

# SECTOR COMMENTARY

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## Malaysian Power Sector – Energising a steady growth path

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## Overview

As a middle-income country with the second-highest GDP per capita in ASEAN, Malaysia's economy is well diversified, with a competitive manufacturing base and a sound industrial and services sector. In support of its aspiration of achieving "high-income nation" status by 2020, the nation's power sector has played a pivotal role in energising the domestic economy while being developed based on gradual regulatory reforms.

Recent developments to ensure energy security and sustainability of the sector include the introduction of imported gas to further diversify the country's fuel sources, as well as increased efforts to develop renewable energy (RE). The debut of incentive-based regulation (IBR) for Peninsular Malaysia has also paved the way towards increased transparency when setting tariffs. As generating capacity is expected to grow in tandem with the nation's development agenda, the Government's continued push for competitive bidding and subsidy rationalisation are critical for the longer-term wellbeing of the sector.

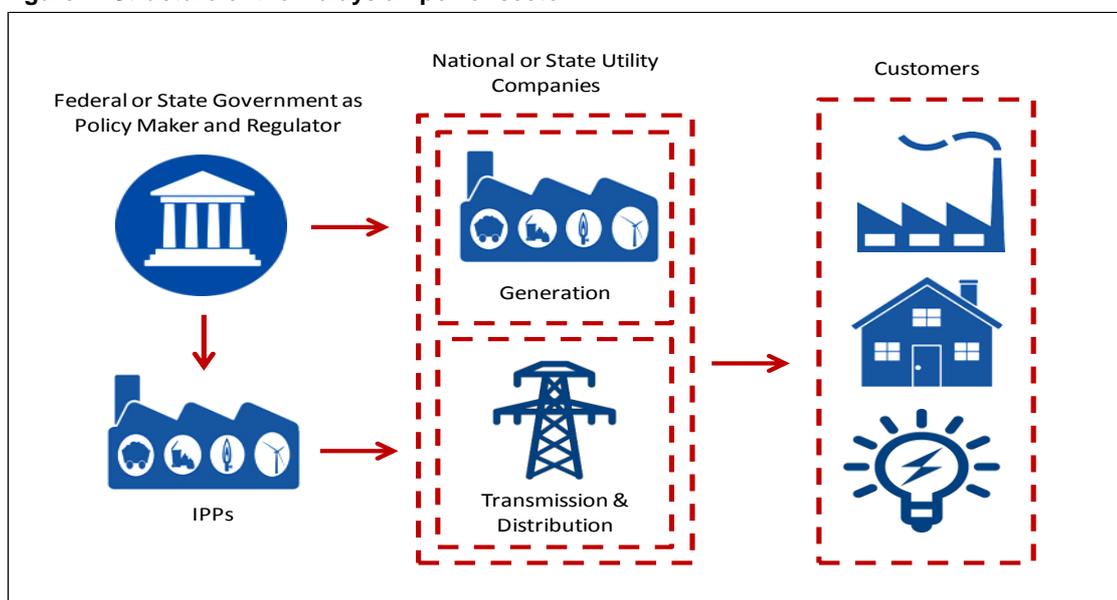
This commentary presents RAM's assessment of the power sector's industry structure, regulatory landscape, capacity and fuel-supply situation, the key players and how these are influencing the sector's growth and infrastructure funding. Our views on the sector are summarised as follows:

- National and state-owned utility companies continue to dominate the landscape.
- Solid government backing through subsidies and periodic tariff reviews.
- Robust Power Purchase Agreements (PPAs) encourage strong private-sector participation.
- Diversified fuel supply and generation mix.
- Matured local-currency bond market supports long-term funding of power infrastructure.

## Industry structure: National and state utilities dominate

- National and state utilities dominate.** The Malaysian power sector is divided into 3 separate grids, in accordance with geographical delineation: Peninsular Malaysia, Sabah and Sarawak. Tenaga Nasional Berhad (TNB – rated AAA/Stable on RAM's national scale) is the national utility company that dominates the National Grid in Peninsular Malaysia. In East Malaysia, Sabah Electricity Sdn Bhd (SESB) and Sarawak Energy Berhad (Sarawak Energy – rated AA<sub>1</sub>/Stable on RAM's national scale) - via Syarikat SESCO Berhad (SESCO) - control the state grids in Sabah and Sarawak, respectively. These national and state-controlled utility companies monopolise all the transmission and distribution (T&D) assets within their respective grids.<sup>1</sup> Apart from Sabah, the utility companies also command the lion's share of generating capacity. In power generation, private participation takes the form of independent power producers (IPPs). The national utility companies play a crucial role as the sole off-takers for the generating capacity and electrical energy produced by all IPPs.

**Figure 1: Structure of the Malaysian power sector**



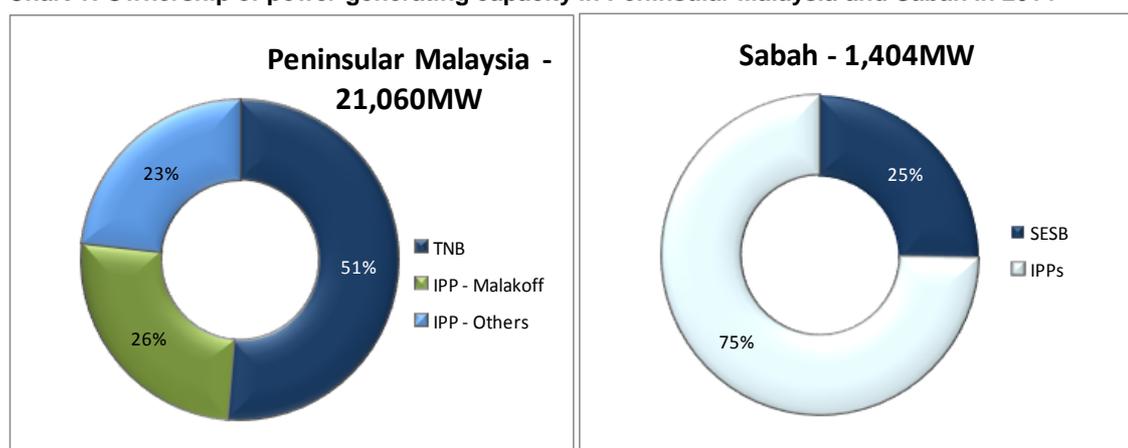
- Strong government ownership.** The national utility company, TNB, was corporatised in 1990 and listed on the Main Board of Bursa Malaysia in May 1992. The Malaysian Government and its various agencies own 69% of the Group in aggregate.<sup>2</sup> The Government also holds a golden share, which allows it to ensure that TNB operates in line with national interests. In September 1998, the Sabah Electricity Board was privatised through a takeover by TNB, via the latter's wholly owned Sabah Electricity Sdn Bhd (SESB). TNB currently holds an 83% stake in SESB while the remaining 17% is owned by the Sabah State Government. Sarawak Energy was incorporated as Dunlop Estates Berhad in 1967. It had been listed on the Main Market of Bursa Malaysia, before being taken private by the Sarawak State Government in January 2010.
- Opening up the power industry.** The debut of YTL Power Generation Sdn Bhd (YTLPG) in 1993 marked the liberalisation of an otherwise fully protected power-generation industry in

<sup>1</sup> Apart from the national and state utility companies, NUR Power Sdn Bhd is the only independent power utility (220 MW) company that is licensed to generate, distribute and sell electricity to tenants at the Kulim Hi-Tech Park in Kulim, Kedah, for 30 years until September 2028.

<sup>2</sup> As at end-August 2014, TNB's major owners were Khazanah Nasional Berhad (33%), the Employees Provident Fund Board (12%), Skim Amanah Saham Bumiputera (8%), and other corporations and government agencies (16%).

Malaysia. The IPPs had been given licences to supply electricity to TNB through long-term PPAs. As at end-2014, the IPPs were responsible for approximately 49% of Peninsular Malaysia's 21,060-MW of generating capacity while controlling 75% of Sabah's 1,404-MW capacity.<sup>3</sup> Malakoff Corporation Berhad boasts the largest portfolio of IPPs, with a 26% share of the market. Although there are currently 6 IPPs in Sarawak, the state's 3,523-MW<sup>4</sup> power-generating capacity is still largely controlled by the Sarawak State Government, through its direct and indirect stakes in the IPPs. Sarawak Hidro Sdn Bhd, which owns the 2,400-MW Bakun hydropower plant at Sungai Balui, Sarawak, is the only IPP not under the control of the Sarawak State Government; Sarawak Hidro is wholly owned by the Ministry of Finance (under the Federal Government).

**Chart 1: Ownership of power-generating capacity in Peninsular Malaysia and Sabah in 2014**



Source: Energy Commission

## Regulatory landscape: Stable and supportive

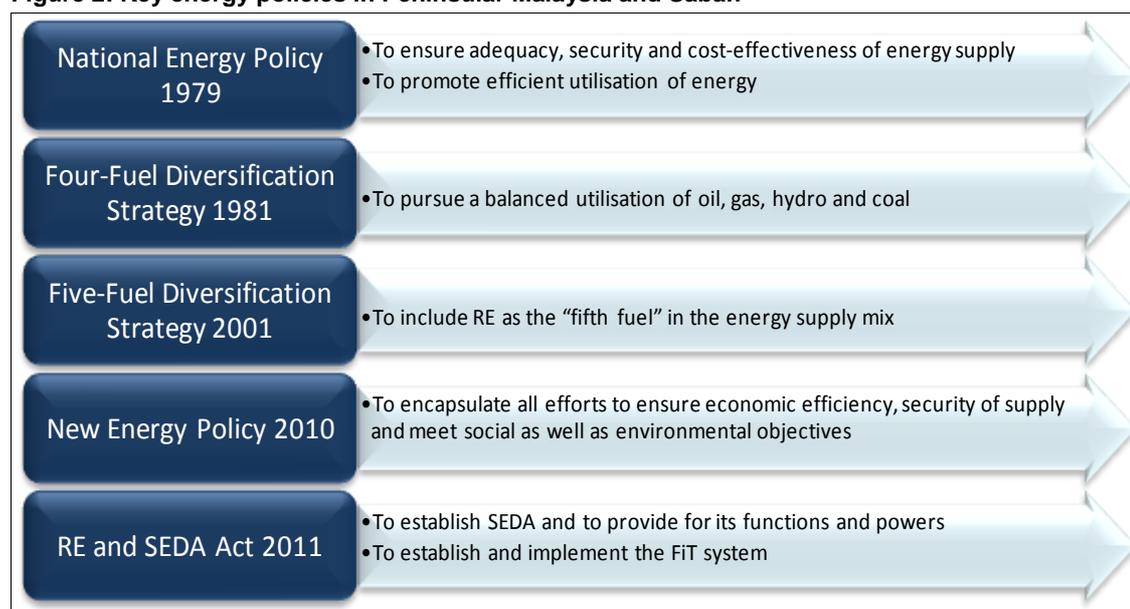
- Overseen by Federal Government.** Electricity supply in Peninsular Malaysia and Sabah is governed under the same umbrella. The Federal Government is in charge of policy, planning and the implementation of electricity supply, with active consultation and participation by the state government, as in the case of Sabah. The Economic Planning Unit (EPU) under the Prime Minister's Department is responsible for overall national macroeconomic planning while the Ministry of Energy, Green Technology and Water (KeTTHA) formulates electricity-supply policies. Under the EPU and KeTTHA, Suruhanjaya Tenaga (Energy Commission) acts as a regulator to promote efficiency and competition while protecting consumers' interests. Meanwhile, the Planning and Implementation Committee for Electricity Supply and Tariff (JPPPET, chaired by the Minister of KeTTHA), is responsible for all issues relating to electricity-supply planning. The committee is tasked to evaluate supply-demand dynamics, proposed capacity plant-ups, tariff revisions and fuel-supply issues, among others. The Sustainable Energy Development Authority (SEDA) was established as a statutory body in September 2011, with the main role of administering and managing the implementation of the feed-in tariff (FiT) mechanism for the development of RE.
- Energy policies evolved with sector development.** In line with the gradual development of the electricity industry, the Government has also formulated various policies over the years. In 1981, the Government adopted the Four-Fuel Diversification Strategy, under which it targets to

<sup>3</sup> This refers to dependable capacity. (source: Sabah Electricity Supply Industry Outlook 2014)

<sup>4</sup> Source: SEB

have a more balanced supply mix of oil, gas, hydropower and coal - to ensure reliability and security of supply. This strategy had been designed to reduce overdependence on oil, with a push for gas as the major fuel in power generation. Renewable energy had subsequently been added under the Five-Fuel Diversification Strategy. Under the 10th Malaysia Plan (10MP, 2011-2015), the Government highlighted the New Energy Policy, which focuses on market pricing for gas and power, the diversification of supplies, with FiT for renewables, as well as energy efficiency. The policy also aims to enhance energy security and reliability of supply through the development of hydro sources, liquefied natural gas (LNG) and coal for power.

**Figure 2: Key energy policies in Peninsular Malaysia and Sabah**



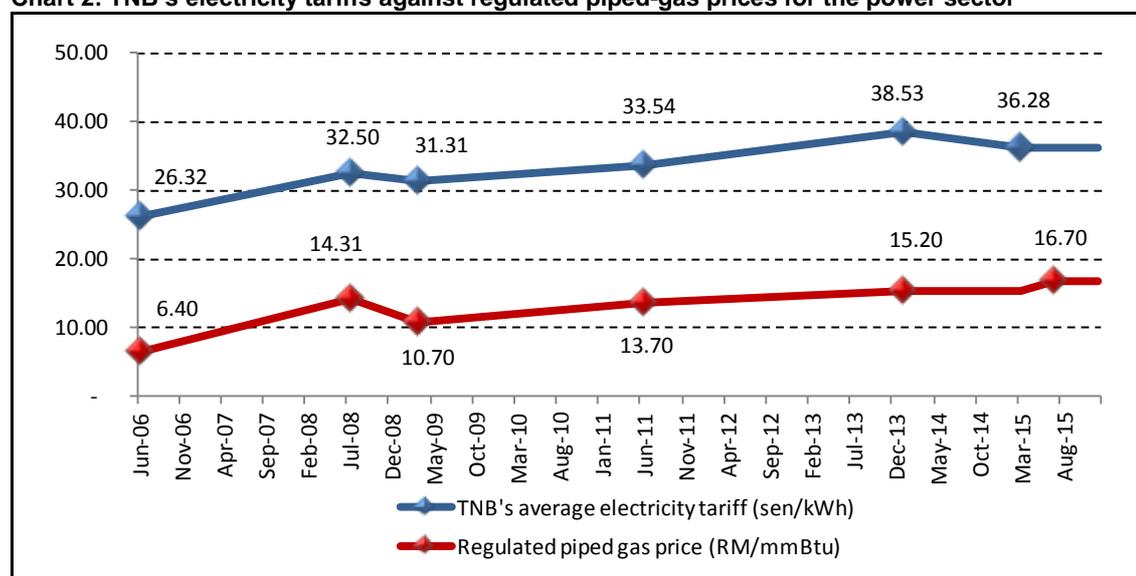
Source: Energy Commission

- 11MP emphasises improving efficiency and reliability of electricity supply.** The recently unveiled 11MP (2016-2020) outlines a further push towards the growth of RE, additional capacity to import LNG via the Pengerang regassification terminal in Johor, intensified plant-up of 7,626-MW of new generating capacity, and related T&D infrastructure in Peninsular Malaysia by 2020. It also reaffirms the Government’s policy of gradually removing energy subsidies and implementing competitive bidding.
- Solid government support.** Malaysian utility companies are perceived to enjoy solid government support. Apart from majority ownership of TNB via various agencies, subsidised gas and periodic tariff reviews also underline the implicit support received by the national utility giant. Notably, the Government’s explicit financial support had taken the form of cash compensation resulting from a fuel-cost-sharing mechanism, where the Government, Petronas and TNB had each borne a third of the additional fuel costs incurred amid the industry-wide gas shortage in 2011. In Sabah, SESB’s financial profile is underscored by significant support from the Federal Government in the form of direct fuel subsidies, development grants and soft loans.
- TNB enjoys stability of returns with new IBR.** While tariff adjustments have always been made in consideration of any fuel-price changes faced by TNB, the setting of electricity tariffs for Peninsular Malaysia had nevertheless been done in a less structured manner before 2014. On 1 January 2014, the Energy Commission implemented the IBR framework, which aims to provide a more transparent system for tariff reviews, including an imbalance cost pass-through (ICPT) mechanism to address fluctuations in fuel costs every 6 months. The market price for all

fuel-related and other specific generating costs as well as any change in the regulated gas price will be reviewed every 6 months against benchmark prices that are determined in the base tariff. Any excess (or reduction) in fuel cost will then be passed on (or given as a rebate) to the consumers via tariff adjustments. Meanwhile, the base tariff will be reviewed every 3 years, providing stability of returns for TNB during that period.

- Implementation hiccups.** In line with the ICPT mechanism, TNB's electricity tariff was adjusted from 33.54 sen/kWh to 38.53 sen/kWh (+14.89%) on 1 January 2014. For the first time, the new rate also includes the cost of imported LNG at market rate, pursuant to the full operations of the country's maiden LNG regasification terminal in Melaka in May 2013. Under TNB's current arrangement with Petronas, the latter will supply up to 1,000 million standard cubic feet of gas per day at a regulated price; any additional quantity will be sold at market rate. The cost of imported LNG, however, generally lags behind oil prices by 5-7 months. Due to initial implementation hiccups, the subsequent tariff reviews had been less timely. Amid a steep decline in coal prices, the Government only announced a tariff rebate of 2.25 sen/kWh (from March to June 2015) in February 2015. That said, the base tariff referenced under the IBR framework remains at 38.53 sen/kWh until the next review in 2017.

**Chart 2: TNB's electricity tariffs against regulated piped-gas prices for the power sector**

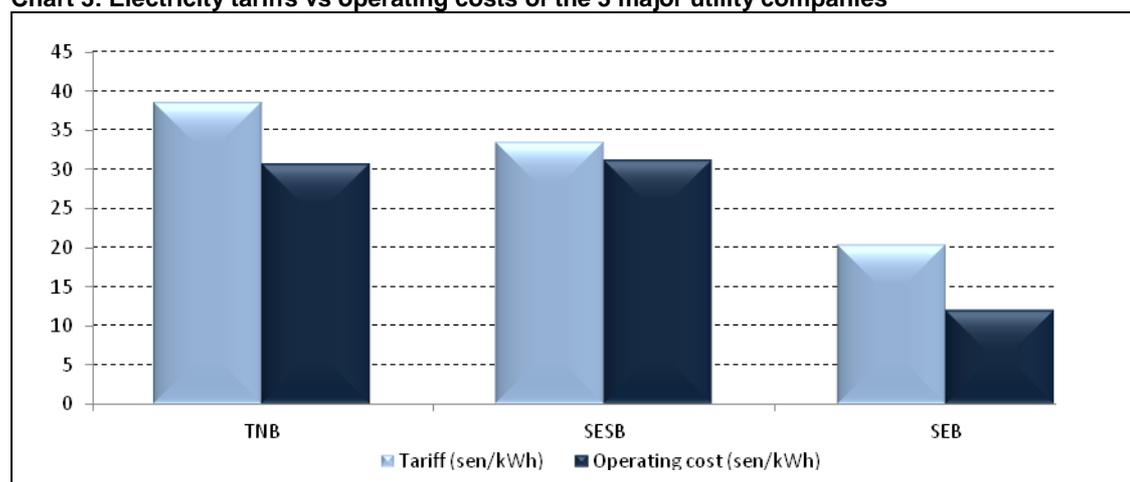


Source: Energy Commission, TNB

- IBR reinforces support for sector.** Gas makes up the largest component of fuel costs for TNB, comprising about 60% of its total fuel expenses in 1H FY Aug 2015. Given this, electricity tariffs had historically risen in tandem with any hike in the regulated gas price (refer to Chart 2). In line with its subsidy-rationalisation plan, the Government had recently announced a regulated gas price hike of RM1.50/mmBtu to RM16.70/mmBtu for the power sector, effective from 1 July 2015, while maintaining the rebate of 2.25 sen/kWh until December 2015 amidst the low prices of oil and coal. Despite initial hiccups, we maintain a positive view on the implementation of the IBR on account of increased transparency and a more structured framework for TNB's tariff reviews. This reinforces our expectation of solid and consistent government support for TNB and the electricity sector, given its critical role as the national electricity company.
- Challenging tariff review for Sabah.** Sabah's tariff reviews do not follow the IBR framework, although it is under the same regulatory purview as Peninsular Malaysia. Even so, Sabah's

electricity tariff revisions have been undertaken concurrently with those of Peninsular Malaysia since January 2014. Sabah's tariffs were elevated 16.9% to 34.52 sen/kWh in January 2014, before being reduced 3.5% to 33.32 sen/kWh from March to December 2015. Unlike TNB, however, SESB relies heavily on more expensive diesel-powered generation (8% of its generation mix in February 2015), and is required to incur higher network costs given Sabah's low population density. In view of its inability to dictate tariffs, SESB continues to face a persistent mismatch between its operating costs and revenue. As such, financial support from the Federal Government has been and is expected to continue sustaining SESB's day-to-day operations. Thanks to this financial backing, SESB remains a timely paymaster to all the IPPs in Sabah.

**Chart 3: Electricity tariffs vs operating costs of the 3 major utility companies**



Source: TNB, SESB and SEB

Note: For SESB, substantial government subsidies have been included as part of its operating costs, without which its tariff would have been unable to cover its costs.

- Tight government control in Sarawak.** In Sarawak, the power industry is tightly controlled by the state government, which is involved in the entire supply chain – as the policy planner, regulator and owner as well as operator of almost all the power-related infrastructure in the state. As such, electricity tariffs are dictated solely by the state government. In line with the gradual reduction of Sarawak Energy's operating costs amid the increasing proportion of hydro-power capacity in its generation mix, the state government recently announced tariff reductions for the domestic, commercial and industrial customer segments. This is expected to decrease Sarawak Energy's average organic tariff by some 6% to 28 sen/kWh by June 2015.<sup>5</sup>

## Capacity: Coal to overtake gas

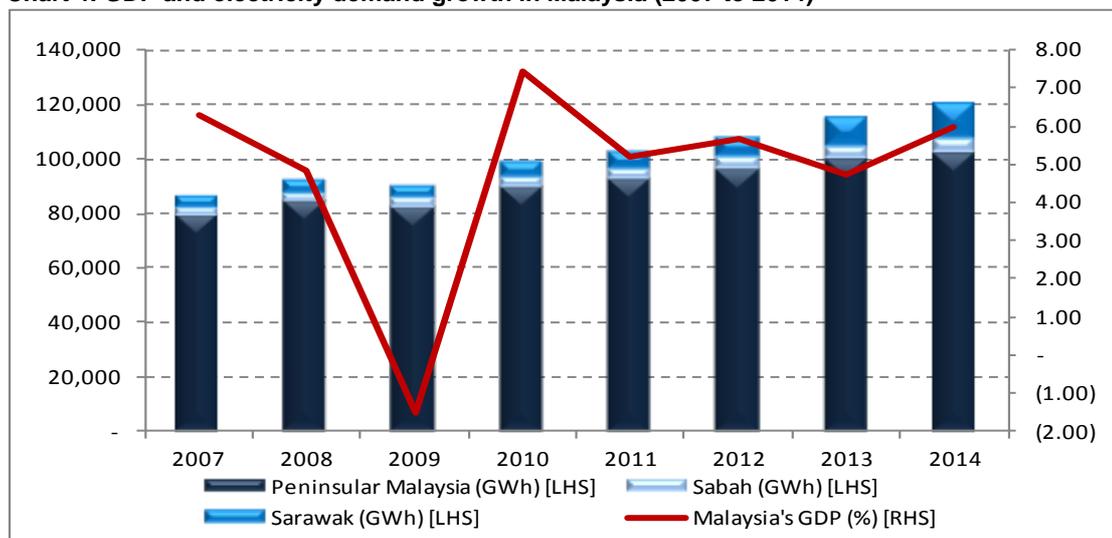
- Electricity demand supported by industrial growth.** Backed by its strong economic fundamentals, Malaysia's growth has been resilient. In the last decade, Malaysia's GDP growth has charted a CAGR of 5.3%. The nation has changed from an agricultural- and commodity-based economy to one based on manufacturing and services. In 2014, demand for electricity increased 4.8% y-o-y to 121,626 GWh, driven by the expansion of electricity sales in the domestic customers (+3.7%) and commercial sector (+2.7%). We expect demand for electricity to track Malaysia's GDP growth, which is projected to clock in at 5.3%<sup>6</sup> this year (2014: 6.0%),

<sup>5</sup> Effective 1 January 2015, electricity tariffs for domestic customers have been reduced from 2% to over 40%. Following this, the rates for the commercial and industrial sectors have been slashed by as much as 40% effective 1 June 2015.

<sup>6</sup> Source: RAM.

supported by the continued implementation of the Economic Transformation Programme (ETP), various development corridors and the recently announced 11MP.

**Chart 4: GDP and electricity demand growth in Malaysia (2007 to 2014)**



Source: TNB, SESB and SEB and Department of Statistics Malaysia

Note: Electricity growth is based on the respective state utility company's financial year-end.

**Table 1: Capacity plant-up schedule (Peninsular Malaysia)**

Plant	Sponsor(s)	Location	Targeted commissioning year	Construction progress *	Capacity (MW)
<b>Peninsular Malaysia</b>					
Coal-fired	TNB	Manjung	2015	100%*	1,010
Hydro-fired	TNB	Hulu Terengganu	2015	92%*	265
Gas-fired	TNB	Connaught Bridge	2015	78%*	385
Coal-fired	Malakoff	Tanjung Bin	2016	89% <sup>^</sup>	1,000
Hydro-fired	TNB	Ulu Jelai	2016	86%*	372
Gas-fired	TNB	Prai	2016	94%*	1,071
Coal-fired	TNB	Manjung	2017	39%*	1,000
Gas-fired	TNB & SIPP	Pasir Gudang	2018	-	1,000-1,400
Coal-fired	TNB	Jimah	2019	-	1,000
Coal-fired	TNB	Jimah	2019	-	1,000
<b>Total</b>					<b>8,103-8,503</b>

Source: Energy Commission

SIPP = SIPP Energy Sdn Bhd

\* Progress as at end-February 2015 (source: TNB's 2Q FY 2015)

<sup>^</sup> Progress as at end-February 2015 (source: Tanjung Bin Energy Issuer Berhad)

- Peninsular Malaysia's generation mix to skew towards coal.** As at end-2014, Peninsular Malaysia's installed electricity-generating capacity summed up to 21,060-MW,<sup>7</sup> primarily fuelled by gas. While Peninsular Malaysia's system reserve margin stands at around 25%,<sup>8</sup> its operating reserve (which considers plant unavailability due to maintenance and unexpected outages) could be tight during certain times, e.g. it only came up to 8.9% or 1,510-MW in June 2014.<sup>9</sup> Recognising this, the Energy Commission has mapped out a long-term generation development plan until 2024. As coal is expected to become the cheapest fuel source going forward (given the utilisation of more expensive market-priced LNG), future plant-ups are

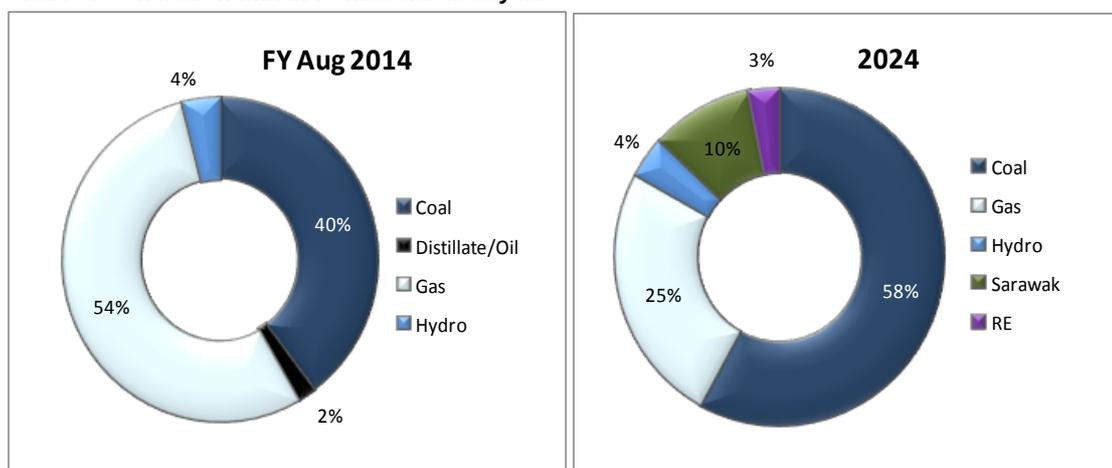
<sup>7</sup> Source: 2014 Peninsular Electricity Supply Industry Outlook by the Energy Commission

<sup>8</sup> Calculated as the excess of installed capacity over peak demand.

<sup>9</sup> KeTTHA, StarBizWeek, 9 May 2015, *TNB takes over Project 3B* (page 16).

leaning slightly more towards coal as their main fuel source, with a total of 5,000-MW of capacity coming on-stream between 2015 and 2019. Meanwhile, various renewable-energy plants are also underway given the incentives under the FiT system. Based on the approved generation development plan, coal-powered generation is expected to constitute 58% of the total installed capacity, followed by gas (25%), hydro (4%) and renewable energy (3%)<sup>10</sup> as well as the possibility of electricity imported from Sarawak (10%) by 2024.

**Chart 5: Generation mix in Peninsular Malaysia**



Source: TNB, Energy Commission

- Newer plant-ups facing some hiccups.** In line with the Government's transformation initiatives, the Energy Commission has been tasked with implementing a competitive bidding process for the procurement of new generating capacity effective 2010. Following this process, 2,253-MW from some first-generation IPPs and a TNB-owned plant had their PPAs extended by up to 10 years from 2015/2017; and a 1,071-MW combined-cycle gas-fired plant in Prai, Penang, had been awarded to TNB and is slated to be completed by March 2016. Another 2,000-MW coal-fired plant in Jimah, Negeri Sembilan, had been granted to a consortium comprising 1Malaysia Development Berhad (1MDB) and Mitsui Co Ltd, to be commissioned by May 2019.<sup>11</sup> Nonetheless, this project has been stalled since 1Q 2015 due to funding issues.<sup>12</sup> Given the delay and tight remaining timeline for completion, the Government has announced that the project will be taken over by TNB and is to be completed by June 2019 and December 2019 for Units 1 and 2, respectively (about 8 months later than originally scheduled). To ensure system security and supply sustainability, the current setback in plant-up progress could be compensated by possible PPA extensions for existing IPPs with some 2,000-MW of generating capacity.
- Tighter PPA terms over time.** Meanwhile, the method of awarding new power projects has become uncertain in the past year. A 1,000-MW gas-fired plant in Johor had been directly awarded to a consortium comprising SIPP Energy Sdn Bhd (SIPP) and TNB, albeit subject to certain conditions. The recent confirmation on TNB taking over 1MDB's 2,000-MW project in the interest of time to delivery is also inconsistent with the Energy Commission's push for competitive bidding. All said, RAM has a positive view of competitive bidding processes for new generating capacity, as this will promote transparency and help ensure cheaper generation for the sector as a whole. That said, we observe that tighter and less lucrative PPA terms are still

<sup>10</sup> Source: 2014 Peninsular Electricity Supply Industry Outlook by the Energy Commission

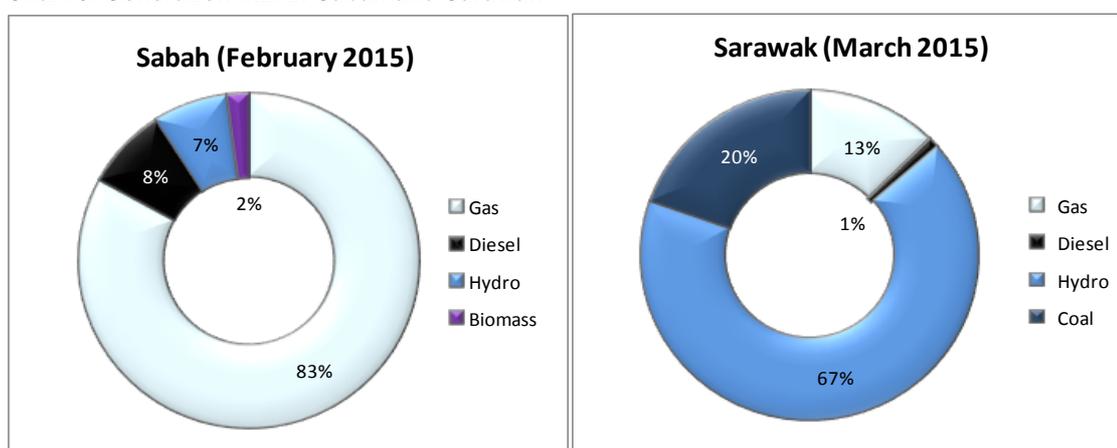
<sup>11</sup> Source: Media Releases by Energy Commission on 9 October 2012, 28 February 2014 and 31 May 2014.

<sup>12</sup> Source: <http://www.reuters.com/article/2015/02/07/malaysia-sukuk-1mdb-idUSL6NOVG2HT20150207>, 7 February 2015.

the order of the day, as underlined by the evolution of contract provisions through the years.

- Electricity shortage in Sabah.** As of February 2015, Sabah's generation mix mainly comprised gas (83%), diesel (8%), hydro (7%) and biomass (2%).<sup>13</sup> This follows the relatively recent commissioning of 2 combined-cycle gas-fired plants in Kimanis, with a total capacity of 385-MW, in 2H 2014. Despite Sabah's estimated system reserve margin of more than 50%, its east coast has been experiencing a power shortage while the west coast is well supplied in terms of generation capacity. More than 25% of the east coast's electricity demand is supported by the west coast grid – through the integrated east-west grid constructed in 2007 – as gas pipelines are non-existent in the east coast and cannot be connected from the west coast due to geographical constraints. As such, the east coast relies heavily on ageing diesel-fired plants that have high outage rates. To solve this problem, the Government is considering several plant-ups, including a 180-MW hydro plant in Upper Padas and a 300-MW combined-cycle gas-fired power plant in Lahad Datu. Nonetheless, the gas-fired plant is currently on hold amid ongoing discussions over the PPA tariff, LNG pricing and the potential need for assistance from the Government.<sup>14</sup>

**Chart 6: Generation mix in Sabah and Sarawak**



Source: Energy Commission, SEB

- Abundant hydro power in Sarawak.** Meanwhile, the Sarawak State Government has embarked on a rapid growth strategy under the Sarawak Corridor of Renewable Energy (SCORE), to propel itself towards becoming a high-income state by 2020, in line with Malaysia's national agenda. In support of this, Sarawak Energy has embarked on an aggressive expansion programme to harness the state's abundant hydro-power potential of more than 20,000-MW. As a start, the full operations of the 2,400-MW Bakun dam in July 2014 and the 944-MW Murum dam in 2Q 2015 are expected to raise Sarawak's generating capacity to around 3,700-MW (on a firm basis). Meanwhile, the SCORE continues to chart gradual growth, with 14 PPAs (to the tune of about 3,100-MW of electricity supply) already signed. Looking ahead, Sarawak targets a long-term generation mix of 60% from hydro plants, with another 20% each from gas and coal-fired plants, respectively.<sup>15</sup> However, RAM cautions that further plant expansion must be at a measured pace amid the current global uncertainties, to preserve Sarawak Energy's credit standing.

<sup>13</sup>Source: Energy Commission, [http://www.st.gov.my/index.php/component/sst/index.php?option=com\\_sst&month=2&year=2015&day=12&controller=graph2](http://www.st.gov.my/index.php/component/sst/index.php?option=com_sst&month=2&year=2015&day=12&controller=graph2)

<sup>14</sup> Source: Sabah Electricity Supply Industry Outlook 2014 by Energy Commission

<sup>15</sup> Source: Sarawak Energy, <http://www.theborneopost.com/2015/03/25/seb-to-build-more-thermal-power-plants-in-next-nine-years/>

## Fuel supply: Diversified sources

- LNG imports to address gas-supply shortage.** Natural gas and coal are the 2 main sources of fuel for power generation in Peninsular Malaysia. Natural gas originates from Kerteh in Terengganu and the Malaysia-Thailand Joint Development Area, through the Peninsula Gas Utilisation (PGU) pipelines. The bulk of the volume from Kerteh is indigenous gas while the rest comes from Indonesia and Vietnam. While gas allocated to the power sector comes up to 1,250 mmscfd, depleting reserves and operational disruptions often reduces the volume received vis-à-vis what is allocated. During periods of supply disruptions, gas-fired power plants have had to use more costly distillate as a substitute. To address this issue, Malaysia's maiden LNG regasification terminal was built and began operations in May 2013, to supply imported LNG via the PGU pipelines.<sup>16</sup> Further plans are afoot to build a second LNG regasification terminal in Pengerang, Johor, by 2017.
- Coal - cheaper fuel source.** According to the Energy Commission, Peninsular Malaysia's power sector currently utilises 21 million MT of coal per annum. This is expected to double over the next decade, in accordance with its generation development plan. Tenaga Fuel Services Sdn Bhd (a subsidiary of TNB) is the sole coal supplier for Peninsular Malaysia's power sector. Coal is fully imported from a diversified list of countries that includes Indonesia, Australia, South Africa and Russia. Although heavily subsidised, TNB's cost per unit of electricity generated by gas-powered plants is almost double that of coal (19.03 sen/kWh vs 10.68 sen/kWh in FY Aug 2014). Given its cost advantage, coal is expected to be the main fuel for power generation. Moreover, coal prices have declined more than 30% since January 2014, mainly due to weaker demand from China. In 2Q FY Aug 2015, TNB paid an average coal price of USD66.40/MT (RM236.40/MT). This compares favourably against the benchmark coal price of USD87.50/MT (RM274.75/MT – based on a benchmark exchange rate of RM3.14 per USD) that has been set under the IBR framework since 1 January 2014. Given the current supply glut, RAM expects coal prices to keep trending downwards, albeit moderated by the appreciating US dollar.

**Table 2: Average price of coal consumed by TNB**

FY Aug	2013	1Q 2014	2Q 2014	3Q 2014	4Q 2014	2014	1Q 2015	2Q 2015
Average coal price (USD/MT)	83.6	77.2	77.8	74.6	72.9	75.4	70.2	66.4
Exchange rate (RM/USD)	3.10	3.23	3.29	3.26	3.20	3.24	3.28	3.56
Average coal price (RM/MT)	259.5	249.0	256.2	243.2	233.0	244.6	230.2	236.4

Source: TNB

- Substantial fuel subsidies for Sabah.** As gas makes up 83% of its generation mix, indigenous natural gas is the main fuel source for Sabah's power sector. According to the Malaysian Gas Association, 13% of the country's natural gas resources are located in Sabah. Gas supply for the power sector has been further enhanced with the commencement of the Sabah Oil and Gas Terminal in April 2014. Sabah's power sector enjoys substantial fuel subsidies. Piped gas is priced at RM6.40/mmbtu compared to Peninsular Malaysia's RM16.70/mmbtu; diesel and MFO are priced at 49.5 sen/litre and 42 sen/litre, respectively.<sup>17</sup>
- Abundant indigenous coal and natural gas in Sarawak.** Apart from hydro resources, Sarawak's power sector also benefits from abundant reserves of indigenous natural gas and coal. Sarawak holds the lion's share (more than 50%) of Malaysia's natural gas resources while

<sup>16</sup> Malaysia Natural Gas Industry Annual Review 2014 by Malaysian Gas Association

<sup>17</sup> Source: Sabah Electricity Supply Industry Outlook 2014 by Energy Commission

controlling nearly 70% of the country's coal reserves.<sup>18</sup> Natural gas is heavily subsidised for the state's power sector. As agreed with Petronas, SEB currently obtains gas from the former at an attractive RM5.50/mmbtu (with an annual 1.5% increment). The terms apply from January 2014 to March 2018 for Miri, and from January 2014 to December 2020 for Bintulu. Meanwhile, coal supply and pricing are fully controlled by the state government via Sarawak Coal Resources Sdn Bhd.

## Key players: Sound credit profiles

**Table 3: Key financial indicators (with adjustments)**

Rating(s)	TNB		SESB		SEB		Malakoff	
	AAA/Stable/P1		Not rated		AA <sub>1</sub> /Stable/-		Not rated	
FY	Aug 2013	Aug 2014	Aug 2013	Aug 2014	Dec 2013	Dec 2014	Dec 2013	Dec 2014
Revenue (RM bil)	37.13	42.79	1.52	1.70	2.32	2.83	4.72	5.59
OPBDIT (RM bil)	9.82	11.40	0.45	0.44	0.84	0.99	1.72	2.46
Pre-tax profit (RM bil)	5.93	7.11	0.21	0.11	0.49	0.71	0.08	0.60
Cash and cash equivalents (RM bil)	9.54	8.11	0.70	0.85	1.28	2.21	2.38	3.57
Total assets (RM bil)	100.00	110.67	5.30	7.36	13.69	17.13	28.07	29.34
Total debt (RM bil)	22.89	25.46	2.86	4.75	6.10	7.50	17.54	18.23
Total equity (RM bil)	37.97	43.46	0.18	0.32	4.26	5.61	4.14	4.18
Adjusted OPBDIT margin (%)	34.84	32.55	39.84	34.03	44.14	43.39	36.48*	43.99*
Adjusted gearing ratio (times)	1.31	1.19	22.40	18.04	3.44	3.01	4.24*	4.36*
Adjusted net gearing ratio (times)	1.06	1.00	18.59	15.37	3.14	2.61	4.24*	4.36*
Adjusted FFODC ratio (times)	0.25	0.25	0.12	0.09	0.07	0.08	0.10*	0.13*
Adjusted FOCFDC ratio (times)	0.09	0.06	0.03	0.05	-0.02	n/m	-0.05*	0.06*

Source: TNB, SESB, SEB and Malakoff

OPBDIT = Operating profit before depreciation, interest and tax

FFODC = Funds from operations debt coverage ratio

FOCFDC = Free operating cashflow debt coverage ratio

n/m = not meaningful

Note: The adjusted ratios take account of the utility company's PPA arrangements with its IPPs, where capacity payments are based on availability and are viewed as being akin to fixed payment obligations.

\*Malakoff's ratios are not adjusted as it is not a utility company.

- Utility companies display strong credit profiles.** Malaysia's power sector is dominated by TNB, SESB and SEB, which are monopolies in their respective jurisdictions. While their financial profiles are fundamentally different, RAM has a favourable view of their credit profiles given their strategic functions and solid relationships with the relevant governments.
- TNB boasts healthy financial profile.** As the national utility company, TNB's top line mirrors the country's economic wellbeing. Gas subsidies and periodic tariff reviews that allow it to fully pass through its fuel costs underscore its strong profit performance, as reflected by its sturdy average adjusted OPBDIT margins and adjusted return on capital employed (ROCE) of 9% and 33%, respectively, in the last 3 fiscal years. Accordingly, TNB boasts a healthy cashflow. Despite heavy capital expenditure predicated on its inherent need to constantly maintain and expand its T&D assets as well as to plant up new generating capacity, TNB reports positive free operating debt coverage ratios. Its balance sheet and debt-coverage matrices are deemed the healthiest among the domestic utility companies. As at end-FY Aug 2014, its adjusted gearing and net gearing ratios stood at 1.19 times and 1 time, respectively, while its adjusted FFODC ratio came up to a healthy 0.25 times.

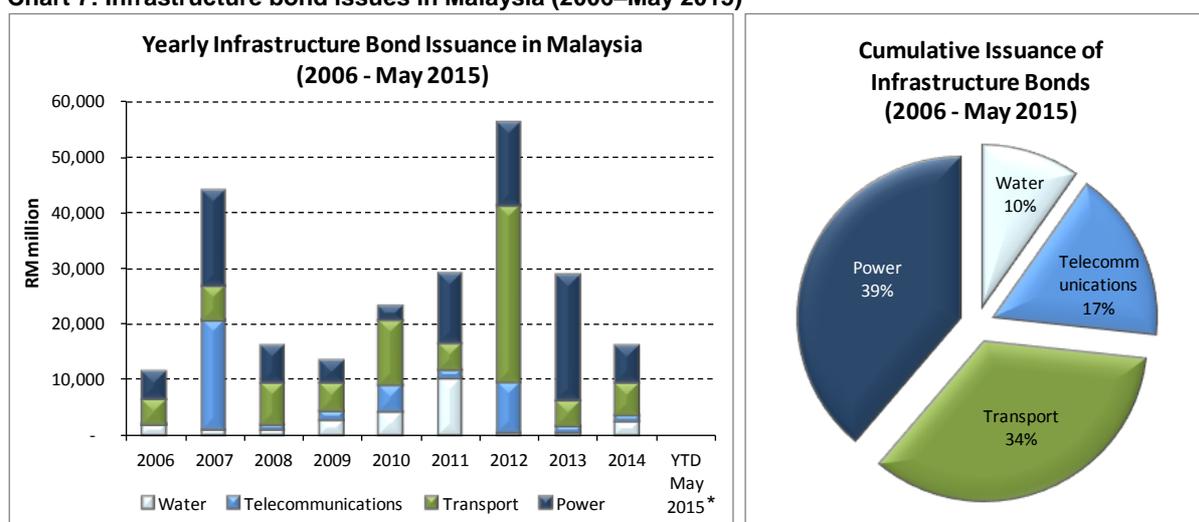
<sup>18</sup>Sarawak holds nearly all of nation's coal reserves, The Star, 23 November 2014, <http://www.thestar.com.my/News/Nation/2014/11/23/Swak-holds-nearly-allof-nations-coal-reserves/>

- **Heavier debt load expected for national plant-ups.** TNB's leverage is expected to increase in tandem with Malaysia's initiatives to raise its power-generating capacity. This will either be via additional drawdown of debts to fund the construction of power plants, or through adjustments on additional capacity payment (CP) obligations to new IPPs. That said, the financial impact on TNB's most recent proposal to acquire Edra Global Energy Berhad's power assets would depend on the acquisition price, should the deal go through. Notably, TNB is exposed to forex fluctuations through its coal purchases, which are denominated in USD, and its foreign-currency debts (24% of its total its borrowings as at end-February 2015). This is amplified by the continued depreciation of the ringgit against the greenback. That said, TNB has been reducing its exposure by constantly trimming its foreign debt load (end-FY Aug 2012: 35%). Further comfort can be derived from the fuel-cost-pass-through mechanism under the IBR tariff-setting framework.
- **SESB enjoys substantial financial support.** SESB's financial profile is considered fundamentally weak. Its average OPBDIT margin of 35% in the last 3 years and its relatively modest debt coverage matrices take into account substantial government subsidies. Total funding from the Federal Government (in the form of fuel subsidies, development grants and soft loans) have been averaging RM780 million per annum over the same span, although the latest tariff adjustments have eased this figure. Under the circumstances, SESB has a frail balance sheet. RAM expects the ongoing financial support to continue in the foreseeable future given SESB's pivotal role in electrifying Sabah and its inherently challenging business prospects.
- **SEB's rapid expansion weighs down balance sheet.** In Sarawak, SEB's robust OPBDIT margins relative to its utility peers is a reflection of the cost effectiveness of its hydro-powered generation. Its adjusted OPBDIT margin has averaged 42% in the last 3 years. In line with increasing demand from the SCORE, SEB's revenue has charted a CAGR of 19% per annum over the same period. RAM expects the growth momentum to be sustained given the progressive build-up in off-take from the SCORE's big-load customers. In view of its expansionary phase and hefty capital expenditure, SEB's balance sheet is expected to be highly leveraged over a prolonged period. To preserve its credit quality, further plant expansion must be at a measured pace amid the current global uncertainties.
- **Malakoff – largest IPP but highly geared.** Malakoff is an investment-holding company with the largest IPP portfolio in Malaysia (and South-east Asia), controlling an effective generating capacity of 5,346-MW (26% of the country's installed capacity). Malakoff's long-standing presence and track record in the local power industry dates back to 1996, when it built and operated its first IPP. Apart from owning 7 power plants in Malaysia, it also has interests in 6 others in the Middle East and North Africa as well as Australia. Its robust average OPBDIT margin of about 40% over the last 2 years is a reflection of its generally profitable IPP business. On the other hand, Malakoff's financial profile is weighed down by its heavily geared balance sheet amid its debt-funded expansion, although the bulk of the borrowings are ring-fenced within the relevant project-financed subsidiaries. Following its recent relisting on the Main Board of Bursa Malaysia, Malakoff has expressed its intention of continuing its expansion, both locally and internationally.
- **Robust PPAs with IPPs.** The PPAs between the country's IPPs and their respective utility companies are relatively straightforward; payments are largely based on the availability of plant capacity. Subject to certain performance requirements, the IPPs earn fixed CPs irrespective of the quantum of electricity sold. Demand risk is also muted as only some newer IPPs are

exposed to a small amount of revenue fluctuation according to dispatch requirements from the utility companies. Moreover, the IPPs earn energy payments that allow them to fully pass through their fuel costs, as long as their power plants operate within the allowable heat rates. Despite the operational problems of various power plants in recent years (particularly coal-fired ones), the financial consequences have been comfortably cushioned by their robust cash buffers. On the whole, debt issues raised by IPPs are generally highly rated - backed by strong counterparties, robust PPAs and well-designed transaction structures.

## Funding trends: Well supported by local debt capital market

Chart 7: Infrastructure bond issues in Malaysia (2006–May 2015)



Source: Bond Pricing Agency Malaysia (BPAM).

\* Issuance up to May 2015 amounted to only RM155 million.

- Funding needs well met by bond issues.** As power infrastructure projects typically have lengthy gestation periods, they generally require longer-term financing, which has been well met by Malaysia's matured bond market. Furthermore, the domestic power sector is characterised by a supportive regulatory landscape, robust PPA terms and strong sponsors as well as counterparties. These are the key catalysts that have supported the growth of power bonds in the country. Since the first IPP bond issue by YTLPG in 1993, the power industry has been one of most active sectors to continuously taps the Malaysian bond market for its funding needs, with tenures ranging from 10 to 30 years (refer to Table 4 on page 15 for the list of outstanding IPP bond issues). Power bonds account for 39% of Malaysia's RM238.7 billion (USD65.4 billion)<sup>19</sup> of cumulative infrastructure bond issues in the last decade.
- Deep and matured domestic bond market.** Home to one of Asia's deepest local-currency debt capital markets, Malaysia's outstanding bonds amounted to RM1.1 trillion (USD288.7 billion)<sup>20</sup> as at end-March 2015 (equivalent to 96% of its GDP). It is the third-largest bond market in Asia<sup>21</sup> relative to the size of its GDP, after Japan and South Korea. Malaysia also leads the global sukuk market, with 56% of total outstanding sukuk as at end-June 2015. Sukuk has become more prominent over the years, with more than 93% of IPP bond issues

<sup>19</sup> BNM Middle Rate as at 29 May 2015: RM3.6515 per USD

<sup>20</sup> Source: Bond Pricing Agency Malaysia; BNM Middle Rate as at 31 March 2015: RM3.7165 per USD

<sup>21</sup> Asian countries here refer to the People's Republic of China; Hong Kong, China; Indonesia; Japan; the Republic of Korea; Malaysia; the Philippines; Singapore; Thailand; and Vietnam.

comprising sukuk after 2000, compared to only 25% before that. We further highlight that nearly all of Malaysia's outstanding IPP bonds - amounting to RM28 billion - are sukuk issues. The depth of Malaysia's domestic bond market and the relative maturity of local institutional investors allow large-scale and long-term investments in the country.

- **High savings rate supports bond market's liquidity.** Malaysia's high savings rate further ensures the availability of long-term financing and sound liquidity in the domestic bond market. As at end-March 2015, the banking system recorded RM1.7 trillion of deposits (USD449.2 billion)<sup>22</sup> while the Employees' Provident Fund (EPF) held RM663.8 billion (USD178.6 billion) of investment assets. Malaysia's bond market benefits from a robust local investor base that is dominated by institutional investors, with the EPF as the single largest investor. The EPF is the sole pension fund for private-sector employees in the country. Pursuant to the Employees Provident Fund Act 1991 (Act 452), the EPF is responsible for providing retirement benefits to its contributors and also provides a mandatory framework for employers to meet their obligations to their employees. The compulsory nature of Malaysia's public pension scheme anchors the EPF's sturdy financial position. As power infrastructure is anticipated to grow in tandem with Malaysia's development agenda, as outlined in the ETP, various development corridors and the recently announced 11MP, its funding needs will remain supported by the nation's thriving bond market.

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<sup>22</sup> Source: BNM. BNM Middle Rate as at 31 March 2015: RM3.7165 per USD

**Table 4: Active sukuk issues by Malaysian IPPs (as at 8 July 2015)**

IPPs	Capacity (MW)	Plant Type	Location	Facility	Tenure (Years)	Maturity Date	Amount (million)	Outstanding (million)
Panglima Power Sdn Bhd *	720	Gas	Teluk Gong, Melaka	Redeemable Secured Serial Bonds	13	18-Mar-16	830.00	60.00
Prai Power Sdn Bhd *	350	Gas	Prai, Penang	<i>Al-Istisna</i> Fixed Rate Serial Bonds	15	26-Feb-16	780.00	65.00
Ranhill Powertron Sdn Bhd *	190	Gas	Kota Kinabalu, Sabah	Islamic Medium-Term Notes Programme	14	27-Jun-19	540.00	220.00
Sarawak Power Generation Sdn Bhd *	320	Gas	Bintulu, Sarawak	Serial <i>Sukuk Musyarakah</i>	15	24-Dec-21	215.00	45.00
Mukah Power Generation Sdn Bhd *	270	Coal	Mukah, Sarawak	Senior <i>Sukuk Mudharabah</i> Programme	15	27-Dec-21	665.00	430.00
Musteq Hydro Sdn Bhd *	20	Hydro	Sungai Kenerong, Kelantan	Bank Guaranteed <i>Sukuk Musharakah</i>	10	26-Jan-22	80.00	65.00
Teknologi Tenaga Perlis Consortium Sdn Bhd *	650	Gas	Kuala Sungai Baru, Perlis	<i>Sukuk Murabahah</i>	10	31-Jul-23	835.00	795.00
Jati Cakerawala Sdn Bhd - SPV for TTPC*	-	-	-	<i>Sukuk Murabahah</i>	10	31-Jul-23	540.00	525.00
Jimah Energy Ventures Sdn Bhd *	1,400	Coal	Jimah, Negeri Sembilan	Senior Islamic Medium-Term Notes Facility	20	05-May-25	4,850.00	3,360.00
Special Power Vehicle Bhd - SPV for Jimah *	-	-	-	Class A Islamic Medium-Term Notes Facility	17	19-May-22	797.00	622.00
				Class B Islamic Medium-Term Notes Facility	29	05-May-34	204.70	204.70
Ranhill Powertron II	190	Gas	Kota Kinabalu, Sabah	(i) Islamic Medium Term Notes	11	17-Jun-22	360.00	300.00
				(ii) Guaranteed Islamic Medium-Term Notes	18	15-Jun-29	350.00	350.00
Sepanggar Bay Power Corporation Sdn Bhd *	100	Gas	Kota Kinabalu, Sabah	<i>Sukuk Murabahah</i>	12	03-Jul-29	575.00	438.00
Kapar Energy Ventures Sdn Bhd	2,420	Multi Fuel	Kapar	<i>Sukuk Ijarah</i>	13	03-Jul-26	2,000.00	1,670.00
Kimanis Power Sdn Bhd	285	Gas	Kimanis Bay, Sabah	Islamic Medium-Term Notes Programme	16	08-Aug-28	1,160.00	1,160.00
Tanjung Bin Power Sdn Bhd *	2,100	Coal	Tanjung Bin, Johor	<i>Sukuk Ijarah</i> Programme	17	16-Aug-29	4,500.00	4,045.00
Manjung Island Energy Berhad - SPV for TNB Janamanjung Sdn Bhd *	1,000	Coal	Manjung, Perak	(i) Series 1 of Islamic Securities Programme	19	25-Nov-30	3,860.00	3,860.00
				(ii) Series 2 of Islamic Securities Programme	20	25-Nov-31	990.00	990.00
Tanjung Bin Energy Issuer Berhad - SPV for Tanjung Bin Energy Sdn Bhd *	1,000	Coal	Tanjung Bin, Johor	<i>Sukuk Murabahah</i>	20	16-Mar-32	3,290.00	3,290.00
TNB Western Energy Berhad	1,000	Coal	Manjung, Perak	<i>Sukuk Wakalah and Ijarah</i>	20	30-Jan-34	4,000.00	3,655.00
TNB Northern Energy Berhad	1,071	Gas	Prai, Penang	<i>Sukuk Wakalah and Ijarah</i>	23	29-May-36	1,625.00	1,625.00
							<b>33,046.70</b>	<b>27,774.70</b>

\* Rated by RAM

Source: FAST, BNM and publicly available information.

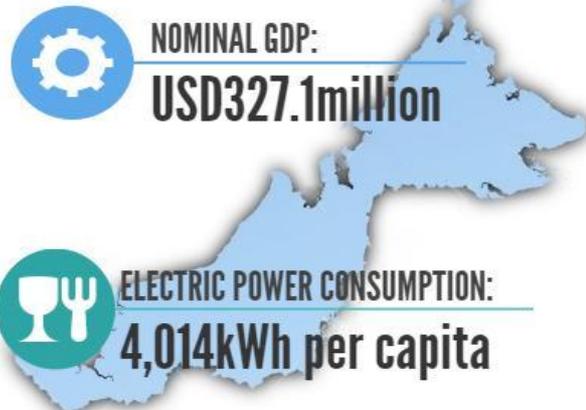
**Table 5: Matured sukuk issues by Malaysian IPPs**

IPPs	Capacity (MW)	Plant Type	Location	Facility	Tenure (Years)	Maturity Date	Amount (million)
Stratavest Sdn Bhd *	60	Diesel	Tawau, Sabah	Guaranteed Commercial Papers/Medium-Term Notes	7	27-Sept-00	184.00
				<i>Al-Bai' Bithaman Ajil</i> Serial Bonds	10	25-Aug-08	276.68
Segari Energy Ventures Sdn Bhd *	1,303	Gas	Lumut, Perak	<i>Sukuk Al-Ijara</i> Revolving Underwritten Facility	4	31-Jan-01	337.50
				<i>Sukuk Al-Ijara</i> Notes Issuance Facility	8	31-Mar-05	521.50
				Conventional Fixed Rate Bonds	12	11-May-06	708.00
				Fixed Rate Facility	15	11-May-06	1,500.00
				<i>Sukuk Ijarah</i> Bonds	6	11-May-12	930.00
Genting Sanyen Power Sdn Bhd *	762	Gas	Kuala Langat, Selangor	Fixed Rate Facility	10	14-Feb-01	1,000.00
				Serial Bonds	3	7-May-04	320.00
				Serial Bonds	3	7-May-04	230.00
Sarawak Power Generation Sdn Bhd *	320	Gas	Bintulu, Sarawak	<i>Al-Bai' Bithaman Ajil</i> Islamic Debt Securities	6	15-Dec-06	160.00
Sandakan Power Corporation Sdn Bhd *	34	Diesel	Sandakan, Sabah	Fixed Rate Serial Bonds	7	6-Aug-07	65.00
Powertek Berhad *	440	Gas	Alor Gajah, Melaka	Commercial Papers/Medium Term Notes Programme	7	13-Aug-08	250.00
				Redeemable Unsecured Bonds	10	30-Aug-11	350.00
YTL Power Generation Sdn Bhd *	390	Gas	Pasir Gudang, Johor	Fixed Rate Facility	15	14-Nov-08	1,500.00
	780	Gas	Paka, Terengganu	Fixed Rate Facility	11	14-Jul-14	1,300.00
Pahlawan Power Sdn Bhd *	334	Gas	Tanjung Keling, Melaka	<i>Al-Murabahah</i> Commercial Papers/Medium-Term Notes	7	21-Jan-09	100.00
				<i>Al-Bai' Bithaman Ajil</i> Islamic Debt Securities	10	31-Jan-12	450.00
GB3 Sdn Bhd *	640	Gas	Lumut, Perak	<i>Al-Murabahah</i> Commercial Papers/Medium-Term Notes Programme	8	21-Feb-09	350.00
				Senior Secured <i>Al-Bai' Bithaman Ajil</i> Bond Facility	13	19-Dec-14	850.00
ARL Power Sdn Bhd	86	Diesel	Tawau, Sabah	<i>Al Bai' Bithaman Ajil</i> Secured Serial Bonds	10	1-Dec-09	177.00
				Islamic Medium Term Notes	7	1-Dec-09	50.00
Sejingkat Power Corporation Sdn Bhd *	100	Coal	Kuching, Sarawak	<i>Al-Bai' Bithaman Ajil</i> Islamic Debt Securities	9	15-Dec-09	195.00
Panglima Power Sdn Bhd *	720	Gas	Teluk Gong, Melaka	Commercial Papers/Medium-Term Notes Programme	7	20-Jan-10	306.00
Serudong Power Sdn Bhd *	36	Diesel	Tawau, Sabah	Fixed Rate Serial Bonds	10	18-Aug-10	75.00
Musteq Hydro Sdn Bhd *	20	Hydro	Sungai Kenerong, Kelantan	<i>Al-Bai' Bithaman Ajil</i> Fixed Rate Serial Bonds	15	26-Jan-12	108.00
Tanjung Bin Power Sdn Bhd *	2,100	Coal	Tanjung Bin, Johor	<i>Istisna</i> Medium-Term Notes Programme	15	5-Sept-12	5,570.00
Mukah Power Generation Sdn Bhd *	270	Coal	Mukah, Sarawak	Junior Sukuk Programme	25	20-Sept-12	285.00
Teknologi Tenaga Perlis Consortium Sdn Bhd *	650	Gas	Kuala Sungai Baru, Perlis	<i>Al-Istisna</i> Fixed Rate Serial Bonds	15	6-Feb-13	1,515.00
Kapar Energy Ventures Sdn Bhd	2,420	Multi Fuel	Kapar	<i>Bai' Bithaman Ajil</i> Islamic Debt Securities	15	8-Jul-14	3,402.00
* Rated by RAM							<b>23,065.68</b>

Source: FAST, BNM and publicly available information.

# Malaysia

• Key Statistics as at 2014 •



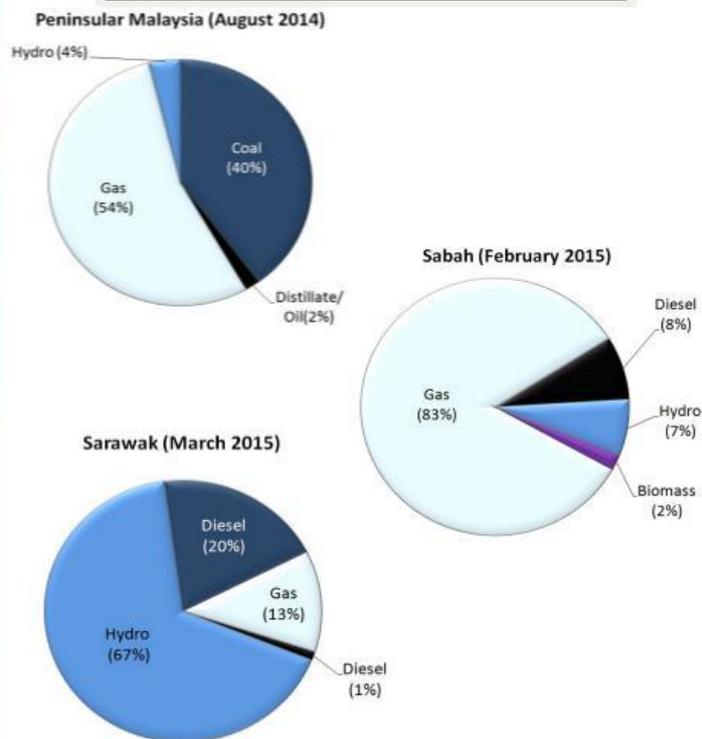
**Fuel Cost Pass Through  
SUBSIDISED MARKET**

**Electric Market Structure  
NON-COMPETITIVE**

## ELECTRICITY PRODUCTION

<b>Electrification Rate:</b> 99.8%
<b>Electricity Production (Peninsular Malaysia):</b> 114,207 GWh
<b>Installed Capacity:</b> 25,986 MW
<b>Peak Load:</b> 16,901 MW (Peninsular Malaysia) 908 MW (Sabah) 2,014 GW (Sarawak)
<b>Reserve Margin:</b> 25% (Peninsular Malaysia) 53% (Sabah) 63% (Sarawak)
<b>Average Tariff (sen/kWh):</b> 38.53 (Peninsular Malaysia) 34.52 (Sabah) 20.48 (Sarawak)
<b>Transmission Losses:</b> 1.6% (Peninsular Malaysia) 1.7% (Sarawak)
<b>Distribution Losses:</b> 6.5% (Peninsular Malaysia) 5.7% (Sabah) 13.0% (Sarawak)

### Generation Mix



Source: Energy Commission, TNB, SEB, Department of Statistics Malaysia and World Bank

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