Journey of Ten Brothers in Securing Energy within ASEAN; Yesterday, Today and Tomorrow

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1 Background

The 17th ASEAN Ministers on Energy Meeting (AMEM) in Bangkok, Thailand in 1999 had requested ASCOPE to undertake the Trans-ASEAN Gas Pipeline (TAGP) Project. Thereafter, an ASCOPE TAGP Task Force was set up in late 1999 with members from Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam. Myanmar and Cambodia joined ASCOPE in February 2001 and Lao PDR joined ASCOPE in 2006. The Task Force was set up to formulate strategies and plan of action for the implementation and realization of the TAGP infrastructure with a view to enhance greater energy security of gas supply for ASEAN. The TAGP project is an ASEAN Project based on the ASEAN Vision 2020.

The TAGP Task Force is a unique cooperation that has no comparison with other regional gas pipeline cooperation in the world. Started with eight and now ten Member Countries with diverse background and culture, ASCOPE Member Countries meets regularly to network, discuss, share, dream and plan for the benefit of ASEAN region as a whole. Now, apart from providing a platform for ASCOPE Member Countries to network and interact with each other under the spirit of preserving the energy resources within ASEAN countries, it also provides an additional channel for business to business arrangements to take place, in addition to the conventional business development activities.

TAGP leverages on the European and other matured gas market to optimize its plan. To date, TAGP’s backbone is via commercial bilateral connections within ASCOPE Member Countries is in placed with approximately 2300km and work is underway to develop the major infrastructure connecting East Natuna to the ASEAN gas market. Other preparations to provide a conducive environment for optimized gas trading within the region are the current work within the ASCOPE TAGP Task Force. These include studies on the Common Gas Specification, Gas Transit Principles and the Unbundling of Costs.

2 Yesterdays achievements by the ASCOPE TAGP Task Force

The first TAGP Masterplan was developed in 1999 and was further revised in the year 2000. The Masterplan served as the potential bilateral connections considering the economic viability as the primary consideration. There are seven interconnections identified back in year 2000; however, only 3 of the planned connections did materialize.

<table>
<thead>
<tr>
<th>Pipeline Interconnections</th>
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<tbody>
<tr>
<td>1 South Sumatra, Indonesia - Malaysia</td>
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<tr>
<td>2 W.Natuna, Indonesia – Duyong, Malaysia</td>
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<tr>
<td>3 E.Natuna, Indonesia – JDA-Erawan, Thailand</td>
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<tr>
<td>4a+4b East Natuna, Indonesia – Kerteh, Malaysia</td>
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<tr>
<td>4a+ac East Natuna, Indonesia - Singapore</td>
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<tr>
<td>5 East Natuna, Indonesia – Brunei Darussalam – Sabah, Malaysia – Pahlawan – Luzon, Philippines</td>
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<tr>
<td>6 Malaysia-Thailand JDA - Vietnam</td>
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<tr>
<td>7 Peninsular Malaysia – Arun, Sumatra, Indonesia (Bilateral)</td>
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Table 1 : List of seven interconnections identified in year 2000
Figure 1: TAGP Map showing the 7 likely interconnections

It is important to note that all interconnections were constructed based on pure commercial basis. ASCOPE TAGP realized the importance of all national oil companies to discuss openly its plan for gas pipeline infrastructure. While doing so, there are areas that can be mutually benefit such as lessons learnt, new technology, cost comparison, optimization of the pipeline itself and potential investors within Member Countries. The first cross border gas pipeline which commissioned in 1991 was from Malaysia to Singapore of 3km in distance and to date there are now eight bilateral interconnections with a total length of approximately 2300km of gas pipelines.

Achievements from 1999-2004:

- 1999 – a 470 km. cross-border pipeline from Yadana, Myanmar to Ratchaburi, Thailand;
- 2000 – a 340 km. cross-border pipeline from Yetagun, Myanmar, to Ratchaburi, Thailand;
- 2001 - a 660 km. cross-border pipeline from West Natuna, Indonesia to Singapore;
- 2001 - a 100 km. cross-border pipeline from West Natuna, Indonesia to the Duyong field of Peninsular Malaysia;
- 2003 - a 470km cross-border pipeline from South Sumatera, Indonesia to Singapore.

Achievements from 2004-2008:

- 2005 – a 270 km. cross-border pipeline from the Malaysia-Thailand Joint Development Area to Peninsular Malaysia via Songkla;
- 2006 - a 4 km. cross-border pipeline from Malaysia to Singapore.

In addition, the following are non-cross border pipeline built in Vietnam:

- 2007 – a 41 km. Phu My-Nhon Trach Gas Pipeline, Vietnam;
- 2008 – a 425 km. onshore pipeline from Magwe-Pyawbwe-Pinpet to Nay Pyi Taw in Myanmar;
- 2008 - the Su Tu Den-Su Tu Vang-Rang Dao In Vietnam.
Other key activities undertaken and completed by the TAGP Task Force are as follows:

- Completion of the Conceptual Master Plan Study for the Trans-ASEAN Gas Pipeline Project (TAGP) in 2000 and obtained approval from the ASCOPE Council in 2001. The Master plan identified seven new possible gas pipeline inter-connections in ASEAN and was employed as a useful guide in the long-term development of the Trans-ASEAN Energy Network;

- Formation of the ASEAN Gas Consultative Council (AGCC) in July, 2003. AGCC was created comprising representatives from the ASEAN Governments/Authorities and ASCOPE to address issues relating to cross-border for gas market integration and to facilitate the implementation of the TAGP Project;

- Formulation and finalization of the ASEAN Memorandum of Understanding (ASEAN MOU) on the Trans-ASEAN Gas Pipeline (TAGP) in June 2004. The MOU is to provide a broad framework for the ASEAN Member Countries to co-operate towards the realization of the TAGP Project to help ensure greater regional energy security;

- Establishment of the ASCOPE Gas Centre (AGC) in Malaysia which will serve as the strategic technical and commercial information resource and capacity building centre in the facilitation and implementation of the Trans-ASEAN Gas Pipeline Project;

3 Today’s current TAGP Infrastructure & Supply-Demand Balance

Over a period of approximately eight years, from year 2000, the gas pipeline infrastructure has grown by 180% from 815km to 2300km of cross border gas pipelines. These pipelines formed part of the Trans ASEAN Gas Pipeline (TAGP). However, all these pipelines are bilateral in nature.

The existing and planned cross-border gas pipeline inter-connections in ASEAN are shown in the following figure:

![Cross-Border Gas Pipeline Inter-connections in ASEAN](image)
Total gas consumption in ASEAN countries today has also reached to approximately 10 BCF / day. In view of the fast pace of the ASEAN countries migrating from infancy stage to developed stage in the gas pipeline business, revision to the previous Masterplan was required and has been concluded. In addition, fundamental changes in various economic factors supported for the revision. The ASCOPE TAGP Task Force finalised the revision of the Updated Masterplan 2008 in December 2008.

The revision of the Supply Demand data was fundamental to the planning work for the gas pipeline infrastructure. In addition, the impact of high oil and coal prices has resulted in a higher demand of gas as an alternative fuel. Consequently, the domestic demand also increased and priority is given for domestic consumers.

At present, ASEAN region consumes approximately 10 BCF/day of natural gas. The initial findings indicates that there will be a supply demand gap around year 2017 growing to the order of magnitude of 12 BCF/day until 2025. This deficiency has taken into consideration the assumption that East Natuna gas is fully commercialized and to be consumed in the ASEAN region.

While the upstream E&P continues to explore for more gas reserves, alternative sources of gas such as coal bed methane (CBM) has started its initial development phase.

Formation of an ASEAN Joint Venture Company to own selected gas pipeline assets are currently ongoing with the target to create a more efficient business model to optimize gas pipeline operations. Several business models have been studied and key success factors have been identified and analyzed. TAGP Task Force still perseveres and is proactively working on some of the issues such as the Transit Principles, Unbundling of Cost, and Common gas specification among others. These factors are required to be in place for a comprehensive implementation of TAGP to be realized.

**Observations:**

- There is a widening supply gap from 2015 rising up to 12,000 mmscf/day by 2025.
- This shortfall reflects declining gas reserves causing gas supply to plateau and starts to decline while at the same time demand continues to rise strongly.
- This shortfall could be addressed by new discoveries in the region, or by increased imports of LNG Gas consumption.

(E&P BD has been informed to study at ASCOPE level how best we can further increase supply)

(East Natuna commercialisation is key at ASCOPE level)

- While finalising masterplan, demand figures constantly increases.

![Regional Supply Vs Demand (Base Case) (inclusive supply from E Natuna)](image)
Further development of TAGP depends on supply availability and the high CO\textsubscript{2} East Natuna still remains as the biggest potential source of supply, which until today the commercialisation of East Natuna remains the biggest challenge. Due to supply constraints, it can be seen that there are also emergence of many Regassification Terminals within the region as another potential source of supply.

Many countries are also implementing domestic gas policies due to supply constraints and this has become an issue of sharing of the gases as a resource to the region.

In view of the rising demand and limited gas supply from the ASEAN region, several countries have started to plan and build LNG Regassification terminals to bring energy from outside the ASEAN region. Several LNG Regassification terminals are being built despite supply uncertainty. The total firm planned capacity for LNG Regassification terminal is approximately 17.5 MTPA which is equivalent to approximately 2450 MMSCFD.

Emergence of LNG Regassification Terminals is significant for the purpose of security of supply. These terminals are expected to be completed between years 2010-2012. Due to gas supply constraints in the region, sourcing energy from outside ASEAN is inevitable. In addition, the region still needs to continue developing gas pipeline infrastructure to support the integrated gas supply in the region.

Despite all these challenges the spirit of ten ASEAN brothers remain intact to work together and progress accordingly. Coal Bed Methane (CBM) being the latest topic for discussion is still in the infancy stage, but nevertheless the choice is inevitable, and again the region is fortunate to have CBM resources in Indonesia and Vietnam. As for the pipeline systems within the region starts maturing, incidents such as pipeline rupture, which the latest being in Myanmar, ASEAN Member Countries have developed and will be developing further cooperation agreements to assist each other when future incidents occur.

Figure 4 – Current TAGP Map based on the Updated Masterplan 2008.
Currently, TAGP Task Force is preparing the entire required framework for the future pipeline interconnections in the ASEAN Region. In the upstream, while Indonesia is working on the Commercialisation of East Natuna, TAGP will provide options for the pipelines. The demand required by each country will be the basis for the pipeline design. LNG Regassification Terminal will be considered as an alternative supply sources for the region.

On downstream activities, AGCC will also be assisting TAGP Task Force to communicate with host Government to ensure smooth gas flow through various countries in order to reach to the desired end customer. Principles of open access, gas transit principles and gas specification harmonization is the key principles identified to be agreed upon within ASEAN countries. These key principles will be the guidelines for ASEAN Member Countries and one of the biggest challenges for ASCOPE is to agree on these principles. Due to the different level of maturity of gas industry within ASEAN countries, reaching an agreement is the most challenging. Our target now is to have the TAGP backbone in placed by 2015. Beyond 2015, TAGP hopes for more flexible gas movement within ASEAN, and for Government and policymakers to fully support the initiative. Another important initiative that TAGP has started to embark on the cooperation with the Heads of ASEAN Power Utilities Authorities (HAPUA), which is another ASEAN cooperation working on the electricity grid. TAGP and HAPUA will be focusing strictly on gas requirement for gas fired power plants only. It is important for HAPUA to be aware of the limited gas supply in the region so that HAPUA will not over plan its power planting program using gas as the source of fuel. Alternative source of fuel needs to be identified to fulfill the electricity demand.

5 Conclusions

For the future framework and pipelines, TAGP will continue its current work on the required framework where the entire network could be optimized for gas trading beyond bilateral interconnections. The required framework, Government support and business models need to be ready when the time comes to transport gas in the most economical and efficient manner. This proactive initiative is important for the region to understand the key success factors required for market readiness.

In an environment where gas is relatively scarce, a close relationship with Government is vital to ensure that policymakers will support frameworks where gas can be utilized in the most efficient manner.
Strategies for the economic development of gas from East Natuna D-Alpha should be accelerated and the market must cooperate closely with the developer. Interested buyers and future joint venture partners in infrastructure should express their interest to the developer.

E&P BDC has to find ways and means to explore for more reserves, find ways to make marginal and high CO₂ fields economically and commercially viable, to consider hydrocarbon resources are made available for ASCOPE Member Countries.

CBM is an alternative gas source, therefore, CBM has to be developed rapidly to encourage its use as a viable 2nd gas source for markets. The development of CBM is currently at the exploration and early development stage and this may be an alternative gas resource for the future. However, due to the nature of CBM, it may be used mainly for the domestic market.

Emergence and dependence of LNG Regassification terminals are expected to dominate the region and LNG resource from outside ASEAN needs to be secured. While it provides an alternative to gas supply resource, LNG Regassification terminals may affect the timing of development of the TAGP.

The present bilateral pipeline interconnections have yet to be optimized for the benefits of the region. The ability for all markets to access gas resources from almost any location in ASEAN will not be achieved until we make a concerted effort on complex issues, for example an open access system, harmonization of gas specifications and gas transit principles. This will promote gas trading beyond bilateral connections only. Nevertheless this would only be applicable beyond satisfying domestic consumption.

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