

THE FUTURE OF THE SUN:

OUTLOOK ON LARGE SCALE SOLAR PROJECTS IN MALAYSIA AND INDONESIA

Wong Kee Hooi and Afriyan Rachmad, ZICO Law Partners and Heads of our Projects Practice Groups in Malaysia and Indonesia respectively share their insights on the challenges and future for solar photovoltaic power generation in these countries. Their partner, Lilian Liew, Head of Debt Capital Markets and Structured Finance, also pitches in her thoughts on the financing aspects of these renewable energy projects.

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1. GROWING GLOBAL INTEREST IN RENEWABLE ENERGY

The demand for solar photovoltaic (PV) power generation has increased significantly in recent times as solar generation is now able to compete more effectively with other conventional power generation.

Globally, the development of utility-scale solar projects is thriving. China, United States and India were the top installers of utility-scale solar energy in 2016.



WHAT'S DRIVING SOLAR?

- Declining prices of solar PV panels
- Rapid technological advances
- Government support in the form of tax breaks, incentives and subsidies



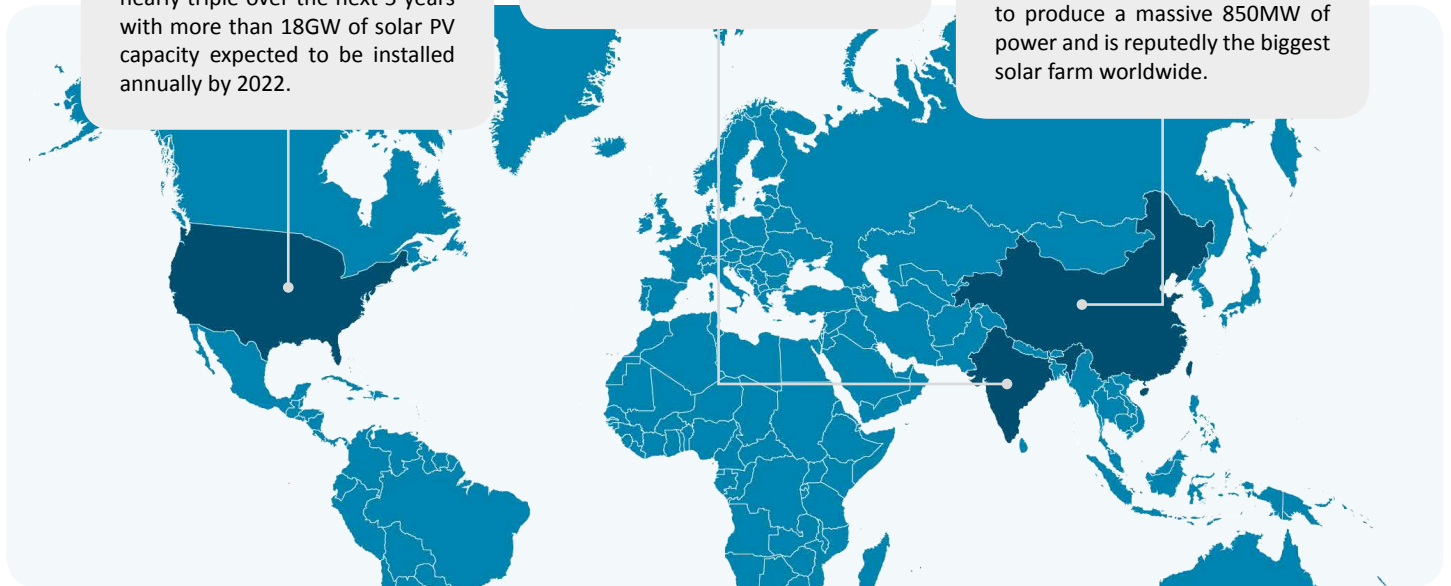
According to the Solar Market Insight Report 2016 Year in Review issued by Solar Energy Industries Association early this year, the U.S. market has installed 14,762 MWdc of solar PV in 2016 – nearly doubling the capacity installed in 2015. The total installed U.S. solar PV capacity is expected to nearly triple over the next 5 years with more than 18GW of solar PV capacity expected to be installed annually by 2022.



In India, the Kamuthi Solar Power Project that is spread over an area of 2,500 acres with a generating capacity of 648MW is currently the world's second largest solar park. The Indian government has expanded its solar plans, targeting USD100 billion in investment and 100GW of solar capacity by 2022¹.



China has been building solar aggressively, accounting for nearly half of the 76-plus gigawatts added worldwide in 2016. China recently unveiled its 40MW facility in Huainan which is currently the largest floating solar farm in the world. In addition, the Longyangxia Dam Solar Park has the capacity to produce a massive 850MW of power and is reputedly the biggest solar farm worldwide.



Within the ASEAN region, considerable effort has been made by its member states to tap into the huge reserves of renewable energy ("RE"). Malaysia, Indonesia and Thailand have introduced feed-in tariffs ("FiT") and regulations for RE, as well as other supportive policies such as tax incentives.

However, the development of RE applications is still considered slow in the ASEAN region due to the various obstacles faced by RE developers, including complex administrative procedures, lack of transparency in regulatory procedures and insufficient access to financial resources.



Feed-in tariff ("FiT") is a system that promotes the generation of renewable energy. The FiT system provides a framework where electricity is generated through the use of indigenous renewable resources and sold at a premium to the utility. Eligible RE generators including individuals and companies are paid a FiT rate (which will generally decrease with time according to their respective annual degression rates) as determined by the regulators for the renewable energy that they supply to the utility with guaranteed access to the grid. This enables the development of various technologies such as solar, biogas and biomass generation and provides favourable returns to investors.

¹ India's Solar Power House BBC Documentary 2017.

2. RENEWABLE ENERGY SECTOR IN MALAYSIA

Malaysia is blessed with an abundance of energy resources, both conventional and renewable. The Fuel Diversification Policy (1981 and 1999) was introduced to ensure that the country is not overly dependent on a single source of energy. RE joined oil, natural gas, hydro and coal as the fifth fuel under the 8th Malaysia Plan (2001-2005).

According to the Sustainable Energy Development Authority (SEDA), which is tasked with promoting and implementing the national policy objectives for RE, RE resources still play a very small role in the national energy mix as it only contributes 3% to the energy mix, compared to the 97% from the conventional energy resources as of 2013.

The Government of Malaysia has over the years introduced and initiated various incentives and RE programs to promote the development of RE.

Malaysian Government's incentives and initiatives to promote RE development

- Pioneer status with a tax exemption of 100% of statutory income for ten years or an investment tax allowance on qualifying capital expenditure incurred to be set against 100% of statutory income for five years.
- The Small Renewable Energy Program, encouraging small generation plants to produce RE and to sell them to electricity utilities or distributors.
- The Biogen Full Scale Model Demonstration Project, demonstrating the viability of biomass and biogas power generation projects connected to the grid.
- The Malaysia Building-Integrated Photovoltaic Project, promoting the use of PV technology in buildings.
- Enactment of the **Renewable Energy Act 2011** to implement the FiT system. Individuals and companies may apply to become eligible producers and those who qualify are granted feed-in approvals by SEDA. The feed-in approval holder enters into a RE power purchase agreement with the utility and all electricity produced thereunder enjoys guaranteed offtake by the utility.

Impact of FiT system

The introduction of the FiT system has produced a positive impact on the use of renewable resources for electricity generation in Malaysia, particularly for solar PV energy. Chart 1 illustrates the levels of energy generated using renewable sources since 2012. It is evident that solar PV attracted the highest uptake under the FiT system. Solar PV remains the renewable resource with the highest tariff notwithstanding its decreasing FiT rates over the last 4 years (see Chart 1 and Table 1).



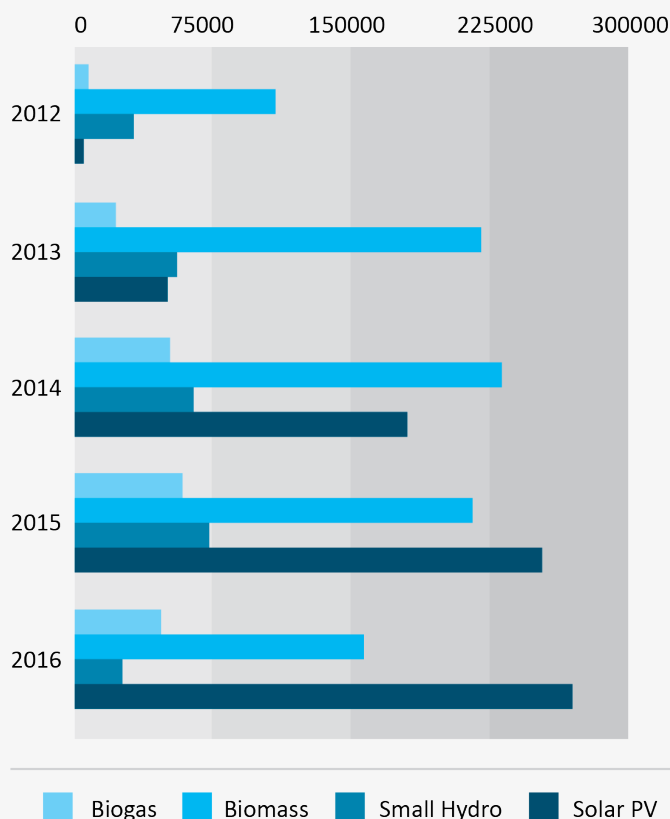
As of 2016, there are a total of 8,606 solar PV systems being established pursuant to the FiT programme under SEDA.



Chart 1:

Annual Power Generation (MWh) of Commissioned RE Installations (as of 2016), based on data obtained from SEDA's website, as at 30 August 2017

Annual Power Generator (MWh)



The FiT rates for solar PV have been decreasing over the years as shown in the table below:

Table 1:

FiT Rates (in RM) for Solar PV from 2014 to 2017, based on data obtained from SEDA's website, as at 30 August 2017

kW / Year	2014	2015	2016	2017
Up to 4kW	1.02	0.92	0.82	0.74
Above 4kW and up to and including 24kW	0.99	0.89	0.80	0.72
Above 24kW and up to and including 72kW	N/A	0.72	0.61	0.52

Under the 11th Malaysia Plan, the Government plans to increase the use of RE in an effort to honour commitments to reduce CO₂ emissions. The Energy Commission of Malaysia (EC) has been entrusted with the task of increasing the capacity of solar PV installations in the power sector by:

- Introducing net energy metering arrangements to facilitate installation of solar PV systems for self-consumption. Excess energy generated may then be sold to the electricity supply utilities.
- Inviting the private sector to build large scale solar (LSS) PV plants in Peninsular Malaysia, Sabah and Labuan to supply electricity to the utilities through long term power purchase agreements.

Large Scale Solar Plants in Malaysia

The Ministry of Energy, Green Technology and Water (MEGTW) together with the EC have in recent years spearheaded the initiative to increase RE in the generation mix by encouraging and increasing the development of LSS plants in Malaysia.

In 2016, the Government introduced a competitive bidding process for the installation of LSS plants whereby interested parties would submit bids for the construction and operation of LSS plants in response to the Request for Proposal issued by the EC. The LSS plants will be connected to the grid and will sell energy to Tenaga Nasional Berhad or Sabah Electricity Sdn. Bhd. under solar power purchase agreements.

For the first round of biddings in 2016, the EC planned to award a capacity target for LSS of 200MW for Peninsular Malaysia and 50MW for Sabah. However, the EC eventually awarded 433.996MW for Peninsular Malaysia and 16.9MW for Sabah, exceeding the original proposed collective tender of 250MW.²

The EC recently conducted its second competitive bidding process, where the submission deadline for proposed bids was on 1 August 2017. The capacity for this second round of bidding was reduced to 30MW per plant.³ This may be because MEGTW and the EC intends to “spread the pie” in order to encourage more developers to undertake LSS projects.

Main challenges faced by LSS Project Developers

(a) Restriction on Foreign Equity Shareholding

Foreign shareholding in LSS plants is generally restricted to 49%. The EC requires that a participant of the LSS program must either be:

- a local company that has Malaysian equity interest of at least 51%; or
- a consortium of local or foreign companies with Malaysian equity interest of at least 51% which includes a minimum of one local company.

Such equity restriction makes it more challenging for local project developers to obtain higher equity funding from foreign investors.

(b) Availability of Land

The unique challenge for solar energy projects is identifying large pieces of flat land, available for lease as project sites, for the 21-year duration of the power purchase agreement.

Aside from technical constraints, another key issue to be considered are land use zoning regulations. Currently, there appears to be no clear position on whether LSS plants must necessarily be located on a piece of land categorised as “industrial” or whether other categories of land use are acceptable. Arguably, unlike conventional plants, LSS plants would not need to be located on industrial land as it has no major impact on the environment.

(c) Grid Connectivity

Aside from having a large piece of flat land, LSS project developers also have to ensure that the site is near the grid. A successful bidder is responsible for constructing, operating and maintaining the interconnection facilities of the LSS plant to the transmission system, and these costs are borne by the bidder⁴. A site with easy access and connectivity to the transmission system avoids high transmission costs, making it more efficient in energy production.

(d) State Government Approvals

Approval and licensing procedures vary from state to state. Developers need to identify planning restrictions, land use zoning regulations or constraints to a particular type of development which may be applicable to the site of the LSS plant.

Missteps in procuring the requisite approvals may result in significant delays in the project. As such, steps should be taken by MEGTW and the EC to seek support from state governments on the implementation of LSS plants by setting clear guidelines and procedures.

² Based on data obtained from the EC’s website (last accessed 30 August 2017).

³ Based on Request for Proposal dated 20 February 2017 issued by the EC for development of LSS Projects.

⁴ Based on Request for Proposal dated 20 February 2017 issued by EC for development of LSS Projects.

3. RECENT DEVELOPMENTS IN INDONESIA'S RENEWABLE ENERGY SECTOR

Under Indonesian Law, RE refers to geothermal, wind, bioenergy, solar, hydro, ocean thermal energy conversion and municipal waste.

The Government of Indonesia provides tax incentives and facilities to RE companies to attract investments to this sector.

New Indonesian Regulations to Promote Development of RE sector

To promote the development of RE power plants, the Ministry of Energy and Mineral Resources (**MEMR**) recently issued MEMR Regulation No. 50 of 2017 regarding RE Utilisation for Electricity

Power Supply ("**MEMR Regulation**"). This regulation obliges PT Perusahaan Listrik Negara (**PLN**) to purchase electric power produced by the RE power plant providers, and also sets the tariff framework.

Tariff Framework

The tariff framework under MEMR Regulation refers to generation costs or Biaya Pokok Pembangunan ("**BPP**"). The purchase price of electric power by PLN from the RE power plant providers is set out below:

Types of RE Power Plant	Tariff	
	Local BPP > Average National BPP	Local BPP ≤ Average National BPP
Solar PV	Maximum 85% x local grid BPP	Based on mutual agreement between PLN and the power plant developer
Wind	Maximum 85% x local grid BPP	
Hydro	100% x local BPP	
Biomass	Maximum 85% x local grid BPP	
Biogas	Maximum 85% x local grid BPP	
Municipal Waste	100% x local BPP	
Geothermal	100% x local BPP	
Ocean Thermal Energy Conversion	Maximum 85% x local grid BPP	

Note: The local BPP and average national numbers for the previous year are determined by the MEMR based on PLN's proposal.

Selection mechanisms

PLN may award RE power plant projects to providers through a number of ways:

- For hydro, biomass, biogas, and ocean thermal energy conversion, a direct selection mechanism involving comparing proposals from at least 2 candidates
- A direct selection mechanism based on the maximum capacity quota offered by RE power plants using advanced and efficient technology that is genuinely dependent on local energy radiation or weather levels
- For municipal waste power plants, by direct appointment
- For geothermal power plants, selection is based on reference price and the geothermal mining working area

The MEMR Regulation also requires PLN to provide and publish standardised procurement documents, power purchase agreement, and the technical guidelines for the selection process. This expedites the purchasing of electric power by PLN from the RE power plant developers. PLN is also required to conduct financial and technical due diligence on the RE power plant providers before the selection is made.

4. FINANCING OF LSS PROJECTS



The cost of financing has fallen in more established solar PV markets as they have grown and proven to be reliable sources of cash flow. A developer's cost of financing has become a critical distinguishing factor for success as the solar PV market becomes increasingly competitive.

With growing knowledge and understanding of renewable projects and the technology involved, super funds are showing stronger investment appetites. Globally, super funds are seen to be investing into LSS in a number of ways including direct investment (either at asset level or through platform companies) or indirectly through public and private pooled investment vehicles. The attraction for super funds is the long-term stable cash flows.

Debt instruments issued to raise capital to fund clean power projects, known as green bonds, is a popular choice among investors for the funding of LSS projects. According to a report from EcoGeneration issued earlier this year, an increase in what was called the "rise of investors seeking to invest for a purpose" was observed where investors desire a positive societal impact in addition to financial returns. National Australia Bank (NAB) was reported to have witnessed this demand in their recently issued 5.5-year EUR500 million green bond which saw strong green and SRI participation with 90% of the book being allocated to this investor group (30% to insurance and pension funds).



Green bonds are a popular method of financing solar projects in other countries. The first green bond was issued in 2007 from the European Investment Bank followed by green bonds from the World Bank. Since then, we have seen many other countries adopting this method for financing solar projects including China which is the leading issuer of green bonds. The China Securities Regulatory Commission has recently released a new set of Guidelines on the issuance of green bonds by public listed companies. Green bonds are also an attractive option in the US. Interestingly, tech giant Apple Inc. just recently issued a USD1 billion green bond to fund RE generation projects including its USD850 million investment in a 130MW solar farm near San Francisco.

Malaysia

Project financing is the most common approach to long-term financing of utility-scale solar projects in Malaysia, given the bankable long term power purchase agreement (21 years from Commercial Operation Date) between the LSS developer and Tenaga Nasional Berhad, a creditworthy off-taker.

In Malaysia, 3 special purpose vehicles wholly-owned by Quantum Solar Park Malaysia Sdn. Bhd. have each been given an award to construct, own, operate and maintain a 50MW LSS plant. Quantum Solar Park (Semenanjung) Sdn. Bhd., being the entity established to raise financing for the 3 special purpose vehicles in aggregate, is expected to issue the country's largest green Sustainable and Responsible Investment sukuk of up to RM1 billion to finance the three LSS plants. The total project cost is about RM1.24 billion and will be funded on an 80:20 sukuk-to-equity financing basis.

The main challenge for a developer of a LSS project to raise funds from the capital market is that LSS projects are still at a nascent stage in Malaysia. It is more time consuming to raise funds from the capital market as investors take longer to assess the risks of funding.

Recognising that the green technology sector is an emerging driver of economic growth, the Government of Malaysia has established a special financing scheme known as the Green Technology Financing Scheme (GTFS) to address such challenges and to promote investments.

Under the GTFS, a qualified Malaysian LSS developer can obtain a 2% interest rebate on the total interest charged by a participating financial institution. This is subject to necessary approval from the Malaysian Green Technology Corporation ("GreenTech Malaysia") and the MEGTW. However, the GTFS is not applicable for bonds or Islamic sukuk issued in the capital markets.

The Credit Guarantee Corporation Malaysia Berhad (CGC) will also provide a guarantee of 60% on the financing amount offered by the participating financial institutions to such developer to the extent of the green technology value as approved by GreenTech Malaysia, or RM100 million (on a group basis), whichever is lower. The developer will need to bear a guarantee fee of 0.5% per annum of the guaranteed amount by CGC.

Indonesia

In Indonesia, most power plant projects are funded through bank and financial institutions using collateral. The Financial Services Authority (Otoritas Jasa Keuangan (OJK)) recently issued OJK Regulation No.51/POJK.03/2017 on 18 July 2017 regarding Implementation on Sustainable Finance for Financial Institutions and Public Companies ("OJK Regulation"). This OJK Regulation aims to promote the growth of responsible and strategic sustainable businesses and investments that balances economic, social and environmental factors against financial gain.

Under the OJK Regulation, financial institutions are required to implement a sustainable financing programme for their business activities. Hopefully, this move will increase the funding appetite, and number of financing options available, for RE projects.

Apart from the above, the Government of Indonesia indicated their commitment to accelerate electricity infrastructure through issuance of government guarantees. The government guarantees

can be in the form of:

- loan guarantee for PLN in obtaining funds for the power plant projects
- business viability guarantee letter to ensure PLN's ability to fulfil its payment to the power plant developers.

5. FUTURE OF LSS PROJECTS

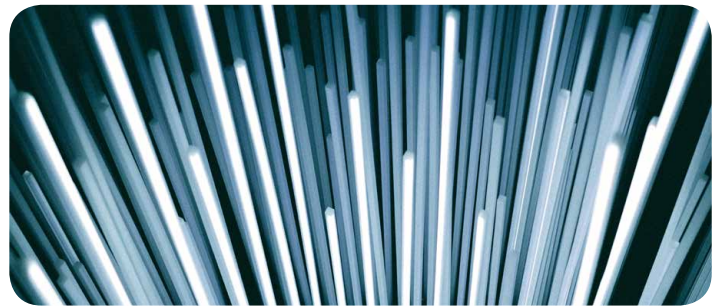
Increasingly, more money is being invested in RE compared to fossil-fuel and nuclear power plants combined. The increase in the efficiency of PV panels and improvement in other technology are making LSS projects a viable energy generation option. Leading energy experts predict that the trend towards RE will become even stronger worldwide in the next few years. A recent study by Oxford Researchers shows that solar's upward swing will be unstoppable in the short term.⁵ Falling manufacturing costs, which dropped by 10% a year since the 1980s, will grow solar's share of global electricity from roughly 1.5% today, to as much as 20% by 2027.⁶

The RE sector has also caught the attention of the global big boys. Royal Dutch Shell and SoftBank were reported to be interested in bidding for Equis Energy, Asia's largest independent RE producer valued at up to USD5 billion. The company owns a portfolio of 97 projects comprising solar, wind and hydro generation assets spreading across countries including Japan, India, Philippines and Australia. Japanese trading companies, global pension funds and buyout firms are also quoted to be in the fray to buy the Singapore-based Equis.⁷

In Malaysia, the Government's policy of encouraging utility-scale solar projects is consistent with the global trend of increased investment in large scale solar plants. This trend is largely driven by the reducing costs of generating solar energy and government initiatives to encourage LSS projects.

To ensure that the process of construction and operation of the plant proceed smoothly once the solar project is awarded, key factors that an investor should consider prior to investing in an LSS project, include:

- level of funding to be injected into the project
- whether this exceeds the foreign equity restrictions
- availability of land for construction of the LSS plant
- connectivity to the grid
- governmental approvals



Encouraging results from the first round of bidding indicates that there is substantial interest in the LSS industry in Malaysia despite the plants being on a relatively smaller scale as compared to other countries. It is likely that this growth will continue in the future in view of the strong support from the public sector and heightened interest from the foreign investors in the region boosted by advancements in technology in the solar PV industry.

Indonesia also has large potential solar resource. The General Plan of National Energy (**Rencana Umum Energi Nasional**) stipulates that Indonesia has the potential solar resource of 207.9GW. The Indonesian government expects that the development of solar power plants shall reach 6.5GW in 2025 and 45GW in 2050, representing 22% of the total potential solar power supply. In the short term, pursuant to the MEMR Strategic Planning for 2015-2019, government of Indonesia plans to increase the solar power plant projects to 0.26GW by 2019.

With that, the future of the sun certainly looks bright and promising!

⁵ Farmer, J. Doyne, and Lafond, Francois. "How predictable is technological progress?" Research Policy 45 (2016) 647-655. Elsevier. Web. 5 September 2017.

⁶ Mathiesen, Karl. "What is holding back the growth of solar power?" The Guardian 31 January 2016. Web. 5 September 2017.

⁷ "Shell, SoftBank among potential suitors for US\$5b renewable energy firm Equis" The Star 25 July 2017. Web. 5 September 2017.



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Kee Hooi has experience advising sponsors, financiers and Government bodies on the development, construction, financing, operation and maintenance of major projects in private power generation, independent and industrial terminals, upstream exploration projects and renewable energy projects.

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Afriyan is a projects and infrastructure specialist with particular expertise in resources and projects including turnkey and construction contracts, production sharing contracts, farm-out as well as service agreements.

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Lilian heads the Debt Capital Markets and Structured Finance practice at Zaid Ibrahim & Co. (a member of ZICO Law).

She has advised Malaysian and international financial institutions and project sponsors on single bank and syndicated term and multi-facility loans, banking regulations and other general banking matters. She has extensive experience in advising, structuring, negotiating and documenting project finance transactions, Islamic finance transactions, debt and equity linked security issues, bank capital instruments, asset-backed securitisation transactions, structured notes and other structured finance transactions. Lilian's experience also includes advising local and international lenders on the financing of some of the largest infrastructure projects in Malaysia based on conventional and Islamic financing structures. Lilian has led many award winning capital market deals, including the world's largest sukuk offering (as at January 2012) by Malaysia's biggest expressway toll company, PLUS Malaysia as well as the ground-breaking Axiata Group's multi-currency sukuk programme of USD1.5 billion

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