Global Power Synergy PCL, Japan's Marubeni Corp and Myanmar's EDEN Group (400 MW) (Thailand, Japan and Myanmar)
- Sembcorp (225-500 MW) (Singapore)

SNAPSHOTS
OF KEY ASIA PACIFIC POWER MARKETS
2016

Philippines

Installed capacity:
Approximately 33,577 MW, of which 15,633 MW is dependable capacity (as of April 2015)
Market Model:
Model 3 transitioning to Model 4[1]

New changes in power regulations and policies

- The government is continuously working toward attracting local and foreign investors to venture into power projects.
- The Energy Regulatory Commission (**ERC**) has approved new capacity limits for generation companies so that no firm can own, operate or control more than 30% of the installed generation capacity of a grid or 25% in the case of the national installed generating capacity.[2]
- At the onset of the Aquino government, the energy sector outlined the following three (3) major pillars as its overall guidepost and direction, to wit: (a) ensure energy security; (b) achieve optimal energy pricing; and (c) develop a sustainable energy plan. The programs that will lead to the attainment of the pillars have been phased into short- (2010-2011), medium-(2011-2013) and long-term (2013-2016) timelines.
- The Department of Energy (**DOE**) has aggressively introduced and promoted the use of biofuels, mainly sugarcane and cassava-based ethanol and biodiesel for transport. The government has also adopted the use of liquefied petroleum gas (**LPG**) and compressed natural gas (**CNG**) to diversify the country's fuel resources for transport and decrease vehicular emissions.
- On 3 June 2015, DOE launched the Energy Virtual One Shared System (**EVOSS**), which aims to facilitate and streamline the process of RE applications side by side the increase in the efficiency of all concerned agencies while fostering a strong private-public sector partnerships. The EVOSS is a joint undertaking of the DOE with the United States Agency for International Development (**USAID**) Building Low Emission Alternatives to Develop Economic Resilience and Sustainability (**B-LEADERS**) Project.
- In September 2015, the DOE lifted the suspension of Semirara Mining and Power Corporation's (**SMPC**) operations for its Coal Operating Contract (**COC**) No. 5 in Semirara Island, Caluya, Antique.[3]
- According to the Board of Investments, the Philippines is expected to close 2015 with fewer approved domestic and foreign investments than last year due to lesser applications for energy-related projects and stricter rules for the 2014-2016 Investments Priorities Plan (**IPP**).

Recent examples of major power transactions

- A certificate of commerciality was issued on 28 December 2014 for the 50 MW Biliran Geothermal Project, which will be gradually installed starting September 2016 up to November 2018. Once completed, this will augment the power supply in the Mindanao region.
- In March 2015, Solar Philippines (the country's largest solar provider) began construction of the largest solar farm in Luzon, 50 MW project in Calatagan, Batangas. Solar Philippines will develop, co-finance, design and construct the project, the first time that any local company has taken an integrated approach to solar farm development.
- As of August 2015, the DOE granted 49 certificates of endorsement for a number of energy power plants in favor of Energy World Corporation, Alsons Energy Development Corporation and First NatGas Power Corp., among others. Hydroelectric plants comprise about 50% of the new grants while the rest are solar, diesel, natural gas, wind and coal-fired power generating facilities.[4]
- Aboitiz Power Corp. (AboitizPower) and SunEdison awarded the Engineering, Procurement and Construction (**EPC**) contract for their first joint solar power project in Negros Occidental. The EPC contractor, Nari Group Corporation, will undertake the construction of the PHP3.5 billion, 59 MW Negros Solar Energy Project. The Negros Solar Energy Project is set for commercial operations in the first quarter of 2016 and will be one of the largest solar power projects in the Philippines.

New opportunities for foreign investors

- The potential for renewable energy is high: 2,000 MW for biomass; 3,400 MW for hydropower, of which 1,700 MW is small hydro; 1,070 MW for geothermal; and 500 MW for wind, as well as large but unquantified potential for solar. Opportunities also exist in the wind and biogas power industry.
- Capital expenditure for solar is expected to decrease substantially in the future.
- Opportunities also exist in greenfield generation projects, joint venture with proponents of indicative projects, retail electricity supply, and privatization of NPC plants and NPC-Independent Power Producer contracts.
- The Department of Energy has also recently opened the 5th Philippine Energy Contracting Round (**PECR**) for exploration and development of indigenous oil and gas, as well as coal.

Recent changes that impact power project development

- The government expects several new power facilities to open in the next five years. In Luzon, a total of 2,300 MW will be added to the grid from June 2015 until September 2019. The Visayas grid is expected to be augmented by about 442 MW, while Mindanao will get an additional 2,000 MW. According to the Department of Energy, the current installed capacity in the country of about 16,250 MW is expected to go up to 25,800 MW (an increase of about 60% by 2030).[5]
- At present, coal power plants comprise over 35% or 5,200 MW of total available capacity in the Philippines. Growth in coal is driven by relatively lower electricity price and stable electricity supply generated by coal, being a base load power plant.
- Renewable energy resources such as wind and solar carry higher break-even prices due to the power plant utilization in relation to the resource but are expected to grow with government support such as the feed-in-tariff systems (**FIT**), which allow renewable energy developers to be paid at premium from market electricity rates, for energy generated by power sources such as wind, solar, run-of-river hydro and biomass plants. Coal is expected to continue driving the growth in total installed capacity in the Philippines and is followed by renewable energy, gas plants and oil.

1 Prior to Republic Act 9136 (Electric Power Industry Reform Act or EPIRA), generation and transmission was under government monopoly (i.e., the National Power Corporation (NPC)). Now (a) generation is privatized with NPC-owned assets in the process of being privatized; (b) transmission assets are publicly owned but operated and maintained by private corporation; and (c) distribution companies and retail electricity suppliers are privately owned and competitive.
2 The ERC has updated the limit to 3,917.32 MW from 3,612.42 MW as of March last year for the Luzon grid; 709.10 MW from 548.18 MW for the Visayas grid; and to 649.11 MW from 589.09 MW for the Mindanao grid. For Luzon, Visayas and Mindanao, the limits represent 30% of the total installed capacity in the grids, which stands at 13,057.75 MW, 2,363.69 MW and 2,163.71 MW, respectively
3 Prior to the suspension, the Corporation was asked to implement safety precautions, procedures, and plans in its coal mining operations following an incident in June that left several dead.
4 List of Generation Companies Issued with Certificate of Endorsement (CoE) by DOE, Department of Energy, last update August 2015.
5 Philippine Energy Plan 2012-2030, Department of Energy

Philippines

Installed capacity:
33,577 MW, of which 15,633 MW is dependable capacity (as of 31 December 2014)
Market Model:
Model 3 transitioning to Model 4

Electricity market trend for the near future

Investments in the near future are mostly in coal and natural gas. The Philippine government, however, is also encouraging investments in renewables and is targeting an additional installed capacity of about 15,000 MW from renewable energy resources by 2030.[6]

In 2014, a total of 220 Renewable Energy (RE) Service Contracts were awarded with 3,184.1 MW of potential capacity and 5.1 MW installed capacity.

Requirements for public bidding for greenfield projects

Generally none, as generation under EPIRA has been privatized.

Exceptions:

- Privatization of remaining NPC power plants and NPC-Independent Power Producer contracts
- Service contracts for oil and coal exploration and development under the PECR is done through public bidding or through negotiations

Renewable energy contracts are also awarded either through an open and competitive selection process or direct negotiation.

Main issues for foreign investors

- Limitations in allowable foreign equity in some areas (e.g., exploration, development and utilization of renewable energy resources; obtaining water permits; land ownership)
- Bureaucratic delay and lengthy administrative procedures (e.g., various permits/licenses from both national government and local government agencies are required)
- Uncertainty in obtaining necessary permits (e.g., obtaining environmental compliance certificates)
- Possible changes in regulatory environment and incentive schemes (e.g., "first come, first serve" rule under the feed-in-tariff system)

Typical hurdles for a power project developer

- Bureaucratic delay and lengthy administrative procedures (e.g., various permits/licenses from both national government and local government agencies are required)
- Uncertainty in obtaining necessary permits (e.g., obtaining environmental compliance certificates)
- Possible changes in regulatory environment and incentive schemes (e.g., "first come, first serve" rule under the feed-in-tariff system)
- Independent power producers may find it difficult to secure power purchase agreements from credit-worthy offtakers (i.e., electric cooperatives)
- High cost and mismatch in demand and supply makes country reliant on fossil fuels despite setting a goal to have half its energy needs met by renewables
- The Philippines has some of the most expensive electricity in Southeast Asia, averaging USD0.18 per kilowatt hour in 2009 because (i) archipelagic geography makes electricity costly in some areas; (ii) generation, transmission and distribution systems are inefficient; and (iii) investment in the sector is low, coupled with the high cost of investments made during the country's power crisis in the 1990s.

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

Key players

Generation

- NPC (for missionary areas)
- Private generation companies

Major players in the generation sector:

- San Miguel Energy
- Aboitiz Power Corp.
- First Gas/First Gen
- AES Transpower
- Energy Development Corp.
- K-Water
- KEPCO/Salcon Philippines
- Solar Philippines

Transmission

- National Transmission Corporation (Transco, owner of transmission assets)
- National Grid Corporation of the Philippines (a consortium between Philippine and Chinese corporations that operates and maintains Transco's transmission assets)

Distribution

- Manila Electric Company as the largest electric distribution utility in the Philippines
- other private distribution utilities and electric cooperatives

6 Energy Sector Accomplishment Report 2014, Department of Energy Annual Report, last update April 2015.

Taiwan

Installed capacity:
41,181 MW
Market Model:
Model 2[1]

New changes in power regulations and policies

The Executive Yuan of Taiwan passed the draft amendment to the Electricity Act (the "Draft Amendment") on 16 July 2015. This Draft Amendment is a landmark of Taiwan government's effort to liberalize the power market, whose market framework and power company management system has remained unchanged for more than 50 years. Among the comprehensive amendment articles, the most noticeable changes are the following:

- To end Taipower's monopoly in the power market, the Draft Amendment mandatorily split Taipower's power generation section and transmission section to be owned by a generation company and a grid company, respectively. The two are not allowed to be shareholders of one another.
- The Draft Amendment establishes a sole grid company that will be state-owned and be responsible for adequate supply of electricity nationwide.
- The Draft Amendment removes restrictions on establishments of power generation companies and power retailers, and further allows power generation companies to sell electricity directly to certain end users without price control by the government.
- The Draft Amendment establishes an independent power dispatch center responsible for general planning and implementation of power supply allocation for equal and fair access to the power grid.

The enactment of the Draft Amendment has yet to have a clear timeline because the Executive Yuan will still submit this bill to the Legislative Yuan for review. Furthermore, the general election for the next president and new legislators by end of 2015 may create an even more uncertainty to a bill, like the Draft Amendment, which involves major policy changes.

Recent examples of major power transactions

- In April 2015, Tokyo Electric Power (TEPCO) and Chubu Electric Power announced the establishment of a new joint venture company, JERA. JERA will become the owner of the major portion of the two utilities' overseas power assets, including three Taiwanese IPPs through share acquisition of overseas holding companies.
- Several global players are interested in Taiwan's power market and looking for development opportunities, especially in renewable energy due to the feed-in tariff scheme adopted by relevant regulations.

New opportunities for foreign investors

- Demands for more renewable energy opens up new opportunities for foreign investors
  - Following the Fukushima incident, there has been widespread public opposition to nuclear power, with demands that government remove nuclear power plants entirely.
  - Taiwan has three nuclear power plants providing one-quarter of baseload power. All 6 nuclear reactors will be decommissioned in 3 to 10 years. The fourth one (Lungmen) has been built, but operation and/or completion of the units has been suspended due to safety and environmental concerns.
  - There might be a considerable shortage of power supply opened up for the market in the near future especially for renewable energy as it is the most promoted energy form by the Taiwan government.
- Currently, Taiwan suffers from a very low Operating Reserve. Since the second quarter of 2015, the Percent Operating Reserve has been constantly below 10 percent and even often below 6 percent. Except for Taipower's relevant on-going projects, there is no clear timeline on when the competent authority will announce the fifth round of IPP solicitation to increase power supply capacity.
- Investment returns for foreign investors have been good and there is less interest in looking to divest unless they have a specific need to divest overseas interests. However, we note that many IPPs are looking toward expansion.

Recent changes that impact power project development

Competition law issues between TaiPower and all IPPs may cause negative impact on Taiwan power market

- Although the executed PPA has been honored and respected by TaiPower and the IPP in general, in 2008 and 2009, Taipower requested that all IPPs in Taiwan amend signed PPAs to reduce fixed discount rate of the capacity charge formula stated in their respective PPAs to reflect much lower interest rate of the market. None of the IPPs agreed to do so.
- In March 2013, Taiwan Fair Trade Commission alleged that all Taiwan IPPs acted "in concert" to reject such request, in violation of Taiwan Fair Trade Act, and imposed a penalty on each IPP. The IPPs brought this case to court and now the case is pending before the Taipei High Administrative Court.
- The above case may be deemed as a sign questioning the certainty during PPA performance, which creates a risk for foreign investment.

1 (a) Generation open to IPPs but state-owned Taipower is still the major generator; (b) transmission and distribution assets owned by Taipower; and (c) Retail monopolized by Taipower.

Taiwan

Installed capacity:
41,181 MW
Market Model:
Model 2

Electricity market trend for the near future

Renewable energy—wind and solar, in particular—is the most promoted form of energy, although it still has a relatively small share of the overall installed capacity.

The Ministry of Economic Affairs proposed in August 2014 that construction of the 4th Nuclear Power Plan be halted for three years until a national referendum could be held, but no agreement reached on timing and terms of referendum. However, there will be a demand for a new generator. Not clear at this point if IPPs will have a role in this development.

Requirements for public bidding for greenfield projects

Taipower purchases electricity, including clean energy. Currently and until the promotional targets set by relevant regulations are met, Taipower will purchase power generated by qualified clean energy suppliers as approved in due courses

Main issues for foreign investors

- Access to the Taiwan market is relatively limited, as it is primarily monopolized by Taipower
- Foreign investment does not present a problem provided experience and commitment to Taiwanese authorities are demonstrated

Typical hurdles for a power project developer

- Uncertainty of securing PPA: The developer of a new power generation project must expend significant cost for the bid preparation, without any guarantee of a favorable outcome.
- Uncertainty of securing land use rights. For projects involving state-owned land, mandatory maximum lease term is 20 years, which is extendable but without any guarantee

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

- Taipower, the monopoly transmitter, distributor and retailer
- IPPs, some with Japanese investors
- Japanese companies playing significant roles in equipment supply, construction and maintenance works; U.S. and European companies also join local market for certain projects

Thailand

Installed capacity:
40,000 MW to be increased to 70,000 MW in 2036
Market Model:
Model 2[1]

New changes in power regulations and policies

- Launch of the Thailand Integrated Energy Blueprint, a new long-term master plan consolidating five key plans as pillars for national energy development: (1) Power Development Plan 2015-2036 (**PDP 2015**); (2) Energy Efficiency Plan 2015-2036 (**EEP 2015**); (3) Alternative Energy Development Plan 2015-2036 (**AEDP 2015**); (4) a new oil roadmap setting out targeted subsidies, removal of existing subsidy on fossil fuels and promotion of biofuels as fuel for transportation; and (5) a new gas roadmap to curb gas demand and establish the structure for LNG facilities.
- The PDP 2015 was approved by the Energy Regulatory Commission of Thailand (**ERC**) and the National Energy Policy Council (**NEPC**) in May 2015, and was subsequently acknowledged by the Cabinet in June 2015. Policies implemented under the new PDP 2015 are as follows:
  - **Fuel mix**

    The PDP 2015's fuel diversification policy increased total installed capacity of clean coal-fired thermal power plants from 20% to 25%, increased purchase of imported electricity from neighboring countries from 15% to 20%, and decreased installed capacity of gas-fired thermal power plants from 64% to 40% in 2036.
  - **Gas-fired power plants**

    Due to the imminent depletion of available natural gas in the Gulf of Thailand, the target installed capacity for gas-fired projects in 2036 has been reduced from 65% to 40%, to be in line with the government's policy to decrease dependency on natural gas.

    Thailand's newest IPP project, the 930 MW Khanom Power Plant (Unit 4) to be owned and operated by Khanom Electricity Generating Company Limited (**KEGCO**), a subsidiary of EGCO, is set to achieve commercial operation in June 2016.
  - **Coal-fired power plants**

    Under the PDP 2015, the installed capacity for clean coal projects is expected to increase to 25% of the target installed capacity. Although future investment may increase, the development may still be in doubt due to the continuing protests from local community and potential environment issues.
  - **Renewables**

    Under the PDP 2015 and according to the new AEDP 2015, investment in renewable energy will be increased to 20% of the target installed capacity. Biomass and waste-to-energy projects will be driven.
  - **Nuclear power**

    According to the PDP 2015, nuclear power projects will be delayed by at least another 20 years due to the Fukushima incident and protests from the local community where the power plant was planned to be located.
  - **Purchase of electricity from neighbouring countries**

    The NEPC is looking to purchase electricity from neighbouring countries in an amount not exceeding 20% of the target installed capacity. Thailand has already entered into a number of MOUs with neighbouring countries for the purchase of imported power. Recently, it has been announced that the Energy Policy and Planning Office (**EPPO**) of Thailand's Ministry of Energy is considering negotiations with the Cambodian government to purchase power from a 2,000 MW coal-fired power plant.
- Regulations on solar PV rooftop projects were amended to liberalize business. Solar PV rooftop projects generating less than 1 MW capacity will not be required to obtain electricity generating licenses or factory operating licenses.
- The ERC has issued regulations to replace the previously existing Adder on purchase price of electricity generated by renewable power projects with a new Feed-In Tariff (FiT) for VSPPs generating less than 10 MW, which will be granted for a period of 20 years (except for landfilled gas-fired projects which will be awarded for 10 years). Currently, new FiT rules only apply to those projects which have duly executed PPAs with state power utilities (i.e., EGAT, MEA or PEA) but have not dispatched electricity to the grid, as well as for projects whose applications were accepted earlier in 2014 under the former Adder scheme (regardless of whether the relevant PPA has been signed). Projects that have applied for a PPA but have not yet been accepted are also eligible to receive the FiT, though these projects will be considered and selected under a new competitive public bidding process.

Recent examples of major power transactions

- In June 2015, EGAT sponsored the issuance and selling of EGAT Infrastructure Fund (EGATIF), which is the first state enterprise infrastructure fund to be established and listed on the Stock Exchange of Thailand. EGATIF will invest in the rights to the revenues generated by EGAT's power plants.
- Gulf Energy Development: Approximately USD2 billion financing of 12 SPP gas-fired power plant projects (with total capacity of 1,470 MW) by 8 local and international financial institutions.
- B.Grimm Power Group: (i) THB17 billion financing of 3 SPP gas-fired power plants located in Rayong's Amata City Industrial Estate (with a total capacity of 366 MW) by 2 local banks and 2 international banks, and (ii) THB7.5 billion financing of 13 solar farms in various provinces (with a total capacity of 114 MW) by 3 local banks.

New opportunities for foreign investors

- In September 2015, the ERC issued an invitation to bid for solar power projects with a combined capacity of 800 MW to be developed by state agencies and certain cooperatives. Interested state agencies/cooperatives need to partner with private investors with solar power experience. Each private investor can participate in more than one project but cannot sponsor more than an aggregate capacity of 50 MW, while each state agency/cooperative is not allowed to develop more than 5 MW capacity. Successful bids will be chosen via a competitive bidding process, which has been divided into two phases (600 MW targeted for the first phase and 200 MW targeted for the second phase). Successful projects will be awarded VSPP PPAs with a fixed purchase price (THB5.66 per kilowatt hour) under the FiT arrangement for a period of 25 years.
  - First phase: Proposal submissions for the first phase closed in November 2015, after which all qualified proposals will be placed in a single pool from which final selections will be made by lucky draw on 15 December 2015. Selected bids will be required to commence the sale and dispatch of electricity to the grid by 30 September 2016.
  - Second phase: No date has yet been announced for the opening of the second phase of bidding.
- Small private players who would like to develop solar PV rooftop projects can more easily obtain required approvals and sell electricity to PEA, MEA, or private users.
- Third Party Access (**TPA**) Regime has been put in place. PTT and PTT LNG have announced their TPA Codes regarding third-party access to their onshore pipeline and Liquefied Natural Gas (**LNG**) terminal.
- The Thai government is presently considering repealing the law on the Industrial Estate Authority of Thailand (**IEAT**) and replacing it with a law on Special Economic Zones (**SEZ**). Although the draft Bill on SEZ contains a grandfather clause allowing operators under the current IEAT law to maintain their existing rights and privileges, it also provides for investors under the new SEZ scheme to receive various benefits (e.g., permission for land ownership by foreigners, permission to bring in foreign experts, executives and specialists, exemption or reduction of taxes and duties, etc.).

Recent changes that impact power project development

- Potential changes in zoning laws (expected to be finalized by end of 2015) and related regulations may affect power plant location.
- Large-scale power projects (THB 1 billion plus) to be developed in conjunction with the public sector (e.g., power plants jointly invested by EGAT or located on land leased from a state agency) will be deemed a Public-Private Partnership (**PPP**) project for the purposes of the new Private Investment in State Undertakings Act 2013 (**PPP Act**) and thereby subject to the requirements applicable to PPP projects as stipulated thereunder, including, amongst others, submission of prospective PPP projects to the PPP Policy Committee, chaired by the Prime Minister, for consideration and approval. In September 2015, the Cabinet approved a draft of the ministerial regulations which, when issued, will amend the PPP Act to increase the minimum value of PPP projects from THB 1 billion to THB 5 billion. The Cabinet also approved the implementation of a PPP Fast Track scheme for greenlighting selected top-priority PPP projects.

1 Electricity Generating Authority of Thailand (EGAT - state-owned enterprise) and IPPs are the main generators of the country. EGAT transmits and distributes electricity generated by itself and IPPs to Metropolitan Electricity Authority (MEA - state-owned enterprise) and Provincial Electricity Authority (PEA - state-owned enterprise) to be further transmitted and distributed to users throughout the country.

Thailand

Installed capacity:
40,000 MW to be increased to 70,000 MW in 2036
Market Model:
Model 2

Electricity market trend for the near future

- With Thailand's decreasing dependency on natural gas, investment trend in the near future is likely to be concentrated in alternative/ renewables, in line with global trends. However, clean coal is still an agenda for diversification, and to enhance national energy security, electricity imports from neighboring countries are expected to rise.
- Among alternative/ renewable energy sources, solar continues to be a top choice for domestic and foreign investors alike; however, as the PDP 2015 focuses on driving biomass and waste-to-energy projects in particular, a rise in the number of these alternative energy projects can also be expected. In fact, the PPP Policy Committee recently greenlighted the development of 2 waste-to-energy power plant PPP projects (with an estimated total investment value of USD176 million) on an expedited basis.
- The general trend among major Thai players is an increasing shift toward outbound investment in neighboring countries and actively establishing a firm presence in offshore markets within the region.

Requirements for public bidding for greenfield projects

- **IPP projects:** The ERC will announce invitations to participate in IPP Solicitation rounds in accordance with targeted installed capacity requirements and solicit requests for proposals (RFPs) from investors.
- **SPP projects:** There is no public bidding process. Investors are required to lodge an offer to sell electricity to EGAT (or PEA or MEA, depending on the size and location of the project) to get approval to enter into the PPA with the relevant state offtaker (i.e., EGAT, PEA or MEA). The offer will be considered in accordance with the public announcement of EGAT, PEA or MEA (as the case may be) to purchase electricity from SPPs which is issued from time to time in accordance with the direction of the PDP 2015.
- **VSPP projects:** A new competitive bidding system has recently been adopted instead of the previously existing "first-come, first-served" basis.

Main issues for foreign investors

No critical issues to be concerned:

- The development of power plants and the sale electricity to EGAT, PEA, MEA or to private/ industrial users is not restricted by the Thai Foreign Business Act (**FBA**). The FBA will apply, among others, to activities that are considered to be service business.
- Foreign investors can own freehold land in Thailand (subject to conditions) for use in connection with their power projects upon the projects receiving investment promotion from the Board of Investment of Thailand (**BOI**), which is normally granted.

Typical hurdles for a power project developer

- New zoning laws: additional restricted area for construction of industrial factories (including power plants).
- Delay in issuance of factory operating licenses.
- Acceptance of arbitration clauses in PPAs with EGAT, PEA or MEA is subject to Cabinet approval on a case-by-case basis. Therefore, EGAT, PEA and MEA would not agree to accept the inclusion of any arbitration clauses in its PPA. In accordance with ERC regulations, the current standard form of PPAs provide for any disputes under the PPA to be referred to experts appointed by ERC for consideration, as opposed to an arbitration tribunal.

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

Local

- Electricity Generating Public Company Limited (EGCO)
- Ratchaburi Electricity Company Limited (RATCH)
- Global Power Synergy Company Limited (a subsidiary of PTT Group)
- B. Grimm Power Group

Key foreign investors include:

- J-POWER Group (through Gulf Electric Public Company Limited)
- GDF Suez (through Glow Energy Public Company Limited by holding 69% equity stake therein)

Vietnam

Installed capacity:
35,000 MW
Market Model:
Model 2[1]

New changes in power regulations and policies

- A number of major new laws impacting the business environment in general have been adopted: Investment Law, Enterprise Law, Construction Law, Tendering Law, new regulations on public-private partnership **(PPP)** investment, etc.
- The Ministry of Industry and Trade (**MOIT**) approved a detailed design of the competitive electricity wholesale market for Vietnam in August 2015.
- Following the issuance of development support mechanisms for wind power projects in June 2011, biomass power projects in March 2014, and projects using solid waste in May 2014, Vietnam is reviewing and issuing a development support mechanism for solar power projects in 2015.
- Amendments to current Power Master Plan VII to reflect developed energy strategy following changes in the power market since 2011.
- In September 2015, MOIT issued new regulations on procedures for investment in build-operate-transfer (**BOT**) thermal power projects, contributing to completion of new PPP legal framework in Vietnam.

Recent examples of major power transactions

- Major BOT and IPP thermal power projects in progress, including Duyen Hai 2, Van Phong 1, Quynh Lap 1, Vinh Tan 1, Nghi Son 2, Vung Ang 2, Vinh Tan 3, Song Hau 2, Long Phu 2 and Nam Dinh 1.
- A number of wind power projects have been implemented: (1) HBRE Wind Power Solution Co. invested in a 120 MW wind farm at a value of VND6 trillion (approximately USD281 million) in Dak Lak Province in the Central Highlands; (2) Cong Ly Trade and Services Company Ltd., a Vietnamese investor, implements Bac Lieu wind power project aiming at a capacity (after Phase II) of 120 MW. For solar and biomass, many projects are currently being done on an ad hoc basis since regulatory and fiscal frameworks are only just emerging.

New opportunities for foreign investors

- BOT thermal power remains a good option to the extent that under the PPP framework, it is generally easier to negotiate more favorable electricity tariffs and obtain more government guarantees. Moreover, investors can receive more fiscal and financial incentives.
- For renewable energy, there is generally a high potential for wind and solar power projects in Vietnam, as the country lies in the path of strong and reliable wind streams. The Master Plan gives a long-term policy to prioritize and incrementally raise the proportion of electricity produced from renewable energy sources (wind energy, solar energy, biomass energy, etc.) and targeted to reach 4.5% of total power capacity by 2020. This includes targets for wind energy to reach 1,000 MW, biomass to reach 500MW.
- From early 2015, an equitization plan for EVN's power-generating entities (GENCOs) was approved for GENCO 3 in 2016 with 6 power plants and a total capacity of 4,564 MW, followed by the equitization of GENCO 1 and GENCO 2. This equitization process creates new opportunities for investors and is crucial for the establishment of an independent wholesale market.

Recent changes that impact power project development

- A key objective of Vietnam's electricity market reforms, with the equitization of EVN's power generating entities (GENCOs), is to encourage new investment. More power project developments and investments are expected.
- For BOT thermal power projects, new rules place strict time limits for investors to follow during implementation. This addresses the status of delays in the implementation of these projects.
- Vietnam's current power supply, through 2015, is viewed as adequate by the business community; however, many firms are expressing concern over Vietnam's future power supply outlook. Majority of firms surveyed, especially those with foreign direct investment, are more concerned with securing uninterrupted power supply than they are with moderate increases in electricity costs. With many firms willing to absorb higher costs, this presents an opportune moment for renewable power to lead private sector investment in renewable energy and play an increasing role in securing Vietnam's future power supply.
- A key concern is dealing with tension between Master Plan VII's continued reliance on coal power and support for renewable energy.

1 (a) Generation: competitive market; (b) transmission is state-owned; (c) wholesale: aim to establish competitive market (experimental from 2015-2016, complete by 2017-2021); and (d) retail: aim to establish competitive market (experimental from 2021-2023, complete after 2023).

Vietnam

Installed capacity:
35,000 MW
Market Model:
Model 2

Electricity market trend for the near future

- Vietnam will experience high electricity demand in the near future. The total capacity of power plants is targeted to be approximately 75,000 MW by 2020 and 146,800 MW by 2030.
- Renewable energy: prioritizing and incrementally raising the proportion of electricity produced from renewable energy sources (wind energy, solar energy, biomass energy, etc.).
- Hydropower: also prioritizing development of hydropower projects for multiple purposes (e.g., flood control, water supply and electricity production).
- Thermo-power: develop a reasonable number of thermo-power plants suitable to the supply capacity and distribution of fuel sources.

Requirements for public bidding for greenfield projects

Public bidding requirement is currently only applied to investment projects under the form of Public-Private Partnership (**PPP**). Accordingly, the government has released lists of PPP projects called for investment. For other greenfield investment projects, there are no reliable and specific legal guidelines on public bidding. As such, for these projects, there are generally no further requirements compared to projects in other sectors.

Main issues for foreign investors

- Policy and regulatory mechanisms need to be further developed to enable renewable energy project development.
- Issues relating to application processes, electricity tariffs, gaps between standardized power purchase agreements (**PPA**s) and bankable PPAs and associated government approvals are not clear and definite enough to allow investors to determine whether renewable energy prospects can meet local regulations, as well as minimize uncertainty and exercise of discretion in regulatory decisions.
- Substantial investment capital and technology costs for renewable energy projects are required, but the price of power sold to EVN is rather low to provide investors any profit, or too little to guarantee for bank loans.
- With EVN's financial situation, foreign investors and banks are unlikely to accept EVN's plan to purchase power from wind power plants without government guarantees.

Typical hurdles for a power project developer

- Financial constraints
- Site clearance and compensation are complicated procedures
- Lack of transparency in governmental decisions

MAIN PLAYERS, INCLUDING ACTIVE FOREIGN INVESTORS

Key local players:

- Hydropower: generators (e.g., Vietnam Electricity Corporation (EVN), a state-owned enterprise and its subsidiaries, Song Da Corporation)
- Thermal power generators (e.g., EVN; PetroVietnam (PVN), a state-owned enterprise, for oil and gas); Vinacomin (a state-owned enterprise, for coal-fired power); An Khanh Thermo-power JSC)
- Renewable energy project developers (e.g., EVN; Cong Ly Trade and Services Company Ltd.; Vietnam Renewable Energy Joint Stock Company; Thuan Binh Wind Power Stock Company; Phu Cuong Group; Thien Tan Group; REC Corp)

Key foreign investors:

- Thermal power generators: Formosa; AES; Malaysia-based JAKS Resources Berhad; China Southern Power Grid Company (CSG); Sumitomo; Janakuasa; Tai Kwang; Samsung; EGATi; Taka Power
- Renewable energy: GE, Vetas, WPD Energy Vietnam, HBRE Wind Power Solution, Greta Energy Inc., EAB Vietwindpower, Enfinity Asia Pacific Limited, Aerogie. plus Solution AG, Terra Wood, Belectric Solar, Global Shere, Doosan, CS Wind Tower, VINA HALLA Heavy Industries

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