

Introduction

Since the establishment of the Economic Research Institute for ASEAN and East Asia (ERIA) in 2007, energy security in the East Asia region has always been one of the core policy research areas, where natural gas and LNG have played a significant role. Accordingly, LNG has been regarded as an essential focal point of ERIA's research activities since 2017, as it is a vital product and an important energy source in the region.

In support of the initiatives on expanding Asian LNG markets, the Institute of Energy Economics Japan (IEEJ) in Tokyo, in collaboration with the Energy Policy Research Foundation, Inc. in Washington, DC, has undertaken a series of workshops, research, and policy assessments since 2017. Joint recommendations were presented at the annual LNG Producer–Consumer Conference from 2017 to 2020.

Demand for natural gas in ASEAN countries is expected to grow faster than the total energy requirement in the region. In parallel with the expansion of renewables, the share of natural gas in ASEAN's energy mix is expected to expand from 21% in 2018 to 24% in 2050, according to IEEJ's Energy Outlook 2021 (IEEJ, 2021). With modest domestic production growth in ASEAN, the import dependency of Asia (including non-ASEAN countries) could rise significantly from the current level of around 30% to nearly 50% by 2050. Therefore, ASEAN needs stable investment on the upstream and downstream infrastructure of natural gas and LNG – receiving terminals, pipelines, gas-fired power generation facilities – and LNG supply sources from within and outside the region.

Natural gas and LNG have been critical in the region, traditionally as the resource to export and now the driver to fuel the region's rapid economic growth. ASEAN region has some of the biggest LNG exporters globally – and now, some of the emerging LNG importers.

Globally, LNG liquefaction plants with significant capacity have started operations in recent years. The world is expected to see a further considerable expansion of LNG production in the next decade, after 130 million tonnes per year of capacity were sanctioned from 2017 to the first half of 2021. Notably, for those projects that got final investment decisions during the period, more than half of assumed volumes have not decided their final destinations. Those new projects will compete for LNG customers against each other and existing LNG production projects vying for contract renewals.

In other words, this creates additional opportunities for LNG players to make the LNG market more flexible. In the past, LNG used to be marketed and sold to ready LNG users. The value chain was constructed in a vertically integrated manner. Nowadays, those with LNG volumes to be supplied may take advantage of their expertise to develop emerging LNG markets and optimise LNG volumes between different international LNG markets. For example, Japanese LNG importers (city gas and electric power companies) with additional LNG volumes, trading houses, and upstream developers – in collaboration with Japanese commercial banks and governmental organisations – have already been active in ASEAN countries to create additional LNG demand. Sometimes they compete and collaborate with LNG players from other countries. Competition

and collaboration could significantly increase LNG consumption points to make market activities more flexible. Increasing transactions between more players should make it less difficult for them to create Asia's LNG price indexes.

Many challenges exist, such as the balance between vertical integration of the LNG value chain and increasing flexibility of LNG transactions, credit ratings of diversified parties to be involved, and different technical standards in other countries. Yet, Japanese players are expected to continue contributing to the development of the LNG market in collaboration with national and private energy companies and regional organisations in the ASEAN region.

The LNG industry experienced a turbulent period in 2020–2021 due to the COVID-19 pandemic and its impact on the global economy. The industry saw extremely low spot LNG prices in the first half of 2020, stagnant project development activities with few investment decisions in the year, followed by the extreme volatility of spot LNG prices at the beginning of 2021. During this turbulent period, the world again learned that LNG is the most versatile energy source to respond to people's energy needs. At the same time, the industry has noticed that global awareness of energy transition is growing. Therefore, the industry and governments must find ways to pursue the harmonised goals of economic prosperity and energy transition with cleaner energy sources.

The pandemic and the accelerating progress of the decarbonisation agenda have added extra complexity to developing a flexible LNG market. Although the situation has constantly evolved, the study cannot ignore those elements and updates them to the maximum extent.

The study aims to identify ways on (i) how to develop LNG-consuming markets in the most promising region for the world's economic growth, (ii) how LNG supply sources could be more flexible and competitive to be accepted in the ASEAN LNG market, (iii) how technical and regulatory standards should be coordinated between individual economies so that future LNG cargoes could move freely between markets in response to dynamic developments in those markets. The study also looks into recent and expected developments of price formation in the Asian LNG markets to see what can be done to promote more suitable price benchmarks in the region. It also looks into financing and investment issues in each segment of the LNG value chain under the evolving LNG pricing developments.

Governmental policies will play a critical role in developing the Asian LNG markets by reducing investment risks in new LNG infrastructure in many emerging Asian countries. Financial support and export assistance measures will also play an essential role in Asia, particularly for countries that present high credit risks. Technical support will also help Asian countries with little experience in the LNG business as they embark on LNG imports. This research effort recognises that world LNG markets are heading towards more liquidity and transparency. Still, they have yet to mimic the open and extensive trading patterns prevalent in the global oil market and may never fully replicate.

For the Asian LNG market to flourish, new supply and demand centres need to grow. Also, the full range of market participants – from sellers and traders to final users such as power utilities – need to be confident that price discovery reflects supply and demand fundamentals. In this

regard, the authors of this report, with great help from workshop session assistants and the ERIA secretariat, have continued their assessment of the role of destination restrictions as an impediment to arbitrage in the Asian LNG market.