GAS MARKET LIBERALISATION IN MALAYSIA: CRITERIA CONSIDERATIONS FOR POTENTIAL MARKET ENTRANTS

Amanuddin Shamsuddin
Amar Hisham Jaafar
Maryam Huda Ahmad Phesal
Tan Ee Sann

ABSTRACT

Natural gas now plays an important strategic role in energy supply as global energy demand grows. Of all hydrocarbon energy sources, natural gas is the cleanest and most hydrogen-rich and it has high energy conversion efficiencies for power generation. In Malaysia, population growth and environmental considerations are likely to have a positive impact on gas demand for power generation in the future. Therefore, Malaysia has undergone a profound transformation that is important to ensure energy security. This paper provides a systematic, flexible and suggested strategies to overcome the challenges and maximize future opportunities on Malaysia's gas market reform towards a competitive and sustainable energy market. The paper is intended to provide informed decision to potential players on the analysis and strategies in relation to the gas Third Party Access (TPA) in Malaysia. The methodology used for the study involved data collection via desktop study, interviews and focus group discussions with experts and key stakeholders in energy (gas) industry in Malaysia. The findings of the study had addressed the challenges of gas market reform, identified the key elements of the TPA system from TPA pilot phase, explored the implications and lessons learned from other countries based on the Malaysian scenario. Based on these existing and current scenario of gas market in Malaysia, this paper provides the strategic recommendation with justifications using SWOT analysis, risk analysis, stakeholder analysis and cost-benefit analysis. The interactions and combinations of the analyses demonstrate a mechanism to make informed decision to the potential entrants on the gas industry reform toward a liberalised market in Malaysia. Hence, these players would be able to consider and make decisions on whether to be part of the gas market liberalisation in Malaysia or otherwise.

Keywords: Gas, Market Liberalisation, Third Party Access (TPA), Energy, Malaysia

INTRODUCTION

Malaysia's gas market is undergoing reforms. Malaysia has developed the gas industry with the introduction of gas policies and establishment of the Malaysia's fully integrated oil and gas company, PETRONAS through Gas Masterplan Study in 1981, which created a long-term strategy and integrated planning for gas industry development in Malaysia, as well as recommending the development of Peninsular Gas Utilisation (PGU) pipeline network (MEA 1981; MGA 2017).

In Malaysia, about 40 percent of natural gas accounted of six Malaysia's total primary energy supply met by domestic gas production and gas imports. Total natural gas consumption is expected to grow at 18% annually between 2007 and 2035 (Kumar, Stern and Shamsuddin, 2020). Meanwhile, gas demand in Malaysia has been growing since the 1980s, mainly due to increasing gas consumption in the power sector and industry (Kumar, Stern and Shamsuddin, 2020). Meanwhile, rapid urbanisation will trigger increased demand for energy to sustain city dwellers and satisfy urban lifestyle needs (EC, 2019) whereby Malaysia's population, at 32 million in 2017 is forecast to grow to 45 million in 2050, with almost 90% expected to live in cities. Here, a conducive ecosystem for the development of a healthy natural gas industry in the future become more challenging.

Therefore, a transition (or reform) of gas industry started in 2016 with the amendment to the Gas Supply Act 1993 which came into effect on 16 January 2017 provides the legal framework for the Third Party Access (TPA), which allows other shippers to supply gas to the Malaysian gas market by using the existing gas infrastructure. The amended Act provides the licensing of the import into regasification terminal, the transmission of the gas until the retailing of the gas, marks the opening of the gas market liberalisation in Malaysia. The first step to achieving gas market liberalisation is the implementation of TPA, allowing third parties to access gas infrastructure (Heather 2015). Previously, only PETRONAS and Gas Malaysia were the exclusive suppliers of gas in the country, with PETRONAS serving the wholesale market through domestic output supplies and foreign reserves (Lim and Goh, 2019) and Gas Malaysia Berhad (GMB), the retail market which comprises the distribution process, running and distributing networks in Peninsular Malaysia and providing manufacturing, commercial and residential customers with gas. Furthermore, the Act further expanded the regulatory role of the Energy Commission (EC) and implementation of TPA in Peninsular Malaysia. As at end November 2019, the Energy Commission had issued 14 new licenses for this purpose where seven are for Liquefied Natural Gas (LNG) importation and seven for shipping.

However, the rising demand and regulating prices of natural gas saw PETRONAS selling natural gas at a relatively low price that affects the Government's revenue collection negatively. All the challenges can be managed based on the lesson learned from other countries of gas market liberalisation for Malaysia to start revamping the Malaysian gas industry transition from monopolistic practices to a free market environment in accordance with Malaysian scenarios.

In summary, this energy transition process requires more than changes in the law. Therefore, the indicators and initiatives involved the synergy of dynamics from various aspects to ensure that the ecosystem is conducive for the development of a healthy natural gas sector to ensure secured energy supply, while catalysing the growth of new industries and generating new revenues for the

nation. This paper is, therefore, proposing some recommendations to new players or entrants to the gas market liberalization in Malaysia based on the experience from other countries as well as the input gathered from this study.

RESEARCH OBJECTIVES

The main objective of this paper is basically to explore the roles that can be played by potential players who might be interested to be part of the liberalization of the gas market in Malaysia. Secondly, these players need to consider and make decisions whether to be involved in the gas business directly or indirectly, taking into accounts the future of energy markets (supply and demand) as well as the operational and implementation issues.

RESEARCH METHOD

Data collection for this research was conducted via desktop study and interview sessions with key stakeholders in Malaysia. The feedback and comments were further enrich through the Gas Workshop and meetings with various stakeholders and experts in gas industry in Malaysia. Specifically, two approaches were applied to gather and analyse the data required to address the research questions or research objectives:

i. Secondary data collection
Secondary data collection on the background and functioning of the Malaysia's energy system, historical energy supply and demand trends, government policies and objectives, energy institutions, gas market reform initiatives, gas and electricity tariffs/prices. Data was collected from national publications, Malaysia Energy Information Hub (MEIH) database, the Energy Commission (EC) and Single Buyer websites.

ii. Stakeholder Interviews
Interviews with stakeholders were conducted to find out:
- the functions of the respective key energy players
- the existing role of the stakeholders
- gas and electricity market structures
- future objectives of the government to reform the gas and electricity markets.

STRATEGIC RECOMMENDATIONS TO POTENTIAL PLAYERS

Since the gas market liberalisation in Malaysia still at the early stage and it will take some time – approximately 10 years (Kumar, Stern and Shamsuddin, 2020) - to fully liberalise, many potential entrants are hesitated to commit themselves. This inclination is coupled by other factors such as the political instability of the country in recent years, the unpredicted scenario of COVID-19 pandemic, the technology and digital development and other factors. Thus, these potential (gas) players would rather play "wait and see" game before they commit themselves. Based on these existing and current scenario of gas market in Malaysia, this paper provides the strategic recommendation with justifications using SWOT analysis, risk analysis, stakeholder analysis and cost-benefit analysis. The interactions and combinations of the analyses demonstrate a mechanism to make informed decision to the potential players on the gas industry reform toward a liberalised market in Malaysia.

SWOT Analysis

SWOT is an acronym representing Strengths (S), Weaknesses (W), Opportunities (O), and Threats (T). It is a method for identifying the potential strengths aimed at exploiting its opportunities to counteract threats and diminish weaknesses. In this method, there are internal and external factors with the S and W representing the former while the O and T represent the latter. The external factors are not within control while internal factors are those within control.

Strength

Ready market – power sector and industry
Gas demand in Malaysia has been growing since the 1980s, mainly due to increasing gas consumption in the power sector and industry. Demand in Malaysia peaked in 2008 and declined in 2009 and remained low for four years, possibly due to the Asian financial crisis and gas curtailment in 2011. Curtailments of domestic gas supply to the power sector lasted for almost 50 days, which impacted power sector system security and reliability. As gas was the main generation source in 2011, a sufficient amount of gas was required to maintain the security and reliability of the system to meet the demand. The gas shortage caused a net loss to utility companies such as Tenaga Nasional Berhad (TNB)'s revenue and more importantly, raised the issue of fuel security in the power sector (Kumar, Stern & Shamsuddin, 2020). Power sectors use natural gas to generate electricity in several power plants. (54.3% of gas usage by TNB). Currently, there are seven power plants that use gas to generate electricity.

Availability of policies and initiatives on Third Party Access (TPA).
Malaysia's Gas Supply (Amendment) Bill 2016 was passed by the government on 14th 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. The goal of the amendments was to enable an effective implementation of the Third Party Access (TPA) system that will allow more players, apart from PETRONAS, to 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.

Ready infrastructure.
One of Malaysia's most fundamental and crucial gas infrastructures is the country's distribution grid system, known as the Peninsula Gas Utilisation (PGU) project. 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. In addition, and in line with the Economic Transformation Programme (ETP), an LNG Regasification Terminal (RGT) has been built in Sungai Udang, Melaka and Pengerang, Johor.

Option to produce power (diversify fuel mix).
The diversification of Malaysia power generation fuel mix allows the utilization of gas to be adjusted based on supply, demand and pricing.

Weakness

Price fluctuation according to market.
Gas prices will become more volatile and fluctuate depending on the global cost of energy rather than being subsidized. In essence, opening the industry to third party players 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.

Gas is more expensive than coal.
It is the national aspiration and hoped of the communities that reliance on coal in the country will eventually be lowered, creating cleaner and more efficient power generation. Natural glass, although clean, is still classified as fossil fuel. The price of gas is relatively higher compared to coal.

Non-strategic locations of gas transmission infrastructure.
Gas supply infrastructure should ideally be in anticipation of demand. Demand centres are spread far apart, which makes laying pipelines as capital intensive venture, combined with the absence of pipelines that pass through industrial areas.

High investment cost.
The initial capital investment and other operational cost will be huge because this is a new business to any new entrants venturing into the gas market.

Opportunities

Gas - clean resource/ low emissions/ environmentally friendly.
Malaysia has generous availability of renewable resources and this is in line with government's effort to reduce greenhouse gas emissions from the energy sector, and to diversify fuel mix with a target of 20% from renewables by 2025.

New revenue stream.
For some existing power sector players, venturing into gas business is considered as new revenue stream which can be explored in distributing gas to non-power consumers. In addition shipping and transmission revenue from the gas business will also be lucrative.

Eliminate middle-man.
There is no longer the need to purchase gas from PETRONAS as power companies such as TNB will handle all distribution and transportation of the gas to its power plants directly. This saves the company from paying expensive middle-man fees. Under high levels of renewable resources, the role of conventional generators will transition from primarily supplying energy to providing reserves and backup generation for intermittent renewable resources. This will eventually increase the demand for gas in the power sector and create more market opportunity for Third-Party Access (TPA) industry players, making the price of gas more competitive. This 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. Use existing facilities, which they pay a tariff for and distribute the gas to either their own plants or facilities, or sell to other interested parties.

Technology innovation - gas conversion into power.
There is opportunity for other technology innovation to be explored, particularly in converting gas to power from the process of hydrogen power.

Potential to expand the market beyond Malaysia.
As the need for gas expands not only in Malaysia, but also other countries around South East Asia, the new entrants are able to expand their distribution market beyond the borders of Malaysia.

Threats

Stiff competition.
With the gas market liberalisation in place, there would be involvement of other local and international investment companies as competitors. Thus, competition is rather stiff.

Shortage of Gas/Curtailment.
While the market may be opened to LNG from other sources, the quality must adhere to standards set by the Energy Commission. Since the supply of gas is insufficient in Malaysia, there is a need to import from Indonesia and Thailand and this may expose the new entrants into more risks.

Lack of pricing information/transparency.
The pricing information is exclusively withheld by certain parties, disabling TPA from making good judgement on the costs required. The new entrants should gain access to accurate information on supply and demand conditions. This would introduce more flexibility for the new entrants to be informed on projected profitability of potential investments in various gas supply and consumption activities.

Limited market.
There is a possibility that the demand for natural gas is declining as more renewables are being considered as source of energy.

Change in government policies and directions.
Malaysia's political turmoil seems unpredictable, thus any change in the current government will bring around delays and changes in the policies and directions.

RISK ANALYSIS

Risk analysis involves examining how project outcomes and objectives might change due to the impact of the risk event. Once the risks are identified, they are analysed to identify the qualitative and quantitative impact of the risk on the project so that appropriate steps can be taken to mitigate them.

Qualitative analysis
A qualitative perspective analyse the likelihood of an occurrence of the potential risk that will we faced by the new entrants should they venture into gas industry market (ranging from unlikely to certain) and the consequence of an occurrence of the said risks from insignificant to severe.

Probability of Risk Occurrence and Risk Impact:
i. Low Risk – low probability with low impact/moderate probability with low impact/low probability with moderate impact.
ii. Moderate Risk – low probability with high impact/moderate probability with moderate impact/high probability with low impact.
iii. High Risk – high probability with moderate impact/moderate probability with high impact/high probability with high impact.

The probability of risk occurrence and risk impact can be depicted in the Risk Assessment Matrix as shown below:

Moderate	High	High
Low	Moderate	HIgh
Low	Low	Moderate

The score of the combination of likelihood and severity/consequence will decipher what response should be taken for the risk. Table 1 below shows the recommended response:

Table 1: Recommended Response

Type of Risk	Recommended response
Low	No additional measures required yet, monitoring required to ensure risk is controlled
Moderate	Efforts are required to reduce risk
High	Project shall not be commenced until the risk has been addressed

The possible risk that will occur should new entrants venture into the gas market industry are identified and listed out based on the likelihood of its occurrence. The consequence or impact of the risk to the new entrants are laid out from low impact to high impact. The result of the analysis are laid out in the Risk Assessment Matrix as shown in the Figure 1. Note that the types of risks are labelled from A-H as per described in the legends below:

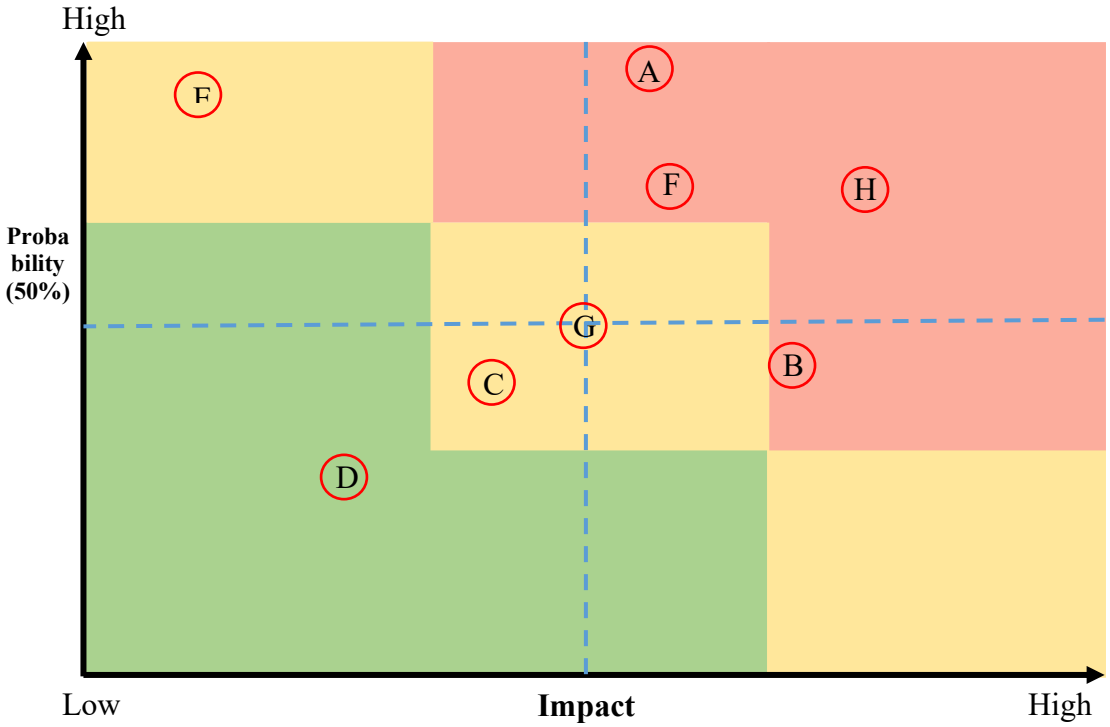

Figure 1: Risk Assessment Matrix

Legends:

A	Stiff competition
B	Shortage of gas
C	Lack of pricing transparency
D	Limited market
E	Change in government policies and direction
F	Price fluctuation
G	Non-strategic location
H	High investment distribution and transmission

From the assessment matrix above, the risks are separated into three categories as low, medium and high risks and recommendations are made based of each risk.

1. Low Risk

D - Limited market

With PETRONAS and Gas Malaysia Berhad (GMB) being the monopoly in gas imports and supply and distribution industry, there is still a small risk of a limited market opportunities in both power and non-power sectors. However, once the new entrants manage to penetrate both industries and offer competitive prices, with the right strategies to promote and create awareness to the customers, they should have no problem in gaining trust in its future customers.

2. Moderate Risk

C- Lack of pricing transparency

Empirical studies suggest that price transparency leads to a more uniform prices. The lack of transparency by PETRONAS in relation to their cost of production and supplies has left gas stakeholders in the blind of the real market opportunities. However, once the gas market is being deregulated, the new entrants will be able to observe first-hand the real market price of gas supply without having to be in the blind relying from PETRONAS and will be able to formulate a competitive price for the gas trading.

E - Change in government policies and direction
Looking at the current political uncertainties in Malaysia, the change in government policy and direction is inevitable. This will highly likely impact any decision made by the new entrants as change in the policies can highly affect any of the current and future agreements related to the liberalization in the gas market. However, they should be able to actively involve with the government, EC and other related agencies to negotiate and improve the formulation of gas market liberalisation.

G - Non strategic location
The non-strategic location of gas transmission and distribution infrastructure could be a risk to the new entrants as suppliers and distributers in the national gas market. Nevertheless, with a proper planning and organization as well as investments whether building their own gas transmission facilities or come up with a beneficial rental agreement with PETRONAS and GMB, they will be able to adjust and gain the advantages in the long run.

3. High Risk

A - Stiff competition
The new entrants will face a stiff competition with all the key players especially PETRONAS and its subsidiaries, namely Petronas Energy and Gas Trading (PEGT) which is currently the sole gas supplier, to import and supply liquefied natural gas (LNG) using existing facilities. Another strong competitor for the new entrants to face is Gas Malaysia Berhad. The strong competition will have a high impact of direction in the gas business as the current price and customers are highly monopolised by both the key players. The Independent Power Producers (IPPs) are currently being supplied by a sole contract with PETRONAS; therefore, the new entrants will have to offer competitive price to attract the IPPs to sign the Gas Sale Agreement with them. Petronas and Gas Malaysia Berhad might control their existing customers and may not want to cooperate and in return will put on limitations and restrictions to accessibility of their network and infrastructures. The new entrants must try to tackle this by negotiating with current key players for a fair competition and approach potential customers to broaden its gas market networking.

B - Shortage of gas
As gas is one of the main generation sources for Malaysia, a sufficient amount of gas is required to maintain the security and reliability of the system to meet the demand. The increasing volume of trades in the global LNG marking are expected to continue over the next decade with large numbers of new liquefaction projects taking decisions in 2019-20. Although it is less likely for a gas shortage to happen in the new future, as seen in 2011, a shortage event could possibly cause a significant net loss to the new entrants' revenue and more importantly, raised the issue of fuel security in the power sector. They must be well prepared for such event in order to maintain the energy security and reduce their potential loss.

F - Price fluctuation
The lack of transparency in relation to PETRONAS's cost of supply makes it impossible to judge the gap between the regulated and unregulated gas price. The new entrants will have to rely on the global market; therefore, any fluctuation will directly affect their revenues. In order to overcome with price fluctuation, they must conduct a proper market and costing research before proceed further.

H - High investment in distribution and transmission
Venturing into the gas transmission and distribution industry means that it is crucial for the new entrants to prepare for high capital cost for such facilities. Presently, Petronas Gas Berhad owns and operates the transmission pipelines while Gas Malaysia Berhad owns and operates the distribution pipelines. The new entrants may have to pay for rental or build its own infrastructures to operate on its own. In order to move forward as a gas supply and distribution competitor, they must perform a thorough cost and benefit analysis for this new venture.

The recommendations for the new entrants to overcome the potential risks related to the gas venture are summarised as follows;

Table 2: Summary of recommendation for potential new entrants

Risk Type	Potential Risks	Recommendations for new entrants
Low	Limited market	To plan the right strategies to promote and create awareness of new entrants on gas venture to the potential customers
Moderate	Lack of pricing transparency	To observe first-hand real market gas supplies and formulate competitive price for own gas trading
	Change in government policy and direction	To actively involve with the government, EC and other related agencies to negotiate and improve the formulation of gas market liberalisation.
	Non-strategic location	To conduct proper planning of organization as well as investments whether building its own gas transmission facilities or come up with a beneficial rental agreement with PETRONAS
	Stiff-competition	To negotiate with current key players for a fair competition and approach potential customers to broaden its gas market networking
	Shortage of gas	To prepare with contingency plan in order to maintain the energy security and reduce its potential loss
	Price fluctuation	To conduct a proper market and costing research.

High *(Crucial)*	High investment in transmission and distribution	To perform a thorough cost and benefit analysis to analyse the feasibility of investment.

STAKEHOLDER ANALYSIS

In order to identify strategic potential of gas industry reform and the evolution of a competitive gas market to the new entrants, this paper will also consider the Stakeholder Analysis perspective. Stakeholder analysis is "an effective technique to evaluate the stakes of different involved parties in a detail method" (Grimble, Aglionby & Quan, 1994). According to Grimble and Wellard (1997), stakeholder analysis can be viewed as "a comprehensive method to comprehend the system and changes in by recognizing the stakeholders and evaluating their respective interests in the institutional setting". Conducting a stakeholder analysis may help: (1) understand the context in which the innovation will be developed and implemented; (2) inform the planning process and the individuals, groups or organisations to be involved; and (3) develop strategies to both support a suitable development and implementation of the innovation and avoid potential barriers to its integration into the system (Franco-Trigo et. al., 2020). This study used stakeholder matrix analysis to analyses which stakeholders have interest and power in the evolution of a competitive gas market due to gas industry reform in Malaysia market. The new entrants can capitalize on the stakeholders with high power and interest if they decided to be the main players in the Malaysia gas market.
Stakeholder matrix analysis involved the following procedures/steps, including:

1) All the stakeholders were identified based on literature review and the data collection process conducted by previous study (Kumar, Stern and Shamsuddin, 2020).
2) All the identified stakeholders were categorized based on their interest and influence on the gas industry reform in Malaysia.
3) All the identified stakeholders have been placed in the appropriate stakeholder matrix quadrants.

For the Step 1, among the stakeholder that have been identified for this study including:
1) Ministry of Economic Affair Malaysia (MEA)
2) Energy Commission Malaysia (EC)
3) Ministry of Energy & Natural Resources (KETSA)
4) Petronas Gas Berhad (PGB)
5) TNB Single Buyer (TNB SB)
6) Independent Power Producer (IPP)
7) TNB Fuel (TNBF)
8) Importers
9) Gas Malaysia Berhad (GMB)
10) Gas Non Power Consumer
11) Malaysia Gas Association (MGA)
12) Technology Provider
13) Malaysia's Performance Management and Delivery Unit (PEMANDU)

For the Step 2, the categorization of the interest and influence of identified stakeholders were based on the data from the previous studies published in top journals related to the gas liberalisation in foreign market including:

Table 3: List of categorization of interest and influence of stakeholders

No	Detail of Papers
1.	Rubino, A. (2020). The political economy of Euro-Mediterranean cooperation in the gas market: The role of domestic stakeholders and the European Commission. Resources Policy, 101883.
2.	Demir, O. (2020). Natural Gas Market Liberalisation in the Context of the EU. In Liberalisation of Natural Gas Markets (pp. 63-102). Palgrave Macmillan, Singapore.
3.	Osička, J., Lehotský, L., Zapletalová, V., Černoch, F., & Dančák, B. (2018). Natural gas market integration in the Visegrad 4 region: An example to follow or to avoid? Energy Policy, 112, 184-197.
4.	Avraam, C., Chu, D., & Siddiqui, S. (2020). Natural gas infrastructure development in North America under integrated markets. Energy Policy, 147, 111757.

For the Step 3, stakeholder matrix quadrants shows the level of power and interest of identified stakeholders with regards to gas market liberalization in Malaysia. Based on the Figure 2 below, it can be regarded that MEA, KETSA and EC have a strong power (influence) on the gas industry reform in Malaysia, while PGB, TNB SB and IPPs have a strong interest on the gas market liberation in Malaysia. Therefore, the new entrants need to have strategic collaboration with MEA, KETSA, EC, PGB, TNB SB, and IPPs to increase the attractiveness of gas market in Malaysia.

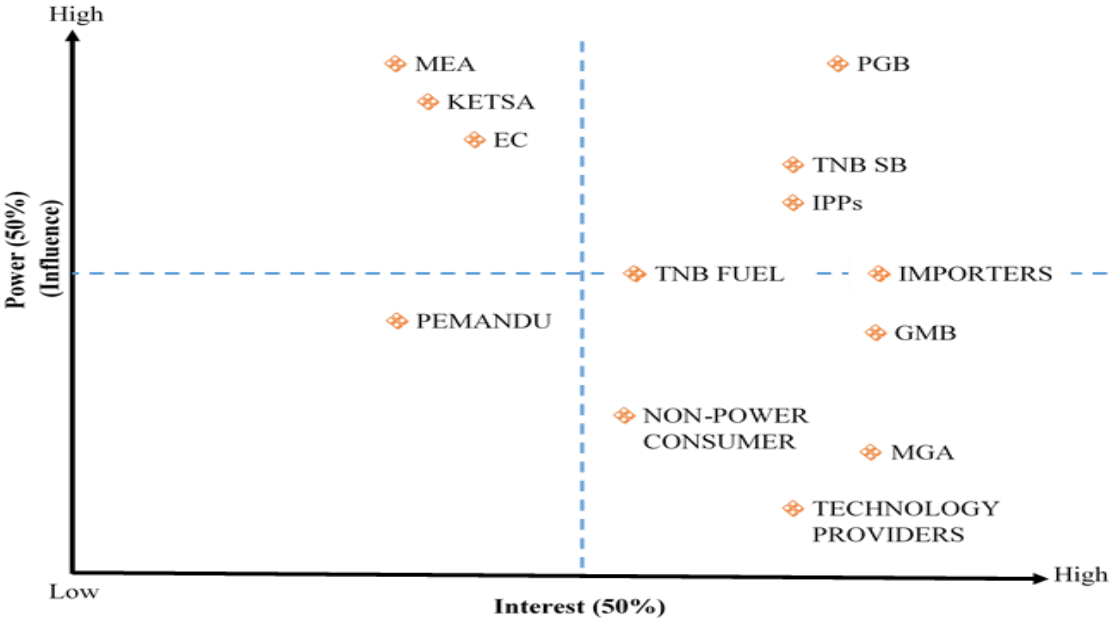

Figure 2: Stakeholder Matrix Quadrants

Legends:

1.	MEA	Ministry of Economic Affairs
2.	KETSA	Ministry of Water, Land and Natural Resources
3.	EC	Energy Commission
4.	PGB	PETRONAS Gas Berhad
5.	TNB SB	TNB Single Buyer
6.	IPPs	Independent Power Producer
7.	TNB FUEL	TNB Fuel Sdn Bhd
8.	IMPORTERS	Shell Eastern Petroleum (Singapore) Pavillion Gas Diamond Gas
9.	GMB	Gas Malaysia Berhad
10.	MGA	Malaysia Gas Association
11.	TECHNOLOGY PROVIDERS	
12.	NON-POWER CPONSUMER	
13.	PEMANDU/ PENJANA	Performance Management and Delivery Unit

As conclusion, stakeholder analysis can be used throughout the entire strategic planning process for the new entrants' decision making with regard to gas industry reform in Malaysia. Stakeholder analysis are used in a variety of countries and highly been accepted as one of the important techniques for strategic decision-making process.

COST-BENEFIT ANALYSIS

A cost-benefit analysis is a process businesses use to analyze decisions. The business or analyst sums the benefits of a situation or action and then subtracts the costs associated with taking that action. However, intangible costs and benefits should also be taken into account in making the final decisions. Further details on cost and benefit have to be further investigated and scrutinized and those processes have to involve more resources and time.

Summarised below are some of the costs and benefits that could be considered in making the decisions. It is to be noted that some of the points have been explained in other section such as the Risk Analysis above.

Costs

a) Uncertainty – possibly new ventures to the new entrants (gas business).
b) High capital investment cost for shipping, transportation and infrastructure.
c) Operational issue such as legal, information and licensing.
d) Unfair competition (for existing players).
e) Change in policies (government).

Benefits

a) Possibly an additional or new revenue stream for some new entrants (gas business).
b) Uninterrupted supply of gas and hence more secure/stable generation of electricity by power sectors.
c) Possibility of getting lower gas price for Malaysia.
d) Enhance technology innovation for gas and electricity – benefits to communities/societies.
e) Low emission from power production.

CONCLUSION

Having analysed the present situation and future direction of the gas market liberalization in Malaysia and other countries, the study provides some recommendations to the potential new entrants in the gas market in Malaysia to make gas market more attractive and hence support the government initiatives. The potential new entrants also may seize this opportunity by embarking on the gas business if the benefits outweigh the costs, both in short term and long term. However, before any decision can be made, the following considerations need to be put in place so that they will be able to address their concerns. Such considerations are:

Table 4: Consideration by potential new entrants

Considerations	Objectives
Short term and long term benefits	Ensure that the project/investment provide benefits to the new entrants and other stakeholders such as customers, nation, communities, and others.
Resource requirements	Ensure appropriate resources (people, time, finance, etc) are available and suitable.
Development of policies and strategies of gas	Ensure that the operations and future directions of gas policies by government are clear and beneficial to the relevant stakeholders.
Detail costings	Ensure that the investments are generating the benefits to the new entrants financially and the costs are contained and well managed.
Implementation framework and mitigation plan	Ensure the project/investments will be implemented efficiently and effectively. Any potential shortcomings should be adequately addressed.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the supports and contributions by all team members of the Fellowship Program between Universiti Tenaga Nasional (UNITEN) and Oxford Institute of Energy Studies (OIES). In addition, the authors would also like to thank you to the management of UNITEN and Innovation & Research Management Centre (iRMC) UNITEN for granting us to use the Pocket Grant 2-2021 (J510050002/2021100) to carry out and hence publish this research.

REFERENCES

Avraam, C., Chu, D., & Siddiqui, S. (2020). Natural gas infrastructure development in North America under integrated markets. Energy Policy, 147, 111757.

Demir, O. (2020). Natural Gas Market Liberalisation in the Context of the EU. In Liberalisation of Natural Gas Markets (pp. 63-102). Palgrave Macmillan, Singapore.

EC (2020). Third Party Access At Work. Towards a world-class energy sector energy Malaysia (Volume 20), page 7-11. Energy Commission.

EC (2017a). 'Gas Supply Act Amendments and Third-Party Access', 6th Malaysia-Republic of Korea Energy Cooperation Workshop. Energy Commission.

EC (2018). *Third-Party Access System (TPA): Why is the TPA system introduced?*, Energy Commission (online). Available at: https://www.st.gov.my/web/faqs/listing/1.

EC (2016). Gas supply industry paving the way to accessibility. Towards a world-class energy sector energy Malaysia (Volume 8). Energy Commission.

EC (2019). Third-Party Access System (TPA): Tariff for the utilisation of gas facilities for 1st January to 31 December 2019. Energy Commission (online). Available at: https://www.st.gov.my/web/industry/details/3/4

EIA (2019). Annual Energy Outlook with projections to 2050.

Franco-Trigo, L., Fernandez-Llimos, F., Martínez-Martínez, F., Benrimoj, S. I., & Sabater-Hernández, D. (2020). Stakeholder analysis in health innovation planning processes: A systematic scoping review. Health Policy.

Gas Supply (Amendment) Act 2016, Laws of Malaysia (online). Available at: https://policy.asiapacificenergy.org/sites/default/files/Gas%20Supply%20%28Amendment%29%20Act%202016%20%5BAct%20A1515%5D.pdf.

Grimble, R., Aglionby, J., & Quan, J. (1994). Tree resources and environmental policy: a stakeholder approach (Vol. 7): Natural Resources Institute.

Grimble, R., & Wellard, K. (1997). Stakeholder methodologies in natural resource management: A review of principles, contexts, experiences and opportunities. Agricultural systems, 55(2), 173-193.

Heather, P (2015). 'The Evolution of European Traded Gas Hubs', OIES Paper NG 104, Oxford Institute for Energy Studies, December 2015. Available at: https://www.oxfordenergy.org/wpcms/wpcontent/uploads/2016/02/NG-104.pdf

Lim, Z.W. and Goh, K.L. (2019). Natural gas industry transformation in Peninsular Malaysia: the journey towards a liberalised market. Energy policy, 128, 197-211.

Maggie Kumar, Jonathan Stern and Amanuddin Shamsuddin (2020). Gas Industry Reform and the Evolution of a Competitive Gas Market in Malaysia. The Oxford Institute of Energy Studies (OIES), England, NG 158.

MEA (1981). Fourth Malaysia Plan 1981–1985 (online), Malaysia: Ministry of Economic Affairs. Available at: https://www.mea.gov.my/en/rmk/fourth-malaysia-plan-1981-1985

MGA (2017). Malaysia: Natural Gas Industry Annual Review 2017 Edition (online), Malaysia: Malaysian Gas Association. Available at: https://malaysiangas.com/wp.content/uploads/2019/03/Natural_Gas_Industry_Review-2017.pdf.

Osička, J., Lehotský, L., Zapletalová, V., Černoch, F., & Dančák, B. (2018). Natural gas market integration in the Visegrad 4 region: An example to follow or to avoid? Energy Policy, 112, 184-197.

Rubino, A. (2020). The political economy of Euro-Mediterranean cooperation in the gas market: The role of domestic stakeholders and the European Commission. Resources Policy, 101883.

Amanuddin Shamsuddin
Accounting & Finance Department
Universiti Tenaga Nasional, 26700 Muadzam Shah, Pahang, Malaysia
Email: amanuddin@uniten.edu.my

Amar Hisham Jaafar
Business & Management Department
Universiti Tenaga Nasional, 26700 Muadzam Shah, Pahang, Malaysia
Email: AHisham@uniten.edu.my

Maryam Huda Ahmad Phesal
Electrical & Electronic Department
Universiti Tenaga Nasional, 43000 Kajang, Selangor, Malaysia
Email: HMaryam@uniten.edu.my

Tan Ee Sann
Mechanical Department
Universiti Tenaga Nasional, 43000 Kajang, Selangor, Malaysia
Email: EeSann@uniten.edu.my