Energy Malaysia
Volume 8
KDN: PP 18540/08/2014(033966)
www.st.gov.my

Towards A World-Class Energy Sector

Energy Malaysia

Suruhanjaya Tenaga
Energy Commission

Volume 8 2016
www.st.gov.my

Gas Supply Industry Liberalisation

Paving the Way to Accessibility

MYR 8.48 Volume 8
ISSN 2289-7488 08
9 772289 748003
*Price includes GST

Innovations

Tips

Guidelines

On-Site

Towards A World-Class Energy Sector
Energy Malaysia
Suruhanjaya Tenaga Energy Commission

Editorial Board

ST Publication No: ST(P)05/06/2016

Conceptualised, Produced and Published for

SURUHANJAYA TENAGA (ENERGY COMMISSION)

by

The IBR Asia Group Sdn. Bhd.
(356247-V)

10-3A, Jalan PJU8/3,
Damansara Perdana,
47820 Petaling Jaya,
Selangor Darul Ehsan, Malaysia.
Tel: +603-7729 4886
Fax: +603-7729 4887
Website: www.ibrasiagroup.com

Printed by

Percetakan Skyline Sdn. Bhd.
(135134-V)

35 & 37, Jalan 12/32B,
Jalan Kepong,
52100 Kuala Lumpur, Malaysia.

Introducing Performance

In achieving the goal of a high-income, developed and industrialised nation by 2020 and beyond, the gas sector has a significant role to play in the overall advancement of the country. Natural gas is responsible for fuelling more than 50% of electricity production in the country, with 99.34% consumption in the non-power sector by industrial users who are also acknowledged to a large extent for driving the growth of the national economy.

As we emphasise in this edition, securing the supply of gas therefore is an essential component of the country's growth and is one of the primary reasons behind the amendments to the *Gas Supply Act 1993 (Act 501)*. The *Gas Supply (Amendment) 2016 Bill* aims, among others, to liberalise and open up the sector to third-party operators thereby expanding sourcing options, facilitating competition and potentially reducing costs while improving supply reliability for consumers.

The Bill has recently been passed on 14 June and moving on, we intend to have it gazetted into law by the end of this year.

The partial liberalisation of the gas industry, through amendments to the existing *Gas Supply Act*, will be well aligned with the Economic Transformation Programme of the Government. This transition phase will undoubtedly have its share of challenges, and other initiatives and measures will be continually implemented to tackle the issues.

The amendments will also see the issuance of several activity-based licences. These include regasification licences to operate a regasification terminal (RGT)—which converts liquid natural gas (LNG) to natural gas for use in the country—and a transportation licence that will allow holders to transport gas through the Peninsular Gas Utilisation (PGU) pipeline. Shipper, import and retail licences will also be introduced to allow existing and new players to ship LNG to Malaysia's RGTs, import LNG from abroad and sell piped gas to consumers on their own premises (such as shopping malls) respectively.

Licenses for plant-based and network system facilities which form the main gas infrastructure will only be issued with approval of the Minister.

The proposed changes to the *Gas Supply Act 1993* will augur well for the future growth of the Industry. The Third Party Access would serve well to facilitate and support a framework for a robust and efficient mechanism towards a reliable and competitively priced gas supply for the fast expanding consumer base. EM

Dato' Abdul Razak Abdul Majid
Energy Commission of Malaysia

(2nd from left) Minister of Energy, Green Technology and Water, Datuk Seri Panglima Dr Maximus Johnity Ongkili officiated the 'Green is a Lifestyle' Campaign during the launching event held at the Putrajaya Botanical Garden.

Educating The Youth For A Greener Future

The 'Green is a Lifestyle (GIAL)' campaign was recently launched at the Putrajaya Botanical Garden by the Minister of Energy, Green Technology and Water, Datuk Seri Panglima Dr Maximus Johnity Ongkili.

GIAL is part of the ministry's several initiatives to create awareness concerning green practices and adopting eco-friendly methods among the Malaysian society. The campaign is particularly aimed at the Malaysian youth as they have been cited as being more conscious of environmental issues as well as being more proactive in this field, compared to those aged 35 years and above.

"We hope that by creating awareness among the current generation, they will in turn educate their parents about adopting a greener lifestyle and practices especially in sustainable energy," Datuk Seri Panglima Dr Maximus Johnity Ongkili told the press. He also added that the continuous growth of the Malaysian population caused a significant increase in the demand for energy and natural resources and that this had also led to a more polluted environment, besides also contributing to global warming and overall climate change. Thus, GIAL also aims to shed light on energy efficiency, water conservation and recycling among the youth, as widespread adoption of these environment-friendly methods will also mean a reduction in the emission of greenhouse gasses.

"The ministry also hopes to extend the campaign to the government to implement energy conservation of electricity and water in buildings around Putrajaya," Datuk Seri Panglima Dr Maximus Johnity Ongkili added.

Smart Meters Nationwide

Installation of smart meters in Malaysia is expected to increase the capabilities of power transmission and distribution utilities.

Through the Advanced Metering Infrastructure plan, Tenaga Nasional Bhd (TNB) will roll out eight million smart meters nationwide over the next five years. The proposed implementation would be carried out in phases with a targeted completion in 2021. To achieve the anticipated target, the company will have to install about 1,500 to 2,000 smart meters per day. Installation of smart meters in Malaysia is expected to increase the capabilities of power transmission and distribution utilities.

TNB Smart Billing project senior manager Datin Siti Laila Sri Asih S Garieb told the *News Straits Times* that the smart meters will be installed in consumers' homes at no additional cost.

"This year, we will conduct the evaluation phase on technologies, customers, partners, processes and risk mitigation before embarking on a nationwide rollout. For now, the costs will be borne by TNB. We do not see this as an investment that should be borne by the customers as we are looking at a win-win outcome for the customers, regulators and the Energy Commission."

To date, 1,000 homes in Cyberjaya and Malacca have already been installed with smart meters, which will aide in a more cost-efficient energy usage, prompt and accurate billing, outage management, smart data management as well as smart payment systems.

The Offshore Technology Conference Asia 2016 provided energy sector players with a platform to share ideas and the latest updates in the sector.

Platform for Progress

The second iteration of the biennial Offshore Technology Conference (OTC) Asia over four days—from the 22-24 March 2016—saw the convergence of oil and gas industry experts from around the world in the Kuala Lumpur Convention Centre (KLCC), Malaysia. Organised by the Society of Petroleum Engineers (SPE) with support from Petronas, the event was attended by 30,000 participants, sponsors and exhibitors, over 2,500 participating organisations and more than 450 thought leaders from 80 nations. Ten country pavilions–representing Australia, Canada, China, Holland, Korea, Malaysia, Mexico, Norway, Singapore and the US were spread across the 6,000m^2 exhibition floor.

OTC Asia provides a platform for oil and gas sector professionals to meet and exchange ideas and opinions as a means to enhance technical knowledge for offshore resources in the industry in Asia. Themed Excellence in Asia, OTC Asia 2016 emphasised the region's achievements in the development of oil and gas technology, and showcased the latest products and services from around the world in an exhibition. The conference also featured a new programme to educate, offer guidance and networking opportunities to the younger generation of engineers, and conferred awards for exceptional innovations.

Speaking to **Energy Malaysia**, Benno Wagner—Regional Sales and Marketing Manager Oil and Gas of Sandvik Asia Pacific (producers of industry components and one of the major exhibitors at the conference)—noted that "In the current volatile industry environment, it is imperative for players to innovate constantly, while keeping expenditure low." He pointed out that the economy in Asia is one of the fastest growing in the world with increasing demand for energy. "In the long term, there are many opportunities for the industry in the region to advance," he added.

Pipeline to Development

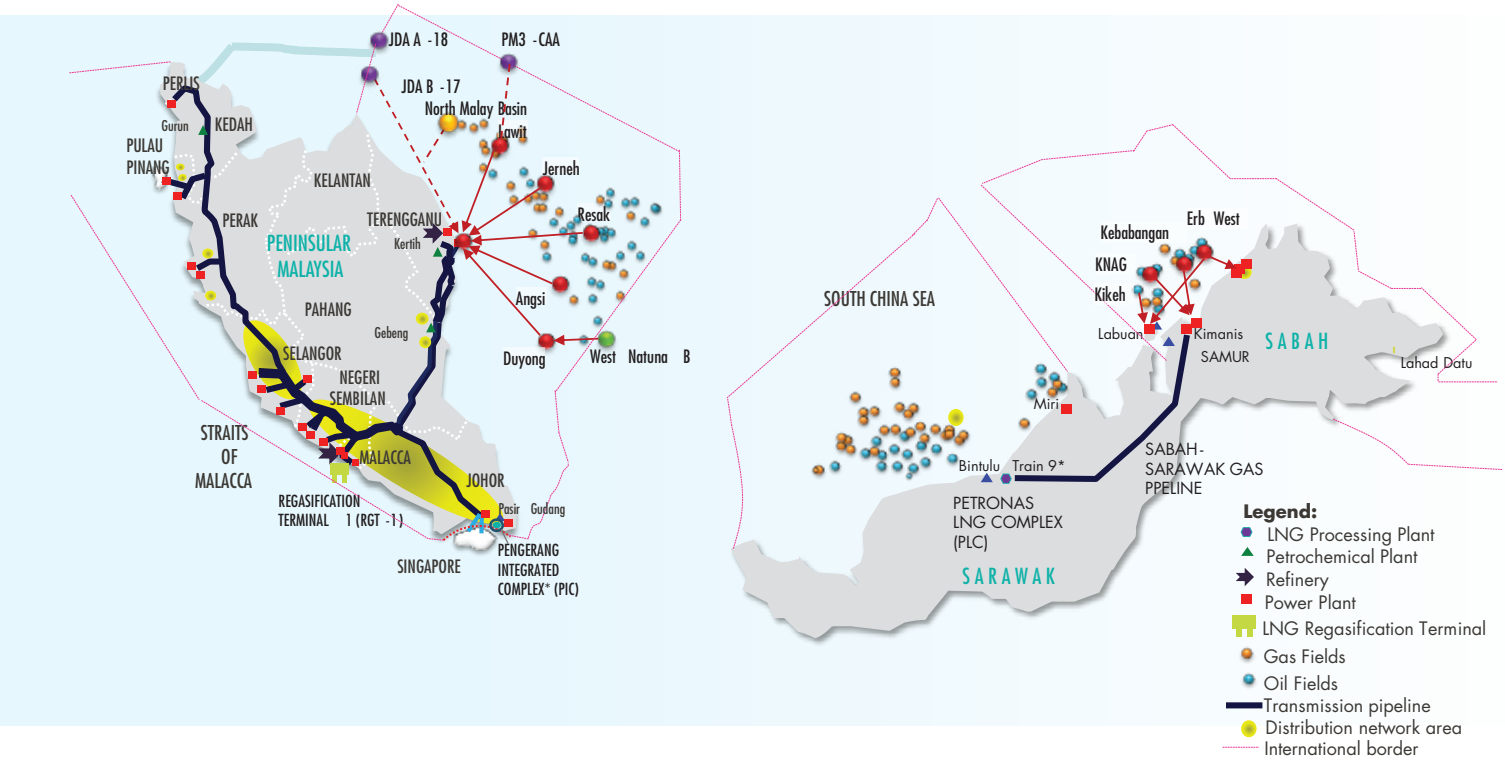
One of Malaysia's most fundamental and crucial gas infrastructure is the country's distribution grid system, known as the Peninsula Gas Utilisation (PGU) project. The distribution system allows gas from the country's offshore fields in Terengganu in the east coast of the Peninsula to be treated, processed and introduced into the grid. The PGU project was completed in three phases between 1984 and 1998.

Gas treatment and processing is done at the six Petronas Gas Berhad's (PGB) gas processing plants (GPPs) located in Kertih and Santong, Terengganu, which have a production capacity of 2,060mmscfd (million standard cubic feet per day) of methane (sales or feed gas). The GPPs can also separate gas into its main components such as ethane, propane, butane and condensate, and in 2013 processed an average of 1,967mmscfd of feed gas.

The gas from the GPPs is introduced to the PGU's more than 2,500km high-pressure, main and lateral pipeline transmission network, and supplied to end-users across Peninsular Malaysia. To ensure the security of gas supply to the Klang Valley, the distribution network is reinforced with PGU Loops 1 and 2, which are parallel to the existing PGU pipelines. The 265km Loop 1 is a natural gas pipeline from Kertih to Segamat while Loop 2 is a 226km line from Segamat to Meru.

The PGU is also linked to the Trans Thailand-Malaysia Gas Pipeline System at Changlun, Kedah, and the Malaysia-Thai Joint Development Area (JDA) in Songkhla, Thailand, allowing additional security of gas supply to Malaysia. The PGU also holds historical significance as being the first Asian export pipeline as it enabled international distribution of natural gas to Singapore. The development of the PGU has helped secure Malaysia's gas supply, ensuring continued socio-economic development.

GAS INFRASTRUCTURE IN MALAYSIA



Amendments Passed

The *Gas Supply (Amendment) Bill 2016* was passed by the Senate on 14 June 2016. It is aimed at increasing the scope of the Energy Commission as the regulatory organisation to include gas import into gasification terminal, regasification, transmission and retail.

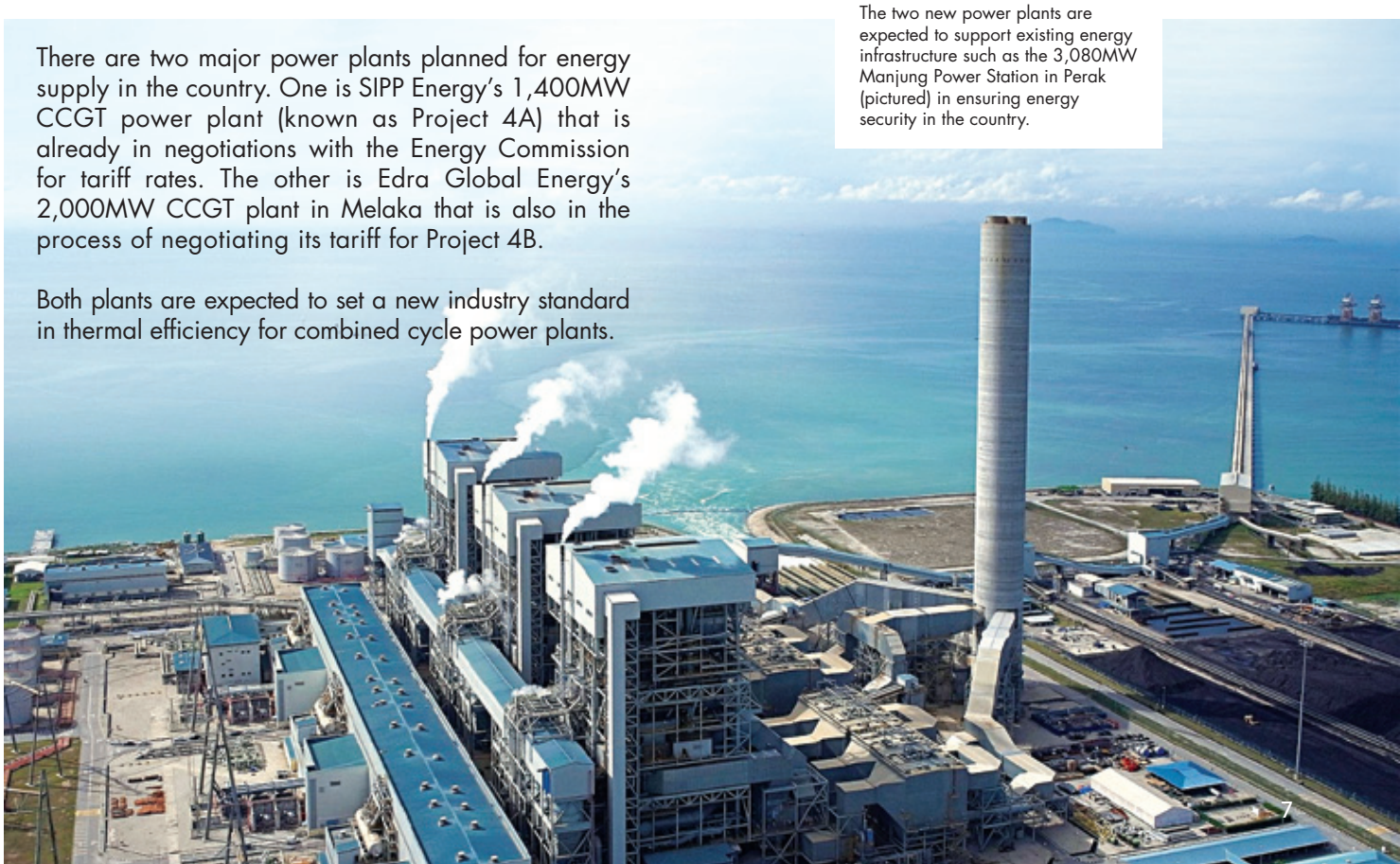
Datuk Razali Ibrahim, Deputy Minister in the Prime Minister's Department explained that the Gas Supply (Amendment) Bill 2016 will enhance competitiveness and create a level playing field for gas importers and suppliers.

Datuk Razali Ibrahim, Deputy Minister in the Prime Minister's Department noted that the goal of the amendments was also to enable an effective implementation of the Third Party Access (TPA) system that will allow more players, apart from Petronas currently, import and supply liquefied natural gas (LNG) using existing facilities at regasification terminals. The *Gas Supply (Amendment) Bill 2016* is also expected to create equal opportunities for gas importers and suppliers and enhance competitiveness, which translates to sustainability and better quality of services for consumers.

Building National Power

There are two major power plants planned for energy supply in the country. One is SIPP Energy's 1,400MW CCGT power plant (known as Project 4A) that is already in negotiations with the Energy Commission for tariff rates. The other is Edra Global Energy's 2,000MW CCGT plant in Melaka that is also in the process of negotiating its tariff for Project 4B.

Both plants are expected to set a new industry standard in thermal efficiency for combined cycle power plants.



The two new power plants are expected to support existing energy infrastructure such as the 3,080MW Manjung Power Station in Perak (pictured) in ensuring energy security in the country.

Expanding to Turkey

~~Malaysian~~ Prime Minister Datuk Seri Najib Razak looks at the share certificate received by TNB's President and CEO, Datuk Seri Ir Azman Mohd *(right)* from GAMA Holding Executive Vice President, M Arif Ozozan *(left)*. With them is Foreign Minister Datuk Seri Anifah Aman (second right).

Malaysian national utility, Tenaga Nasional Berhad (TNB), made significant progress in its foray into Turkey's rapidly-expanding energy sector with the successful transfer of shares from GAMA Enerji AS—Turkey's power and water infrastructure development company—to Global Power Enerji AS, a wholly owned unit of TNB. In December 2015, TNB acquired a 30% stake in GAMA Enerji, which is a subsidiary of GAMA Holding, one of the most prominent conglomerates in Turkey with activities in construction, EPC contracting, concessions, trade and energy/water investment.

M Arif Ozozan, GAMA Holding's Executive Vice President exchanged the GAMA Enerji share certificates with Datuk Seri Ir Azman Mohd, TNB's President and CEO, in a ceremony witnessed by Malaysian Prime Minister Datuk Seri Najib Razak and Tan Sri Leo Moggie, TNB's Chairman. Its position as one of the largest energy markets in Europe and an annual 6% growth in power consumption makes Turkey an attractive destination for TNB.

Long-Term Goals

One of the world's largest natural gas plants and Australia's biggest resources project has started production. The US$52 billion Gorgon liquefied natural gas (LNG) project off Australia's northwest coast shipped its first cargo in March, a significant milestone for the project. Australia has several other LNG plants in the pipeline and is predicted to overtake Qatar as the world's biggest liquid natural gas producer by 2020.

The collapse in oil prices, which places pressure on the value of LNG, and an excess of supply have been hurting energy companies, but Chevron, the second biggest US oil firm, said the long-term fundamentals for LNG are attractive. "We expect legacy assets such as Gorgon will drive long-term growth and create shareholder value for decades to come. The long-term fundamentals for LNG are attractive, particularly in the Asia Pacific region, and this is a significant milestone for all involved," Chevron's chairman and chief executive John Watson told *Agence France-Presse*.

The Gorgon LNG project by Chevron in West Australia, is projected to produce enough LNG to overtake Qatar by 2020.

Suruhanjaya Tenaga
Energy Commission

Safe And Efficient Usage Of Electricity

Test the automatic circuit breaker switch in your home today!

Automatic circuit breaker switches found in the electrical distribution board in your home are to protect you and your family from the dangers of electric shock.

Ensure that the automatic circuit breaker sensitivity does not exceed **100 mA or 0.1 A** and is tested at least once a month to ensure that it always functions satisfactorily.

A simple way to test the automatic circuit breaker is to press the test button (marked 'T'). Automatic circuit breaker switch that works well will trip when the test button is pressed and you can restore the switch to its original position.

If the automatic circuit breaker switch does not trip after the test button is pressed, you should immediately consult a Registered Electrical Contractor for inspection and replacement of the automatic circuit breaker switch.

If you are using an **electric water heater** in the bathroom, make sure that the automatic circuit breaker switch with a sensitivity of not exceeding **10 mA or 0.01 A** is installed in the water heater circuit.

VALUE OUR LIVES. AVOID ACCIDENTS AND WASTAGE!

PRACTISE EFFICIENT WAYS OF USING ELECTRICITY

Switch off electricity when not in use. The more you waste, the more you pay.

Use energy-efficient electrical appliances such as refrigerators, fans, TV, lights and air-conditioners with energy efficiency labels.

Use electrical appliances at moderate speed, temperature and load.

Use natural lighting and ventilation to reduce the use of electrical appliances.

Monitor the electricity consumption level at your premises.

Energy Commission | No. 12 Jalan Tun Hussien, Precinct 2, 62100, Putrajaya
Toll Free Number: 1 800 2222 78 | Telephone: 03 8888 8500 | Fax: 03 8888 8637 | Website: www.st.gov.my

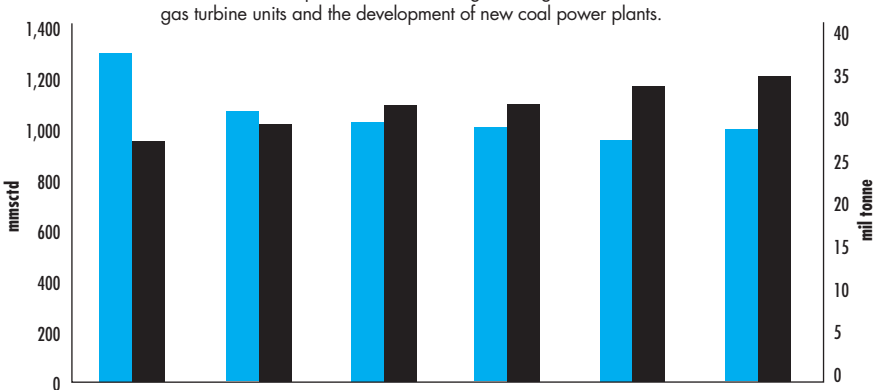
Competitive Gains

Liberalisation and the Development of the Gas Sector

The Malaysian gas industry is one of the country's most important sectors, essential to national economic growth. **Datuk Ir (Dr) Abdul Rahim Hashim, Vice Chancellor of Universiti Teknologi Petronas (UTP)** pointed out that the ongoing amendments to the *Gas Supply Act 1993* and the proposed liberalisation of the sector are expected to strengthen the industry by enhancing effectiveness and efficiency of supply throughout the sector.

PROJECTED GAS AND COAL CONSUMPTIONS

The forecast trend for primary energy supply for 2015 to 2020 showing a decline in the dependence on natural gas owing to the retirement of gas turbine units and the development of new coal power plants.



	2015	2016	2017	2018	2019	2020
Gas	1,285	1,051	1,285	1,285	1,285	1,285
Coal	27	29	27	27	27	27

Source: Peninsular Malaysia Electricity Supply Industry Outlook 2016

Strengthening the industry will require competent and skilled manpower. To this end, UTP was established by PETRONAS—Malaysia's national oil company—in 1997 to see to it that the country produces experts in engineering fields, particularly in relation to the oil and gas sector. The university offers five engineering, three technology and two science programmes at graduate and undergraduate levels to the more than 30,000 students who have passed through the institution.

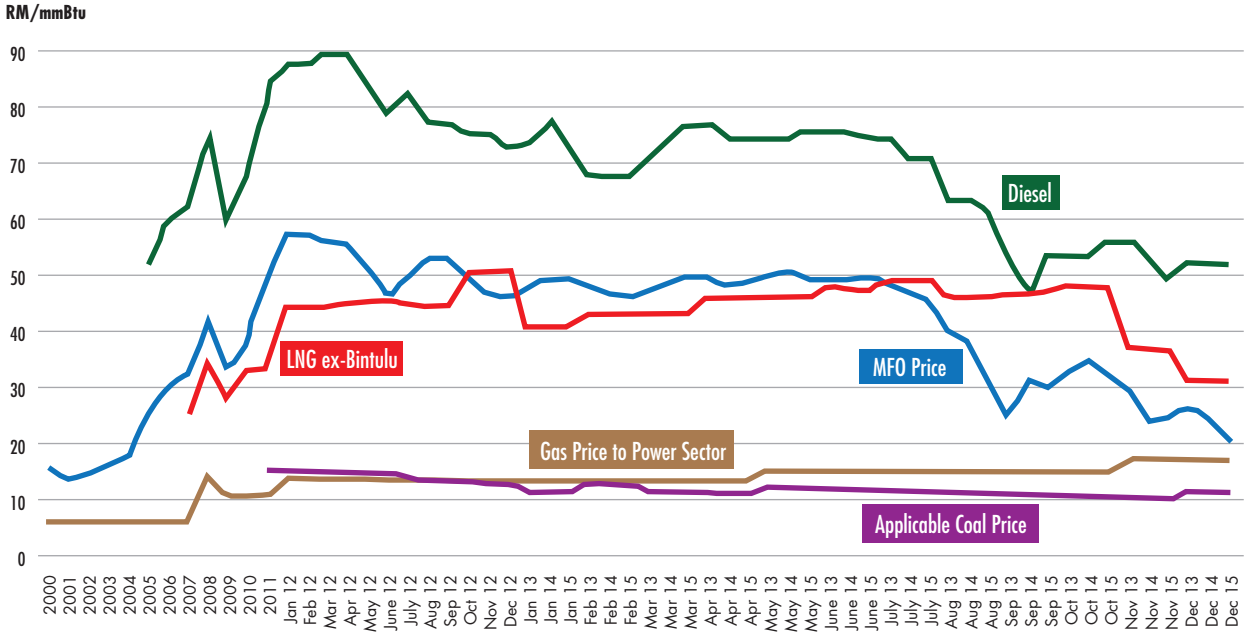
"The majority—about 60%—of the graduates enter the oil and gas industry, and the remaining enter other sectors of the economy. Since the pioneering set of graduates in 2001, there have been about 4,000 UTP alumni in PETRONAS, and the remaining are spread out throughout the oil and gas industry," Datuk Abdul Rahim explained. He noted that while the numbers are encouraging, as the country develops and advances, the need for more engineers in the industry will grow.

One instance is in the proposed Third Party Access (TPA) that will allow other players' entry to the import and sale of gas in the country. Implementing the system in Malaysia would require training manpower with the skills required to effectively manage the transition and the system. This means understanding the various codes that need to be developed as guidelines and assigning individuals with relevant backgrounds to undergo training in countries such as the UK and Australia that have had experience in implementing a third party system.

THIRD PARTY ACCESS

Liberalising an industry is a crucial phase in its development, a step that starts with the government funding a platform with infrastructure and facilities to attract investors. An example is the Malaysian electricity sector and TNB being the initial single generator, distributor and supplier, and the eventual liberalisation to include other independent power producers (IPPs). Datuk Abdul Rahim noted that "when the industry matures, then it is time to bring in some competition because sometimes legacy players may not be as competitive in providing services; one has to ascertain whether the prices they offer are competitive."

AVERAGE FUEL PRICE TREND IN RM/mmBtu



Source: Peninsular Malaysia Electricity Supply Industry Outlook 2016

The electricity tariff was reviewed under the IBR framework—comprising a base tariff and the Imbalance Cost Pass-Through (ICPT)—in January 2014. Fuel and other generation costs will be reviewed every six months to reflect an increase or decrease in market prices and generation-specific costs.

To do so, legacy players are benchmarked and their operations ring-fenced to regulate them and ensure that they remain competitive. Mechanisms such as the Incentive-Based Regulation (IBR)—a system that uses rewards and penalties to enhance the performance of utilities—have also been implemented, in 2014 for the electricity industry (as part of the Malaysian Electricity Supply Industry (MESI) reforms) and commenced on 1st January 2016 for the natural gas sector. Opening the market to more players is also a means to encourage competition and performance.

But what does it really mean? Datuk Abdul Rahim pointed out that the phrase "market price" and the word "competitive" tend to leave people with thoughts of cheaper tariffs. "There's always the misnomer that when you liberalise, you get cheaper energy. It is not always so," he said, adding, "In Europe, prices increased after the energy industry was opened. The question is whether we can bring more players on board who can get gas elsewhere and put it into the gas grid and distribution system available in the country."

In essence, opening the industry to third party players (such as IPPs with gas-fired plants) will allow such participants to bring in natural gas, which they can import more competitively from their choice of sources: the Middle East, the US or Africa. They use existing facilities, which they pay a tariff for and distribute the gas to either their own plants and facilities, or sell to other

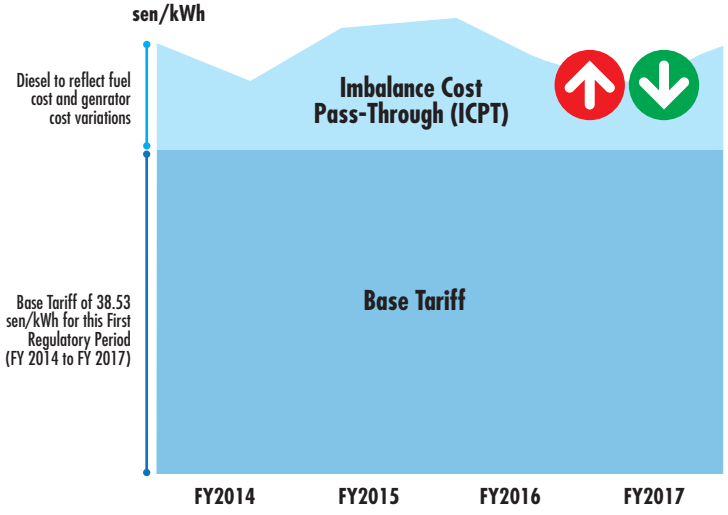
> *"Interventions—such as the proposed liberalisation of the gas sector—are required to make the market more effective and efficient."*
>
> **- Datuk Ir (Dr) Abdul Rahim Hashim**
> Vice Chancellor of
> Universiti Teknologi Petronas (UTP)

interested parties. "And that is what the amendments to the Gas Supply Act is all about. It is to liberalise the market, make it more competitive and at the same time ensure that supply is not hindered."

TARGETED ASSISTANCE

The ongoing proposal to liberalise the gas sector, remove subsidies, and amend the *Gas Supply Act* and base tariffs on market prices will create a more effective and competitive industry. Prices will become more volatile and fluctuate depending on the global cost of energy. An example is the worldwide decline of crude prices that allowed the cost of petrol to stay low even without subsidies. However, if international prices increase, so will the price of petrol in the country.

ICPT MECHANISM



Source: Peninsular Malaysia Electricity Supply Industry Outlook 2016

Peninsular Malaysia's electricity tariff is determined through the Imbalance Cost-Pass-Through (ICPT) mechanism under the Incentive Based Regulation (IBR) framework that takes into account the prices of piped gas, LNG, coal, medium fuel oil, distillate and other generation costs such as those related to the Purchase Power Agreements (PPAs), displaced cost from renewable energy and the cost of importing electricity.

Subsidies are usually not meant to last forever, and instead are frameworks to start off an industry. "Ultimately, every industry and consumer should go on a market price basis, then you know whether you are really competitive in the market with your products and services. Are you competitive or is it only because of subsidies?" Datuk Abdul Rahim asks. Another question is whether the consumers benefit directly from the subsidies.

"Sometimes, they may not. Implementing subsidies have to be undertaken strategically, because who gets to enjoy the subsidy—is it companies (from higher profits) or is it a pass-through where the benefits go to consumers directly?" Using the across-the-board subsidy of petrol as an analogy, he pointed out that the benefactors were people who have cars with bigger engines, and not a motorcyclist whose engine capacity is only 50cc. Subsidies have to be targeted; where the bulk of the energy goes needs to be considered, as well as who benefits from it.

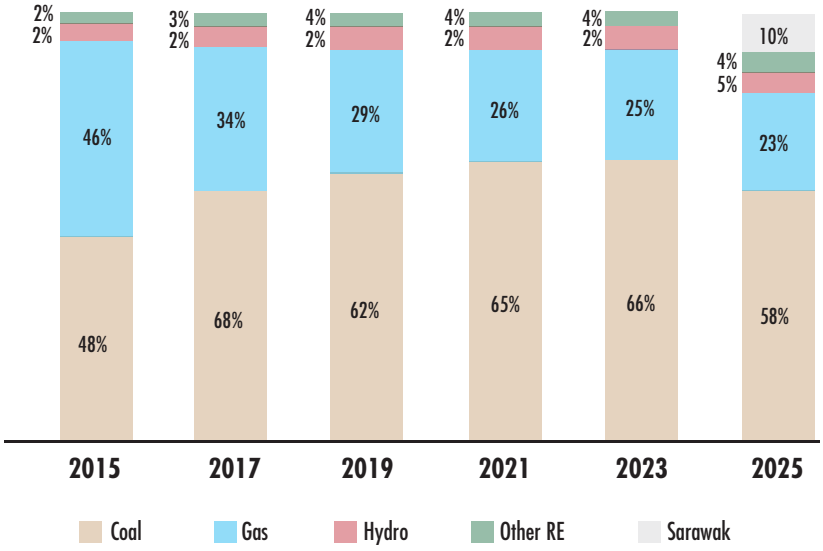
NATIONAL CORNERSTONE

Moving forward, the gas sector will remain a critical part of national development, with a major share of energy consumed by the

Comprising a regasification terminal (such as the Petronas terminal pictured) with a 200,000 cubic metres capacity, the Pengerang Regasification Terminal is expected to receive LNG from local and international carriers when it becomes operational in 2017.

APPROVED GENERATION MIX (2015-2025)

Consumer awareness about electricity consumption and energy efficiency has increased, with growing implementation of renewable energy (RE) projects. The RE share in the overall fuel mix is projected to gradually increase up to 3% of total energy generated in 2020.

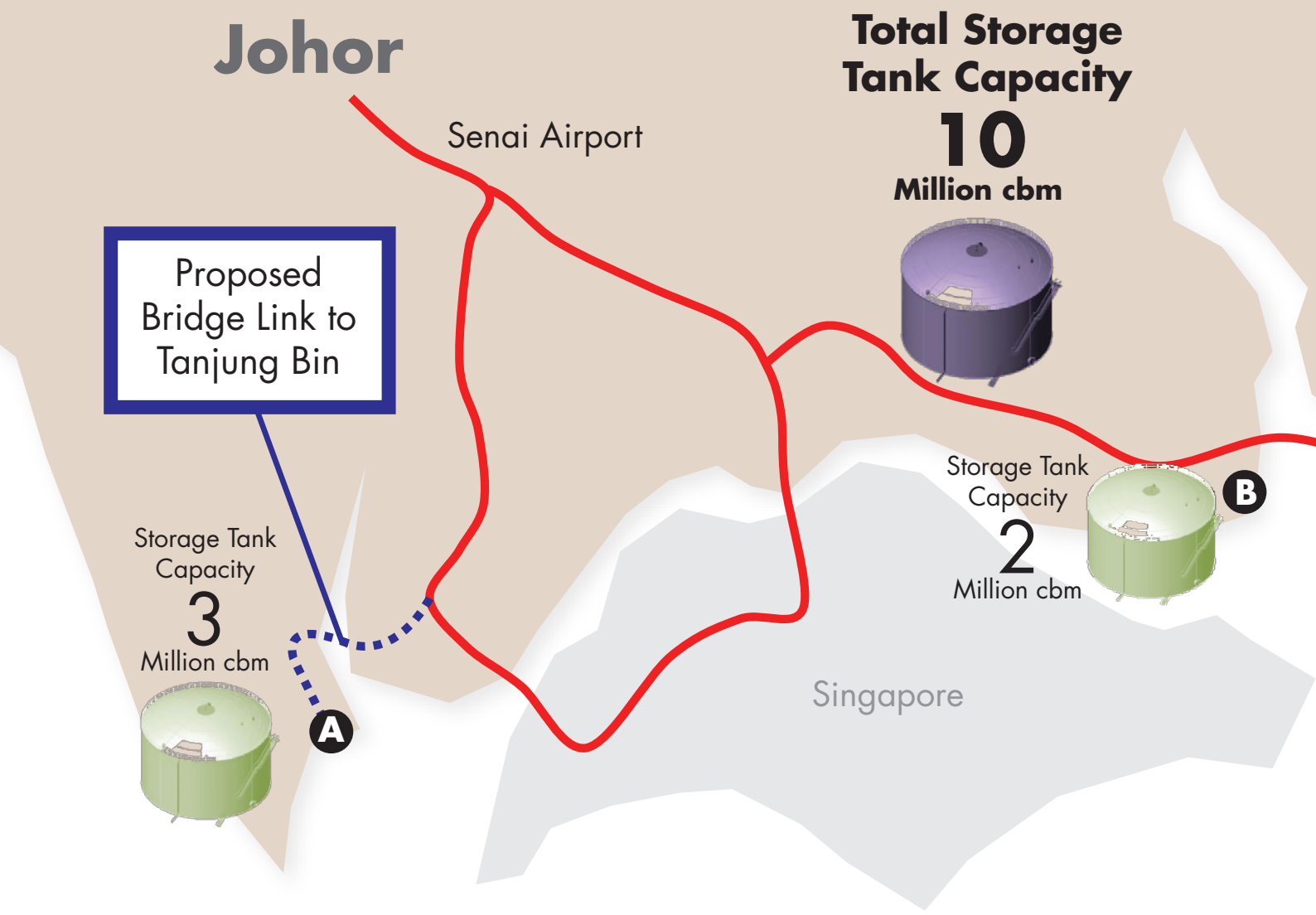


Source: Peninsular Malaysia Electricity Supply Industry Outlook 2016

manufacturing and industrial sector. It is to this end that the Malaysian government is pushing for reasonable and competitive gas prices to encourage and attract foreign and local investment to the country. Datuk Abdul Rahim points out that at the same time, energy prices should not be overly subsidised, particularly for energy-intensive industries.

The idea, Datuk Abdul Rahim explains, is to move to higher value-added type of industries that are more service-based rather than the basic manufacturing, which consumes more energy resources. "I think the *Economic Transformation Programme* (ETP) outlines the framework for which sectors we should focus on, as well as trying not to attract energy-intensive industries. The services industry is getting bigger as the country tries to increase the sector's contribution to the national economy to 80%, with 20% from manufacturing. And even then, the manufacturing sector should comprise high-end manufacturing."

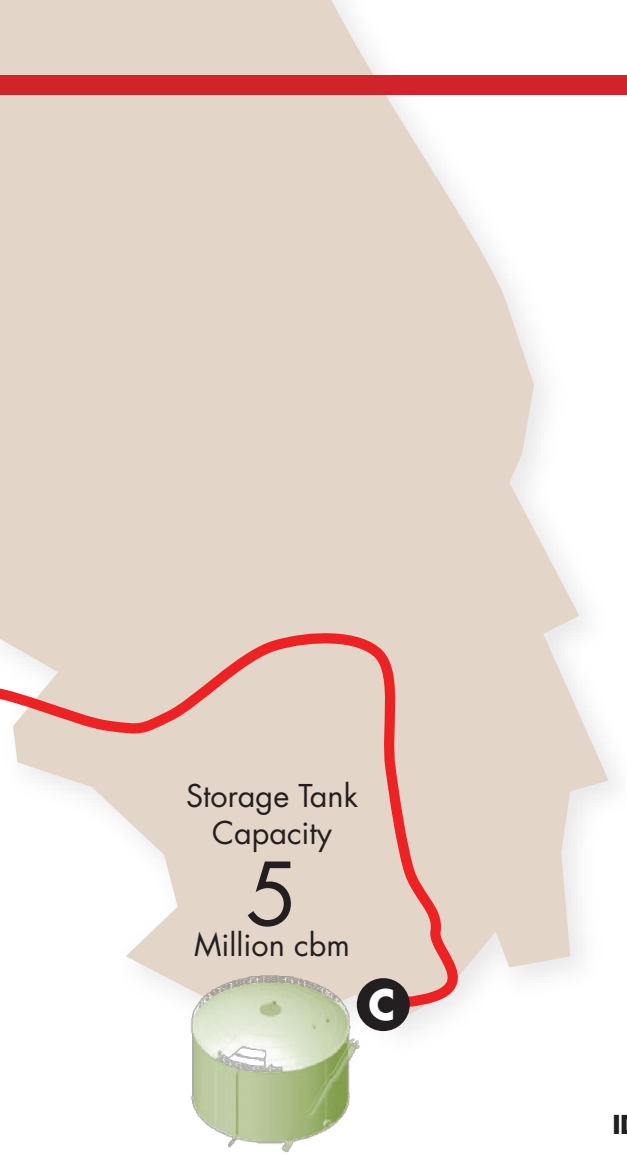
Opening the gas industry to third party players and the proposed amendments to the Gas Supply Act are aimed at securing energy supply and availability, while strengthening effectiveness and efficiency in the industry. Datuk Abdul Rahim noted that energy policies may need to be revised more often to address issues of demand and the pervasiveness of technology in the industry. "You can then overlap them and see that the energy policy is robust and structured, and has its end objective in ensuring that energy supply is available, attracting local and international investments while remaining sensitive to CO_2 emissions and the impact of global warming." EM



Fuel for Transformation

The Pengerang Integrated Petroleum Complex

With numerous pivotal projects in the pipeline and impending amendments to gas supply legislation that will allow third party access to the local gas market, Malaysia's oil and gas industry is set to undergo a substantial conversion. This is in tune with government measures, set out in the Economic Transformation Programme, to ensure that the economic viability of the industry remains intact in the face of uncertainty in both upstream and downstream markets. The Pengerang Integrated Petroleum Complex (PIPC) is one of these endeavours; a massive development in the southern tip of the Malaysian peninsula with the task of processing oil and gas imported into the country. **Energy Malaysia** takes a tour around this mega project to learn more about it.



If all the proposed projects see completion, South Johor will have a potential oil storage capacity of 10 million cubic metres.

THE SOUTH JOHOR PROJECT LINEUP

A. Tanjung Bin
- Oil storage
- Developer: Seaport Worldwide
- Current storage capacity : 890,000 cubic metres

B. Tanjung Langsat
- Oil storage, marine services, steel, oilfield services and equipment (OFSE), chemical
- Developer: Johor Corporation
- Current storage capacity: 820,000 cubic metres

C. Pengerang
- Oil storage
- Current storage capacity: 1.3 million cubic metres

Source: Johor Petroleum Development Corporation Berhad

IDEAL LOCATION

A district in the Malaysian state of Johor, Pengerang sits to the East of Singapore, with a coast that stretches along the Singapore Strait. PIPC occupies a 20,000-acre plot of this district, and planned projects that can be contained within its perimeter are oil refineries, naphtha crackers, petrochemical plants, a liquefied natural gas (LNG) import terminal and a regasification plant.

As it is located along a major international shipping tract, the complex is connected to global oil and gas networks, including the Middle East-Singapore-China lane, and can readily accept vessels originating from all corners of the world. It is also a stone's throw away from the thriving regional trading hub that is Singapore, spurring further growth in the area.

Additionally, at 24 metres deep, the waters around the complex are deep enough to accommodate very large crude carriers (VLCCs) and Ultra Large Crude Carriers (ULCCs), which give these massive tankers unhindered access to the jetty. Once anchored in, the crew would not have to worry about the ships being at the behest of nature, as the harbour is sheltered from storms.

CAPABLE HANDS

It is a challenging task to effectively oversee such a large-scale project and ensure that everything transpires without running aground. Therefore, to keep the wheels turning on all the projects within the PIPC and storage hubs, a new Federal Government agency called the Johor Petroleum Development Corporation (JPDC) was formed.

JPDC serves as a subsidiary to Malaysia Petroleum Resources Corporation (MPRC) whose role is to nurture and strengthen the oil and gas services sector of the nation. In comparison, JPDC's main responsibilities are more focused as it coordinates industry projects in the state. Hence, it is entrusted to manage the development of the PIPC.

The state-level corporation also serves as a one-stop information centre on which investors, oil and gas stakeholders, interested parties and the local community can call upon for enlightenment on the project. JPDC's Board of Directors consists of a well-balanced mix of representatives from both the Malaysian Federal Government and the Johor State Government, which helps streamline the government's efforts in guaranteeing the success of the PIPC.

PERTINENT PROJECT

The PIPC has been labelled as a vital component that is of benefit to not only the local economy, but the national one as well. The Economic Council, which convened on the 13th of February 2012 and was chaired by the Prime Minister of Malaysia Datuk Seri Najib Razak, stated that the PIPC is a "national project of strategic importance." It is a glaring indication of the strength of the backing given by the government of Malaysia for the undertaking.

By the following year, two significant projects have been confirmed for the PIPC area. The first is the Pengerang Independent Deepwater Petroleum Terminal (PIDPT), which is a RM5-billion joint-venture between an integrated specialist technical services provider in the oil, gas and petrochemical industry, DIALOG Group of Malaysia, a supplier of logistics and distribution services to the chemical and oil industry, Royal Vopak of Netherlands, and Johor State Secretary Incorporated (SSI).

Construction of this terminal is well underway, with sizeable land reclamation of an estimated 500 acres. The total storage capacity available at PIDPT is planned for five million cubic metres by the year 2020.

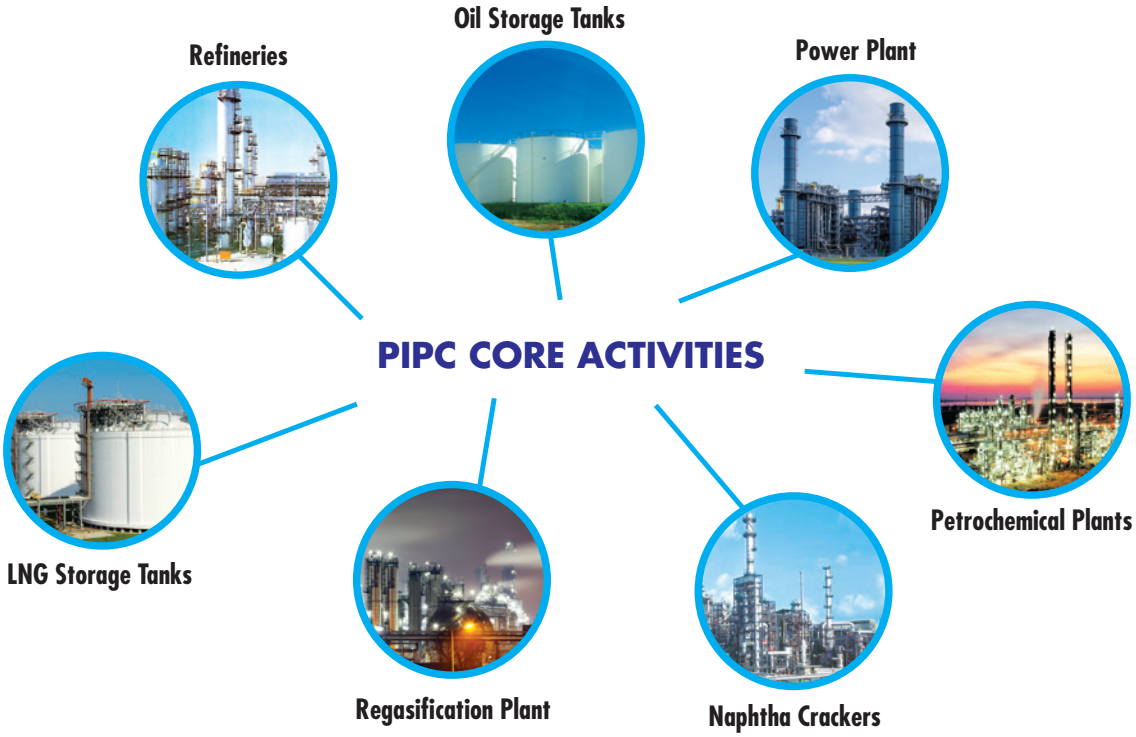
Malaysian oil giant Petronas helms the second PIPC venture, the Refinery and Petrochemical Integrated Development (RAPID) Project. The RM60-billion project is being prepared for commissioning in 2016. With a 300,000 barrel per day capacity, RAPID is set to become a refining powerhouse.

Petronas is making good progress with the project. It has recently set into operation its material offloading facility (MOLF) at Tanjung Setapa, which, together with a second MOLF

THE PENGERANG APPEAL

Strategic Location at The Southeastern Tip of Peninsular Malaysia

- Access to existing **major international shipping lanes** Middle East –Singapore –China
- **Water depth of 24m** accommodates very large crude carriers (VLCCs) and ultra large crude carriers (ULCCs)
- **Safe and sheltered harbour**
- No breakwater required with sufficient seagoing passage for VLCCs and ULCCs
- Low negative socioeconomic impact
- Availability of sufficient development land
- **A single candidate plot in excess of 20,000 acres**
- **Very few Environmentally Sensitive Areas** (ESAs) which are easily preserved
- Proximity to an existing major trading hub; **Adjacent to Singapore**



The sizeable Pengerang Deep water Petroleum Terminal will be a pertinent enabler in the Pengerang Integrated Petroleum Complex 's bid to become a regional oil and gas hub.

that will be opened in Teluk Ramunia, will cater to the demands of the RAPID project. These two are equipped with berthing facilities to accept bulk cargo.

INDUSTRY BASTION

With unstable prices and uncertain crude oil outlook currently putting a damper on the sector, many companies built on a foundation of oil and gas are paring down on human capital. This has led to a situation where job opportunities are not that many within the industry.

However, the prospects are not entirely bleak, as the PIPC shines like the light at the end of the tunnel. Growing at a healthy rate and posting a considerable appetite for qualified personnel, the mega project has been the recipient of oil and gas workers hailing from across the country, who find it nearly impossible otherwise to secure a job in the field.

With the first phase of the project currently on track for completion by the turn of the decade, the PIPC is expected to reinvigorate the industry. Once up and running, the PIPC will catalyse new high-value and high-demand products and by-products.

These include polymers, plastics and pharmaceutical products, which will be created from the refined feedstock. In creating these products, Malaysia's petrochemical complexes will be able to generate greater value and investments from its oil and gas sector.

With its promise of pumping in more oil and gas business into the country and bolstering the sector against the degrading effects of fluctuating global industry trends, the PIPC is a crucial addition to Malaysia. It is already showing great potential of changing the local energy landscape for the better, and all that remains is to await when it starts running at full steam and reap the economic benefits the project will bestow. EM

Securing the Sector

Market Liberalisation and LNG Supply

As Malaysia is a producer of oil and gas, hydrocarbons – particularly natural gas – play an important role in its economy. Not only is it one of the main feedstock for power generation, it is also a key export item and revenue generator for the country. However, in recent years, LNG in Peninsular Malaysia has faced several challenges, with demand increasing but supply diminishing. Energy Malaysia speaks with **Ir. Roslee Esman, Director of Gas Development and Regulation at the Energy Commission**, about the situation.

According to Ir. Roslee, the gas supply has been steadily declining since 2008 as maturing oil and gas fields have led to a slowdown in production. This has led to a situation where consumption is outstripping supply, as seen in 2015 when piped gas supply was at 1.916 billion standard cubic feet per day (scfd) while demand stood at 2.222 billion scfd.

The seriousness of the situation was further emphasised when production in the aforementioned oil and gas fields, which are mainly located offshore Peninsular Malaysia's east coast could be affected at any time as most of the fields are maturing and are being exhausted.

The challenge therefore is to ensure adequate supply of gas in light of rising demand. Presently, the shortfall is overcome by buying natural gas from Indonesia, as well as from joint-development fields. These include the Joint Development Area between Malaysia and Thailand (MTDJA) and the Commercial Arrangement Area (CAA) between Malaysia and Vietnam.

In addition, and in line with the Economic Transformation Programme (ETP), an LNG Regasification Terminal (RGT) has been built in Sungai Udang, Melaka. The terminal commenced operation in May 2013, enabling LNG to be brought in, converted into gaseous state and then fed into the Peninsular Gas Utilisation (PGU) pipeline, which is the main gas transmission pipeline for Peninsular Malaysia. In total, 2,019 kilotonnes of oil equivalent (ktoe) of LNG was imported to Malaysia in 2014, compared with 1,450 ktoe in 2013. A second RGT is currently under construction in Pengerang, Johor.

The completion of the RGT in Melaka is also an important development for Malaysia's energy security. It "enables the import of LNG from any LNG source in the world, which can then be sold to domestic consumers. Therefore, it is a crucial step towards market liberalisation." Indirectly, liberalisation of the gas industry will be beneficial to the consumers and country.

The liberalisation is being implemented in the form of the *Gas Supply (Amendment) 2016 Bill*, which was passed by the Senate on 14 June 2016.

"Most of our offshore fields are maturing, so supply of gas can be affected at any time, and that will cause problems for electricity generation and local industries that rely on gas. This is why the RGT in Melaka and the upcoming RGT in Pengerang are vital to the country's energy security."

– Ir Roslee Esman
Director, Gas Development and Regulation Division, Energy Commission

GAS LICENCES UNDER THE AMENDED GAS SUPPLY ACT

REGASIFICATION
A licence to operate an RGT terminal to convert LNG to gaseous state

TRANSPORTATION
A licence to transport gas through transmission pipelines

IMPORT
A licence to import LNG into Malaysia

PRIVATE GAS
A licence for those using gas through a piping system but excludes retail activities.

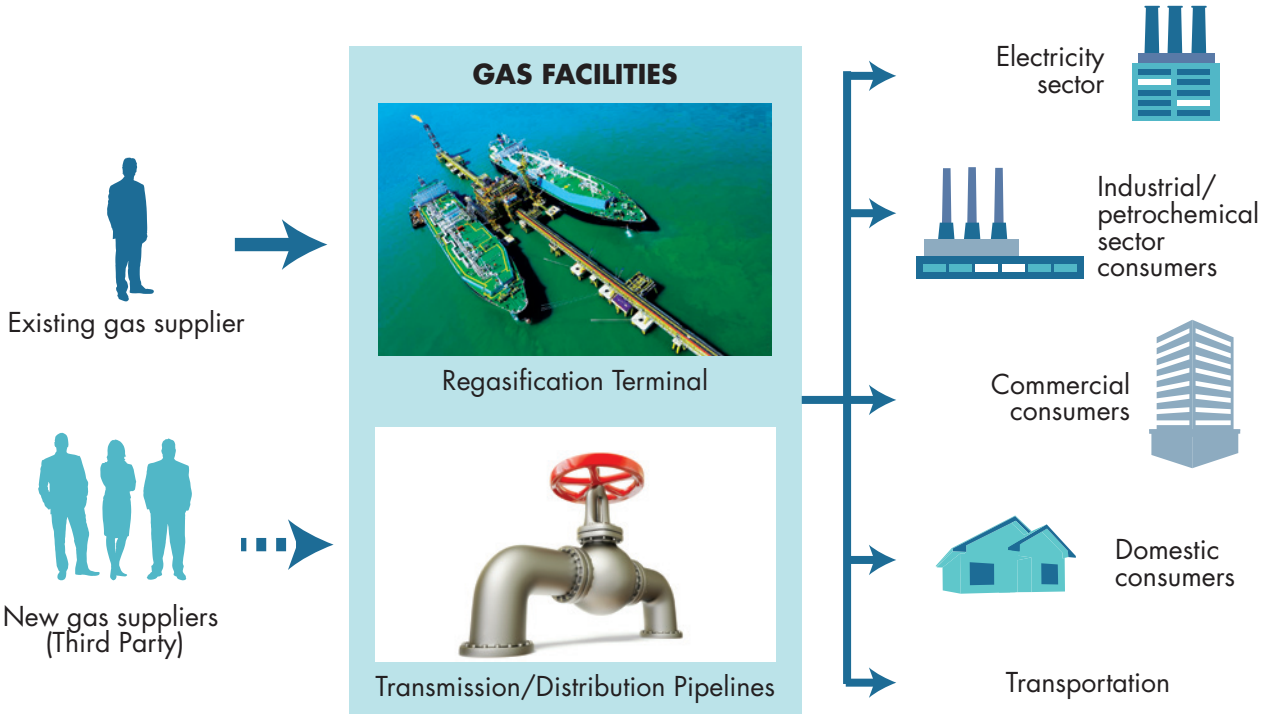
DISTRIBUTION
A licence to distribute gas through distribution pipelines.

SHIPPING
A licence to ship gas through regasification terminals, transmission & distribution pipeline

RETAIL
A licence for selling or using gas through the licencee's piping system to end users, premises such as a shopping complex or apartment

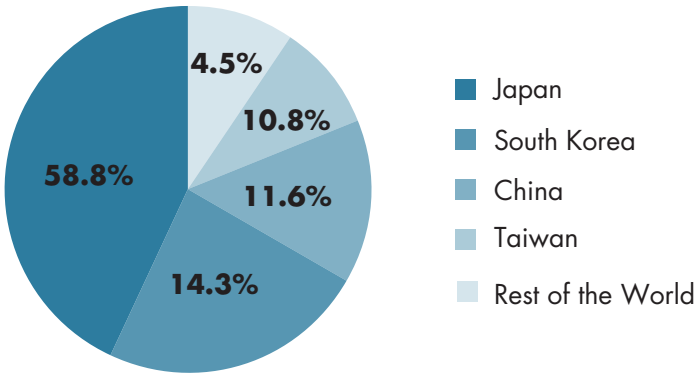
THIRD PARTY ACCESS

Besides infrastructure owners, third parties will also be able to access and utilise gas facilities for the purpose of shipping gas to consumers.

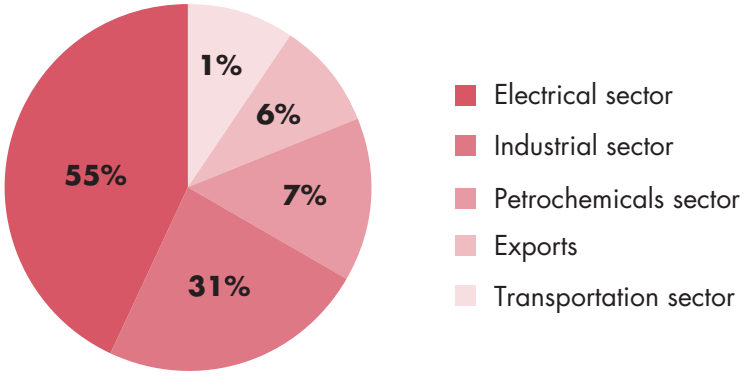


6% or 27,835 ktoe of LNG was exported in 2014. This brought in revenue of RM64.3 billion or 8.4% of Malaysia's export earning.

MALAYSIA LNG EXPORTS (2014)



PENINSULAR MALAYSIA DOMESTIC LNG USE



One of the major aspects of this Bill is the introduction of the Third Party Access (TPA) system that will allow new players to participate in the Malaysian gas market (currently dominated by PETRONAS and Gas Malaysia Berhad).

CREATING NEW LICENCES

The TPA regime will introduce several regulated activities that would need to be licenced. These are import into regasification terminals, regasification, shipping, transportation, distribution, retail and using gas as private licensees.

The amended Act will see a greater responsibility being placed on the Energy Commission, as it will be responsible for monitoring the quality of gas, as well as the supply and security. While the market may be opened to LNG from other sources, the quality must adhere to standards set by the Energy Commission.

The amendments will see the liberalisation of the price of gas to reflect market price rather than being subsidised. Ir. Roslee clarified that the problem with subsidised piped gas is that Malaysia is paying higher market prices for imported LNG and for gas obtained from Indonesia, the MTJDA and the CAA, but selling it to domestic consumers at a highly discounted price.

Furthermore, he is of the view that outreach is important. "(We need) to educate domestic consumers to understand that adopting market prices for LNG will be a massive boost for the Malaysian economy, and will increase competitiveness in the gas industry."

As Malaysia continues to enjoy economic growth, so too will power consumption and demand for natural gas, which is responsible for fuelling more than 40% of electricity production in the country. Therefore, a steady and secure supply of LNG is necessary for energy security. The Gas Supply (Amendment) 2016 Bill aims to do just that. EM

Managed and Maintained

Ensuring Gas Supply Security for National Economic Development

The *Gas Supply Act 1993 (Act 501)* and the *Gas Supply Regulations 1997* were introduced to govern the usage, activities and supply of piped gas, protect the interests of consumers and the public, and ensure that gas supply businesses remain viable. While *Act 501* encompassed a wide range of administrative and technical aspects (such as reliability, safety, quality and efficiency), it is important to note that the Act is not applicable throughout the gas supply system, and only relates to the Peninsula and Sabah. It only applies to the supply of natural gas through pipelines downstream of the last flange of the city gate station, while natural gas transmission and the lateral pipeline systems up to and including the city gas stations are outside the scope of the *Gas Supply Act*.

"The Energy Commission makes continuous efforts to ensure that the price of natural gas for the non-power sector remains competitive and cost-effective."

Petroliam Nasional Berhad (Petronas)—the national oil and gas company—is the main producer of natural gas in the country. In the Peninsula, the gas is transmitted to the over 2,139km Natural Gas Distribution Network (NGDS) via the 1,416.22km Peninsular Gas Utilisation (PGU) pipeline, through various city gate stations (a facility comprising an array of valves and pressure-reduction systems that meters the gas and reduces the pressure to allow safe delivery to consumers). In Sabah and Labuan, gas is channelled to the non-power sector via an 8,080-metre pipeline.

With 12,568 consumers in the Peninsula and only 23 in Sabah, the challenges in the distribution of piped natural gas in the two regions differ significantly. According to **Nor Azman Meli, Head of Gas Supply Unit** at the Energy Commission, some of the challenges include limited network infrastructure development and expansion, short-term projection due to slowing growth in natural gas demand, and an increasing cost of supply from domestic and foreign sources.

He pointed out that gas supply infrastructure should ideally be in anticipation of demand to enable 'plug and play.' He added that consumers choosing their preferred fuel should give priority to energy efficiency and environmental issues, in which natural gas has been proven to be energy-efficient and greener compared to other alternatives."

In Sabah, the gas supply issues encountered are due primarily to low demand. In addition, demand centres are spread far apart, "which makes laying pipelines capital intensive, combined with the absence of pipelines that pass through industrial areas in the state," Nor Azman said.

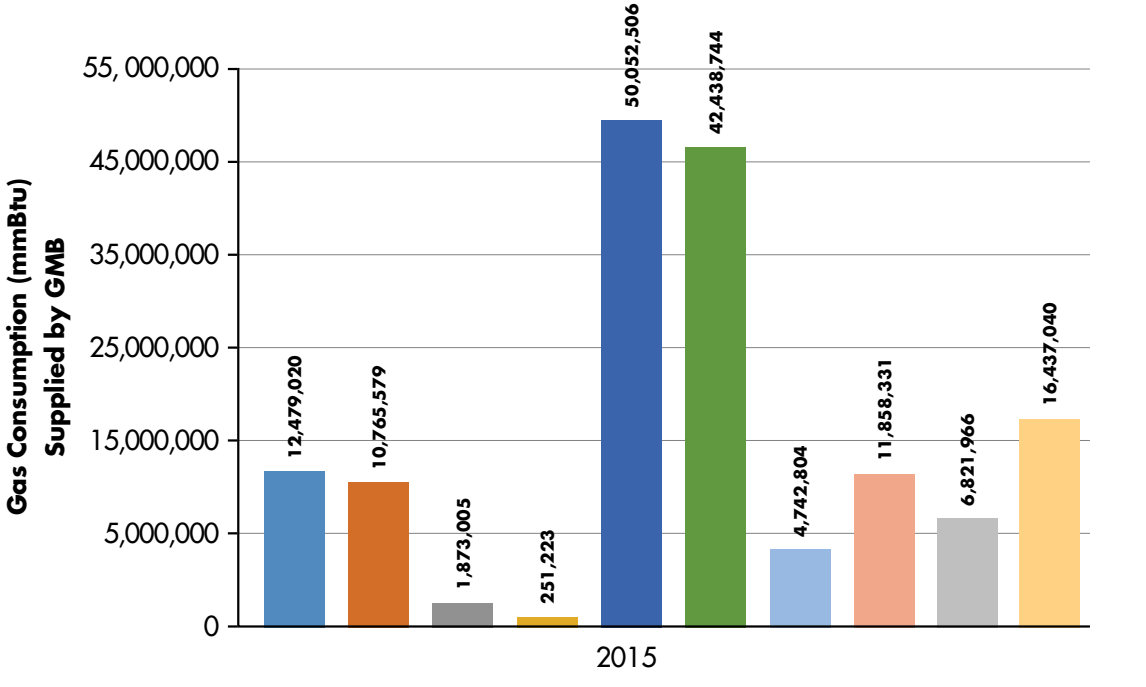
COMPETITIVE AND COST-EFFECTIVE

The Energy Commission is already working to resolve these challenges; through active communication and consultation with the main players in the country, Gas Malaysia Berhad (GMB) and the Sabah Energy Corporation Sdn Bhd (SECSB)—the licensed piped natural gas distributors. Among the Energy Commission's initiatives in the Peninsula is enhancing economic regulatory measures, such as the Incentive Based Regulation (IBR), with an efficient tariff regulatory framework for piped gas distribution licensees.

"This is in line with the Economic Transformation Programme (ETP) in which our national electricity utility and gas utility are regulated efficiently to spur national growth," Nor Azman explained. "The Energy Commission continually seeks for improvements in our regulatory mechanism to ensure that the pricing of natural gas remains competitive and demands are met."

These efforts, in Sabah, include assisting the SECSB in implementing a

Natural Gas Consumption by Industry Sub-sectors in the Peninsula in 2015



Source: Industry Sub-sectors in the Peninsula

Virtual Pipeline System, an innovative solution using delivery tanks to bring gas supplies to consumers who are located in areas where it will not be financially viable to construct new pipelines.

The Energy Commission has also worked with Universiti Teknologi Malaysia-Malaysia Petroleum Resources Corporation (UTM-MPRC) Institute for Oil & Gas and the Sabah Skills and Technology Centre to develop training programmes aimed at developing local engineers and fitters in the gas industry. The course will be promoted through outreach programmes, which will also highlight the important roles played by registered gas competent persons in the installation, operation and maintenance of gas supply systems.

SECURING RELIABLE SUPPLY

The Energy Commission also established the National Gas Taskforce working group comprising stakeholders and government agencies that regularly monitors the gas supply situation in the Peninsula. The aim of the taskforce is to ensure security and reliability of supply of gas to the power and non-power sectors at all times.

"One of the initiatives of the working group is to closely monitor the planned and unplanned shutdowns at the upstream gas facilities that involve main players such as Petronas as well as the Single Buyer of the power sector," Nor Azman said.

He noted that a monitoring status report that contains the latest information for stakeholders is prepared and circulated by the Commission every day during the shutdown period. "This ensures that gas supply to the most critical sectors of the country is effectively managed and maintained."

Average Natural Gas Composition in Peninsular Malaysia

Gas Composition	MT-JDA Gas [Mole (%0]	Kerteh [Mole (%0]
Methane (CH_4)	85.81	94.03
Ethane (C_2H_6)	4.60	2.89
Propane (C_3H_8)	1.38	0.32
Butane and above	0.2	0.17
CO_2	6.52	1.83
N_2	1.49	0.63

Average Natural Gas Composition in Sabah and Federal Territory of Labuan

Gas Composition	Mole (%) Kota Kinabalu, Sabah	Mole (%) Labuan
Methane (CH_4)	92.62	92.43
Ethane (C_2H_6)	3.37	3.29
Propane (C_3H_8)	1.46	1.25
Butane and above	1.03	0.88
CO_2	1.36	1.29
N_2	0.15	0.86

Source: Energy Malaysia

Securing gas supply to the power and non-power sectors ensures that the country's economy continues to advance. The power sector consumes about 50% of the natural gas supplied to the Peninsula, while in the non-power sector, the consumption of piped natural gas is mainly by industrial users, at 99.34%. EM

Fuelling a Sector

Natural Gas in Electricity Generation

As of 2013, Petronas estimates that there are some 50,123 trillion standard cubic feet (TSCF) of reserve natural gas in the whole of Malaysia. This is compared to only 40,400 TSCF in 1993. The abundance of this natural energy source has been put to excellent use as a fuel for the power sector. We look at how the natural gas share in the generation mix has changed over the years, and how much this fuel would influence the future of electricity production.

The 1,071MW combined cycle gas turbine (CCGT) power plant in Seberang Prai, Penang is one of the latest in TNB's generation plant to be powered by gas. Other similar-capacity gas power station projects are currently in the pipeline.

As the national power company, Tenaga Nasional Berhad (TNB) has been ensuring that its over 8 million customers receive a stable, constant supply of electricity. In order to meet this demand, the company relies on several different types of energy sources to generate the electricity. Called the electricity generation mix, TNB's go-to sources include hydropower, gas, coal, oil and diesel.

Thanks to its considerable reserves, and the fact that the fuel itself is among the cleanest-burning non-renewable energy source, natural gas has been the top pick for electricity generation.

A look at the fuel mix confirms this, as it holds the largest share ahead of other energy sources. As part of the electricity generation mix, natural gas comprised 50.4% of all fuel types in 2013, a rise from 41.7% two decades before.

THE COAL COMPETITION

However, natural gas is not the only popular generation fuel in recent years. While it posted the sizeable increase mentioned from 1993 to 2013, the rise pales in comparison to the growth achieved by coal in the same period – 11.6% to 38.0%. **Dato' Roslina Zainal, Vice President of Regulatory Economics and Planning Division** at TNB, explains why the preference of generation fuels shifts periodically.

"TNB does its generation planning on a least-cost basis. Therefore, when coal prices dropped, it became the fuel of choice, resulting in the building of more coal plants such as the ones at TNB Janamanjung in Perak," she says. "We also refer to the Herfindahl-Hirschman Index (HHI), which gauges market power as well as the concentration of certain fuels and commodities. If the index for a certain fuel type hits its limit, we will reduce dependence on that fuel."

That, she adds, is the reason why TNB is now shifting its focus away from coal. "Right now, the HHI for coal has maxed out, necessitating us to look at gas as a more preferable energy source. Additionally, we have to consider the environmental

The gas supply security in the country has been boosted significantly by regasification terminals such as this one in Sungai Udang, Melaka, and another under construction in Pengerang, Johor.

> *"TNB uses about 1,300 MMcf of gas a year, and gas power stations have a service life of 21 years, therefore ensuring that efficient facilities and established redundancies to avoid gas shortages are top priorities."*
>
> **Dato' Roslina Zainal**
> – Vice President of Regulatory Economics and Planning Division at TNB

impacts of having too many coal-fired power stations. This is also in line with Malaysia's commitment in reducing its carbon footprint, which was voiced during the *2015 United Nations Climate Change Conference (COP 21)*."

ENSURING ADEQUATE SUPPLY

As gas makes its return to the forefront, it is crucial that supply security is guaranteed. "There are a few gas power station projects that will come online in the near future – such as the Edra Global Energy Project in Alor Gajah, Melaka and the SIPP Energy Project in Pasir Gudang, Johor – which will join the existing gas-fed power stations. These new stations alone will generate more than 3,000MW of electricity; a testament to their sizes and their fuel needs," Dato' Roslina Zainal states.

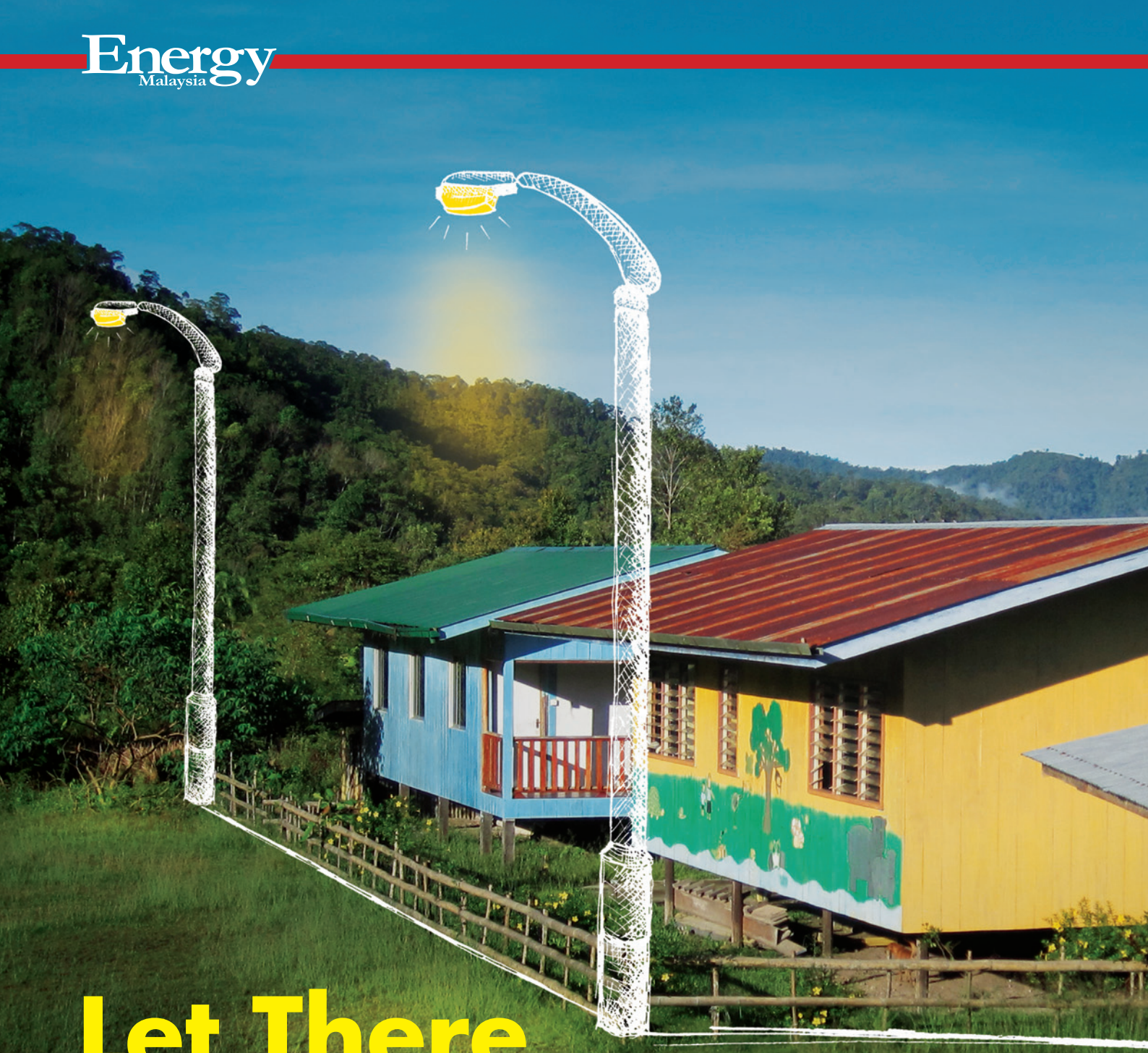
"The regasification terminal (RGT) at Sungai Udang in Melaka has helped safeguard reliable supply of natural gas, and with the Pengerang RGT in Johor well on its way to completion, we are confident that gas supply procurement would not be an issue in the coming years," she adds.

LOOKING AHEAD

With the imbalance cost pass-through (ICPT) framework in place, TNB is also looking at making its customers understand why the natural gas price is going up, with the cost being reflected in the bill. "Most people wonder why natural gas in Malaysia is becoming more expensive despite falling oil prices. The reason is simple: the gradual removal of subsidy by the government," she says. Therefore, until the market price is reached, the upward adjustments will continue periodically.

The *Gas Supply Act* amendments will also bring welcomed change to the local gas industry. The amendments will centre around liberalising the market, allowing other players to come into the picture. "With the expected transparency and openness in the sector, TNB and other players can make their own decisions when it comes to gas procurement," Dato' Roslina Zainal reveals. "We want to see clear, equitable rules and a proper mechanism that will lead to not only more competitive gas prices, but also security of supply."

With electricity demand rising 2% to 3% annually, Dato' Roslina Zainal says that efficient use of electricity is the way to go to help curb accelerated usage of natural gas resources. This can be achieved either by price signals, where time-of-use tariff mechanisms encourage better usage patterns, or government regulations, where allowing only energy-efficient appliances to be sold in the country minimises wastage. Via these measures, the finite reserves of natural gas can last for a longer period. EM



Let There Be Light

Powering Change in Kg Buayan

Air-conditioners, refrigerators, televisions and computers... the electricity to run these power-hungry appliances is something that many in Peninsular Malaysia, especially those in urban areas, take for granted. In East Malaysia, across the South China Sea, it is a different story as many rural areas there are without grid connection to electricity. People living in such parts have to rely on alternative methods of securing electricity, and one village in Sabah has decided to go with the renewable method.

Right: While the capacity of the mini-hydro generator at Kampung Buayan is just 10MW, the improvements it has made to the lives of the villagers have been massive.

Previous page: Having been without electricity since it was founded before the Second World War, the village of Kampung Buayan in Sabah now enjoy regular power supply thanks to the mini-hydro station installed at the nearby Papar River.

Located two and a half hours' drive from Donggongon town in the West Coast Division of Sabah, Kg Buayan is a small community of around 500 people. The village is surrounded by thick rainforest, and not so long ago, people wishing to travel to the nearest town had to hike for almost eight hours. The construction of a dirt road a few years ago has allowed vehicular access to Kg Buayan, cutting travel time considerably.

While road connectivity has been achieved, grid connectivity is a rather more difficult problem to solve. Because of the rainforest and the topography of the land, building transmission towers is out of the question. This limitation also meant that Kg Buayan has been without electricity for most of its existence (which some have calculated to be as far back as before the Second World War).

This all changed in 2009 when the community got together with Tonibung – an indigenous non-governmental organisation focused on encouraging the take-up of renewable energy. A decision was reached to utilise the power of the nearby Papar river by building a mini-hydro plant. Using funds from government agencies and donations, the system was completed and the lives of the villagers have since improved.

For one thing, schoolchildren in Kg Buayan are now able to study past dusk, when in the past, candles and kerosene lamps were not adequate to provide sufficient lighting for reading when the sun went down. And so the performance of students in the village's small primary school has improved since electricity became available.

Another way electricity supply has enhanced people's lives in Kg Buayan is that it allows those making crafts to sell to work later into the night. Speaking to the *Daily Express* newspaper, villager Irene Kodoyou noted that electricity "helps increase their production and with it, better income from craft sales."

MANAGING THE SYSTEM

Although the power generated is 24/7, the people of Kg Buayan still need to be watchful of their consumption since the system's capacity is just 10MW. Therefore, a list of do's and don'ts with regards to electricity usage was drawn up during the planning stages to ensure that the energy is not wasted. In addition, a coordinator has been appointed to manage the system and make sure that everyone adheres to the rules.

This task has fallen on the shoulders of the aforementioned Irene Kodoyou.

Recalling the time when the system was first introduced, Irene noted in an interview with the *Daily Express* that some people were so excited to have electricity that they bought items such as rice cookers which consumed a lot of power. And so the system tripped.

These days, management of power is much better. Instead of every family having an appliance of their own, items such as fridges are shared between people so that energy usage is kept low. Also, members of the community pay a fee of RM2, RM5 or RM10 – depending on their usage. Coordinating the use of energy-hungry appliances and collecting this tariff are two of Irene's tasks. Incidentally, the money is used to help maintain the system as well as pay for other community activities.

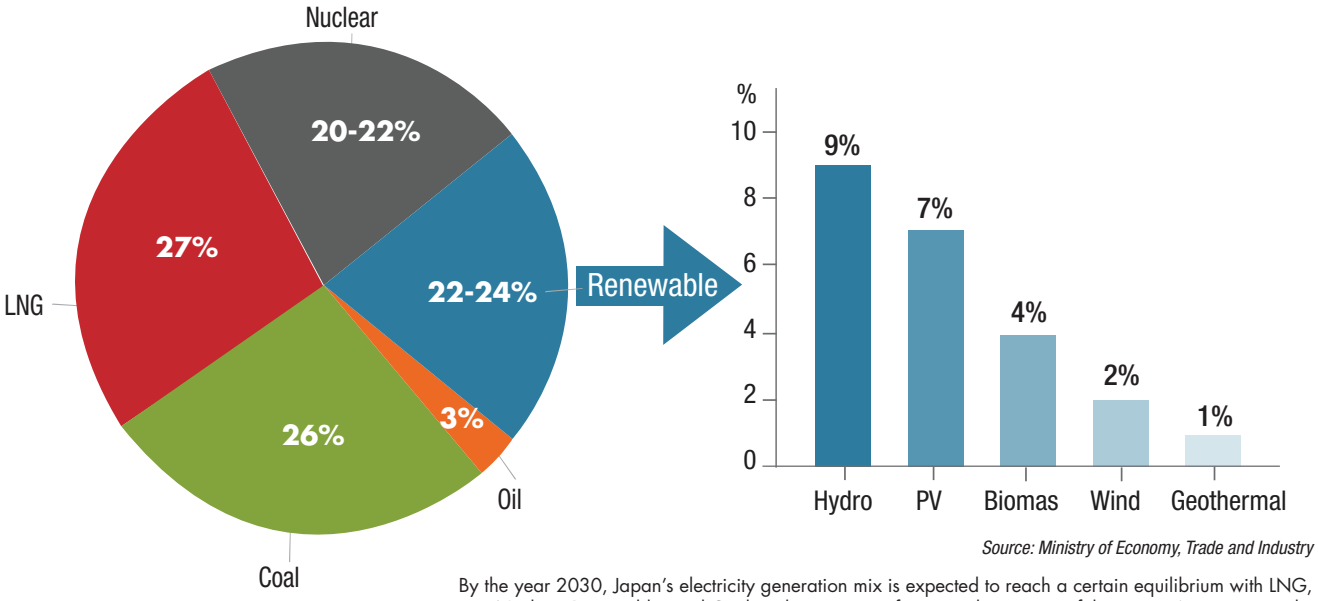
Ultimately, community is the key to the success of the Kg Buayan mini-hydro system. That means everyone has to play their part – in paying what is required of them, in watching their electricity use so that it does not exceed capacity, and in keeping the river clean and free of debris so that the generator can continue to run. Thanks to people power, power is constantly available to the people of Kg Buayan. EM

People Have the Power

Japan Liberalises Its Energy Sector

In many countries, electricity supply is a monopoly, or at best, an oligopoly, where one or a few providers control the market. One of the main problems with such a situation is that it can lead to a lack of choice for consumers who are forced by default to choose one supplier, even if the tariffs are too high. Another complication is a risk of a lack of innovation owing to the dearth of competition. In Japan, a radical plan to liberalise the country's electricity supply sector is sparking the industry.

2030 JAPAN ELECTRICITY GENERATION MIX



Source: Ministry of Economy, Trade and Industry

By the year 2030, Japan's electricity generation mix is expected to reach a certain equilibrium with LNG, Nuclear, Renewables and Coal each accounting for around a quarter of the country's energy supply.

Estimated to be valued at around RM274.4 billion, Japan's electricity retail market has long been the domain of 10 companies operating regionally. The largest of these is the Tokyo Electric Power Company (TEPCO), which is also the fourth largest electricity utility in the world. The next two largest are the Kansai Electric Power Company (KEPCO) – which operates in Japan's second main industrial area and Chubu Electric Power.

That has all changed from April 2016 as more players are being welcomed into the power supply market. This is part of Prime Minister Shinzo Abe's plans to liberalise the industry in order to reduce costs and ensure greater reliability for consumers. This is to be achieved thanks to the increased competition which is expected to spur innovation – in services and pricing – in both existing and upcoming providers.

Analysts at Bloomberg New Energy Finance are confident of the positive impact that such reforms will have on the market, estimating retail electricity costs to go down by 15%. At the same time, it also gives consumers more choice in deciding where their electricity comes from, as they can choose to sign up with a company that uses renewables or with one that does not use coal or nuclear.

Providers have also been getting creative with regards to the services and incentives they are offering. For example, one of the newly registered electricity suppliers is Tokyo Gas, the largest gas distributor in the Japanese capital. The company aims to leverage on its existing customers and sell electricity to them at a discounted rate thus creating a win-win situation.

Another fresh entrant is mobile phone carrier KDDI Corp. It's promotion plan is to give rebates of up to 5% of monthly power rates in the form of electronic cash credits to its mobile phone subscribers.

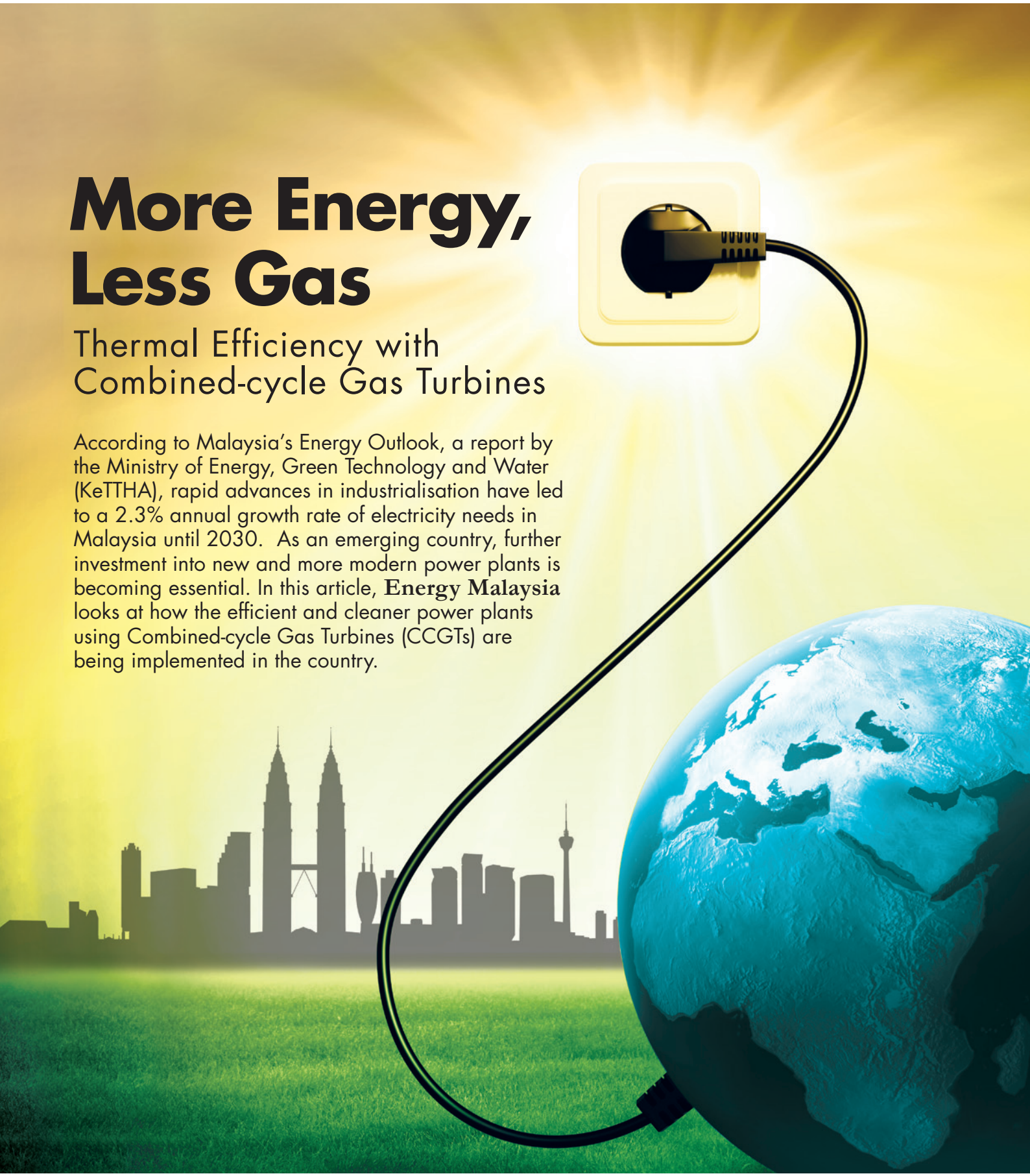
Even long-established players are forming alliances with new partners. According to the Japan Times, TEPCO and telecommunications conglomerate SoftBank Group are linking up to bundle electricity, telephone and internet services in one package for consumers. As competition heats up, more partnerships are expected to be formed, leading to greater benefits for consumers.

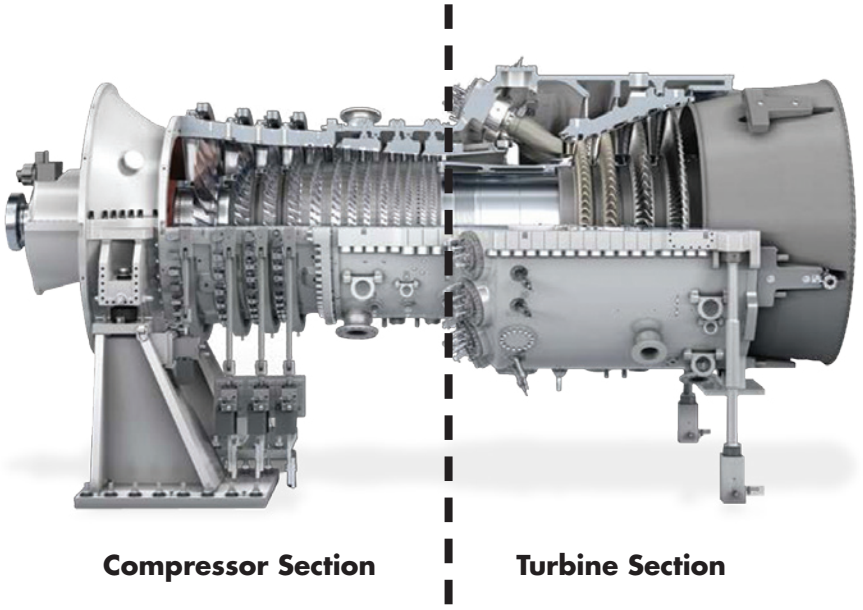
Incidentally, although Japan's population is on the decline, electricity consumption is not. The country's Ministry of Economy, Trade and Industry has anticipated a 22% rise in demand to 1.18 trillion kilowatt-hours from 2013 to 2030. Not only does this mean potential for growth for those in the electricity supply market, it should also spur further improvements in infrastructure and services to meet the expected spike. EM

More Energy, Less Gas

Thermal Efficiency with Combined-cycle Gas Turbines

According to Malaysia's Energy Outlook, a report by the Ministry of Energy, Green Technology and Water (KeTTHA), rapid advances in industrialisation have led to a 2.3% annual growth rate of electricity needs in Malaysia until 2030. As an emerging country, further investment into new and more modern power plants is becoming essential. In this article, **Energy Malaysia** looks at how the efficient and cleaner power plants using Combined-cycle Gas Turbines (CCGTs) are being implemented in the country.





An example of a gas turbine that is used in a combined-cycle power plant.

A combined-cycle power plant uses both gas and steam turbines to produce up to 50% more electricity from the same fuel than traditional simple-cycle plants. The waste heat from the gas turbine is routed to the adjacent steam turbine, which generates extra power. The term "combined-cycle" refers to the combining of multiple thermodynamic cycles to generate power. Combined-cycle operations employ a Heat Recovery Steam Generator (HRSG) that captures heat from high temperature exhaust gases to produce steam, which is then supplied to a steam turbine to generate additional electric power.

An increasing number of gas turbines have an efficiency exceeding 60.0% in its combined-cycle operation, making CCGT power plants among the most efficient in the world.

POWERING UP

With a generating capacity of 1,017 MW, the TNB Prai Combined-cycle Power Plant (CCPP) is currently the most powerful and efficient gas-fired power plant in the Southeast Asian region. The new high-efficiency power plant comprises two blocks of single-shaft combined-cycle gas turbines that utilise the most efficient H-Class technology gas turbine, with an efficiency rate of 59.7%.

Similar class gas turbines are set to drive Malaysia's Pengerang Co-generation Plant (PCP) that will feed electricity to Petronas' nearby integrated petroleum complex in 2017. Once fully operational, the plant will have four cogeneration units, producing 1,220MW of power and up to 1,480 tons per hour of steam.

An aerial view of the Prai Combined-cycle Power Plant (CCPP), which uses advanced gas-turbine technology to realise the highest thermal efficiency for power generation.

PHASING OUT

In East Malaysia, the state government-owned energy company Sarawak Energy has plans to upgrade its 330MW gas-fired power plant in Tanjung Kidurong, Bintulu. The existing open-cycle turbines will eventually be phased out as the new CCGTs are installed for better efficiency.

Currently, about 15% of Sarawak's power generation is from its Bintulu and Miri gas-powered plants and 10% from coal resources. About 75% of Sarawak's current power is derived from the hydropower plants at Murum, Bakun and Batang Ai hydroelectric plants. With the implementation of CCGTs, it is hoped that reliance on coal in the state will eventually be lowered, creating cleaner and more efficient power generation.

Improving thermal efficiency is the first and most important step towards affordable energy. The more efficient use of fuel throughout Malaysia results in affordable electricity tariff for homeowners, schools, government agencies, businesses and industries. EM

HOW A COMBINED-CYCLE POWER PLANT PRODUCES ELECTRICITY

1 Gas turbine burns fuel

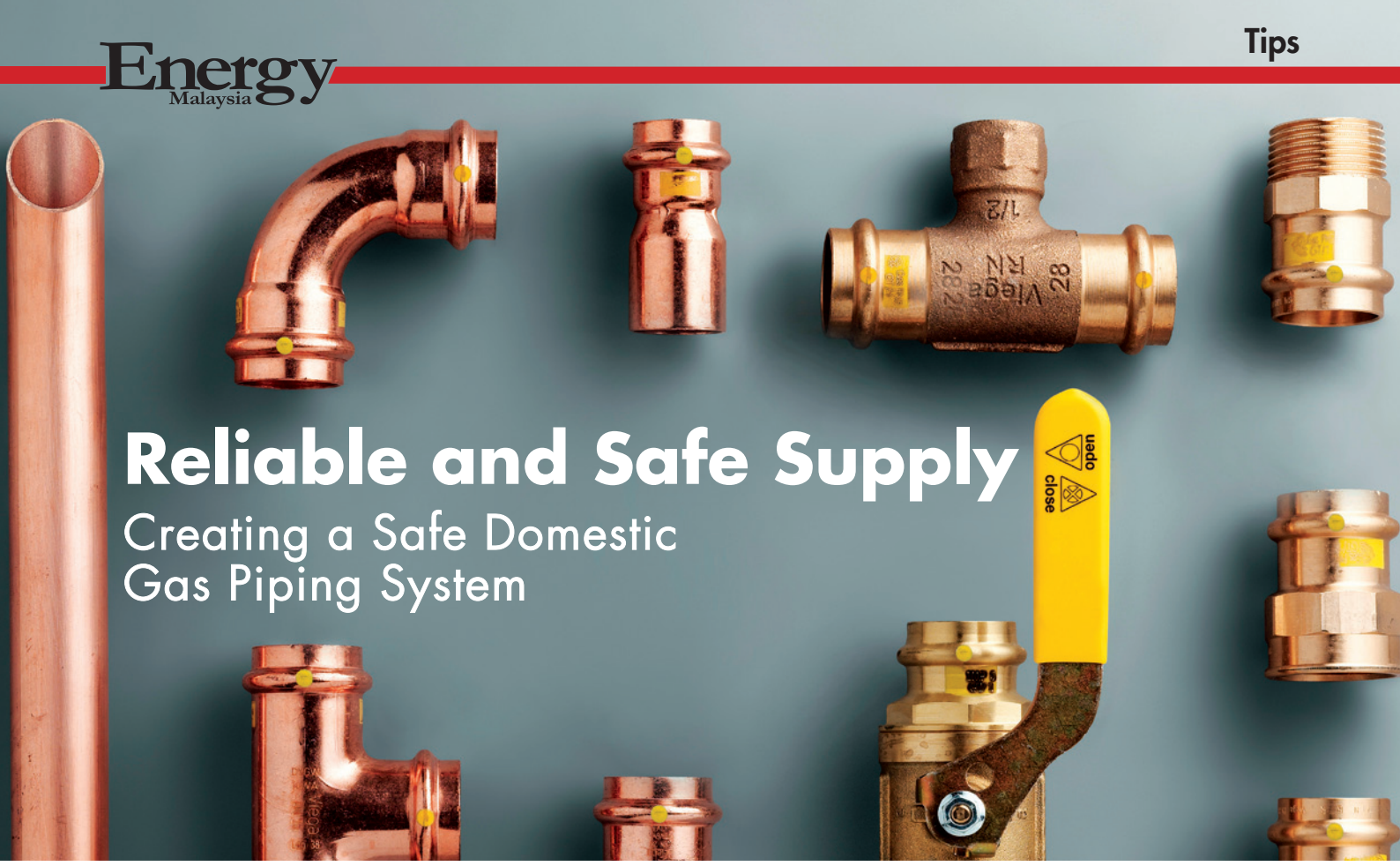
- The gas turbine compresses air and mixes it with fuel for combustion into very high temperature gases. The hot gases move through the gas turbine blades, making them spin.
- The fast-spinning turbine drives a generator that converts a portion of the spinning energy into electricity while the other portion is used to drive the compressor.

2 Heat recovery system captures exhaust heat

- A Heat Recovery Steam Generator (HRSG) captures exhaust heat from the gas turbine that would otherwise escape through the exhaust stack.
- The HRSG creates steam from the gas turbine exhaust heat and delivers it to the steam turbine.

3 Steam turbine delivers additional electricity

- The steam turbine drives a generator where, through electromagnetic induction, the spinning energy is converted into electricity without additional fuel.
- Where the gas turbine and the steam turbine drive the same generator, it is referred to as a single-shaft CCGT.

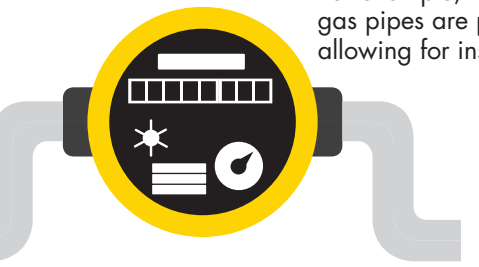


Reliable and Safe Supply

Creating a Safe Domestic Gas Piping System

Pipes offer significant convenience to people who use gas for residential or industrial purposes. However, the flammable nature of gas means that pipeline installation can be hazardous if not planned and implemented properly and according to established standards. To this end, the Energy Commission published the *Guidelines on Domestic Gas Piping Installations* to ensure the integrity of building and increase public safety.

Clear, Visible and Safe



The piping system must be designed in such a way that the gas meter provided by the supplier can be easily located. For example, in Malaysia, gas pipes are painted yellow, allowing for instant recognition.

To protect an installation from damage, pipes should not pass through dangerous areas such as near high-voltage wires, sources of excessive external stress vibration or corrosion, or areas with high traffic. They should also not be laid under or through load-bearing foundations or walls, and outlet fittings or piping should not be placed behind doors.

Pipelines should be routed close to walls, not cut into load-veering walls and be at least 50mm away from other services. There should also be enough clearance to permit the use of a pipe wrench without straining or bending the pipe. If electrical services are used in the same duct, the gas riser must be separated from them using a gas-tight partition.

Secured Outlets

Isolation valves need to be accessible to users, as they allow gas to be confined to certain areas during an emergency, such as a fire or a leak. These should be located on each floor and section of the building, where gas is piped.

Each outlet, including pipes with valves, should be securely closed with an approved threaded cap or plug to ensure they are airtight, and should be left closed until an appliance is connected.

It is unlawful to remove or disconnect any gas equipment without first unplugging or capping the outlet from which the gas equipment is to be removed. For safety reasons, this is best done with a screwed joint-fitting.

Preventing Dangerous Leaks

To prevent the distribution of gas leaks through the building, piping inside buildings should not be laid in escape routes, shafts, chimneys, gas vents, ducts and other unventilated spaces.

If such areas cannot be avoided, gas detectors must be installed to detect any leaks. Also, pipes passing through a cavity must take the shortest route possible, and be properly encased in sleeves. If there is no other route available, pipes should run above a ceiling, and drop down to appliances.

As often as possible, gas pipes should run outside a building. This is especially true when the operating pressures exceed 35kPa (5psi). For maintenance purposes, pipe risers should also be installed at easily accessible locations such as corridors or dedicated shafts. Such ducts must have 2-hour fire-rated doors, with one side an external wall with fixed louvres or ventilation blocks, so that any leak will dissipate into the atmosphere. Additionally, such pipes should enter the building aboveground to ensure that they remain in well-ventilated locations.

Operation and Maintenance

Maintaining the safe operation of the system in accordance with the manufacturer's specifications is the duty of the owner – or occupant – of the premises.

A responsible person should be placed in charge of a gas pipeline or installation to ensure that certain basic safety and administrative requirements are met, such as:

- Ensuring that the gas pipeline can be identified continuously.
- Immediately taking all reasonable steps to shut off supply when a gas leak is suspected or known.
- Informing the Energy Commission or gas utility licensee if gas continues to escape after supply has been shut off.
- Taking all reasonable steps to ensure that gas can be re-supplied without causing any danger after supply is shut off for safety reasons.
- Ensuring that the gas installation is well-maintained.
- Ensuring that safety is observed at all times so as to prevent danger from arising at the gas installation.
- Attending and assisting any inspection on the gas installation carried out by the Energy Commission or any authorised officers.
- Keeping a maintenance record detailing when any maintenance or repairs are carried out.
- Being informed of any alteration or repairs carried out on the supply system by a competent person.
- Being notified of any necessary or emergency repairs done by a competent person.
- Taking adequate precautions preventing a gas installation or equipment from being accidentally or inadvertently made unsafe during maintenance.

Preparing a Maintenance Programme

The responsible person in charge of the gas pipeline/ installation is also responsible for proper maintenance programmes and safety measures. This includes steps for regular leak surveillance of the system and emergency procedures, which have to be established in advance and rehearsed regularly, for an orderly implementation during emergencies involving gas leaks or fires.

The piping system must be subjected to a thorough inspection and be tested by registered competent persons at least once every three years. Pressure vessels must comply with the Department of Occupational Safety and Health (DOSH) requirements, and maintenance and repair work on the system must similarly be performed by competent persons.

While uncommon, pipeline failures can and do occur. There are also many hazards associated with gas leaks that incorporating proper and recommended design, maintenance and repair processes can mitigate. The Energy Commission's guideline aims to minimise such incidents, and ensure a safe and convenient gas supply. EM

Breaking Ground

Recently passed by Parliament, the Gas Supply (Amendment) Bill 2016 aims to liberalise the supply of natural gas in Malaysia by changing certain provisions of the existing Gas Supply Act 1993. One of the key amendments is the introduction of Third Party Access (TPA), which will open up the market to other players outside of the Petronas and Gas Malaysia duopoly. Energy Malaysia speaks with **Asmayati Abd Manan – Head of the Gas Industry and Tariff Development** at the Energy Commission to find out more about the proposed TPA, guidelines and the responsibilities of the Energy Commission.

Presently, the importation of natural gas is solely done by Petronas. Imported liquefied natural gas (LNG) complements and compensates for the dwindling indigenous gas supply in order to fulfil the demand for gas in the country. In terms of pricing, Petronas, in consultation with the Government, sets the price of LNG-sourced gas based on certain formula. However, the Government has seen a potential for the liberalisation of the gas market where new players other than Petronas can also import LNG into Malaysia. Liberalising the market is one such measure as it will introduce competition and more competitive pricing into the system.

According to Asmayati, the successful implementation of TPA requires access to the regasification terminals (namely in Sungai Udang in Melaka as well as the upcoming one in Pengerang, Johor) as well as the transmission and distribution pipelines. The transmission pipeline is the Peninsular Gas Utilisation (PGU) network which runs through Peninsular Malaysia, connecting its northern-most tip to its southern-most point. The distribution pipelines are the ones that link the PGU to the various districts and ultimately the end-user.

Currently, there are two types of licences for piped gas supply in Peninsular Malaysia. The Private Gas Licence licenses the holder to supply and use piped gas on one's own premises, for example stand-alone restaurants. The other is the Gas Utility Licence which is for those who are supplying gas

"One of the reasons for the amendments to the Gas Supply Act 1993 is to promote healthy competition where the end goal is for consumers to enjoy competitive gas prices."

GAS SUPPLY ACT 1993 (GSA 1993) AMENDMENTS

Frequently-Asked-Questions

Objectives of the Amendments

To enable the Energy Commission to license the import, regasification, transportation (through transmission pipelines), shipping (through regasification terminals, transmission and distribution pipelines), distribution (through distribution pipelines), retail and usage of gas. The purpose of licensing the said gas infrastructures is to give rise to a healthy competition among players in the gas market.

This regulatory system is used in other countries such as the United Kingdom, Singapore and Australia. Based on the history of the gas industry development, this system is proven successful in securing the continuity of gas supply at competitive rates, thus enabling consumers to optimise their costs of production.

through a gas pipeline to a person other than the private gas licensee. Examples include Gas Malaysia Berhad and Sabah Energy Corporation Sdn Bhd.

NEW GUIDELINES IN THE PIPELINE

The introduction of TPA will see several new licences being created. These include a licence to import LNG, a licence to ship the gas via pipeline in Malaysia, a regasification licence to operate regasification terminals, a transportation licence to transmit piped gas across Peninsular Malaysia, a distribution licence and a retail licence.

Licenses that involve infrastructure will only be issued after approval by the Minister owing to the high level of investment required to construct and implement the main gas infrastructure such as regasification terminals, transmission and distribution pipelines. However, the Energy Commission will be responsible for issuing and approving licenses that do not involve investment in major gas infrastructure.

Asmayati also explained that the Energy Commission is working on finalising the guidelines on how to apply for the various licences aforementioned. Once these are finalised, they will be published on the Energy Commission's website and interested parties can also apply for them online.

While the exact details of the licence applications are still being worked out, there are some basic ground rules to which all would-be licensees have to adhere. For instance, the licensees have to be companies incorporated in Malaysia. However, in the case of importers, they only need to have a place of business in the country. They also need to have a minimum paid-up capital (the amount to be determined by the Energy Commission) and be in a viable financial position as well as have the technical expertise to carry out their tasks.

NEW RESPONSIBILITIES

The *Gas Supply (Amendment) Bill 2016* also expands the powers of the Energy Commission with regards to the regulation of the piped gas sector. Asmayati explained that, "Currently, the Energy Commission's regulatory scope only covers the downstream supply of gas from the city gate station to the appliances in consumers' premises. This means that we only regulate the economic and safety aspects of the gas distribution segment."

The amendments will see the Energy Commission's regulatory scope extend to the economic aspects of the regasification and transmission side, although safety in these two areas will remain the responsibility of the Department of Occupational Safety and Health (DOSH). These new powers enable the Energy Commission to regulate the tariffs for regasification, transmission and distribution in order to prevent abuse of dominant position. The price of gas however will be dependent on the market. However, under the *Gas Supply (Amendment) Bill 2016*, the Energy Commission may regulate the gas price of retail licensees should there be a need to do so.

Although Malaysia is a major producer and exporter of natural gas, the fast rising pace of domestic demand means that other sources of this commodity have to be secured. By liberalising the market through the *Gas Supply (Amendment) Bill 2016*, the government is laying out a playing field which will be attractive to industry players, resulting in a more competitive sector and greater benefits for consumers and the country. EM

Activities that will be Licenced Under the Amended Act

The validity period of these licences will be determined either by the Minister or the Energy Commission. Licences for regasification, transportation and distribution will be subject to the Minister's approval due to the involvement of high costs to develop gas infrastructures. Licences for the import, shipping, retail and usage of gas will be subject to the Energy Commission's approval.

a) Import to Regasification Terminals
b) Regasification
c) Shipping
d) Transportation
e) Distribution
f) Retail
g) Usage

Conditions to be Fulfilled to Become a Licence Holder

These conditions are imposed to ensure that only qualified and skilled entities are permitted to take part in the Malaysian gas market. These are also to secure the future growth and advancement of the gas market.

a) Company incorporated in Malaysia or abroad that has been approved by the Energy Commission
b) Paid-up capital as stipulated by the Energy Commission
c) A solid financial status
d) Relevant technical expertise
e) Additional requirements stipulated by the Energy Commission from time to time

Import of LNG into Regasification Terminals

Investors may import LNG from abroad or from Bintulu, Sarawak to Peninsular Malaysia. They may spot purchase the gas to be sold based on the current market price. To be an importer, a huge capital will be required and the said entity must possess a solid business record to be a player in the Malaysian gas market. Importers of LNG are required to apply for licence from the Energy Commission.

New Business Opportunities Created with Third Party Access System

Investors that want to be involved in the gas business will be required to satisfy all licencing conditions stipulated by the Energy Commission. They are advised to assess the returns that will be gained from their investment and to strategise to compete favourably with other investors.

Gas Transportation and Distribution

Under the Third Party Access system, new transporters and distributors are expected to come into existence in areas that currently have no access to piped gas. In areas with existing piped gas, a separate gas network will not be allowed in order to avoid overlap. Only areas currently without access to piped gas are open to new investors for the transportation and distribution of gas. In doing so, investors are therefore advised to perform a market research before investing in those areas.

Gas Shipping

As gas shippers, investors will obtain their supply via LNG importers or via the gas pipelines from gas producers in Malaysia, Thailand or Vietnam. Gas shippers will sell the gas based on certain terms and enter into an agreement with operators of transmission pipelines to transport gas to consumers' premises upon payment of a fee that will be fixed by the Energy Commission. Investors interested in gas shipping need significant capital and good business records to obtain the licence from the Energy Commission. They also need to be able to compete with other gas shippers to ensure sustainability of the gas market in Malaysia.

Gas Retail

Gas retail is a new segment in providing piped gas services to new settlements. Investors will be assigned one housing/condominium/business complex for the sale of gas to consumers. In comparison to other divisions in the gas market chain, gas retail does not require a huge capital. However, as gas retailers, prospective investors need to possess good safety and business records in order to be able to provide safe and effective service for gas consumers. Prospective investors should perform proper research to determine the risks involved as retailers.

Gas Competent Persons and Contractors

"Unless otherwise exempted, no work in respect of installing, constructing, maintaining, repairing or operating any gas pipeline or installation or part thereof shall be carried out except by or under the supervision of and certified by a competent person." So it is stated in Section 35 of the *Gas Supply Act 1993 (Act 501)* to ensure that only the right personnel handles gas-related works in the interest of safety. But how does a gas competent person or contractor earn certification?

Azlan bin Mohamed Nor, Head of Gas Competency at the Energy Commission, talks us through the various classes, qualifications, certification processes and job scopes of gas competent persons and contractors.

"We take compliance to competency certification conditions very seriously, and would not hesitate to decertify gas competent persons or gas contractors if they are proven guilty of offences such as false declaration, gross negligence or serious misconduct."

- Azlan bin Mohamed Nor
Head of Gas Competency

GAS COMPETENT PERSONS

Who is a Gas Competent Person?

Under the *Gas Supply Act 1993 (Act 501)*, a gas competent person is defined as a person who does installing, constructing, maintaining, repairing or operating of any gas pipeline or gas installation.

How many classes of competency are there?

There are five competency classes of gas competent persons, which are:

- Gas Engineer
- Gas Engineering Supervisor
- Class I Gas Fitter
- Class II Gas Fitter
- Class III Gas Fitter

What prerequisites are required to apply to be a Gas Competent Person?

- Candidates for Gas Engineer should hold a degree in engineering, be registered as a professional engineer with the Board of Engineers, and should have not less than 2 years of working experience in the gas pipeline and/or gas installation work.
- Candidates for Gas Engineering Supervisor should hold a degree or diploma in engineering and should have not less than 2 years of working experience in the gas pipeline and/or gas installation work.
- Candidates for Class I Gas Fitter should have not less than 2 years of working experience as Gas Fitter II.
- Candidates for Class II Gas Fitter should have not less than 2 years of working experience as Gas Fitter III.
- Candidates for Class III Gas Fitter should have suitable educational qualifications determined by the Panel and should have not less than 1 year of working experience in the gas pipeline and/or gas installation work.

What is the application process like?

A candidate who possesses the necessary prerequisites can apply via a letter addressed to the Secretariat at the Energy Commission, which will then forward the application to the Examination Panel. Subsequently, the candidate will be called to sit for a written competency examination before undergoing an interview conducted by the Panel.

However, a candidate who has passed gas engineering courses accredited by the Energy Commission, such as gas courses organised by the Gas Technology Centre, Universiti Teknologi Malaysia and Institut Kemahiran Mara, can be exempted from the written examination.

What is the scope of work for a Gas Competent Person?

A Gas Competent Person's responsibilities include:

- Endorsement of gas pipeline and installation plan
- Endorsement of certificate of completion of gas pipeline and installation
- Endorsement of test certificate of gas pipeline and installation
- Repair of gas pipeline and installation
- Maintenance of gas pipeline and installation

How does the Energy Commission keep tabs on a Gas Competent Person?

A Gas Competent Person must register with the Energy Commission before performing any work as an accredited competent person, and this registration has a validity of one year. It has to be renewed at least two months before the expiry date.

GAS CONTRACTORS

Why are Gas Contractors important?

As it is a high-risk undertaking, gas-related work has to be done by a certified Gas Contractor, as mentioned in Regulation 103 of *Gas Supply Regulations 1997*: "No person shall perform or carry out any work in respect of installing, constructing, testing, commissioning, calibrating, maintaining, repairing or operating a gas pipeline or gas installation or part of it unless he holds a valid Certificate of Registration as a Gas Contractor issued under these Regulations."

Are there different categories of Gas Contractors?

Yes, there are four:

- Class A
- Class B
- Class C
- Class D

What are the necessary prerequisites to register as a Gas Contractor?

- Registered with the Registrar of Business or Registrar of Companies
- Provides insurance coverage for employees under the *Employees Social Security Act 1969*
- Possesses suitable equipment, testing equipment and instruments related to work as determined by the Energy Commission
- Employed on a full-time basis competent person(s) as specified under sub regulations 105(1), 106(1), 107(1) and 108(1) or Table 4 in the Second Schedule under the Regulations (below)

Gas Contractor	Minimum Class for Competent Person to be Employed
Class A	(i) Gas Engineer or Gas Engineering Supervisor; and (ii) Class I Gas Fitter
Class B	Class I Gas Fitter
Class C	Class II Gas Fitter
Class D	Class III Gas Fitter

Source: Table 4, Second Schedule, Gas Supply Regulations 1997

How long is the validity period of the registration?

Gas Contractors have to pay an annual renewal fee in order to maintain their registration with the Energy Commission. The fee for Class A is RM1,000, Class B is RM500, Class C is RM350 and Class D is RM150.

How can the public check whether a Gas Competent Person or Contractor is certified by and registered with the Energy Commission?

They can check on the official Energy Commission website (http://www.st.gov.my). Under the *Consumer* tab, they can click on the *Gas* tab, which will lead them to the lists. These lists are updated every month.

If there are further doubts, they can contact the Energy Commission, directing their queries to the Gas Development And Regulation Department.

The Environmental Quality (Clean Air) Regulations 2014 Forum

(From left) Nor Rashidah Mohd Ghazali, Dato' Dr Nadzri Yahaya and Ir Azhar Omar discussed the benefits, concerns and challenges of the Clean Air Policy.

Representatives and stakeholders in the Malaysian energy and environment sectors came together on 16 May 2016 for the Environmental Quality (Clean Air) Regulations 2014 Forum. The Clean Air policy, which comes into full effect in June 2019, aims to regulate the emission of air pollutants from industrial activities—such as power generation and asphalt mixing—in the country.

Delegates consisted of representatives from the Malaysian Department of Environment (DOE), the Energy Commission, utilities (including Tenaga Nasional Berhad and Sabah Electricity Sdn Bhd) and independent power producers. The conference was a platform for power producers in the Peninsula and Sabah to obtain information and share their concerns and challenges in meeting the requirements of the Clean Air policy, as well as to ensure that the stakeholders in the power generation industry achieve a win-win situation.

In his opening speech, Dato' Dr Nadzri Yahaya, Deputy Secretary-General (Energy and Green Technology), Ministry of Energy, Green Technology and Water (KeTTHA), emphasised the crucial need to balance the three pillars of sustainable development, which are economic growth, social advancement and environmental protection. He noted that while power plants commissioned after 5 June 2014 already comply with the regulation, older plants have been given until June 2019 to perform the necessary modifications to their systems to satisfy the requirements of the regulation.

Mashitah Darus, Director of Air Division of the DOE in her presentation titled *The Clean Air Regulations Forum for Power Generating Plants in Peninsular Malaysia and Sabah* highlighted the need for new Clean Air regulations. The current policy replaces the *Environmental Quality (Clean Air) Regulations 1978* and the *Environmental Quality Regulations (Dioxin and Furan) 2004* in line with increasing awareness about environmental care, technology and changes in air quality. The new regulation is also based on World Bank standards, best practice techniques for air quality and provisions applied across ASEAN and Asia.

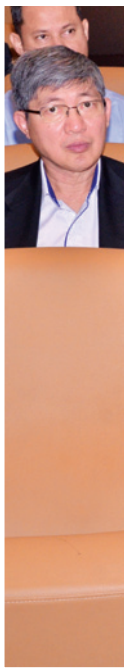
Other presenters at the forum were Nor Rashidah Mohd Ghazali, Chief Assistant Director of Air Quality of the DOE and Ir Azhar Omar, Senior Director of Electricity Supply and Market Regulation Department of the Energy Commission. Nor Rashidah gave an overview and discussed the provisions of the Regulations while Ir Azhar talked about the effect of the policy in a presentation titled *Environmental Quality (Clean Air) Regulations 2014: Its Changes and Impact to Generations in Peninsular Malaysia and Sabah*.

He highlighted the challenges such as the cost of modifications to comply with the regulation, pointing out that under the Incentive-Based Regulation (IBR), this cost will be passed to the consumers via tariff adjustment. Ir Azhar also noted that outages may occur when the modification works are ongoing, which may affect the stability of the grid. In addition, there are issues with inadequate space for installation and a change in existing laws such as the Power Purchase Agreement.

The Environmental Quality (Clean Air) Regulations 2014 Forum also included an interactive Question and Answer session with participants discussing and sharing their thoughts and ideas on the best measures to ensure the success of the policy. EM

Gas Supply (Amendment) Act Workshop

Attendees deep in discussion on the amendments to the *Gas Supply Act 1993* (GSA) during the break-out session.



Representatives from the gas industry, manufacturers, and government agencies gathered at the Energy Commission headquarters in Putrajaya to participate in a workshop on the proposed amendments to the *Gas Supply Act 1993* (GSA) on the 7th of March 2016. The event was organised by the Energy Commission and the Economic Planning Unit (EPU).

Datin Badriyah Abdul Malek, the Director of Energy at the EPU, delivered the opening remarks. She highlighted that the amendments had been mooted since 2012 and that they were going to be tabled in Parliament during the March 2016 sitting.

The aim, she explained, is to complete the first reading of the amendments to the GSA during this session of Parliament, which will run from the 7th of March to the 7th of April 2016. If time permits, then the second and third readings of the Bill will also take place during this period. The ultimate goal is to have the Bill passed and gazetted into law by the end of the year.

The main objective of the amendments is to allow for third party access (TPA) to Malaysia's piped gas distribution network, which currently has two players, namely Petronas and Gas Malaysia. Describing TPA as an important milestone to the country's gas supply industry,

Datin Badriyah explained that it will be a step towards liberalising the market. This includes deregulating the price of gas in order to attract more players.

The Director of Energy at the EPU concluded her address by thanking the Energy Commission for its work in formulating the amendments. She also explained that the workshop was the last leg of consultations made before the amendments are presented to Parliament. As stakeholders in the industry, the attendees were asked to help formulate several frequently asked questions that will help the EPU prepare for enquiries from Members of Parliament.

Datin Badriyah was followed to the podium by Nursaliza Samsudin, Senior Analyst from the Energy Commission, who gave a presentation on TPA. She explained that its objectives are threefold – to provide for the entry of new players into the Malaysian gas market, to create a level playing field, and for consumers to benefit from this system. Nursaliza Samsudin also touched on the technical aspects of the TPA such as the introduction of new licences for players wishing to enter the field.

Above: Shahrilnazim Shaari, Head of the Energy Commission's Legal Unit, speaking on the expanded role of the Energy Commission under the proposed amendments to Gas Supply Act 1993 (GSA).

Below: Attendees from the event assisted the Economic Planning Unit (EPU) by formulating questions that were likely to be asked by Members of Parliament once the amendments were presented.

The briefing on the GSA amendments was then handled by Shahrilnazim Shaari, the Head of the Energy Commission's Legal Unit. He revealed that the Bill expands the responsibility of the Energy Commission, which will be to regulate the TPA system and monitor the competitiveness of the industry. The second part is the result of an agreement reached between the Energy Commission and the Competition Commission for the former to handle all aspects of competition within the power industry.

The attendees were then separated into different groups to discuss the amendments and formulate questions that the EPU team might face from Parliament. This they did and the concerns they raised reflected the varied sectors from which they come.

Questions were raised about whether local and foreign gas players will be treated differently, about how Sarawak (which is not covered under the GSA) factors into the programme especially with gas trading between it and Sabah, and how the Energy Commission will ensure that prices will not become too exorbitant. The event ended with Datin Badriyah and the Energy Commission team engaging the floor in a question and answer session. EM

Benchmarking Study of Generation Cost

Above: Among the experts in the international team for the study. Sitting from right: Bill Heaps (Managing Director of Strata), Rodney Ward (Associate Director of EMCa) and Abhishek Kumar (Principal Consultant Frost & Sullivan). Standing: Paul Sell (Managing Director of EMCa).

Right: The Q&A session drew many questions from the attendees with many focused on the methodology of the study to gain further clarification.

Bill Heaps, Managing Director of Strata Energy Consulting shared that TNB operated a low failure rate network in comparison to providers in other countries.

On the 1st of March 2016, an industry briefing and presentation was held at the Energy Commission's Headquarters in Putrajaya, delivered by officials from Frost & Sullivan, Energy Market Consulting Associates (EMCa), and Strata Energy Consulting. The session, entitled *Benchmarking Study of Generation Cost and TNB's Transmission and Distribution Costs,* was organised by the Energy Commission and attended by industry players such as Tenaga Nasional Berhad (TNB), Ministry of Energy, Green Technology, and Water (KeTTHA), and the Economic Planning Unit.

The event was held to share the final report on the benchmarking study carried out by Frost & Sullivan in association with EMCa and Strata over a period of 6 months, beginning from mid-2015. The objective of the study was to investigate the costs of TNB relative to a number of international comparator utilities, specifically in Thailand, Australia and New Zealand. The scope of the study covered TNB's generation, transmission and distribution costs and is intended to improve how the Energy Commission would formulate their regulatory framework in relation to the energy sector in Malaysia.

Marlinda Mohd Rosli, Head of Electricity Pricing Unit at the Energy Commission, opened the event, which continued with an introduction to the whole study by Abhishek Kumar, Principal Consultant of Frost & Sullivan. It was then followed by four presentations, each focusing on a specific scope of study and a governance review presentation.

Among key findings from the study include TNB Transmission having the best reliability performance for the period of 2010 to 2014, and TNB Distribution performing efficiently across capital expenditure and operating expenditure when compared to providers in Thailand, Australia and New Zealand.

The briefing was concluded with an engaging question-and-answer session. The attendees were recommended to use the results of the study with caution as there exists different categorisations of costs across countries, and to use them in conjunction with other assessment tools. EM

WE WOULD LIKE TO HEAR FROM YOU!

Energy Malaysia welcomes your questions, comments and suggestions to help the Energy Commission of Malaysia work better at safeguarding your interest.

Article Feedback

Edition Number:	
Article Title:	
Comments:	

Name:	
Designation, Company:	
Contact Number:	
Email Address:	

Where to lodge complaints and how to get in touch with the Energy Commission?

Send in your feedback and questions at ***energymalaysia@st.gov.my***
or call our toll free number: **1-800-2222-78** or fax: **+603 8888-8637**

Where to get more energy-related data and statistics?

Log onto our official website: ***www.st.gov.my*** for the latest updates and news.
Or visit the Malaysia Energy Information Hub, our national energy database:
http://meih.st.gov.my/

Send the completed form over to us:

AMG International
The Penthouse, 10-3A, Jalan PJU 8/3, Damansara Perdana, 47820 Petaling Jaya, Selangor Darul Ehsan, Malaysia
fax: 03-7729-4887 e-mail: clientservice@amginternational.net

Suruhanjaya Tenaga
Energy Commission

ORDERLY SUPPLY and USE OF ENERGY

Established under the *Energy Commission Act 2001*, *Suruhanjaya Tenaga* (ST – The Energy Commission) is a statutory body entrusted with regulating the energy sector, in particular electricity and piped gas in Peninsular Malaysia and Sabah to ensure security, reliability, safety, efficiency and economy.

The Energy Commission...

Advises
Ministers on all matters concerning the national policy objectives for energy supply activities, the supply and use of electricity, the supply of gas through pipelines and the use of gas.

Regulates
electricity and piped gas tariffs and the quality of supply services, as well as promote competition and prevent misuse of monopoly power.

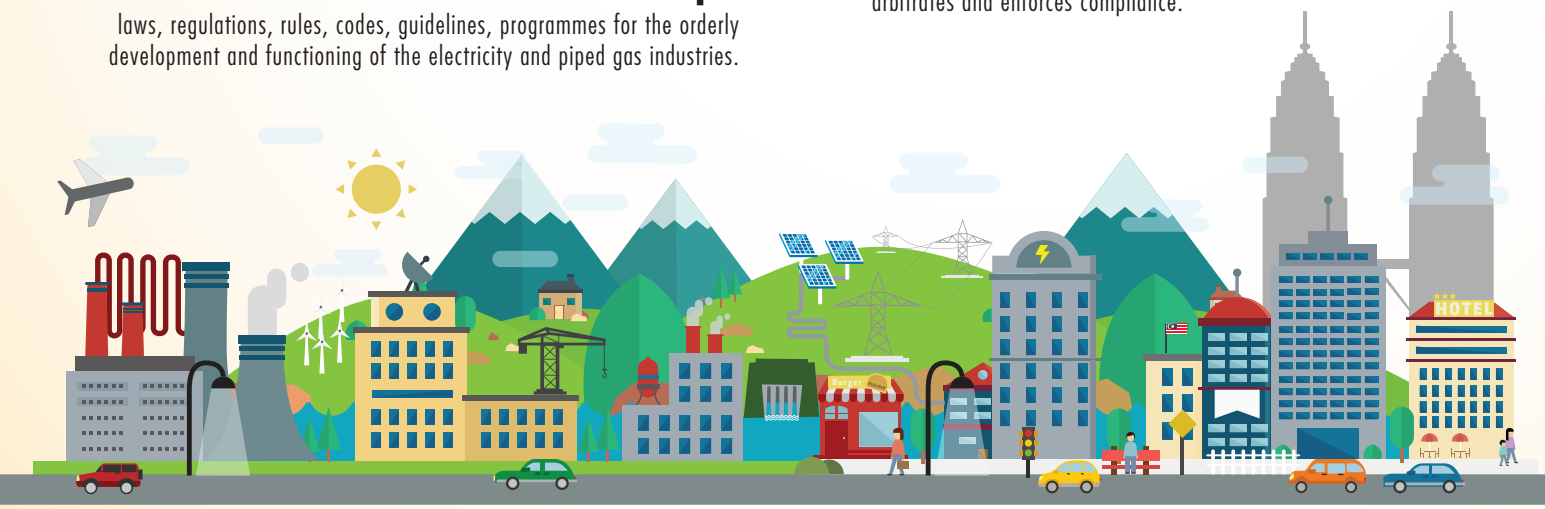
Promotes
good practices, as well as research, development and innovation in the electricity and piped gas industries.

Plans and develops
laws, regulations, rules, codes, guidelines, programmes for the orderly development and functioning of the electricity and piped gas industries.

Licenses and certifies
electricity and piped gas suppliers, competent electricity and gas personnel, training providers, contractors, equipment and installations, energy service companies and energy managers.

Monitors and audits
performance and compliance of licensed and certified suppliers, service providers, installations, equipment importers, manufacturers and retailers.

Investigates
complaints, accidents, offences and industry issues; arbitrates and enforces compliance.



Energy Commission | No. 12 Jalan Tun Hussien, Precinct 2, 62100, Putrajaya
Toll Free Number: 1 800 2222 78 | Telephone: 03 8888 8500 | Fax: 03 8888 8637 | Website: www.st.gov.my