Chapter 5

Conclusion

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Previous chapters discussed the oil supply-and-demand balances of ASEAN countries, the developments and challenges of oil stockpiling in the ASEAN, and potential items for cooperation toward oil-stockpiling development within and beyond the ASEAN member countries. Based on these observations and discussions, this chapter summarises the findings and explores several policy proposals.

5-1.The Wide Variety and Diversity of ASEAN Countries

First of all, as Chapter 1 reveals, ASEAN countries have extensive variety and diversity in terms of their stages of economic development, oil-market conditions, import dependence, primary energy mix, oil-security policy principles, and oil- stockpiling development. Like the European Union (EU), the ASEAN is a regional framework composed of countries in the same geographical region but unlike the EU, this geographical proximity does not guarantee the closeness of their political, economic, and social features. Some countries have a higher per capita income and thus a different energy consumption structure from other countries with lower per capita income. Some countries are endowed with significant natural resources and, therefore, import dependence is not a big issue while for other countries, securing a stable and reliable oil supply is an acute policy issue. In some countries, the NOC is a dominant player in the domestic oil market but in others, private players are the primary suppliers of oil products to their markets. This extensive variety and diversity of background amongst the member countries cannot be overemphasised in considering any policy initiative or cooperation in ASEAN countries.

This variety and diversity also means that no single ‘cookie cutter’ approach toward oil-stockpiling developments will work effectively in ASEAN countries. In the 1970s, facing a serious threat of oil-supply disruption, countries in the Organisation for Economic Co-operation and Development formed an international organisation called the

IEA. This organisation required its member countries to build up a certain level of oil stockpiling as well as to release this stockpiled inventory in coordination with other members in case of actual supply disruption. This kind of obligatory approach toward member countries was feasible mainly because the countries were in similar stages of economic development and had the capability and resources to achieve the required stockpiling volume and participate in the coordination framework. Most European counties are more or less net oil importers and had similar oil-supply security concerns; another reason was that the 1973 oil crisis was a very shocking event and so member countries found a strong incentive to realise these oil- supply security arrangements. In ASEAN countries, however, such conditions do not apply, and any type of obligatory framework as in the IAE would not be workable there.

What would be appropriate for ASEAN countries is a framework that is more flexible but inclusive of all member countries. The APSA, established in March 2009, could serve as a starting point for such a framework. As discussed in Chapter 2, the agreement is rather too flexible to be effective in an emergency. How to modify and operationalise the agreement will be the primary focus of the regional oil-security arrangements for ASEAN for the moment.

It is also necessary to keep in mind the ASEAN's various and diverse features in order to form a cooperative arrangement between ASEAN countries and non-ASEAN countries such the US, Japan, or South Korea. Because the progress and challenges in oil-stockpiling development vary greatly between different ASEAN countries, any cooperative actions in the ASEAN have to be designed to fit the specific needs of each ASEAN country. Cooperative actions with Indonesia, for instance, should have different items than those with Myanmar because the former has much higher demand and a wider geographical reach than the latter. Likewise, cooperative actions for Viet Nam should be different from those for Cambodia because the former has already provided a concrete oil-stockpiling development road map while the latter has just begun to work on one. The best practice for a certain ASEAN country may not be so for another. The menu of cooperative actions should, therefore, be tailored to meet the unique requirements and challenges of each ASEAN country.

5-2. How to 'Visualise' the Benefits of Oil Stockpiling

As dependence on imported oil supply increases in almost all ASEAN countries, any serious policy planner and government official in the relevant sector will recognise the importance of promptly building up oil stockpiling. In fact, government officials of the ASEAN+3 countries regularly gather once a year for the ASEAN+3 Oil Stockpiling Roadmap Forum where they review and discuss the latest status of each country's oil- stockpiling development and share their experiences and challenges in development. Information on the necessity and benefits of oil-stockpiling development under the current oil market environment has been uniformly shared amongst the officials of the member countries via the relevant ministries of each country.

However, this recognition is not necessarily shared amongst the entirety of government organisations in each country. Because of rapid economic growth, there is an extensive need to develop different types of infrastructure, including water supply facilities, roads, railroads, bridges, and grid networks. There is also a need to boost the capacity for electricity generation. Government budgets are always constrained to meet this demand. If the necessity of oil-stockpiling development is not sufficiently recognised throughout the entire government, especially by the ministry of finance or the relevant ministry that oversees the allocation of government budgets, there will be insufficient budget allocated to the development of oil stockpiling. This, in turn, will lead to delays in development. This phenomenon has, in fact, been observed in many ASEAN countries. Recognition of the benefits of oil stockpiling is shared amongst a relatively small circle in each country's government organisation.

This is because the benefits of oil stockpiling are difficult to understand. Unlike highway roads or airports or even refineries, oil stockpiling itself does not generate cash benefits. Building a new highway, for example, will increase the transportation of goods and persons, and it is easy to quantify its economic effects. Oil stockpiling, however, only holds inventory and, conversely, generates operation and maintenance costs rather than cash profit. Oil stockpiling is held for an emergency and is not used for commercial profit. Building up oil stockpiling is, therefore, rather closely related to national defence activities, and it may not be appropriate to judge its utility solely from an economic standpoint.

Quantification or visualisation of the benefits of oil stockpiling is needed in order to address this issue. As mentioned earlier, expenditures to develop oil stockpiling are similar to defence expenditures so discussion in the context of a cost-benefit analysis may not be appropriate. Yet such quantification of oil stockpiling benefits is a common interest amongst all relevant government officials of ASEAN countries. Quantified—or at least visualised—material explaining why oil stockpiling has to be developed would help more government officials and decision makers better understand the issue. If these officials recognise the importance of oil stockpiling and endorse the idea, it will be possible to mobilise more resources, from human to capital, and contribute to developing the oil stockpiling system.

Quantification of oil stockpiling is a difficult task. The simplest method would be to assume a crisis case and calculate the economic loss avoided by stockpiling. In fact, the IEA has conducted this analysis, which was published in 2013.[25] The analysis assumed an Organisation for Economic Co-operation and Development country and its cost calculation was done in accordance with this assumption. Conducting a similar analysis assuming the development of a new oil-stockpiling base may be helpful in addressing the need for quantification. Needless to say, different ASEAN countries have different backgrounds, as already mentioned. Some countries may prefer to build an underground stockpiling facility while others would be more willing to choose a floating stockpiling base. Even if the same type of facility is chosen, the expenditures will be different. While any cost-benefit analysis will be a hypothetical one, such a case study will facilitate the development of stockpiling facilities.

[25] International Energy Agency, *Focus on Energy Security* (Paris: International Energy Agency, 2013)

Table 5-2-1. Indices of Oil Supply Security and Degrees of Impact on Supply Disruption

	Oil dependence	Net import	HHI	Oil intensity	Stockpiling days
Brunei	**22%**	**0%**	***No data***	**70.2**	**31 days**
Cambodia	**25%**	**100%**	***No data***	**137.6**	***No data***
Indonesia	**45%**	**42%**	**0.256**	**180.5**	**22 days**
Lao PDR	**24%**	**100%**	***No data***	**43.7**	**15 days**
Malaysia	**35%**	**0%**	***No data***	**145.1**	***No data***
Myanmar	**14%**	**60%**	***No data***	**95.0**	**23 days**
Philippines	**32%**	**94%**	**0.632**	**94.4**	**30 days**
Singapore	**60%**	**100%**	**0.479**	**93.3**	**90 days (power generation)**
Thailand	**41%**	**59%**	**0.290**	**219.0**	**43 days**
Viet Nam	**35%**	**12%**	***No data***	**233.6**	**62 days**

Impact of oil supply disruption					
Large	65%+	80%+	0.80+	200+	Below 30 days
Moderately large	50-65%	60%-80%	0.60-0.80	150-200	30-50 days
Medium	35-50%	40%-60%	0.40-0.60	100-150	50-70 days
Moderately low	20-35%	0%-40%	0.20-0.40	50-100	70-90 days
Low	below 20%	0%	0-0.20	0-50	More than 90 days

Sources: International Energy Agency (IEA), '*Energy Balances of non-OECD Countries*' (2014), '*APEC Energy Statistics*'.

Visualisation of oil stockpiling benefits may be easier. Table 5-2-1 is one such attempt. It summarises five benchmarks related to the oil-supply security of ASEAN countries. A high percentage of oil in total primary energy supply and a high percentage of import dependence suggest high vulnerability against oil-supply disruption. A high percentage on the Herfindahl-Hirschman Index (HHI) means that a country's import sources are more concentrated and, therefore, the country's supply security is high risk. A high oil intensity suggests that a country needs more oil to generate a unit of economic growth and that an oil-supply disruption will have greater economic impact on the country. The number of stockpiling days shows the degree to which a country can absorb the shock of an oil-supply disruption. Higher levels of risk are indicated with darker shades of green. The darker greens signify that the country is considered to have a higher risk in oil-supply security. Indonesia and the Philippines are regarded as high-risk countries.

Although the table only shows the degree of risk and does not specify the benefits of oil stockpiling, it certainly shows the degree of the potential cost of supply disruption relative to other countries. It also shows in which areas, from oil dependence in primary energy mix to oil intensity, countries are vulnerable against oil-supply disruption. This guide will be a reference in deciding specific policy actions.

5-3.Prepare for short-term measures

One of the extreme goals of an oil-stockpiling development policy, at least in terms of infrastructure, is to construct an oil-stockpiling base and build up oil inventory for that base. This arrangement, however, requires a large amount of money. It also takes a long time to acquire the land, construct the tank storage and oil-shipment facilities, train operation staff, and maintain the facility once it is built. It is difficult for most ASEAN countries to achieve this goal within a short period of time (e.g. within five years). These ASEAN countries' oil-import dependence is increasing and thus the security risk concomitant to an oil-supply disruption is also growing. It is, therefore, necessary to consider a means of enhancing oil-supply security in a shorter period of time.

As discussed elsewhere in this report, one such measure is a leased stockpiling system (ticket stockpiling). Countries with plenty of oil inventory but are facing declining domestic demand (e.g. Japan or South Korea) may be willing to issue a ticket to an ASEAN country in return for segregating a specific volume of their stockpiling as the ticket holder's inventory. This ticket system can be a bridging facility until said ASEAN country builds its own stockpiling facilities.

Another such short-term measure is a bilateral oil-stockpiling arrangement. The partner country in this case may again be Japan or South Korea but as the US has an expanding capacity for exports of oil products, it might also be capable of providing such services to ASEAN countries. Since the oil industries of Japan and South Korea have a high interest in increasing their oil-product exports to ASEAN countries, such a bilateral arrangement could be achieved relatively easily if ASEAN countries could allow the oil industries in Japan and South Korea access to their domestic market. In addition, the governments of Japan and South Korea are either expanding their oil-product inventory or are already maintaining a large amount of oil products and, therefore, a government-to-government level of agreement can be realised for this stockpiling arrangement.

These two measures can be regarded as a market-based arrangement as the arrangement is done mostly on a commercial basis and the primary players are private oil companies on the supplier side. While this market-based approach is not sufficient to achieve oil-supply security, it is still an effective means, at least in the shorter term.

Conducting emergency drills is also an important measure. If an emergency scenario is assumed as mentioned earlier, an exercise should be conducted. This exercise

can be implemented even if oil-stockpiling facilities have not yet been built. It provides an opportunity to review how to collect accurate information, who decides supply priority if the domestic oil supply is far short of the domestic demand, and who makes key decisions about oil supply. Thailand, for example, has been conducting such exercises every year and has accumulated expertise in emergency crisis management. APERC has already arranged such exercises in several ASEAN countries that are also APEC members. Utilising such services will be a good way to kick off exercises.

5-4. How to Reconcile Commercial Interests with Stockpiling Development

The next challenge is to determine who will be the primary player for stockpiling; in other words, who will bear the cost of developing stockpiling. If we look at the example of Organisation for Economic Co-operation countries, it was found that European countries tend to choose an association (or agency) type of stockpiling in which the owners are private oil companies. In the US, as observed in Chapter 3, all stockpiling volume is held and operated by the US government (the Department of Energy, specifically). Japan and South Korea, on the other hand, have combined government and private stockpiling systems. In ASEAN countries, it will be necessary to determine who will lead oil-stockpiling development and how.

In most ASEAN countries, the dominant entity in the oil market is an NOC and it is natural to involve the NOC in oil-stockpiling development. The biggest question will be to what extent private capital or foreign capital is employed. Because oil stockpiling is a core activity in energy security, some countries may prefer to restrict investment from these nongovernment sources. On the other hand, foreign companies have much better expertise in oil stockpiling management than local NOCs. They can be an important financial source if the government's budget is not large enough. Determining to what extent to include nongovernmental players is a key issue to consider.

Even if a government decides to utilise private or foreign sources, the next issue will be whether those sources have interest in investing in stockpiling facilities. The government, therefore, needs to make sure that the investment scheme is an attractive one for the investors through methods such as opening the domestic market to those investors.