Bird & Bird

Malaysia-to-Singapore Electricity Imports

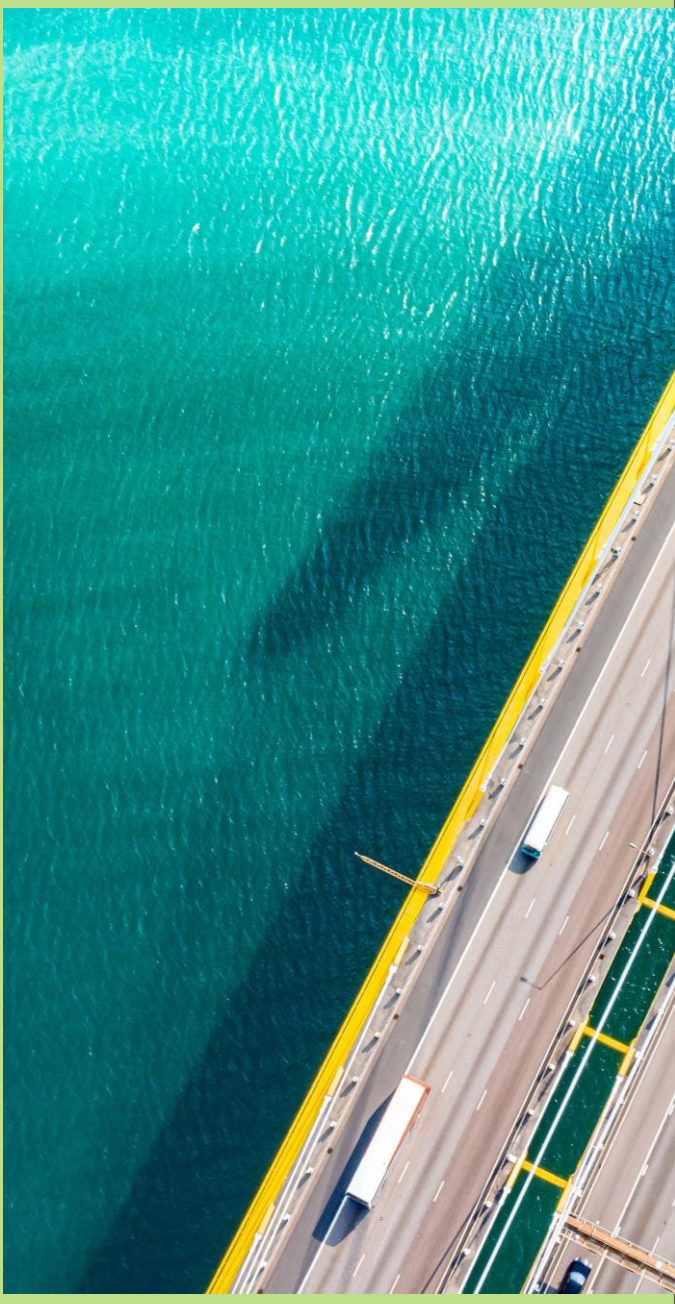
June 2024

Jointly Produced with:

TAY & PARTNERS

PSC

Specialist Consultants
to the Electricity Industry



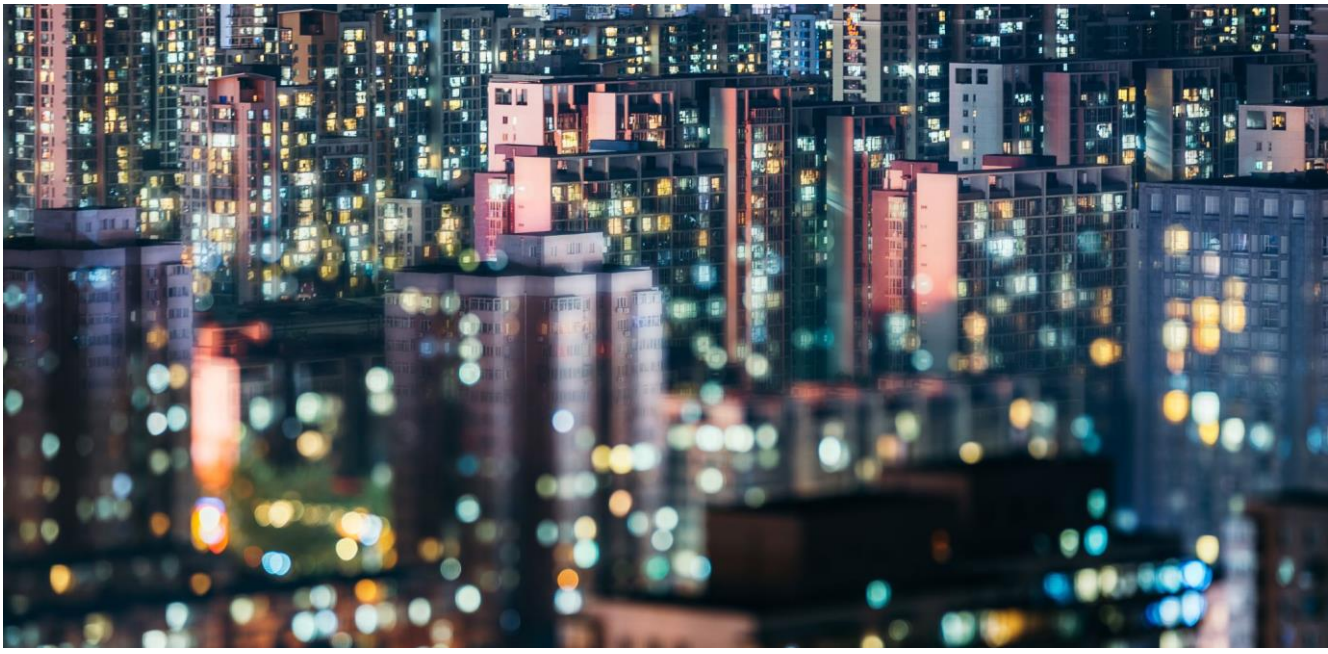
ASEAN Power Grid

The ASEAN Power Grid (APG) is a key strategic regional infrastructure project aiming to accelerate regional connectivity and market integration in the region. In November 2023, the ASEAN Power Grid Advancement Program (APG-AP) led by the ASEAN Centre for Energy (ACE) in partnership with the Clean, Affordable and Secure Energy for Southeast Asia (CASE) project and Southeast Asia Energy Transition Partnership (ETP) formally kicked off to accelerate the progress of the APG.

Under the APG-AP, Southeast Asia's key players will collaborate on resources and efforts to advance the APG from its planning stages to implementation. The APG-AP intends to study the Lao PDR-Thailand-Malaysia-Singapore Power Interconnection Project (LTMS-PIP) to glean insights for other upcoming multilateral power trading opportunities in the region.

Singapore clearly endorses the objectives of the APG, which will drive greater integration of renewable energies in ASEAN and provide member states with accessible, affordable, and resilient electricity. As the cross-border electricity trade increased, Singapore is actively formalising initiatives to enhance cross-border electricity trade and cooperation based on renewable energy sources, such as solar, wind, and hydropower. Singapore plans to import up to 4 gigawatts (GW) of low-carbon electricity by 2035. This is projected to constitute approximately 30% of Singapore's total electricity supply in 2035. Power trading will benefit exporting countries when they obtain investments to harness renewable energy and energy-efficient technologies to trade the surplus electricity. ASEAN member states have unanimously recognised that multilateral trading is critical for better resource sharing between ASEAN countries.

In this article, we discuss how Singapore and Malaysia's power import policies and regulatory frameworks can further facilitate power trading projects between the two countries.



Singapore Electricity Imports Framework and RFP

Singapore Policies

The import of electricity is generally governed by the overarching Electricity Act 2001, which mandates that an electricity licence has to be granted before engaging in any electricity import activities.

The Energy Market Authority (EMA) has published a detailed *Guide to Electricity Imports* to provide regulatory clarity on how electricity imports will be treated in Singapore's electricity market and how electricity imports may enter Singapore.

Singapore power import RFP

The Singapore Energy Market Authority (EMA) issued a Request for Proposals (RFP) in July 2022 to invite bidders to submit their proposals for importing electricity into Singapore. The RFP garnered a good number of proposals despite the obvious challenges (technical, legal, political and operational) and EMA has todate granted Conditional Approvals to the following entities:

- Keppel Energy Pte Ltd to import 1 GW of electricity from **Cambodia**
- 5 entities (as listed below) to import 2 GW of electricity from **Indonesia**
    - Pacific Medco Solar Pte Ltd (formed by PacificLight Renewables Pte. Ltd., Medco Power Global Pte. Ltd. and Gallant Venture Ltd.) for an import capacity of 0.6 GW
    - Adaro Solar International Pte. Ltd. (formed by PT Adaro Clean Energy Indonesia) for an import capacity of 0.4 GW
    - EDP Renewables APAC for an import capacity of 0.4 GW
    - Vanda RE Pte. Ltd. (formed by Gurin Energy Pte. Ltd. and Gentari International Renewables Pte. Ltd.) for an import capacity of 0.3 GW
    - Keppel Energy Pte. Ltd. for an import capacity of 0.3 GW
- Sembcorp Utilities Pte Ltd to import 1.2 GW of electricity from **Vietnam**

The Conditional Approvals granted by EMA were built on multiple Memoranda of Understanding (MOU) for energy cooperation between the various partner countries which served as the cornerstone for power import project for Singapore.

Progress in electricity imports into Singapore

The proposed project for electricity imports from Cambodia aims to harness solar energy, hydropower and wind power which will be backed by battery energy storage systems (BESS) or pumped storage hydropower (PSH) within Cambodia. The green energy generated will then be transmitted to Singapore via subsea cables of more than 1,000 km in length.

As for the proposed electricity import from Indonesia, this will tap on the photovoltaic and BESS manufacturing plants that are planned to be progressively installed in Indonesia with commercial operations commencing from end 2027. Based on our understanding, importers are working through Indonesian land use rights and operational issues as well as Indonesian local content requirements to facilitate imports to Singapore.

The proposed project for importing electricity from Vietnam will harness offshore wind power, amongst others, and the green energy generated will then be transmitted to Singapore via new subsea cables spanning around 1,000 km in length.

Singapore's Second Minister for Trade and Industry, Mr Tan See Leng said in November 2023 that "We hope these projects will support the development of our broader ASEAN Power Grid. Given the good progress of this initiative so far, we are now studying the possibility of taking in more electricity import projects, taking into account energy security and cost considerations."

Import Trials

Whilst preparing for such large-scale electricity imports, Singapore had in June 2022 commenced a pilot project to import up to 100 megawatts (MW) of renewable hydropower from Lao PDR to Singapore via Thailand and Malaysia using existing interconnections (the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP)). The LTMS-PIP is based on a bilateral power purchase agreement signed in September 2021, between Singapore's Keppel Electric and Laos' state-owned Electricite du Laos. This marked the first renewable energy import into Singapore and Keppel Electric was also the first entity to be issued an electricity import licence by the EMA. Since the commencement of the project, about 270 gigawatt hours (GWh) of electricity have been exported to Singapore from Laos.

Another pilot that EMA has been working on is the 100MW Malaysia trial. YTL PowerSeraya was appointed as the importer for this pilot and electricity will be supplied via the existing interconnector between Singapore and Malaysia over a two-year period.

Onshore Legal Challenges

Power imports present several novel challenges to the legal industry with retailers in Singapore exploring various means of purchasing green power from offshore power producers and retailing green power alongside the existing power generated from Singapore's onshore Combined Cycle Gas Turbines (CCGTs).

The sale and purchase of imported power is typically effected through power purchase agreements (PPAs). However, if a regional grid or transmission operator is put in place for power imports, we anticipate a flourishing market for virtual power purchase agreements (VPPAs) as well. VPPAs are financial agreements that act as a hedge on electricity prices and allow the buyer to receive Renewable Energy Credits (RECs). 1 REC represents the environmental attributes of the generation of a 1-megawatt hour (MWh) of energy produced by renewable sources. RECs are typically purchased by energy-intensive facilities which need to offset their electricity consumption from non-renewable sources.

VPPAs will only work if the offshore power producers are able to sell green power directly into the Singapore grid for the prevailing tariff / wholesale market price as VPPAs operate on the principle of contract for difference between the floating wholesale market price and the fixed VPPA price. It is also important for contracting parties to understand how VPPAs work and be aware of any inherent risks as VPPAs are long-term contacts.

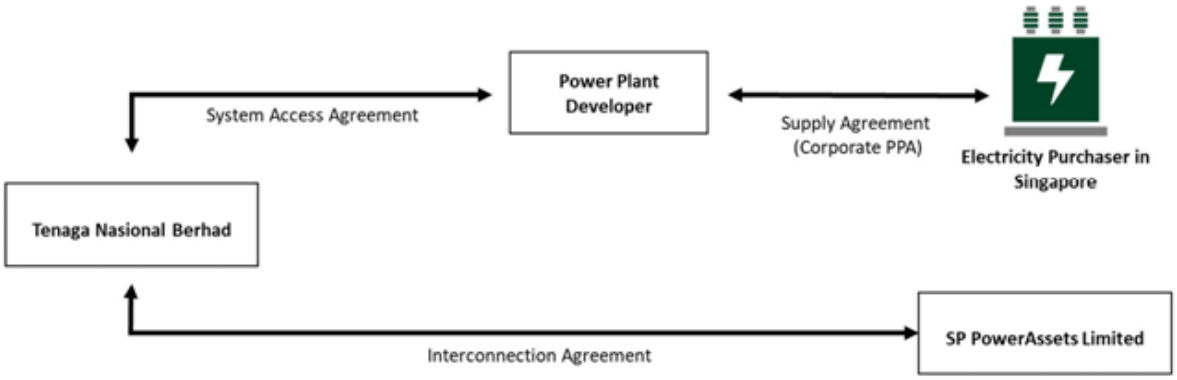
Imports from Malaysia to Singapore

CBES Scheme

Recognizing Malaysia's potential in exporting power to neighbouring countries, Malaysia's Energy Commission issued a detailed Guide for Cross-Border Electricity Sales (CBES) on 31 December 2020, establishing the basic framework for cross-border electricity transactions between Peninsular Malaysia and its neighbours (CBES Scheme). However, the export of renewable energy to Singapore was temporarily banned pursuant to the second version of the CBES that was issued on 25 October 2021.

Under the CBES Scheme, the sale of electricity from Malaysia to Singapore must be generated from non-renewable energy sources and must not exceed 100MW. The electricity can only be transferred to Singapore through the existing interconnection.

The CBES Scheme is depicted in the diagram below:



The CBES Scheme contemplates the following contractual arrangement:

a) a supply agreement entered between the power plant developer (PPD) in Peninsular Malaysia and a purchaser in Singapore to purchase the electricity generated by the PPD;

b) a system access agreement entered between the PDD and Tenaga Nasional Berhad as the grid owner. The agreement consists of technical and commercial arrangements for connection, access and operation to the grid system and the cross-border interconnection and for wheeling of electricity generated as submitted to the Energy Commission; and

c) an interconnection agreement executed between Tenaga Nasional Berhad, as the owner of Malaysia's national grid, and SP PowerAssets Limited, as the owner of Singapore's grid system, for interconnection between Peninsular Malaysia and Singapore.

CBES RE Scheme and Energy Exchange Malaysia

In October 2023, the Malaysian Government reversed its stand and approved cross-border sales of renewable energy to neighbouring countries, which is implemented through a renewable energy exchange mechanism (CBES RE Scheme). On 15 April 2024, the Ministry of Energy Transition and Water Transformation (PETRA) announced the establishment of Energy Exchange Malaysia (ENEGEM) which is a platform set up to facilitate cross-border green electricity sales to neighbouring countries. The CBES RE Scheme will be implemented through ENEGEM based on the latest third edition of the CBES that was issued recently in April 2024. The Minister of Economic Affairs, Rafizi Ramli, explained that this decision was partially driven by the high energy demand in neighbouring countries, stating that 'the creation of an electricity market system for cross-border renewable energy trade will position Malaysia as a leading regional renewable energy hub'. As announced by PETRA, the sale of cross-border renewable energy through ENEGEM will "further strengthen its cross-border electricity integration while paving the way for greater renewable energy development and regional cooperation on cross-border energy trading between ASEAN countries".

The cross-border sale of renewable energy to neighbouring countries via the ENEGEM platform will be conducted through a bidding mechanism. To kick start this process, PETRA announced the first pilot scheme under ENEGEM to auction 100MW of renewable energy to Singapore. Key features of the auction as announced by PETRA are as follows:

a) the pilot scheme will be open to renewable energy bidders who hold electricity generation and/or retailer licence for the Singapore Electricity Market;

b) interested bidders must register with the Single Buyer to participate in the auction;

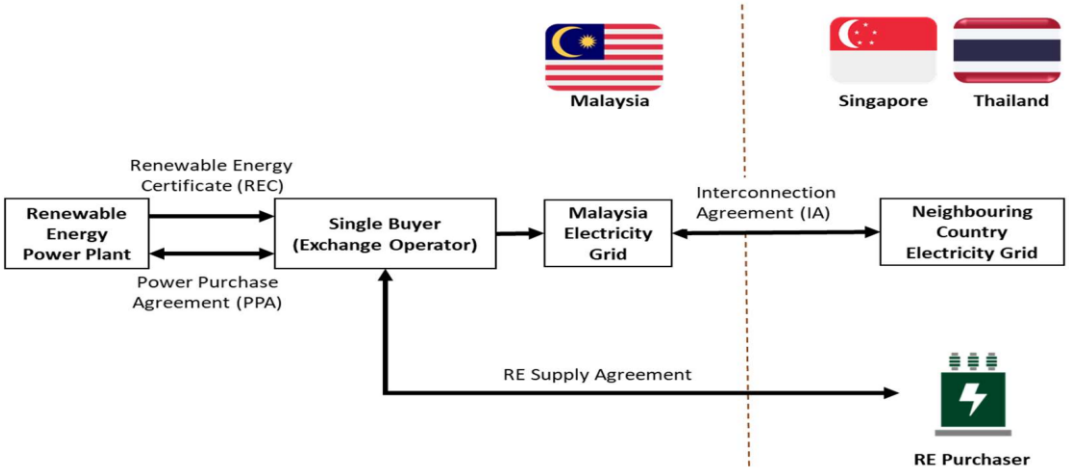
c) after the qualification process, successful applicants will be notified to proceed with auction to purchase Green Electricity on auction day; and

d) winning bidders must enter into renewable energy supply agreement with the Single Buyer for the sales and purchase of green electricity.

The ENEGEM platform will be operated by the Single Buyer. The Single Buyer is the entity authorised pursuant to the Electricity Supply Act 1990 of Malaysia to conduct electricity planning and manage electricity procurement services for Peninsular Malaysia. The Single Buyer is responsible for all operations and initiatives related to the CBES RE Scheme, which include the procurement and sales of renewable energy, implementation of the auction process, scheduling and settlement, and issuance and redemption of renewable energy certificates related to the CBES RE Scheme. The Single Buyer will act as the verifier of green attributes and the issuer of the renewable energy certificates associated with the cross-border electricity trading.

Under the CBES RE Scheme, green electricity will be transferred via the existing interconnection between Peninsular Malaysia and the neighbouring country, with a capacity of up to 300MW for Singapore and subject to availability for Thailand. The green electricity sold will be sourced from solar and hydro plants or any other renewable sources approved by the Energy Commission.

The CBES RE Scheme is depicted in the diagram below:



Under the CBES RE Scheme, it is envisioned that owners or producers of renewable energy power plant will sell generated renewable energy to the Single Buyer through a PPA and the Single Buyer will auction the renewable energy on ENEGEM to bidders from Singapore or Thailand and enter into a renewable energy supply agreement with the successful bidders for the sales and purchase of green electricity. Among other conditions, the renewable energy purchasers will be required to provide a settlement bank guarantee to the Single Buyer prior to the execution of the renewable energy supply agreement. The renewable energy purchasers must also bear all taxes, duties, contribution, charges and levies which may be imposed by law and required by the renewable energy supply agreement.

The CBES Scheme and the CBES RE Scheme currently apply only to the cross-border sale of electricity from Peninsular Malaysia to the neighbouring countries. They do not apply to the states of Sarawak and Sabah, where the states' electricity sectors are regulated separately and independently from the federal government.

Malaysian network

One point of note that does affect the capacity of the Malaysian network to enable international wheeling is the lack of a tariff mechanism to financially support the transmission infrastructure investment in the country, which may be necessary to export greater volumes of renewable power externally. As a result, the cost of this is effectively placed internally on the Malaysian consumer. Conventionally, a utility can be remunerated for necessary investments through the tariff structure that places these costs on relevant parties. At present, Malaysia doesn't acknowledge that parties may influence the scale of reinforcements needed to operate the grid for these purposes.

There are ways that this can be remedied; one possible avenue may be in the form of a Transmission Use of System Charge (TNUoS) that enables remuneration of the System operator for approved capital investments and can be developed to enable costs to be recovered from the relevant parties. A positive example of this approach can be found in Oman. There are varying other forms that this may take and varying schools of thought on the market signals that these arrangements create. The UK is a prime example of this.

On a relevant note, there is a need to consider the systemic constraints that may be inherent to the transfer of power. Invariably, when a network is operated in a way that it was not designed to do, there are consequential impacts. This may be related to technical performance, such as overloading of certain areas, or reliability impacts. These issues are alleviated in most modern systems through the application of system balancing or by reinforcement. In Malaysia, most balancing is intrinsically linked to the existing thermal generation in the form of primary and secondary response. This generation is generally contracted through a PPA that requires these functions to be fulfilled, though perhaps not disaggregating the remuneration of the service provision.

The question becomes, what to do when there is no existing generation in the location that needs a constraint to be alleviated? Ordinarily, this would simply be a regulatory choice to enable reinforcements to the network that form part of the regulated asset base, but when power is wheeled across jurisdictional boundaries it may not be deemed reasonable for the Malaysian consumer to pay the cost if they see little real benefit. To avoid the costs of system reinforcement, other provisions of operational planning may be applied. These may be monetised and classed as an ancillary service. To parties that are seen to be the protagonists in driving international exports, it may be that the cost associated with this ancillary service could be applied though this would have to be considered further to be wholly enacted.

Hope for interconnections

Power imports serve to transmit energy from power rich nations to power hungry nations, creating a collaborative win-win situation for all involved parties and a means for resource-poor nations to attain net zero goals.

Cross border power interconnections create energy security, boost economic activities and foster collaborations. It is very much hoped that the legal and regulatory barriers as well as transmission and market challenges will be overcome so that the ASEAN Power Grid (APG) will take shape and accelerate regional connectivity.

Meet your Co-Authors

Sandra Seah
Partner
Bird & Bird ATMD LLP

Chang Hong Yun
Partner
Tay & Partners

Terrance Goh
Associate
Bird & Bird ATMD LLP

Hoong Wei En
Partner
Tay & Partners

Genessa Chew
Trainee
Bird & Bird ATMD LLP

Graeme Hutchison
Technical Director
PSC Consulting

This article is jointly produced by our Singapore office, Bird & Bird ATMD LLP, Tay & Partners and PSC Consulting. It does not constitute legal advice and is intended to provide general information only. Information in this article is accurate as of 24 June 2024.

Thank you

twobirds.com

Abu Dhabi • Amsterdam • Beijing • Bratislava • Brussels • Budapest • Casablanca • Copenhagen • Dubai • Dublin • Dusseldorf • Frankfurt • The Hague • Hamburg • Helsinki • Hong Kong • London • Lyon • Madrid • Milan • Munich • Paris • Prague • Rome • San Francisco • Shanghai • Shenzhen • Singapore • Stockholm • Sydney • Warsaw