

## **THE COMPLEXITIES OF PROGRAMME MANAGEMENT: CASE STUDY OF TRANS-ASEAN GAS PIPELINE**

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### **ABSTRACT**

By the end of 2015, member countries of the Association of Southeast Asian Nations (ASEAN) entered into regional economic integration called ASEAN Economic Community (AEC). One of the most important aspects of this integration is to secure energy supply in the region to achieve competitive economic region. Trans-ASEAN Gas Pipeline (TAGP) is an energy programme that focus on the optimisation of the region's energy security. As a programme, however, TAGP is exposed to many challenges. This paper analyse the complexities of TAGP from six different perspectives, including technical, environmental, financial, taxation, jurisdictional and organisation. The organisational complexity is analyse using the "two-way" system approach. Our analysis concludes that TAGP is a capital intensive programme that requires extensive resources, including expertise in the technical and environmental fields. Due to its nature as a cross-border energy programme, TAGP also possess a high exposure in the taxation and jurisdictional aspects. Further, our analysis found that political interest adds complexities in the programme management. Programme management office (PMO) could increase the effectiveness of the programme, particularly in a cross-border programme where the volatility of economic and political condition is hard to predict.

**KEYWORDS: Complexities, Programme Management, Trans-ASEAN Gas Pipeline.**

### **INTRODUCTION**

As an organisation, The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967 in Bangkok, Thailand. The organisation has ten member countries, including the Philippines, Indonesia, Malaysia, Singapore, Thailand, Brunei Darussalam, Vietnam, Lao PDR, Myanmar, and Cambodia. According to ASEAN Declaration, ASEAN has seven aims and purposes which mainly focus on the cooperation within member countries in the aspects of economic growth, social progress, cultural development, regional security, education, and cooperation with the international and regional organisations.

In November 2007, the ASEAN Leaders agreed to enter into regional economic integration called ASEAN Economic Community (AEC) by the end of 2015. The AEC blueprint was created by identifying the characteristics and elements of the AEC. Four main elements of the

AEC are single market and production base, competitive economic region, equitable economic development, and integration into the global economy. In regards to this, energy cooperation programme is highly important to achieve these objectives, particularly related to the establishment of the competitive economic region.

As a region with more than 600 million people, the demand of electricity and energy is extremely high. However, from the supply side, this is not the case. In the Southeast Asia region, the statistic from Asian Development Bank shows that 219 million people have lacked access to electricity and another 100 million people have only intermittent access to electricity and basic energy services (Sovacool, 2009). To cope with this situation, ASEAN decided to construct a Trans-ASEAN Gas Pipeline (TAGP) network, which will optimise the distribution of natural gas among ASEAN member countries.

Using TAGP as a case study, this paper analysing the complexities of energy programme management. The importance of programme management, including the tools and technique is examined. The literature review of the complexities in the programme management from different perspective also discussed. Further, the importance of programme management in the ASEAN energy programme is analysed from the perspective of complexities. Together with ASEAN Power Grid, TAGP is one of the most important energy programmes in the ASEAN. This paper is focused on analysis of the complexities of the TAGP as a programme. The complexities are discussed from six different aspects including technical, environmental, financial, taxation, jurisdictional, and organisational. An organisational complexity is analysed from the perspective of “two-party” programme system.

Our analysis concludes that TAGP is a capital intensive programme that requires expensive resources, including expertise in the technical and environmental fields. Due to its nature as a cross-border energy programme, TAGP also possesses a high exposure in the taxation and jurisdictional aspects. Our analysis found that the political intention adds complexities in the programme management, particularly in the environment with high volatility in the economic and political situation.

## **PROGRAMME MANAGEMENT AND COMPLEXITIES**

### **The Importance of Programme Management**

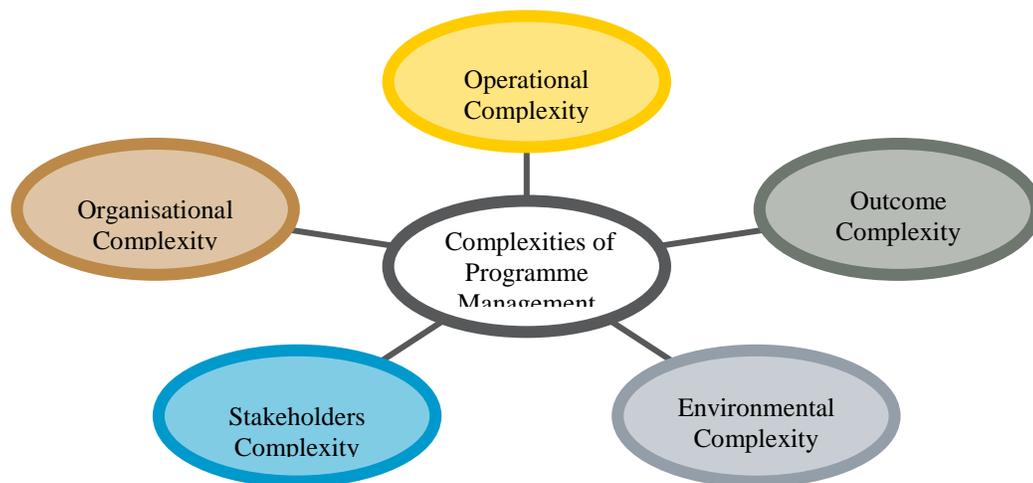
The research on programme management is derived from the study of a single project. Previously, scholars were focusing on the management of a single project because organisations, at that time, were built for achieving a clear output, conducting activities that only related to one project. With the rapid development of the economy and the need for globalisation, organisations starting to grow and have to deal with multiple projects at the same time. In that case, simple project management was not enough for organising several projects simultaneously. Ferns (1991) developed the definition of programme management as a coordinating mechanism for directing related projects.

Further, a number of studies related to programme management were conducted to look for different approaches and processes. For instance, the programme life cycle is a widely used process, which describe several phases and key factors of programme management (Thiry, 2004; Pellegrinelli, 1997). In addition to the programme life cycle analysis, there are some other significant techniques are being researched to support programme management, such as programme planning and control, benefit management, risk management and stakeholder management (APM, 2007). Recently, professional associations, such as the American Project Management Institute (PMI) and the UK Association for Project Management (APM), have been formed, indicating a more and more significant position of programme management.

Organisations face a variety of complexities. In order to cope with these complexities, organisations need a set of management methodology in achieving beneficial goal and strategy of their organisation. In the cross-border programmes, organisations should focus on the cooperation within member countries in various aspects through the implementation of various programmes in the organisation. In this regards, programme management is a significant methodology that could help organisations to complete the programme in an effective and efficient manner.

### Framework of complexity

In practice, programme management is not only an extension of multiple project management, but also includes the interaction between the projects with similar business expectation. To successfully manage the programme, a good understanding of the complexity of programme management is essential. It enables the organisation to find the root cause of the problem and make possible improvements. Heaslip (2014) came up with a framework to analyse five different aspects of complexity of programme as shown in Figure 1.

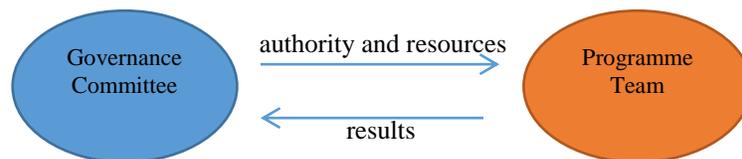


**Figure 1:** Complexity of programme management. *Source:* (Heaslip, 2014)

## Causes of complexity

There are variety of elements that arouse complexities in program management. The operational complexity, which includes the activities to complete the project, is related to the number of tasks within a project or programme. Unpredictable results could be a possible cause for increasing the outcome complexity. Environmental complexity changes with the volatile external environment, which is difficult for the programme manager to control. Stakeholder complexity indicates the high dependency to the support from stakeholders. In a bureaucratic organisation, it is hard to avoid the organisational complexity.

Figure 2 describes a “two-party” project system which commonly used in programme management (Heaslip, 2015). The governance committee defines the goals, approves plans and assigns resources to the programme team while the programme team works under supervision and responsible for reporting results to the governance committee. The “two-party” system is a simplified model of organisation in programme management. Normally, there could be several committees that have different tasks, duties, perspectives and priorities. The program manager should make sure that the decision-making processes in the organisation are effective when several committees work together.



**Figure 2:** The “two-party” programme system. *Source:* (Heaslip, 2014)

## Assessment of organisational complexity

Heaslip (2015) added that there are two major kinds of different committees in organisation: *governance committee* and *review committee*. While governance committee issue approval and control the changes in the process of the programme, review committee helps the team by checking of the team’s purpose, but approval is not required from them. Identifying the contribution of committees to organisational complexity enables us to exam and reduce complexities in programme management. Compared to review committee, governance committee tends to provide more significant issue to the organisational complexity. In order to reduce the complexity in organisation, several methods could be used:

- The number of the committee should be as less as possible.
- The authority of each committee should be balanced.
- Responsibilities of governance scope should be limited.

## **Programme Management Strategy for Energy Programme**

Energy is becoming one of the most important topics today which relates to both business and people's daily life. An energy programme could be conducted by the single domestic organisation, government or within the global organisation, depending on the scope and goal of the programme. Thus, key factors for successfully implementing an energy programme vary with different kind of programme as well.

The first step of general implementation flow of energy programme is the evaluation of different risks, like operating and technical risk, construction and sponsor risk, commercial and environmental risk and political risk (Ali et al, 2008). Especially for the political risk, each country has its own standard and blueprint of energy consumption. Programme management of the energy programme within multiple countries should pay attention to the regulation and energy strategy of each country to make sure that the strategy of the programme is feasible.

Secondly, the fund and the sponsors are also significant for programme management strategy. If the programme is conducted by the domestic organisation for the sustainability of business, the focus of the strategy of the programme should be aligning it to the strategy of the company to achieve beneficial change of the company. If it is sponsored by government, it must be aware of the energy strategy and mission at a higher level to ensure the effectiveness of the programme and optimisation of resources within the programme.

Having a clearly defined framework of programme management is also considered an essential factor for the success of the programme. The strategy of the programme is normally came up with by committee or top management of the organisation. Then a programme team is formed for finishing the programme, following the orientation of the committee.

## **CASE STUDY: THE TRANS-ASEAN GAS PIPELINE**

### **Background**

In many years, oil and coal have been the main energy sources in Southeast Asia. The utilisation of natural gas provides an alternative energy for this region. However, the distribution of the natural gas within the region is not evenly spread. The Trans-ASEAN Gas Pipeline (TAGP) programme was established to cope with this problem. The TAGP programme succeed could enhance the energy security among ASEAN member countries. Further, it is expected that ASEAN could also improve their economic competitiveness.

Based on their updated Masterplan (2015), TAGP aims to build a total of approximately 7,000 kilometres of pipeline networks. Most the pipeline networks are offshore and undersea. As of May 2015 (refer to Table 1), an approximate of 3,631 kilometres of pipeline networks has been built and operated under thirteen cross-border projects.

Year of completion	Project	Length (kilometres)
1991	Singapore – Malaysia	5
1999	Yadana (Myanmar) - Ratchaburi (Thailand)	470
2000	Yetagun (Myanmar) - Ratchaburi (Thailand)	340
2001	West Natuna (Indonesia) – Singapore	660
2001	West Natuna (Indonesia) - Duyong (Malaysia)	100
2002	CAA – Malaysia	270
2003	South Sumatra (Indonesia) – Singapore	470
2005	Malaysia-JDA	270
2006	Malaysia to Singapore	4
2007	CAA – Vietnam	330
2009	JDA – Thailand	100
2013	M9 – Thailand	260
2015	JDA – Malaysia	352

**Table 1:** Progress of TAGP network as of May 2015. *Source:* (ASEAN Council of Petroleum, 2015)

In addition, there are four projects with approximately 4,400 kilometres and currently under feasibility studies (refer to Table 2). There is also another proposed pipeline project from East Natuna (Indonesia) to Palawan (The Philippine) that was deferred due to commercial and economic consideration.

Project	Length (kilometres)
East Natuna (Indonesia) to Erawan (Thailand)	1,500
East Natuna (Indonesia) to Kerteh (Malaysia)	600
East Natuna (Indonesia) to Java (Indonesia)	1,400
East Natuna (Indonesia) to Vietnam	900

**Table 2:** Proposed TAGP projects. *Source:* Author's compilation using information from ASEAN

## Organisational Structure of TAGP

The ASEAN Council of Petroleum (ASCOPE) was established on 15 October, 1975 in Jakarta, Indonesia. Since 1999, ASCOPE has responsibility to undertake the TAGP programme. Each member country in ASEAN is represented in the organisation by their respective national oil companies or authority in charge of petroleum issues to serves ASCOPE Council members. In addition, ASCOPE National Committee was also established to implement the policies and decisions of the ASCOPE Council. The current members of ASCOPE and organisational structure are shown in Table 3.

Members	Country represented
Pertamina	Indonesia
Petronas	Malaysia
Philippine National Oil Company	The Philippine
Keppel Corporation	Singapore
PTT Public Company Limited	Thailand
Petroleum Brunei	Brunei Darussalam
PetroVietnam	Vietnam
Myanmar Oil and Gas Enterprise	Myanmar
The Ministry of Mines and Energy	Cambodia
Lao State Fuel Company	Lao PDR

**Table 3:** Members of ASCOPE. *Source:* (ASEAN Council of Petroleum, 2015)

ASCOPE Council Committee holds the highest authority within the organisation. ASCOPE Council Committee are responsible for the organisation course of action and responsible to guide and oversees all programs under the organisation. In addition, ASCOPE National Committee was created to implement the policies and decisions which were made and approve by ASCOPE Council. Both ASCOPE Council Committee and ASCOPE National Committee comprise of national oil companies or authority from each ASEAN member countries.



**Figure 3:** Organisational structure of ASCOPE. *Source:* (ASEAN Council of Petroleum, 2015)

## **ANALYSIS: THE COMPLEXITIES OF TAGP PROGRAMME**

Based on statistical data from Macquarie (2015), energy imports in Asia is predicted to increase by 53 percent in 10 years. This amount is approximately equal to world's crude oil production today. The gas demand in ASEAN has increased by 4.8 percent and the gas consumption in Indonesia has increased up to 10 percent in the year 2013. The TAGP is a renewable energy infrastructure which is developed to transfer the gas from suppliers and producers to buyers across ASEAN member state countries. Desker (2015) argued that the increment of energy demand, especially among ASEAN member state has led to several solutions which are the development of renewable energy infrastructures such as TAGP.

As an extensive energy programme, TAGP faces many complexities. TAGP programme consists of thirteen completed projects and four planned cross-border projects in the future. The environmental aspect and lack of expertise in the implementation are some of the issues faced by TAGP. From the macro-level perspective, ASEAN's position as one of the largest economic power in the world attracts other countries and international organisational to put their interest within the region. Moreover, it is also a difficult task to align the strategy of each member countries with the TAGP programme.

Based on the framework of complexities developed by Heaslip (2014), this study analyses six perspectives of complexities, including technical, environmental, financial, taxation, jurisdictional, and organisational. The analysis is conducted based on the information obtained from the website of the ASEAN and TAGP. Further, a current literature review related to TAGP, complexities, and energy programme management provides significant analysis to the complexities of the TAGP as a programme.

### **Complexity from Technical Perspective**

According to ASEAN Centre of Energy (2015), TAGP is constructed with the aim to guarantee the continuity of the gas supply and allow the gas to be transported across ASEAN member states. According to Xunpeng (2014), a TAGP gas transmission network of 8,000 to 10,000 kilometres which could potentially connect about 80% of gas reserved of the ASEAN states was proposed to be constructed from 2000 to 2020. Moreover, the distribution of gas through TAGP may diminish the state's reliability of crude oil (Xunpeng, 2014).

Regarding to International Gas Union (2009), the first cross-border pipeline was built in 1991 and was located between Malaysia and Singapore. In 1999, a 470 kilometers pipeline was built across the border of Yadana, Myanmar and Ratchaburi, Thailand. Another two pipelines were built in 2001. One from West Natuna, Indonesia till Singapore (660 kilometres) and the other that crosses the Duyong field of Peninsular Malaysia (100 kilometres). These TAGP projects were led by PETRONAS for the ASEAN energy cooperation. The development of the TAGP continued with the construction of a 470 kilometres pipeline in the following two years that connects South Sumatera, Indonesia to Singapore. In 2005 and 2006, a 270 kilometres pipeline was built from the Malaysia-Thailand Joint Development Area to Peninsular Malaysia through Songkla, Thailand and four kilometres pipeline from Malaysia to Singapore.

## **Complexity from Environmental Perspective**

Considering to the technical challenges of this program, West Natuna, Indonesia is where one-quarter of the country's reserved gas located. The construction of the pipeline was delayed because of the excessive amount of carbon dioxide discovered in the gas (Smith, 2008 cited by Sovacool, 2009). Sovacool (2009) also affirmed that the company did not have any expertise and technologies to develop the gas pipeline hence, they required more money to carry on the project. Xunpeng (2014) added that the increasing gap between demand and supply of the gas has led to the implementation of LNG regasification in the gas connectivity.

Moreover, the fact that different regulations between countries slowed down the progress of the project as the program terms and conditions made by the ASEAN state members were thought considering the project being developed in synchrony by the state members. Studies concerning the environmental impact caused by the development of TAGP have been made. Sovacool (2014) added that the gas pipelines had potential to cause land degradation and produce greenhouse gas emissions. The study shows that on-shore and off-shore construction processes such as drilling and transportation would have caused harm to the ecosystem and human health.

## **Complexity from Financial Perspective**

From the financial perspective, TAGP is a capital-intensive programme. The construction of natural gas pipeline can cost as much as \$420,000 per mile (Parker, 2004) and billions of dollars will also need financing for pipeline infrastructure, platforms, drills, and compression equipment (Sovacool, 2009). In this respect, each ASEAN member country recognised the importance of financing in the construction of the pipelines and in the supply, transportation and distribution of natural gas to member countries (The ASEAN MoU on the Trans-ASEAN Gas).

Sovacool (2010) identified five multilateral and regional development banks that contributed in TAGP programme including Asian Development Bank, Japan International Cooperation Agency, Japanese Bank for International Cooperation, International Finance Cooperation and World Bank. In the case of Asian Development Bank, countries wishing to receive ADB loans have to agree to unbundled and privatised the assets under public-private partnership. Further, a rigorous peer review process that includes various proposals, concept papers, and management review meeting add the complexities before the loans are given. "Projects will be selected based on sound economic and financial rates of return, and the potential impact for poverty reduction" (Asian Development Bank – ASEAN Infrastructure Financing Fund).

The source of finance itself could be another factor that adds complexities in this cross-border TAGP programme. For Japan, ASEAN is one of the strategic priority areas to strengthen the connectivity and robust infrastructure within the region (JBIC Annual Report 2014). Sovacool (2010) argued that Japan could obtain benefit from this TAGP programme because it could help Japan secure access to natural gas reserves located in Southeast Asia and strengthen Japanese leadership in Southeast Asia. Haniff and Fernie (2008) explained this condition as, "This is because construction projects are implemented in an emergent manner, based on changes, unknowns and the political negotiations with the project team over time."

## **Complexities from Taxation Perspective**

As a cross border construction programme, TAGP's exposure to taxation is high. Most of the countries in the East Asia and Southeast Asia demonstrate the complexity in their tax structure and regulatory system (Chua, et al, 2003). In the ASEAN Tax Guide Report (2013), KPMG reported that cross border taxation was an issue in some of ASEAN member countries. In recent years, tax authorities in the Philippines (Bureau of Internal Revenue) and Cambodia (General Department of Taxation) focused on cross border transaction including withholding tax obligation on cross border payments for management and technical service.

It is not an easy process to harmonise taxation policy among countries participate in TAGP programme. Roberts and Cull (2003) argued that the variety of fiscal terms between ASEAN might lead investor to find the most lucrative country to invest, which might not result in the development of necessary infrastructure. The Myanmar Oil and Gas Enterprise, an arm of the government, places 20 percent tax on all forms of energy production and utilized TAGP as an important tool for political and economic power (Sovacool, 2010). One would expect that the discovery of natural capital increased wealth and welfare of a nation (Mideksa, 2013). Further, Directorate General Taxation of Indonesia suggested that the taxation policy will be considered based on the applicable tax laws and regulation in each member country rather than through harmonisation among ASEAN member countries.

## **Complexity from Jurisdictional Perspective**

In the TAGP programme, there are two types of pipeline segments: onshore and offshore. It is relatively straightforward in determining the jurisdiction and responsibility over the onshore pipelines due to the ASEAN member countries put a high level of integrity and respect on each other territory. For offshore pipelines, an intensive coordination in programme management is necessary. Programme management has been seen as a mechanism for coordinating and directing related projects (Pellegrinelli, 2010; Ferns, 1991; Gray, 1997).

Unresolved territorial dispute in South China Sea also contributed to the complexities of TAGP programme. For example, the Spratly Islands, located in the middle of South China Sea disputed by China and the ASEAN member countries, including Brunei Darussalam, Malaysia, the Philippines, and Vietnam. There are at least two pipeline projects in this dispute area, including 'Indonesia (East Natuna) to Malaysia (Sabah) and the Philippines (Palawan-Luzon)' and 'Indonesia (East Natuna) to Thailand (Joint Development Area/Erawan)'.

## **Complexities from Organisational Perspective**

ASCOPE is a direct organisation which implement and monitor the progress of TAGP programme. As part of ASEAN organisation, ASCOPE also comprises of ten representatives from each member country. Using the "two-way" system developed by Heaslip (2015), the analysis will focus on three aspects that contribute in the organisational complexities, including the political interest of each member country and governance of the programme. As the highest

authority in the ASCOPE, Council Committee performs evaluation and monitor function in TAGP programme.

ASCOPE has challenges to define this goal and resource allocation. There are ten representatives from each ASEAN member country in the committee with their own specific interest in the TAGP programme. This condition could lead the TAGP programme affected by political risk derived from the interest of each member country. Haendel (1979) defined political risk as “the risk or probability of occurrence of some political events that will change the prospects for the profitability of a given investment.” From the micro level perspective of each country, the political risk also enhances the complexities of the TAGP programme. Indonesia has been evaluated as one of the most risky market in East Asia due to the political instability (Chua, et al, 2003).

The complexities also occur from the governance of the programme itself. According to (Heaslip, 2015), there should be separation between the governance committee and programme team. In the TAGP case, the programme team is the same authority that also responsible as a governance committee. Heaslip also suggested that the limitation of governance authority and governance scope is needed. One of the project under TAGP programme is West Natuna (Indonesia) - Duyong (Malaysia) project which implemented by Pertamina and Petronas. At the same time, Pertamina and Pertronas also representative authority for Indonesia and Malaysia in ASCOPE.

## **CONCLUSION**

This paper analysed the application of programme management took into consideration the complexities of the programme. Programme management is an effective approach to manage several projects with the mutual organisational goal. The importance of programme management was highlighted through the study of TAGP in the ASEAN community context which analysing the complexities of cross-border energy programme. The complexities in TAGP are analysed from six distinct perspectives, including technical, environmental, financial, taxation, jurisdictional, and organisational. The analysis in this study allows the organisation to make an improvement of programme management process in order to increase the performance of the programme.

With regards to this, the establishment of programme management office (PMO) could increase the effectiveness of the programme and support the alignment between projects and organisation strategy. The PMO will record the information and effectively execute the programme, which is beneficial for the improvement of organisational strategy. The role of governance committee and review committee also could enhance the performance of programme management, if properly applied. The volatility of economic and political condition has a significant impact on the programme management with several cross-border projects. Further study of programme management with particular complexities related to cross-border projects is encouraged to analyse in the future. There is possibility to analyse the complexities from another perspective in the other cross-border programme.

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