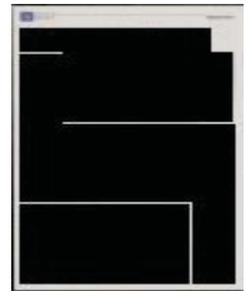


Headline	Can Malaysia adapt to and embrace efficient power generation?		
MediaTitle	The Malaysian Reserve		
Date	21 Sep 2017	Color	Full Color
Section	Money	Circulation	12,000
Page No	10	Readership	36,000
Language	English	ArticleSize	1068 cm ²
Journalist	ALIFAH ZAINUDDIN	AdValue	RM 10,075
Frequency	Daily	PR Value	RM 30,225



Can Malaysia adapt to and embrace efficient power generation?

An open and competitive market will also encourage power producers to invest in more efficient energy generation technologies

by ALIFAH ZAINUDDIN

SUSTAINABLE and reliable energy supply is the bedrock of any country's success. A secure and reliable energy supply ensures the wellbeing of a country and its people. Malaysia is no exception.

Much of the country's economic success over the last four decades was due to the ability by power producers to deliver uninterrupted power supply. The stability of Malaysia's reliable power supply has in turn allowed the country to accommodate an economic growth of 4%-5% per annum.

Changes in the Malaysian power generation sector began back in the late 1980's with the major nationwide power blackout. This led to the creation of independent power producers (IPPs), abandoning a single power producing model.

Today, power generation in the country is mainly dominated by gas and coal, accounting for 78% of the country's energy mix, and in the last five years, renewable energy (RE) has emerged, adding 22% to the country's

energy mix. Global warming and greater environmental concern are forcing nations around the world to consider initiatives to adopt RE.

The chart below shows the diversification of the country's energy source for power generation. (Chart: Installed capacity by plant type.)

Managing extraction of natural resources and the effective use of resource revenues are a challenge for many countries, especially in the developing world. Adding on to that, most countries face the challenge of finding the right fuel mix to ensure a sustainable and secure energy supply.

Malaysia is looking to rely on more sustainable sources of energy as the cost of fossil fuels increases every year. Total energy consumption in Malaysia is high as subsidies are being extended to consumers. In 2011 alone, the country spent a whopping RM14.5 billion to buy fossil fuels to generate energy.

"In planning for our country's energy and electricity needs, one has to consider the security of supply to the consumers. The second, what is

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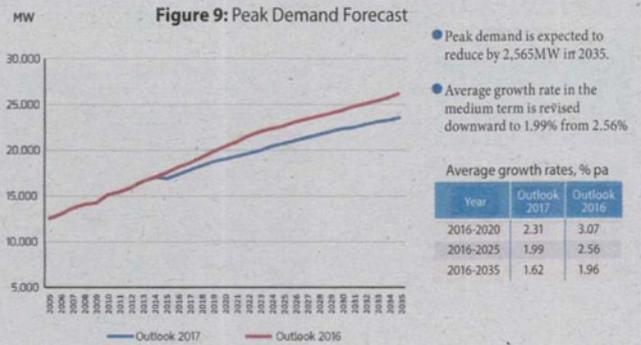
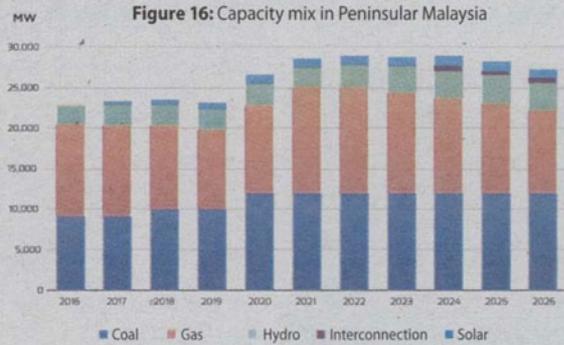
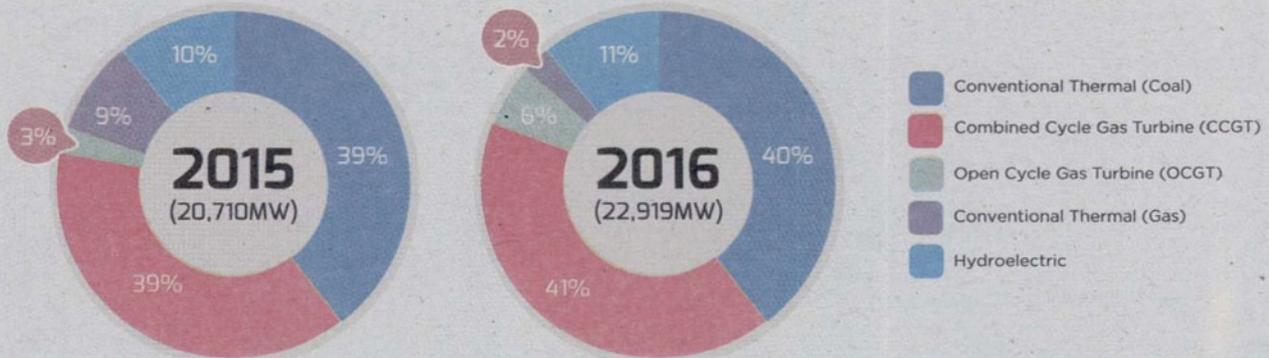


Figure 4: Installed capacity by plant type



the affordable price that will maintain the economic growth and lifestyle expectation," said Energy Commission (EC) chairman Datuk Abdul Razak Abdul Majid at a forum in July.

"We have initiated planning criteria which look at diversification of fuel or fuel consumption and technologies, so that we will not be dependent on any one single fuel at any one time," he said.

Meeting Demand

The demand for electricity in Malaysia is expected to rise between 2% and 3% annually in tandem with the country's economic growth, said RAM Rating Services Bhd in a recent research report on the power sector.

RAM also said power demand rose 5.6% year-on-year to 135,584GWh in 2016, driven by the commercial sector and partly due to the warming effects of the El Nino phenomenon in the middle of the year.

Malaysia's rapid economic growth has fuelled the rise in power demand. In 2005, power generation was slightly above 80,000GWh. This figure is expected to balloon to 180,000GWh by 2035, according to an EC report.

Total installed capacity at the end of December 2016 had increased to 22,919MW, an 11% rise compared to

20,710MW recorded at the end of 2015. The latest forecast by the EC anticipates demand to peak at 20,989MW in 2026, a steep 21.2% increase compared to 17,317MW in 2016.

As the country's total energy consumption is expected to rise, authorities and stakeholders need to seek cost effective and efficient solutions. Power generation technological advancement allows the development of new, high-efficiency plants. These plants can produce more electricity with less use of natural resources.

Such cost and operational benefits will ensure tariff remains competitive, reduce the government's subsidy burden, ensure growth for the industrial sector and protects the environment. This is important to ensure the stability and quality of Malaysia's electricity supply. (Chart: Peak Demand Forecast.)

Given that energy demand is expected to rise in the next five years, the government is already planning ahead with plans to commission 12 new generation projects between 2017 and 2023. These new plants will increase capacity by 9,171MW. Billions of ringgit are expected to be poured into these projects.

The new plants comprise 5,282MW capacity from gas, 3,000MW from coal

and 889MW from hydro. These new power projects will also replace 6,256MW from retired power plants.

The most notable among the new projects is the Pengerang Co-generation Plant, which will generate 1,220MW of electricity, at the Petronas Pengerang Integrated Complex in Johor. The plant will supply 600MW of electricity to the peninsula grid over a three-year period — 400MW in 2017 and an additional 200MW in 2019.

Other projects include Jimah East Power Sdn Bhd's coal plant, as well as gas plants by Edra Energy Sdn Bhd, SIPP Energy Sdn Bhd and Tadmax Resources Bhd.

The delay of committed projects such as SIPP Pasir Gudang (1,440MW) and the 500kV Ayer Tawar-Bentong South new transmission line has resulted in the short extension of three existing gas plants under Port Dickson Power Sdn Bhd, Powertek Bhd and SJ Sultan Ismail, Paka.

All three plants have been operationally extended to generate 436MW, 434MW and 257MW of power supply respectively until 2019.

Keeping Tariff Low But At What Cost?

Ensuring sufficient electricity is not the country's biggest challenge.

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Ensuring tariffs are kept at affordable levels is giving related authorities sleepless nights. At 38 sen per KWh, Malaysia currently enjoys one of the lowest tariffs among its neighbouring countries.

It is an open secret that the country's tariffs are subsidised. Over the last five years, the government had provided about RM15 billion in subsidies to ensure affordable electricity supply to households and industries. In the long term, a continued dependence on subsidies will hamper efforts to conserve energy and reduce wastage. An open and competitive market will also encourage power producers to invest in more efficient energy generation technologies.

"It is not helpful to the nation. We want to go back to the real economic scale," said Ministry of Energy, Green Technology and Water Secretary General Dr Zaini Ujang.

"In many countries that I have visited, I asked my counterparts what is the best way for Malaysia to improve. The answer, almost always, is to improve our tariffs or revoke the tariffs," he said.

In such an "artificial cost structure", the authorities face an almost impossible task to create an efficient power generation ecosystem.

"For example, a power plant has an efficiency of about 30%-40%. Some 60% of the availability of the energy that should be captured is wasted. With new technologies, they can go more than 60%," he said.

Embracing Efficiency

The efficient use of energy has been a national priority since the Ninth Malaysia Plan was implemented between 2006 and 2010. The National Energy Efficiency Master Plan was introduced in 2010, which involves a ten-year plan created after series of consultation processes with industry stakeholders, including government ministries and agencies, and the private sector.

The technology to lower global carbon emissions and make coal and gas more efficient is available now. For gas-fired power plants, cutting edge technology now allows large heavy duty turbines to deliver efficiencies up to 62%. Thermal power plants can be upgraded to provide an improvement in efficiencies from 34%-38% through turbine and boiler upgrades or software solutions and data analytics.

Tariff structures and the lack of incentives should not be barriers for the country to move towards creating an efficient power generating industry. It will be a tough balancing act but an act that is needed for the country's future.



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Pic by Muhd Amin Nazrul