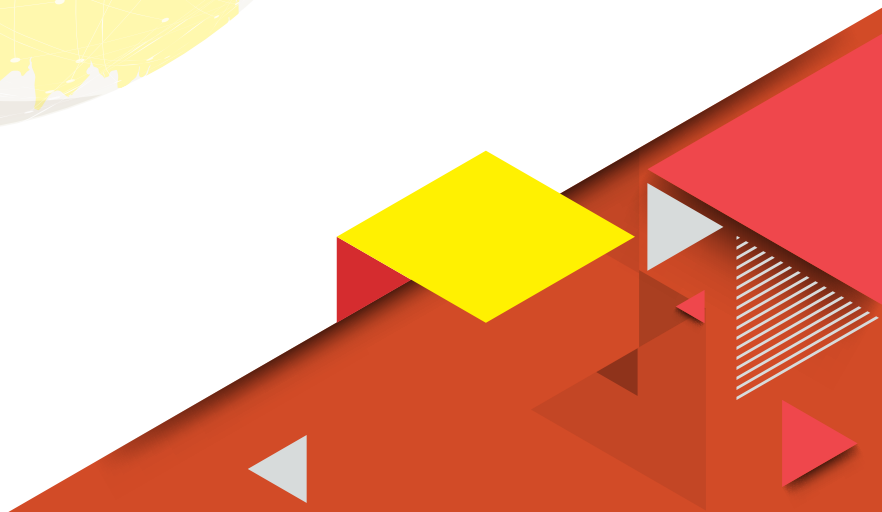


PENINSULAR  
MALAYSIA  
GAS INDUSTRY  
OUTLOOK  
**2019**





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Published by:

**SURUHANJAYA TENAGA** (ENERGY COMMISSION)

No. 12, Jalan Tun Hussein, Precinct 2, 62100 Putrajaya, Malaysia

T : 03 8870 8500

F : 03 8888 8637

1-800-2222-78 (ST)

[www.st.gov.my](http://www.st.gov.my)

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## PREAMBLE

Natural Gas, or commonly referred to as gas, is a naturally occurring hydrocarbon gas mixture consisting of mostly methane and other hydrocarbons such as ethane, propane and butane. Gas is one of the cleanest, safest and most useful forms of energy used in our day-to-day lives. It has been used in Malaysia since 1984 in the first Gas Power Plant in Paka and the gas industry has since transformed into the thriving industry that it is now.

Gas is supplied throughout Peninsular Malaysia via an integrated 2,500-kilometre pipeline system built by PETRONAS Gas Berhad called the Peninsular Gas Utilisation (PGU) which was built in three phases from 1984 to 1998. A 2,000-kilometre gas distribution pipeline network which utilises gas from the PGU was built by Gas Malaysia Berhad (GMB) to cater for small and medium industries, commercial establishments and residential customers.

From 1997 to 2005, there was an unprecedented demand and growth in gas which led PETRONAS to import gas from West Natuna, Indonesia in 2002 and developed the Commercial Arrangement Area set-up between Malaysia and Vietnam. Furthermore, by jointly developing the B17 and A18 blocks in the northern Peninsular Malaysia-Thailand seas in 2005, PETRONAS managed to secure additional gas from its sovereign rights to the jointly developed field, i.e. the Malaysia-Thailand Joint Development Area. Two regasification terminals were built in Sg. Udang, Melaka and Pengerang, Johor to import Liquefied Natural Gas (LNG) to further increase and ensure the supply of gas.

Today, gas is one of the most widely used fuels in Malaysia especially to generate electricity and is supplied as feedstock for the petrochemical industry. A liberalised gas market, through the newly implemented Third Party Access (TPA) regime, will act as a catalyst for new suppliers to bring imported piped gas or LNG into the Malaysian market and compete with the existing suppliers in a fair and transparent manner.

Recent efforts in promoting the use of cleaner fuels have opened up new possibilities, such as small-scale LNG, to monetise natural gas towards making it the fuel of choice for a cleaner future.

# CHAPTER 1

## MALAYSIAN ECONOMIC AND INDUSTRY OVERVIEW



## MALAYSIAN ECONOMIC AND INDUSTRY OVERVIEW

Based on the latest report published by the Central Bank of Malaysia, the world economy recorded the lowest growth rate in 2016 since the Global Financial Crisis<sup>1</sup>. Many advanced and emerging economies are experiencing slower growth in recent years. This is attributed to subdued investment activity amid weak business sentiments, heightened political and policy uncertainties, fluctuating external demand, weak commodity prices and volatile financial markets. Despite the challenging economic environment, the Malaysian economy recorded a commendable growth of 4.2% in 2016<sup>2</sup>. Against external and domestic challenges, all sectors of the economy recorded a modest expansion during the year.

The Malaysian economy, as measured by the Gross Domestic Product (GDP), expanded 5.9% in the fourth quarter of 2017 from a year earlier, supported by a positive expansion in both private and public sector spending<sup>3</sup>. Private sector spending continued to be the main driver of growth, further supported by the robust expansion in real exports of goods and services following strong demand for manufactured and commodity products.

Meanwhile, for the year 2018, the Malaysian economy recorded a sustained growth of 4.4% in the third quarter of 2018, supported by an expansion in domestic demand amid a decline in net exports growth<sup>4</sup>. The World Bank revised its forecast on Malaysia's GDP growth this year to 4.9% from its earlier forecast of 5.4% back in July<sup>5</sup>. The revision was made mainly after considering the cancellation of major infrastructure projects, which translates into lower public investment, besides easing export growth<sup>6</sup>.

As for 2019, Malaysia's GDP will remain on a growth path, supported by its diversified economy and nature of exports, with the private sector activity as the main driver for growth for the rest of 2018 and 2019<sup>7</sup>. The following graph shows Malaysia's GDP growth versus the Natural Gas Consumption growth up to the year 2020. Although the trendline is not perfectly in tandem with the growth of the economy, on average, the growth of the GDP indicates the growth of the actual gas consumption.

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<sup>1</sup> Central Bank of Malaysia, Annual Report 2016 (Kuala Lumpur: Central Bank of Malaysia, 2017), 3

<sup>2</sup> Ibid.

<sup>3</sup> Central Bank of Malaysia, Annual Report 2017 (Kuala Lumpur: Central Bank of Malaysia, 2018), 3

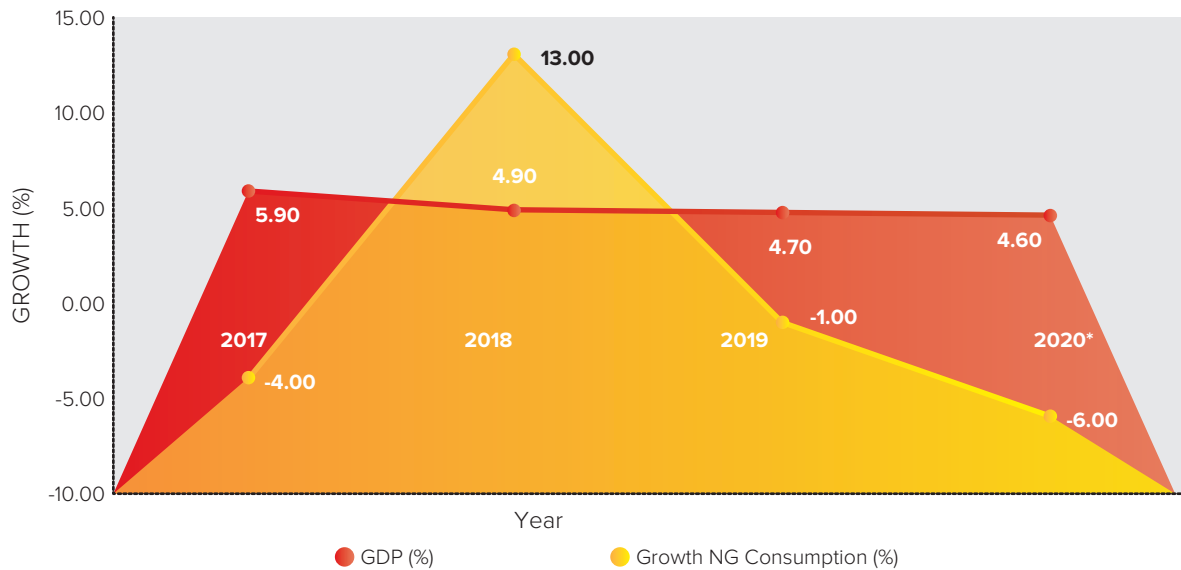
<sup>4</sup> Central Bank of Malaysia, BNM Quarterly Bulletin (Kuala Lumpur: Central Bank of Malaysia, 2018), 9

<sup>5</sup> The Edge Markets, dated <http://www.theedgemarkets.com/article/world-bank-malaysia-gdp-grow-47-2019-46-2020>

<sup>6</sup> Ibid.

<sup>7</sup> The Star Online, dated 9 October 2018: <https://www.thestar.com.my/business/business-news/2018/10/09/malaysia-gdp-to-remain-on-growth-path-into-2019/>





### Malaysia's GDP Versus the Growth of Natural Gas Consumption in Peninsular Malaysia

From the industrial point of view, natural gas has always played a fundamental role in supporting Malaysia's socio-economic development. This is evident as natural gas made up 41% of the energy supply in 2016 having increased by ten folds since 1983 due to rapid growth and industrialisation activities<sup>8</sup>. Today, gas is Malaysia's largest source of energy, providing more than half of the fuel required for power generation, followed by small and large industries<sup>9</sup>. It also forms the backbone of Malaysia's petrochemical industry, where it has helped extend the country's industrial capabilities further downstream in the oil and gas value chain.

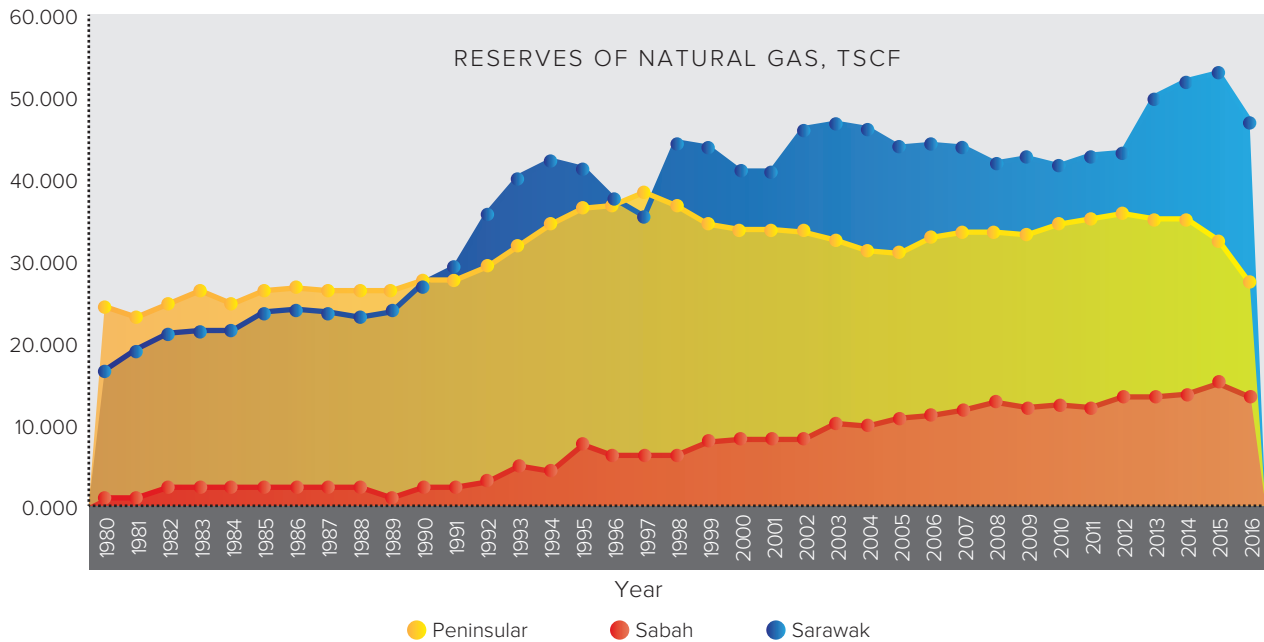
With total resources estimated at 100.7 trillion standard cubic feet, Malaysia is among the top 15 countries worldwide with proven natural gas reserves and the third largest in the Asian Pacific region with resources that will last up to 40 years if no large discoveries are made in that period<sup>10</sup>.

<sup>8</sup> National Energy Balance 2016 & Malaysian Energy Information Hub - Primary Energy Supply

<sup>9</sup> PETRONAS, Flow (Kuala Lumpur: PETRONAS, 2017), 8

<sup>10</sup> Investvine, Natural Gas Flipping the Switch Dawn of a New Era (Hong Kong, 2017), 13

Natural gas, therefore, is expected to continue to play an important role in helping to power Malaysia's economy and in ensuring the security of the nation's energy supply for up to 2050<sup>11</sup>. A breakdown of the country's natural gas reserves by region is shown in the graph below up to the year 2016, with most of the country's natural gas reserves in the eastern areas, predominantly in the offshore areas of Sarawak.

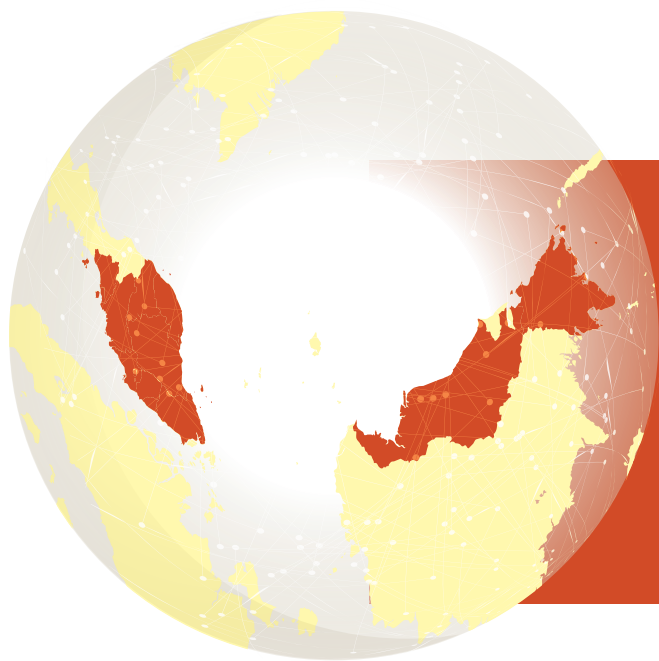


### Malaysia's Gas Reserves 1980-2016

Source: Suruhanjaya Tenaga, Malaysia Energy Statistics Handbook 2017 (Putrajaya: Suruhanjaya Tenaga, 2017), 9

<sup>11</sup> Malaysian Gas Association, Natural Gas Industry Annual Review (Kuala Lumpur: Malaysian Gas Association, 2017), 10

# CHAPTER 2



## A SNAPSHOT OF THE GAS SUPPLY SYSTEM IN PENINSULAR MALAYSIA

# A SNAPSHOT OF THE GAS SUPPLY SYSTEM IN PENINSULAR MALAYSIA

## A. TRANSMISSION

PETRONAS embarked on the PGU system in 1982. Phase 1 was accomplished in 1984 and it enabled gas, after first being processed in a Gas Processing Plant (GPP), to be supplied to various customers in Kerteh and at the Telok Kalong industrial area. Phase 2 was implemented throughout the late-80s and early-90s and involved laying a 681-kilometre trans-Peninsular Malaysia gas transmission pipeline to link Kerteh with customers on the West Coast of Peninsular Malaysia, as well as Pasir Gudang, Johor and Singapore in the south. At the same time, three additional GPPs were constructed to cater to the rising gas demand. Phase 3 extended the gas transmission pipeline northwards along the West Coast to Perlis and at the same time, GPPs 5 and 6 were constructed in a complex at Santong, Terengganu, which is just 12 kilometres away from the first GPP complex. The GPP complexes, located in Kertih and Santong, Terengganu have a capacity to produce a total of 2,060 mmscfd of sales gas. Gas is supplied throughout Peninsular Malaysia via an integrated 2,500-kilometre pipeline system built by PETRONAS Gas Berhad.

As demand has outgrown supply, Peninsular Malaysia has started importing piped gas from Indonesia (West Natuna B) and has also been producing the nation's share of gas resources from the Commercial Arrangement Area with Vietnam (PM3CAA) and Joint Development Area with Thailand (MTJDA).

## B. DISTRIBUTION

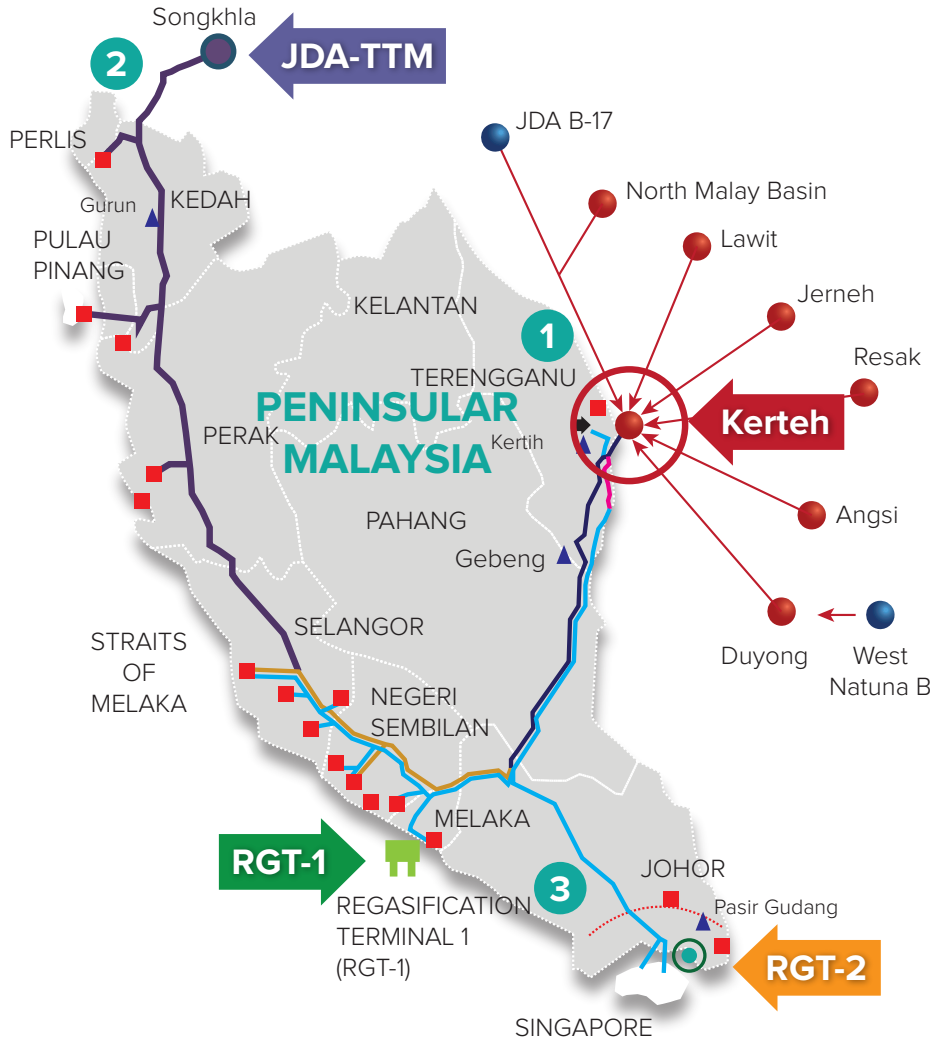
Further complementing the PGU system is the Natural Gas Distribution System (NGDS) operated by GMB that branches off from the PGU at the city gate stations. GMB was established on 16 May 1992 to sell, market and distribute natural gas as well as to construct, operate and maintain the NGDS within Peninsular Malaysia. Up to the year 2017, GMB operates and maintains 2,243 kilometres of gas pipeline across Peninsular Malaysia.

The NGDS for Kinta Valley is targeted to supply natural gas to the industrial areas located in Kinta Valley. The pipeline networks will take off from the PGU pipeline near Ayer Tawar, Sitiawan, Perak where the city gate station is located. With a pipeline length of 140 kilometres, it is expected that a total of 44 industrial users located in the Kinta Valley are poised to reap the benefit of clean and competitive fuel with the availability of natural gas once the project is completed.

## C. RECENT DEVELOPMENTS – REGASIFICATION TERMINAL

In 2010, the development of Malaysia's first LNG Regasification Terminal in Sungai Udang, Melaka was announced on 10 June 2010 under the 10<sup>th</sup> Malaysia Plan with the vision to open the gas market for TPA. Since May 2013, Regasification Terminal Sungai Udang (RGTSU) has commenced its operation. With its unique design consisting of an offshore jetty, regasification unit, two moored floating storage units and a three-kilometre sub-sea pipeline connecting to a new 30-kilometre onshore pipeline that links to PGU as well as its fast-track development, it began receiving LNG cargoes in 2012 and commenced its full operations in 2013. As of December 2017, RGTSU has successfully received 122 LNG cargoes. With a total of 3.8 Mtpa receiving, storage and regasification capacity, RGTSU will boost the supply capacity into the PGU system by approximately 530 mmscfd. The terminal is owned and operated by Regas Terminal (Sg. Udang) Sdn. Bhd.

In Johor, located as part of the Pengerang Integrated Petrochemical Complex (PIPC), the Pengerang LNG import, regasification and re-export terminal consists of a regasification unit, two 200,000-cubic-metre LNG storage tanks, among the largest in the region, and a dedicated jetty berth. The terminal is to provide primary gas supply to the Pengerang Refinery & Petrochemical Integrated Development (RAPID) and its associated facilities, the Pengerang Cogeneration (Power) Plant (PCP) and the PGU grid to augment the availability of gas in the country. In addition to regasification, for which the terminal has a capacity of 3.5 Mtpa and can provide approximately 500 mmscfd the equivalent of sales gas, it will also offer LNG unloading and reloading, storage and handling services. The terminal, which began its operations in November 2017, is owned by Pengerang LNG Terminal (Two) Sdn. Bhd. and is operated by Regas Terminal (Sg Udang) Sdn Bhd. The following map highlights the location of both the RGTSU and the Pengerang LNG Receiving and Regasification Terminal (RGT2) as well as the location of other sources of gas supply in Peninsular Malaysia.



Sources of Gas Supply in Peninsular Malaysia

# CHAPTER 3

YEAR IN REVIEW - 2018



## YEAR IN REVIEW - 2018

Global oil production is on a decline due to production cuts as agreed by the Organisation of the Petroleum Exporting Countries (OPEC) in its effort to increase crude oil prices<sup>12</sup>. However, LNG pricing remains relatively unaffected as it is still largely driven by regional demand and supply.

While oil production continues to be rationalised, global LNG trade continued its momentum from an average of 258 million tonnes in 2016 to 293 million tonnes in 2017, as new LNG capacity in Australia and the United States comes online and is met with growth in the Asian Pacific region, particularly in China, amidst growing concerns over the use of cleaner fuel to meet energy demands in urban areas<sup>13</sup>.

For the year in review 2016 and 2017, Malaysia has seen significant developments in making TPA for the domestic gas market a reality. The amendments to the Gas Supply Act (GSA) 1993 as well as a new Incentive-Based Regulation (IBR) framework for the gas distribution sector, RGTSU and RGT2 are part of the legal framework that will facilitate TPA. The piped gas supply infrastructure is further enhanced with the introduction of the Terengganu Gas Terminal to remove the CO<sub>2</sub> from raw gas from the JDA B17 field and the newly commissioned North Malay Basin field. Concurrently, the introduction of new supply sources and assets such as the RGTSU which commenced in 2013, the Pengerang regasification terminal as the second LNG regasification terminal which commenced its operations in 2017, the Pengerang Integrated Complex (PIC), the expansion of the gas transmission and gas distribution networks in Peninsular Malaysia as well as a new TNB power plant in Prai will provide new opportunities for both new and existing players in the gas market. As for the distribution system, a total of 109 projects have been completed from the year 2017 until November 2018 with a total of 127,68 kilometres of pipeline built.

These developments have continued in 2018, where several parties have been working diligently to expand the Malaysian gas market.

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<sup>12</sup> DW Made for Minds, "NON-Opec members agree to cut production to boost prices,"DW, 10.12.2016, <https://www.dw.com/en/non-opec-members-agree-to-cut-production-to-boost-prices/a-36723303>

<sup>13</sup> International Gas Union, IGU 2017 World LNG Report (Spain: IGU,2017), 7



## A. REGULATORY FRAMEWORK TRANSFORMATION

### 1. Third Party Access (TPA) and Amendments to the Gas Supply Act (GSA) 1993

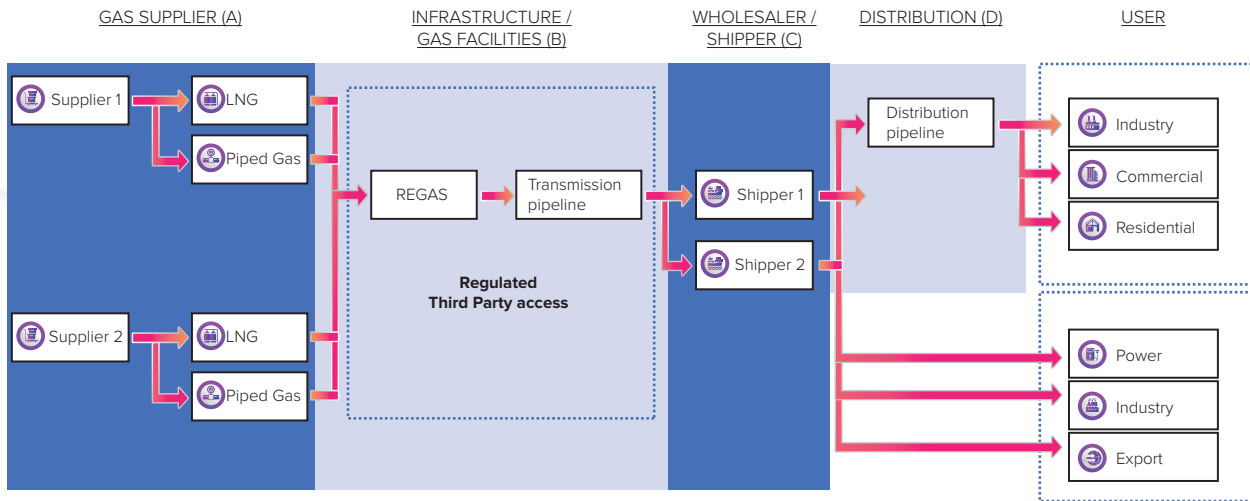
The Gas Supply (Amendment) Act 2016, which was passed by the Parliament in 2016 and subsequently *Gazetted* on 9 September 2016, was specifically aimed to cater for the implementation of the TPA system in Malaysia. It amends the GSA 1993 and subsequently came into force on 16 January 2017 (“Commencement Date”). This marked the beginning of a new era in the gas supply industry in Malaysia, where the GSA 1993 now provides a platform for the entry of new gas suppliers into Malaysia by creating a level playing field to foster healthy competition among the existing gas suppliers, as well as future ones.

The benefits of these amendments and the implementation of the TPA system would transcend to the consumers in the form of competitive gas prices, quality services provided by the relevant service providers, as well as an enhanced sustainability of gas supply.

TPA will also create a pathway for third parties to access gas infrastructure for the supply of gas to consumers. TPA will serve as the foundation for sustainable economic development and prosperity for Malaysia in its endeavour to become a developed, high-income nation.

By actualising the TPA, the supply industry in Peninsular Malaysia will be less dependent on sole suppliers which are PGB and GMB. Any parties that meet the criteria based on the Guidelines on Licence Application issued by Suruhanjaya Tenaga (ST) can be involved in this industry by becoming licensees, making use of the gas infrastructure such as the regasification terminals, pipeline transmissions and distribution pipelines to sell gas to consumers.

In addition to this, a legal framework has also been established, starting with the amendments made to the GSA 1993. These amendments empower ST with regulatory powers to oversee the implementation of the TPA system, including the powers to issue subsequent codes, guidelines and directions to cover more operational aspects of the TPA system. The GSA 1993 will be applicable throughout Malaysia except for the state of Sarawak. However, the Act may be implemented in Sarawak with the prior approval of the Yang di-Pertuan Negeri Sarawak on a date to be notified in the *Gazette*. The following figure shows the gas value chain diagramme from the gas supplier until it reaches the end user.



**Gas Value Chain Diagramme**

Two types of amendments have been made to the GSA 1993, namely the TPA-related amendments and other amendments.

#### (a) TPA-Related Amendments

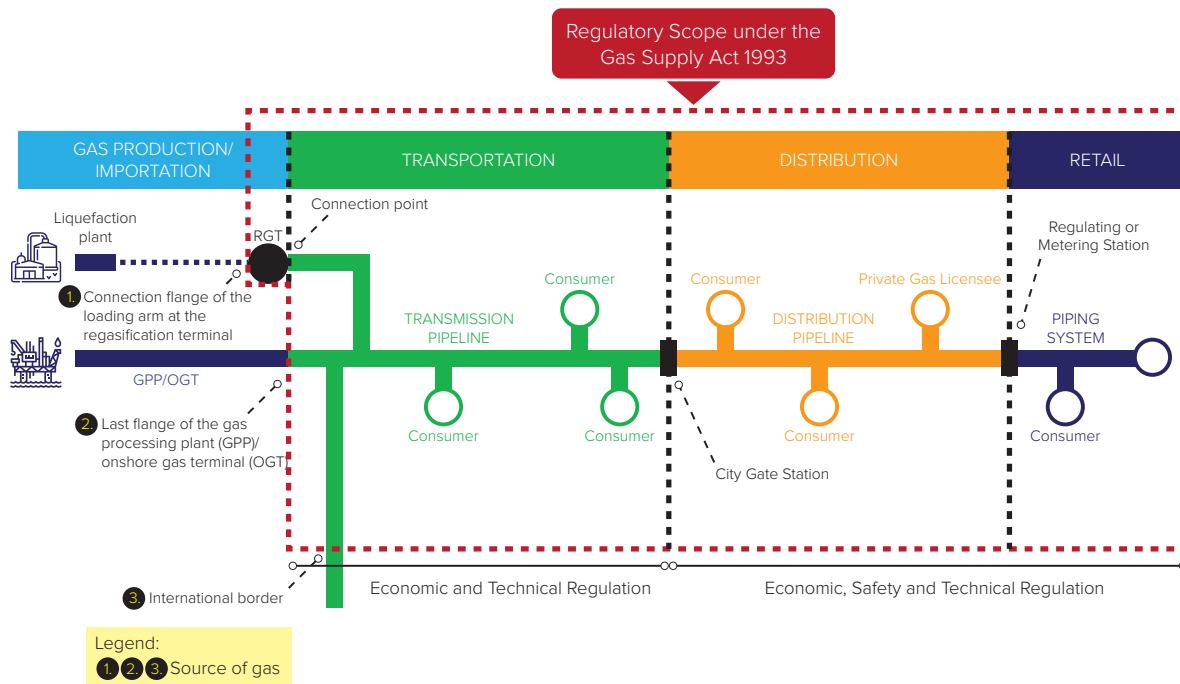
##### i. Expansion of the Regulatory Scope of GSA 1993

Before the commencement date, the regulatory scope of ST began either downstream of the last flange of city gate stations or from a storage tank or cylinder specifically used for the reticulation of gas. The scope of regulation involved all economic, safety and technical matters covering the supply of approximately 450 to 500 mmscfd.

From and after the commencement date, the regulatory scope of ST has been expanded significantly. It now begins:

- For liquefied natural gas, from the connection flange of the loading arm at a regasification terminal;
- For natural gas received from a gas processing plant or an onshore gas terminal, from the last flange of the gas processing plant or onshore gas terminal;
- For natural gas imported into Malaysia through pipelines, from the international border; and from a storage tank or cylinder specifically used for reticulation of gas.

Up to the last flange of the city gate stations, the scope of regulation involves only economic and technical matters, whereas downstream of the last flange of the city gate stations, or from a storage tank or cylinder specifically used for reticulation of gas, the scope of regulation covers all economic, safety and technical matters. Altogether, this covers the supply of approximately 2,400 mmscfd.



### Expanded Scope of Regulation

#### ii. TPA and Licensed Activities

The amendments have introduced the TPA concept, as well as the seven activities which need to be licensed under the GSA 1993.

#### iii. Tariff

In line with the implementation of the TPA system, the amendments have also introduced the imposition of a common tariff for the common use of the three gas facilities, namely the regasification terminals, transmission pipelines and distribution pipelines, which will be looked at later on.

#### iv. Competition in the Malaysian Gas Market

To further support the implementation of the TPA system in Malaysia, the amendments have introduced a special section which addresses competition matters in the GSA 1993. The purpose of this is to create a conducive environment to foster healthy competition among industry players.

For this purpose, there are two prohibitions which have been introduced under Part VIA of the GSA 1993, namely under Section 28C and Section 28G.

##### • **Prohibition 1: Anti-Competitive Agreements under Section 28C**

Under Section 28C, any agreement (horizontal or vertical) which has the object or effect of significantly preventing, restricting or distorting competition in the market is prohibited.

Section 28C goes on further to give examples of horizontal agreements which are deemed to have the object of significantly preventing, restricting or distorting competition in the market, and they are agreements which have the object of:

- Fixing purchase or selling prices of gas or any other trading conditions of gas;
- Limiting or controlling production, market outlets or market access, technical or technological developments or investments in the gas industry;
- Sharing of markets or sources of gas supply; or
- Performing an act of bid-rigging.

Deeming these agreements as anti-competitive means that entering into these agreements would automatically make the parties to the agreement in infringement of the provisions of Section 28C.

It is pertinent to note that the list of anti-competitive agreements is not exhaustively limited to the ones covered under Section 28C. Any other agreement could potentially be found to be anti-competitive if they have the object of significantly preventing, restricting or distorting competition in the market.

### • Relief of Liability from/under Section 28C: Individual and Block Exemptions

Notwithstanding Section 28C, Section 28D provides that a person may relieve his liability for the infringement under Section 28C based on the following reasons:

- There are significant identifiable technological, efficiency or social benefits directly arising from the agreement;
- The benefits could not reasonably have been provided by the parties to the agreement without the agreement having the effect of preventing, restricting or distorting competition;
- The detrimental effect of the agreement on competition is proportionate to the benefits provided; and
- The agreement does not allow the persons, including licensees, concerned to eliminate competition completely in respect of a substantial part of the licensed activities.

To rely on this relief of liability, such person must apply for either an individual exemption, which is granted in respect of a particular agreement or a block exemption, which is granted in respect of a particular category of an agreement. ST may grant such exemptions subject to any conditions or obligations.

### • Prohibition 2: Abuse of Dominant Position

Under Section 28G, any conduct which amounts to the abuse of a dominant position in the market is prohibited.

At the outset, it is important to understand that the size of the market share of a person shall not be regarded as conclusive evidence of such person's dominance in the market. Section 28G also does not prohibit a person in a dominant position from taking any step which has reasonable commercial justification or represents a reasonable commercial response to the market entry or market conduct of a competitor. In short, just by being in a dominant position does not render a party as infringing the prohibitions under Section 28G. The abuse of such dominant position needs to exist.

An abuse of dominant position may include but is not limited to the following:

- Directly or indirectly imposing unfair purchase or selling price or other unfair trading condition on any party pertaining to the delivery of gas or utilisation of facility in the market;
- Limiting or controlling production, market access, technical or technological developments, or investments in the gas industry to the prejudice of persons;
- Applying different conditions to equivalent transactions with other trading parties which places the other trading parties at a competitive disadvantage; or
- Making the conclusion of agreements conditional upon acceptance by the other parties of obligations which, by their nature or by commercial usage, have no connection with the subject of the agreement.

As with Section 28C, the situations in which an abuse of dominant position may be found are not exhaustively limited to the ones listed in Section 28G. A case-to-case evaluation shall be carried out in order to make such findings.

## **(b) Other Amendments**

Other amendments made to the GSA 1993 are as follows:

### **i. Obligations of Licensees**

Licensees are now required to carry out the following for the purpose of enhancing economic regulation, efficiency and competitiveness. These obligations are to ensure that ST has the necessary and relevant information to undertake, plan, monitor and regulate the gas market to ensure the continued growth and development of the industry:

- Submit a five-year rolling business plan to ST - A requirement imposed only on regasification, transportation and distribution licensees.
- Implement standards of performance and service - A requirement imposed only on regasification, transportation, distribution and retail licensees.
- Maintain separate accounts for separate activities - A requirement imposed on all licensees.

## ii. Power to Resolve Disputes

The GSA 1993 now confers upon ST wider powers to resolve disputes both between licensees and consumers, and also between licensees.

For disputes between licensees and consumers, the scope of resolution covers the tariff imposed by facility owners, the duty of a retail licensee to supply gas, recovery of expenses by licensees, the requirement of security by licensees, metering disputes, and the reduction, disconnection or cessation of the retail of gas. Meanwhile, for disputes between licensees, the scope of resolution is wider. It covers all matters except for those pertaining to competition matters.

Notwithstanding the above, in cases where the dispute is contractual, ST may decide whether it should be determined in accordance with the dispute resolution provisions in the agreement or whether it should be determined by the court.

## iii. Power to Audit and Obtain Information and Documents

The amended GSA 1993 also confers upon ST the power to audit any person (including licensees, institutions, manufacturers, importers, or gas contractors) on any licensed activity.

It also confers on ST the power to require any person to furnish all information and documents as reasonably required by ST to carry out its duties or functions under the GSA 1993.

## iv. Power to Issue Codes, Guidelines and Directions

Apart from the above, the amended GSA 1993 also confers upon ST the power to develop and issue codes relating to the use of regasification terminals, transmission and distribution pipelines as well as other codes as deemed fit and expedient. Such codes shall take precedence over any agreement that may exist between licensees and other parties, and the failure to comply with the codes is deemed an offence under the GSA 1993. To that effect, the TPA Code for Malaysian Regasification Terminals, the TPA Code for Malaysian Transmission Pipelines and the TPA Code for Malaysian Distribution Pipelines have been issued by ST and are available for viewing and downloading on its website at <http://www.st.gov.my/index.php/ms/industry2/843-third-party-access-system-legislation>.

In addition, guidelines or directions may also be issued by ST on any matter as provided under the GSA 1993 or as may be expedient or necessary for the interest of carrying out the provisions of the GSA 1993. As with the codes, failure to comply with the guidelines or directions is deemed an offence under the GSA 1993. To date, two guidelines have been

issued by ST, namely the Guidelines on Competition for the Malaysian Gas Market in relation to Market Definition, Anti-Competitive Agreements and Abuse of Dominant Position, and the Guidelines on Licence Application. All guidelines which have been issued are available for viewing and downloading at the same web address as given in the paragraph above.

## **2. Licences under TPA**

The main legal framework of the TPA is the Gas Supply (Amendment) Act 2016 which lists down seven different activities, for which interested parties must apply for and be granted a licence. Qualified parties who intend to participate in the licensed activities can apply for a licence. ST have issued the Guidelines on Licence Application, which assist the interested parties on the necessary requirements and steps to be taken to apply for the respective licences. The seven types of licensed activities under the act are as follows:

- (a) Import into regasification terminal;
- (b) Regasification;
- (c) Shipping;
- (d) Transportation;
- (e) Distribution;
- (f) Retail; and
- (g) Use of gas.



### 3. TPA Codes

Within its expanded regulatory scope, pursuant to the amendments made under the GSA 1993, ST now has the power to develop and publish codes, guidelines and directions. As such, three Codes were developed for each of the major gas facilities that are regulated under the Act namely:

- (a) The TPA Code for Malaysian Regasification Terminals;
- (b) The TPA Code for Malaysian Transmission Pipelines; and
- (c) The TPA Code for Malaysian Distribution Pipelines.

The objectives of establishing a framework for TPA to the said facilities are as follows:

- (a) To promote the development of a competitive gas market by establishing uniform principles to be applicable to the relevant parties;
- (b) To ensure transparent, fair and non-discriminatory practices in all transactions concerning the use of the gas facilities;
- (c) To prevent abuse of dominance and any potential anti-competitive conduct; and
- (d) To ensure safe and reliable supply of gas.

With these goals in sight, it is of utmost importance for ST to ensure that all parties involved in the TPA regime comply with the provisions in the Codes including the facility owners, facility users and the connected parties. The provisions mainly describe all the principles that must be adhered to when the parties involved in the TPA-related affairs are developing or co-developing the necessary documents such as the Access Arrangement, Gas Facility Access Agreement, Gas Connection Manual and etc.

#### 4. Tariff Determination for the Utilisation of Gas Facilities

After the date of commencement of the Gas Supply (Amendment) Act 2016, the word tariff in section 13 of the Act refers to the tariff in respect of the utilisation of gas facilities i.e. regasification terminal, transmission pipeline and distribution pipeline, as well as the gas price at the retail segment i.e. shopping complex and residential area.

ST, with the approval of the Minister, will determine the tariff for the utilisation of gas facilities to ensure the financial sustainability of gas facility licensees in providing good quality services and at the same time in protecting the interest of its users. In addition to that, ST may also determine the gas price at the retail segment with the objective of protecting the consumer's interest as options are limited for the retail licensee gas suppliers.

ST will determine the tariff for the utilisation of the following gas facilities:

- (a) Regasification terminal;
- (b) Transmission pipeline; and
- (c) Distribution pipeline.

ST has adopted the IBR framework as a structure in setting-up and determining tariff for the utilisation of the above gas facilities. The built-in incentives within the IBR framework will incentivise gas facility licensees to improve the quality of their services without sacrificing the reliability of services. The IBR framework has the following features:

- (a) Determination of regulatory period;
- (b) Establishment of regulatory accounts and reporting mechanism;
- (c) Separation of regulatory accounts from other non-regulated business;
- (d) Determination of the required annual revenue requirement for the regulatory period;
- (e) Determination of reasonable return for the regulatory period;
- (f) Determination of financial performance and technical efficiency targets for the regulatory period with incentive/penalty mechanism; and
- (g) Implementation of efficiency sharing mechanism between licensee and consumers in the next tariff regulatory period.

ST has issued three (3) guidelines which incorporate most of the above features or requirements as follows:

- (a) Guidelines on the Determination of Regasification Facility Tariff Under IBR;
- (b) Guidelines on the Determination of Gas Transportation Facility Tariff Under IBR; and
- (c) Guidelines on the Determination of Gas Distribution Facility Tariff Under IBR.

The above guidelines have been effective starting from 30 August 2018 and are applicable to gas facility licensees. At the end of 2018, ST with the approval of the Minister has determined the tariff for the utilisation of gas facilities for a pilot regulatory period in 2019 for the following gas facility licensees:

- (a) Petronas Gas Berhad;
- (b) Regas Terminal (Sg. Udang) Sdn Bhd; and
- (c) Pengerang LNG (Two) Sdn Bhd.

## **5. Towards Market-Based Gas Pricing - IBR Framework for the Determination of Natural Gas Tariff and Gas Facility Tariff**

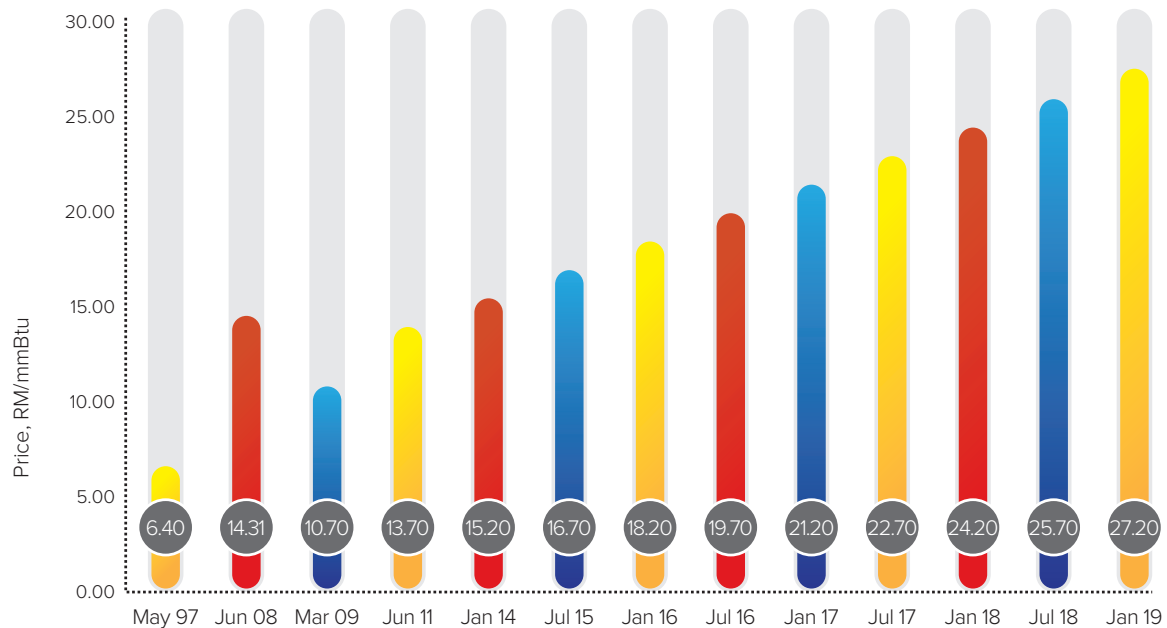
A decision on GMB's gas selling price (base tariff) and implementation of gas cost pass-through mechanism for the first regulatory period has been made by the Government on December 2016. The decision will continue to be in force until it is amended and revoked.

In line with the Government's policy on the liberalisation of the gas supply industry, the Government has started the gas subsidy rationalisation programme since 2011. At the end of the programme, it is expected that the gas price for the end-consumers at the transmission and distribution segments will be on a willing-buyer, willing-seller basis. Nevertheless, any decision on the gas price or tariff must be made before the commencement date of the GSA (Amendment) 2016 and will continue in force until it is amended or revoked.

In the first quarter of 2017, the Government decided to continue the subsidy rationalisation programme by increasing the existing regulated gas price for both the power and non-power sectors by RM1.50/mmBtu for every six months until it reaches the market price. The formula indicating the gas market price which is indexed to the Malaysian LNG export price has been determined by the Government. The successful implementation of the gas subsidy rationalisation programme is anticipated to push the gas price to reach a competitive level and attract new gas suppliers to bring gas into Malaysia.

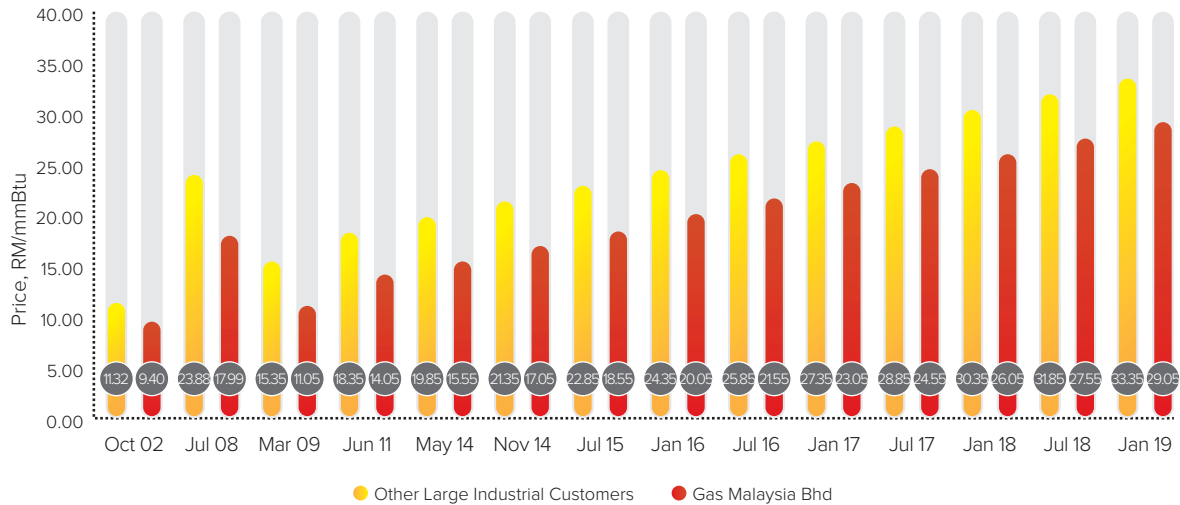
Since the launch of the *Subsidy Rationalisation Programme* in 2010, the Government has made considerable strides in moving towards market-based pricing for energy, which includes natural gas. It formally enshrined this objective as one of five (5) key strategic pillars of the country's *New Energy Policy* (2011-2015), subsequently reaffirming its importance in the *11<sup>th</sup> Malaysia Plan*.

To operationalise the subsidy rationalisation effort for natural gas, the Government announced in May 2011 that regulated gas prices for both the power and non-power sectors would be increased by RM3.00/mmBtu every six months from June 2011 until market parity is reached. However, this increase was later adjusted to RM1.50/mmBtu every six months in 2014, with a mandate limited to three years. In December 2016, the Government provided a further mandate for this increase to continue indefinitely for the non-power sector until market parity is reached. In May 2017, the same decision was made for the power sector. The culmination of these decisions has served to further entrench prospects of moving to market-based pricing of natural gas. The figures below indicate the regulated prices for the power sector.



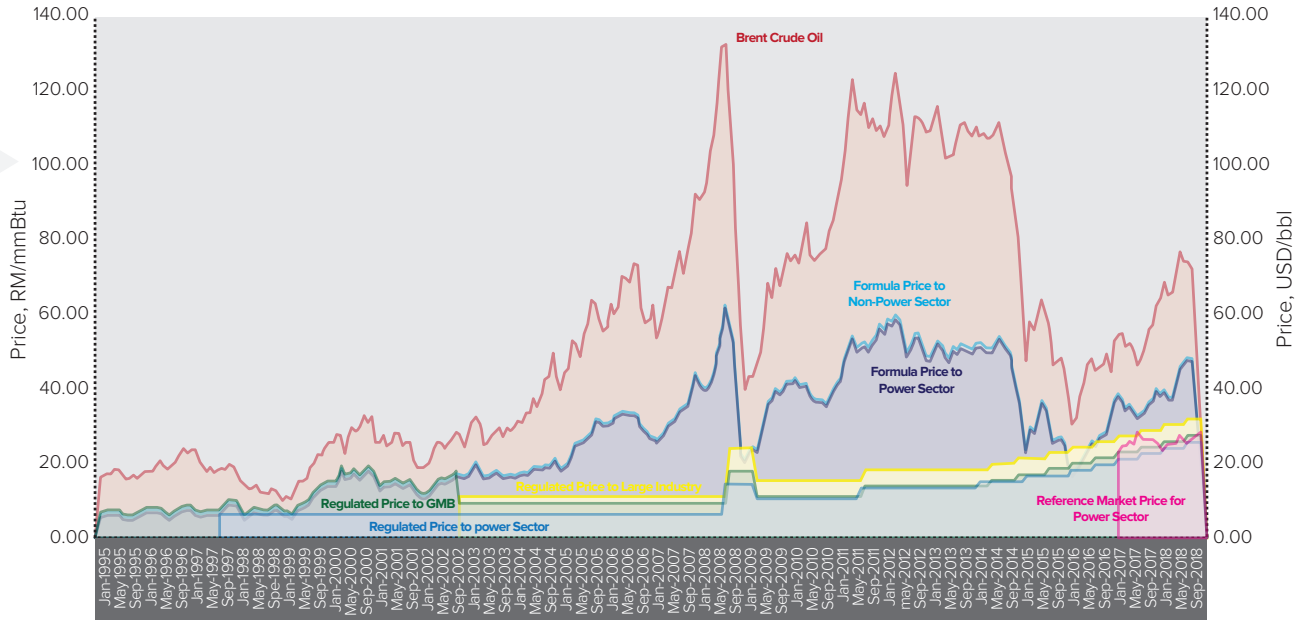
**Regulated Prices for the Power Sector**

In addition, the graph below shows the regulated prices for the non-power sector.



### Regulated Prices for the Non-Power Sector

The Government’s price reform efforts have led to considerable progress in liberalising the gas market, with the transition further assisted by the decline in the world oil prices since late 2014. This is illustrated by the disparity between the regulated and market prices for power as at June 2017 which stood at a mere 31% while for wholesale non-power at just 15% – a far cry from the 60 to 70% range that prevailed for most of the pre-reform period (2002 to 2015) as shown in the following graph. It has concurrently reduced the annual gas subsidy burden, enabling both the Government as well as industry players to redirect vital economic resources toward other areas of the economy.



**Regulated and Market Prices for Power and Non-Power Sectors**

## B. GROWTH IN GAS INFRASTRUCTURE AND SUPPLY

In meeting the energy needs of a fast-growing country in an equally fast-growing region, Malaysia took on an integrated approach to developing key supply sources and infrastructure for the gas market.

The latest integrated gas development in Peninsular Malaysia is the North Malay Basin project, approximately 186 miles (300 kilometres) offshore northeast of Kerteh, with an estimated gross recoverable resource of more than 1.5 trillion cubic feet of natural gas and more than 20 million barrels of condensate since July 2017<sup>14</sup>.

To further diversify Malaysia's source of fuel and secure supply from the global gas market, LNG import and regasification terminals were commissioned in strategic locations in the west coast and south of Peninsular Malaysia as mentioned in Chapter 2C.

<sup>14</sup> HESS, 'North Malay Basin', HESS Website, USA, 2013-2018, 1  
<http://www.hess.com/operations/offshore/north-malay-basin>

Infrastructure wise, the growth of the PGU transmission pipeline has been stable since the commencement of the first PGU pipeline in 1984, with a total length of 2,554 kilometres in 2016. In 2017, the pipeline network was expanded primarily to cater to the needs of the PIC. However, the volume of gas throughout has reduced from 2,148 mmscfd in 2016 to 2,084 mmscfd as of July 2017 due to lower than projected consumption by key customers<sup>15</sup>. The PGU line was successfully connected to 39 customers as of 2017. Also, planned maintenance works were successfully carried out, which accounted for the PGU transmission line's 99.98% gas delivery reliability for the year 2016<sup>16</sup>.

Further downstream, TNB's Prai Combined Cycle Gas Turbine (CCGT) power plant was commissioned on 20 February 2016, with a capacity of 1,071 MW. Meanwhile, the Pengerang Cogen Plant Phase 1, with a 400 MW capacity that supplies to the national electricity grid, underwent commissioning on 21 October 2017 and commenced operations in the fourth quarter of 2017.

At the distribution level, the growth rate of natural gas consumption from the distribution pipelines for 2016 in Peninsular Malaysia was 2.97% (the consumption in 2016 being 439 MMsfc/day), comparably lower than the preliminary forecasted consumption in 2016 using the Forecast Pro software which calculated it at 8.81%. On the other hand, in 2017, the growth was calculated at 12.29% (the consumption in 2017 being 488 MMsfc/day), having increased tremendously from 2016 which was at 6.05%, mainly due to the higher demand of gas from the industrial sector<sup>17</sup>.

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<sup>15</sup> Petronas Gas Berhad, PGB Annual Report 2016 & 2017 (Kuala Lumpur: PGB, 2016 & 2017)

<sup>16</sup> Ibid.

<sup>17</sup> Gas Malaysia Berhad, Monthly Report GMB 2016 & 2017 (Shah Alam: GMB, 2016 & 2017)

# CHAPTER 4

## THE WAY FORWARD





# THE WAY FORWARD

## A. PROSPECTS

In becoming a highly effective energy regulator, ST continuously finds new and better ways to promote new players, create a competitive market, ensure supply reliability and enhance the overall piped gas industry.

The implementation of TPA and the introduction of key amendments in the GSA further augments ST's role as the regulator for the piped gas industry which is deemed to grow with newcomers' market entry.

RAPID in Pengerang, Johor will commission and commence its operation in 2019 and begin its oil refining and petrochemical production, thus increasing the demand for natural gas. Meanwhile, GMB plans to expand the areas of distribution pipelines for the year 2019 to 33 of the existing areas in the four regions in Peninsular Malaysia: the northern region (Kamunting, Bukit Minyak, Nibong Tebal, Kulim and Sitiawan), the central region (Kapar, Sungai Buloh, Beranang, Rawang, Kuala Lumpur, Bestari Jaya and etc), the southern region (Tebrau, Batu Berendam, Lipat Kajang, Masai, Kluang, Pasir Gudang and etc) and the eastern region (Kuantan and Teluk Kalong). In addition, GMB will also expand its coverage to 12 new areas such as Sri Gading, Krubong, Ayer Tawar, Bota, Bemban, Lahat, Meru, Chemor, Bercham, Lunas, Sungai Bakap and Bandar Sunway.

## B. INDUSTRY PROJECTION

The energy mix for Peninsular Malaysia at the end of 2017 comprised of 53.74% of coal, 39.52% of gas, 5.83% of hydro and 0.91% of others. Since 2000, coal consumption has increased significantly to more than 50% of the total energy mix. The latest coal power plants that went online was Tanjung Bin Energy Sdn Bhd on 21 March 2016 with a capacity of 1,000 MW and TNB Manjung Five Sdn Bhd on 28 September 2017 with the same capacity of 1,000 MW. Upcoming coal power plants include two units of Jimah East Power Sdn Bhd in June 2019 and in December 2019 with a capacity of 1,000 MW respectively.

In support of gas as a major contributor to the nation's energy mix, the Government has approved the allocation of 800 mmscfd of gas for Peninsular Malaysia's power sector from 2018 to 2020. Recently, Pengerang Power Sdn Bhd has commenced its operation starting 21 October 2017 with a capacity of 400 MW and an additional capacity of 200 MW in 2019. In 2017, ST has also awarded two combined cycle gas-fired power plants namely Southern Power Generation Sdn Bhd (commercial operation by 2020) and Edra Energy Sdn Bhd (commercial operation by 2021).

These latest ultra-supercritical coal plants and combined cycle power plants have a higher thermal efficiency (LHV) of 44% and 61% respectively which enable the generation of electricity with a lesser amount of fuel contributing to a lower CO<sub>2</sub> emission intensity, in line with Malaysia's efforts to meet the Paris Agreement on climate change.

In contrast with total energy consumption, electricity generation in Malaysia ex-Sarawak still relies heavily on coal due to its relatively cheaper price per energy output<sup>19</sup>. However, natural gas will still continue to contribute significantly due to its clean burning property and hence, lower Green House Gas (GHG) emissions<sup>20</sup>.

From the following graph, for the year 2025, coal is expected to still dominate the electricity generation industry as the primary feedstock, making up approximately 39% of the total generation mix. However, Malaysia will also target to achieve 20% for renewable energy contribution into the nation's electricity generation mix by 2025.

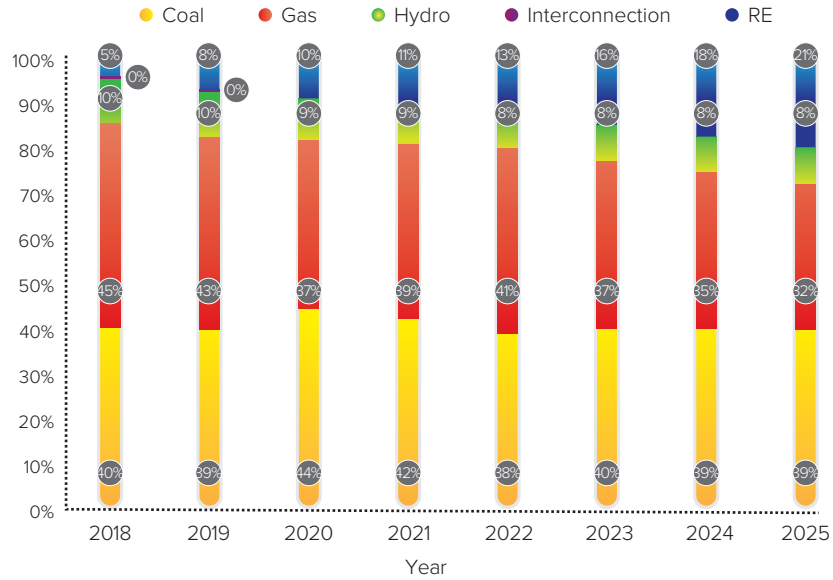
The early adoption of renewable energy will help the industry to be more competitive, and will help to be a first mover in the region to not only supply electricity in Malaysia but will also be empowered to do business outside of Malaysia. The target will also benefit the country from the spillover effect of renewable energy development through jobs and wealth creation, a multiplier effect and a more sustainable management of energy resources.

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<sup>18</sup> Gas Malaysia Berhad, Monthly Report GMB 2017 (Shah Alam: GMB, 2017)

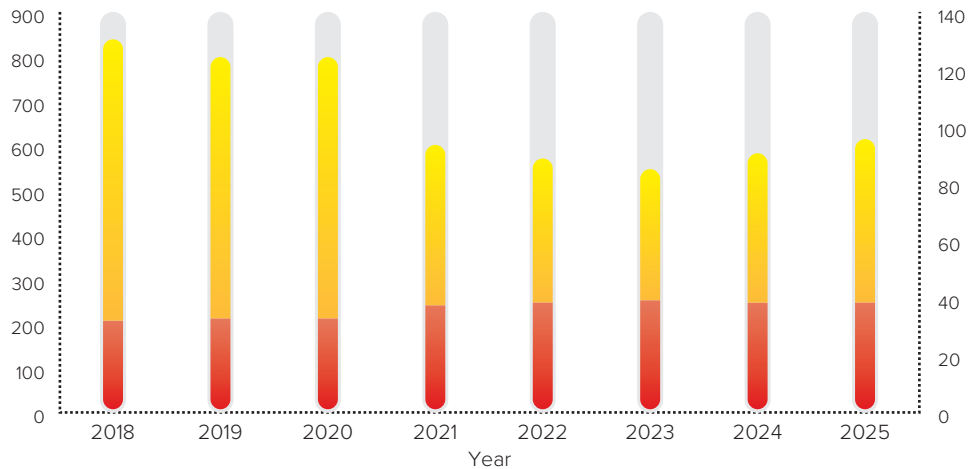
<sup>19</sup> MIDF Research, Liberalising Gas Supply In Malaysia (Kuala Lumpur: 2016), 3

<sup>20</sup> Malaysian Gas Association, Malaysia: Natural Gas Industry Annual Review 2016 (Kuala Lumpur: 2016), 22



**Energy Generation Mix**

The graph below shows the primary energy supply for the period of 2018 to 2025. As per share of renewable energy will be increasing in the energy generation mix, the future increase of demand can be catered by renewable energy. Thus, the use of coal can be minimised.

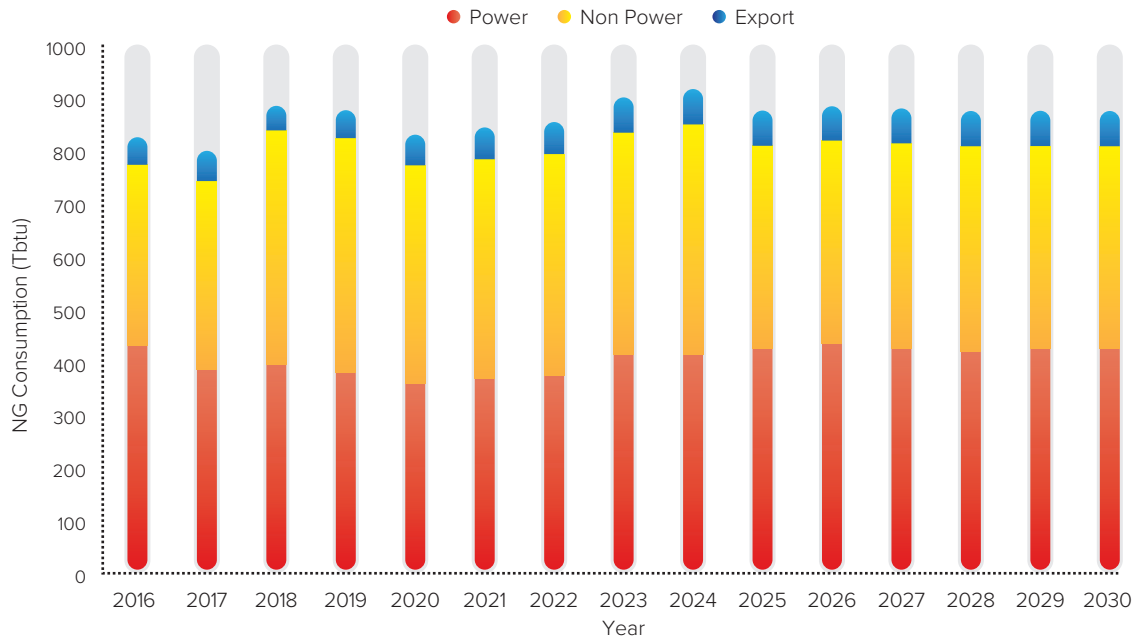


Gas, mmscfd	840	800	800	598	571	549	582	615
Coal, mil tonne	32	33	33	37	38	39	38	38

**Projected Gas and Coal Consumption**

In addition, the graph below shows the trend line for Natural Gas Consumption via the Transmission Pipeline in Peninsular Malaysia for up to 2030. For the power sector, the decline in demand from 2019 to 2020 is due to the retirement of several gas-fired power plants in the system which will be replaced by a new coal-fired power plant. Beginning 2021, the gas demand for power is likely to increase as a new gas-fired power plant will come into commission. The demand for the power sector will stabilise around 400Tbtu towards 2030.

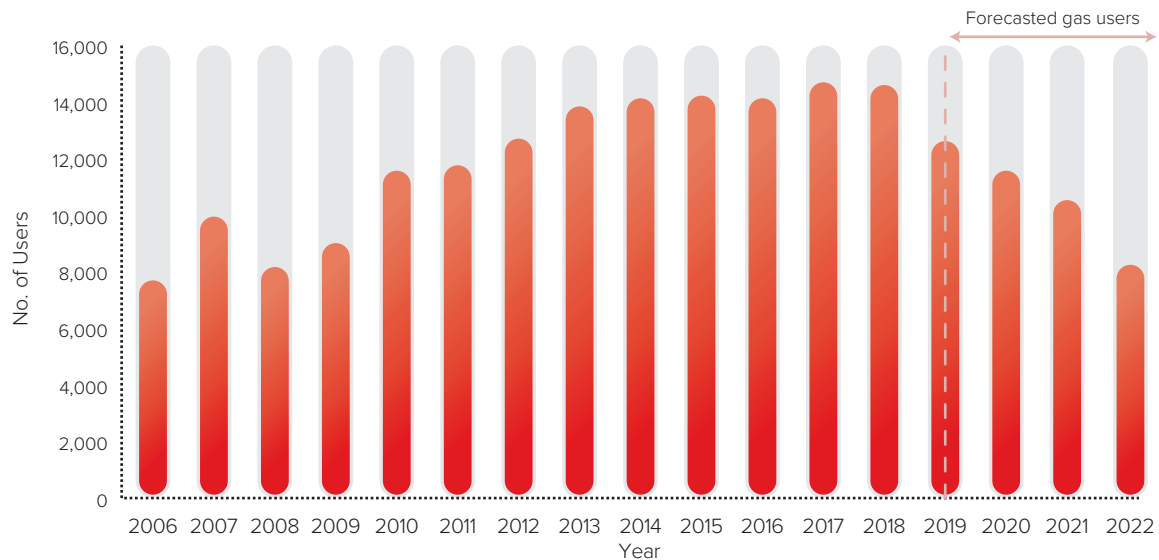
It is forecasted that growth in gas demand in sectors other than the power sector will be driven by the Pengerang Integrated Complex and by gas sold via reticulation pipelines, as well as exports to Singapore.



**Natural Gas Consumption via Transmission Pipeline in Peninsular Malaysia**

For Peninsular Malaysia, domestic natural gas pipelines are necessary not just to provide fuel for power generation, but also to provide a stable supply of fuel and feedstock for industries. Demand in the domestic distribution market is mainly driven by the private sector due to the moderated and declined growth in the public sector<sup>21</sup>. On the supply side, all economic sectors continued to expand; from services, manufacturing, agriculture to mining<sup>22</sup>. The manufacturing sector is the second largest sector that consumes natural gas from the distribution and transmission pipelines.

Further down the supply chain, as shown in the graph below, the number of natural gas users in Peninsular Malaysia has been fluctuating at varying rates for the past 12 years<sup>23</sup>. Pre-2010, there was an average of 12.8% increase in the number of new users every year. Since the newly amended GSA 2016 have been in force, the number of customer is expected to reduce due to the introduction of a new category of gas licence. However, this reduction will not affect the consumption of gas.



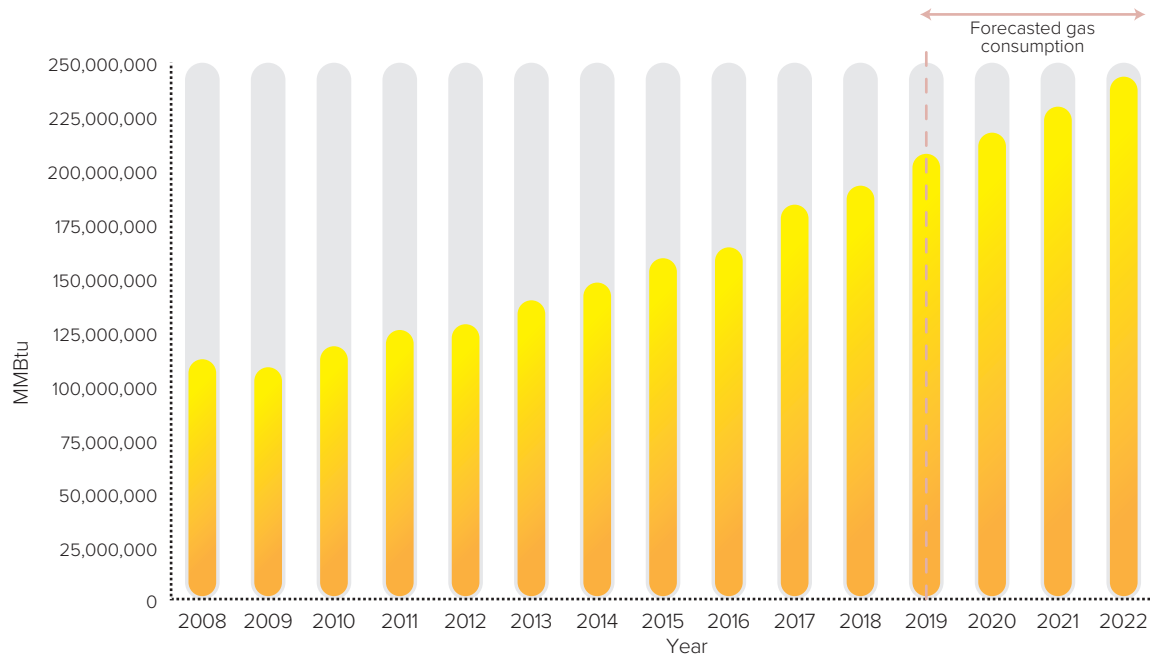
**Natural Gas Users via Distribution Pipelines in Peninsular Malaysia**  
(Note: GMB customers only)

<sup>21</sup> Economic Performance and Prospects website

<sup>22</sup> Ibid.

<sup>23</sup> Gas Malaysia Berhad, 2006 to 2018 Monthly Report (Shah Alam: 2006 to 2018)

The consumption of natural gas has been increasing at an average of 5.7% during the period of 2008 to 2018<sup>24</sup>. As seen in the graph below, for the next four years, the average growth will be increasing<sup>25</sup>, with consumption of the industrial sector still dominating the rest. The industrial sector represents a diverse range of industries that include rubber products, food, beverage and tobacco, chemical products, fabricated and basic metals and glass products, which will further expand their service by distributing gas to new customers and new pipeline projects in the future. GMB anticipates that these growth trends are expected to continue along with the growing demand for supply albeit at a slower pace than what the market has seen before.



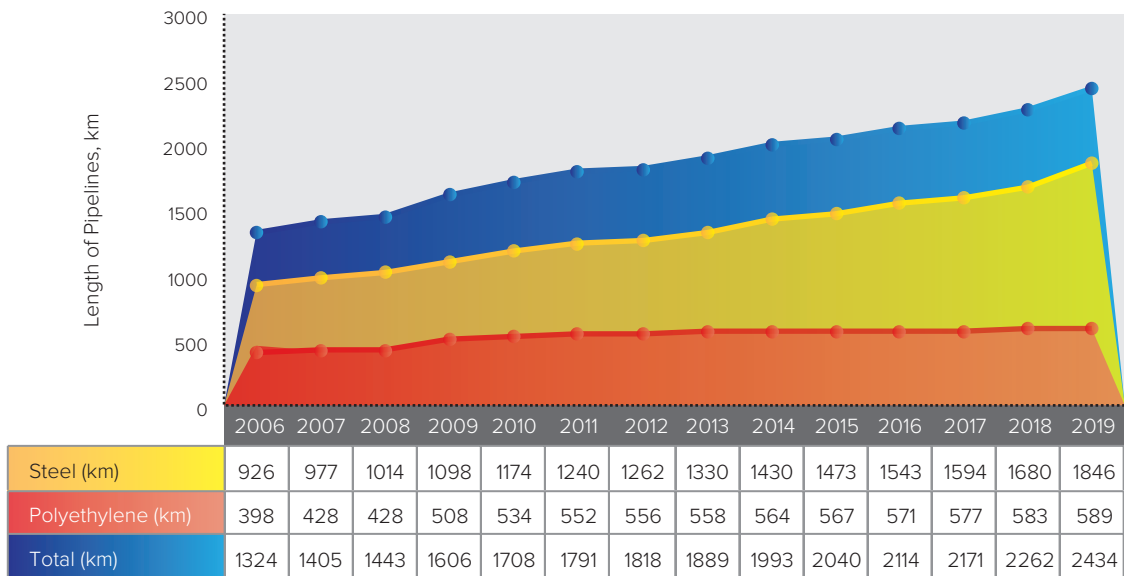
**Consumption of Natural Gas via Distribution Pipelines in Peninsular Malaysia**  
(Note: GMB customers only)

<sup>24</sup> Gas Malaysia Berhad, 2008 to 2018 Monthly Report (Shah Alam: 2008 to 2018)

<sup>25</sup> Using Forecast Pro software and estimated forecasted data from GMB

From the graph shown below, the length of pipelines shows an increasing trend from the year 2006 up to 2019. With the introduction of the TPA, there will be more opportunities for new entrants to participate and to invest in new infrastructures hence the pipeline network will be expanded.

**RECENT, CURRENT AND FUTURE EXPANSIONS**



**Natural Gas Distribution Pipeline Length in Peninsular Malaysia – Current and Forecasted  
(Note: GMB customers only)**

### C. GAS SUPPLY INDUSTRY CHALLENGES

One of the challenges includes the transition from a monopolistic to a market-based pricing. Prices will become more volatile and fluctuate depending on the global cost of energy. A good example would be the worldwide decline of crude prices that has allowed the cost of petrol to stay low even without any subsidies. However, if the international prices increase, so will the price of petrol in the country<sup>26</sup>. Other than that, the challenge in liberalising the gas market in our country is the task of unbundling monopolistic activities. This creates an impending need to address and supervise the separation of some gas-related activities which have previously been carried out by one business entity to ensure that no conflict of interest arises which would then affect competitiveness and the successful implementation of the TPA system.

Other challenges include:

- i. Ensuring the existence of transparency across the board, and creating a level playing field;
- ii. Attracting new players into the market;
- iii. Setting the tariff for the use of gas infrastructures which would be fair for both the gas infrastructure owners as well as the users;
- iv. Facilitating the process for the current users and suppliers who are on a long-term contract; and
- v. Having a liquidity market for the gas industry.

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<sup>26</sup> Suruhanjaya Tenaga, Energy Malaysia Volume 8 (Putrajaya: 2016), 13



## CLOSURE

Domestic gas production in Peninsular Malaysia has gradually declined in recent years, whilst domestic gas demand has increased. Moreover, new gas fields contain higher contents of CO<sub>2</sub> and require higher Capital Expenditure (CAPEX) and Operating Expense (OPEX) to develop and operate compared to existing fields. The rise in demand can affect the development of the country if it is not immediately resolved. Hence, the move to market-based gas pricing is vital to liberalise the market and to ensure supply security through competitive gas prices. In response, the Government introduced the TPA concept to ensure the security, reliability and sustainability of gas supply in Malaysia. To support the TPA, two regasification terminals which are the RGTSU and the RGT2 have been constructed. In addition to this, a legal framework has also been established, with amendments made to the GSA 1993 via the Gas Supply (Amendment) Act 2016 which came into effect on 16 January 2017. These amendments will further empower ST with regulatory powers to oversee the implementation of the TPA system, including the powers to issue subsequent codes, guidelines and directions to cover more operational aspects of the TPA system.

The TPA system will create a platform for other players other than PETRONAS and GMB to utilise three major gas infrastructures in Malaysia, namely the regasification terminals, transmission pipelines and distribution pipelines, without fear of discrimination, irrespective of the ownership of such gas infrastructures. The main objective of the TPA system is to attract new suppliers to inject gas into the Malaysian gas market whilst promoting healthy competition among each other. In a scenario where there are many new gas suppliers, gas consumers will be able to choose the gas supplier that is best suited to their needs and this in the long-term would benefit them and result in a continued growth of the country's economy.

Mitigation actions include the issuance of related codes and guidelines to enable a smoother implementation of the TPA principles, as well as continued interaction and consultation with industry players with the overall purpose of ensuring that a well-rounded view and decision is made by ST amidst the changing landscape.

# ACRONYMS AND ABBREVIATIONS

<b>CAPEX</b>	Capital Expenditure
<b>CCGT</b>	Combined Cycle Gas Turbine
<b>GCPT</b>	Gas Cost Pass-Through
<b>GDP</b>	Gross Domestic Product
<b>GMB</b>	Gas Malaysia Berhad
<b>GSA</b>	Gas Supply Act
<b>GPP</b>	Gas Processing Plant
<b>IBR</b>	Incentive-Based Regulation
<b>LNG</b>	Liquefied Natural Gas
<b>LPG</b>	Liquefied Petroleum Gas
<b>mmBtu</b>	Million Metric British Thermal Unit
<b>mmscfd</b>	Million Metric Standard Cubic Feet per Day
<b>Mtpa</b>	Metric tonnes per annum
<b>NGDS</b>	Natural Gas Distribution System
<b>OPEX</b>	Operating Expense
<b>PCP</b>	Pengerang Cogeneration (Power) Plant
<b>PIC</b>	Pengerang Integrated Complex
<b>PIPC</b>	Pengerang Integrated Petrochemical Complex
<b>PETRONAS</b>	Petroleum Nasional Berhad
<b>PGU</b>	Peninsular Gas Utilisation
<b>RAPID</b>	Pengerang Refinery & Petrochemical Integrated Development
<b>RGT2</b>	Pengerang LNG Receiving and Regasification Terminal
<b>RGTSU</b>	Regasification Terminal Sungai Udang
<b>ST</b>	Suruhanjaya Tenaga
<b>TNB</b>	Tenaga Nasional Berhad
<b>TPA</b>	Third Party Access





**SURUHANJAYA TENAGA (ENERGY COMMISSION)**

No. 12, Jalan Tun Hussein, Precinct 2,  
62100 Putrajaya, Malaysia.

Tel: (03)-8870 8500 Fax: (03)-8888 8637 Website: [www.st.gov.my](http://www.st.gov.my)  
Toll Free Number: 1 800 2222 78 (ST)