Chapter 3

Successful Government and Industry Relationships for Stockpiling Development

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CHAPTER 3

Successful Government and Industry Relationships for Stockpiling Development

3-1 Why are Government-Industry Relationships Key to Oil Stockpiling?

This chapter addresses government and industry (G-I) relationships with respect to oil stockpiling in ASEAN. As discussed in previous sections, a successful G-I relationship is the cornerstone of a country's stockpiling development and operations. This section discusses why G-I relationships are so important and how these relationships can be built with reference to the experiences of IEA member countries.

3-1-1 Capitalising on industry knowledge

Firstly, cooperation with the oil industry provides practical knowledge for oil stockpiling. Crude oil and petroleum products are highly flammable and dangerous, and their handling (loading, unloading, storage, transport, etc.) requires specialist expertise and special facilities. In addition, they should be managed by organisations or personnel that specialise in safety and environmental issues to prevent any leakages or a release of oil into the surrounding environment. Cooperation with the oil industry, specialising in the operational handling of crude oil and petroleum products, is key to capitalising on its knowledge and expertise.

In principle, governments are expected to allocate a budget for human resources, expertise development, and accumulation of knowledge in order to stockpile oil, which is essential for national energy security. As discussed in Chapter 1, oil imports to ASEAN countries are increasing rapidly, making it urgent to develop practical stockpiling systems. It is therefore beneficial to make use of the knowledge of the domestic industry available in each country for stockpiling oil.

3-1-2 Securing efficiency

Cooperation with the oil industry, which engages in the commercial handling of oil and petroleum products, can improve stockpiling systems and efficiency. The industry's decision-making systems and handling procedures for supplying oil to the market should be fully utilised in a country's stockpiling operations. Developing stockpiling systems requires significant

investment and resources, and efficiency is essential. As such, governments should make the most of the oil industry's knowledge and expertise for efficient business operations, for example in forming practical organisations and decision-making processes, determining effective staff allocation, and implementing cost-effective maintenance.

Cooperation with the oil industry is also essential in building stockpiling stations. In particular, a close G-I relationship is key to optimising stockpile management, from designing to constructing and operating new stockpiling facilities.

3-1-3 Government resource constraints

The third aspect is in a way the most critical: government resource constraints. While most ASEAN countries have growing infrastructure needs, such as for road construction, power supply, and telecommunication systems, their infrastructure systems have yet to be developed and they have limited financial and human resources available for social infrastructure development, including oil stockpiling. In recent years, major countries have conducted various cost-benefit analyses with respect to oil stockpiling, which is raising awareness of its economic benefits.[7] That being said, its effectiveness may look still less tangible for many policy planners and policy makers compared to other infrastructure, such as railroads and telecommunication systems. Thus, a practical solution is to make the most of the industry's financial and human resources, which requires incentives to encourage cooperation in oil stockpiling.

The recent trend worldwide has been for governments to opt for private finance initiatives to ramp up investment in social infrastructure. In the UK, which has taken the lead in adopting private finance initiatives, businesses with the following conditions are considered suitable for the initiatives (HM Treasury, 2008) :

- The businesses require significant capital investment for the construction and maintenance of facilities.
- The needs can be considered as services by the public, output to the private sector, and defined as such in the contract accordingly, with the risks clearly shared between the public and private sectors.
- The life cycle costs of the construction of facilities and the provision of services can

[7] For example, the following analysis was conducted:
International Energy Agency, 'Focus on Energy Security
Costs, Benefits and Financing of Holding Emergency Oil Stocks,' (2013), NZIER Report to Ministry of Economic Development, 'New Zealand Oil Security Assessment Update,' (2012), Department of Energy & Climate Change, 'Future Management of the Compulsory Stockpiling Obligation in the UK,' (2013), Hale & Twomey, 'National Energy Security Assessment Identified Issues: Australia's International Oil Obligation,' (2012)

be defined, with the risks clearly identified and quantified.

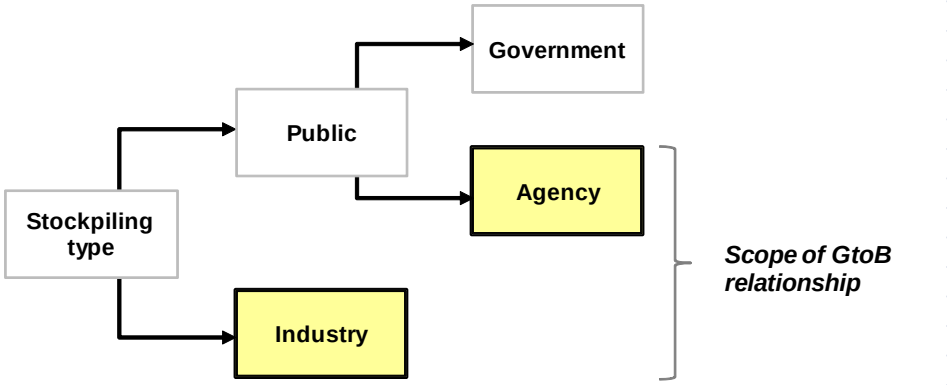
- Significant capital expenditures are required for the construction and maintenance of facilities.
- Significant changes, such as rapid technological innovation and political about-face, are not anticipated.
- The resulting public services will be ensured and provided for a long period of time.

As oil stockpiling meets most of these conditions, it is important to capitalise on industry resources, including private funds.

3-2 Scope of the Government-to-Business Relationship for Oil Stockpiling

By ownership, oil stockpiling can be classified into public stockpiling and private stockpiling. The former consists of government stockpiling and agency stockpiling. In most cases, agency stockpiling is funded and managed by private companies that belong to the agency. Stockpiling types that require industry involvement, therefore, consist of private stockpiling and agency stockpiling, which are operated by private funds.

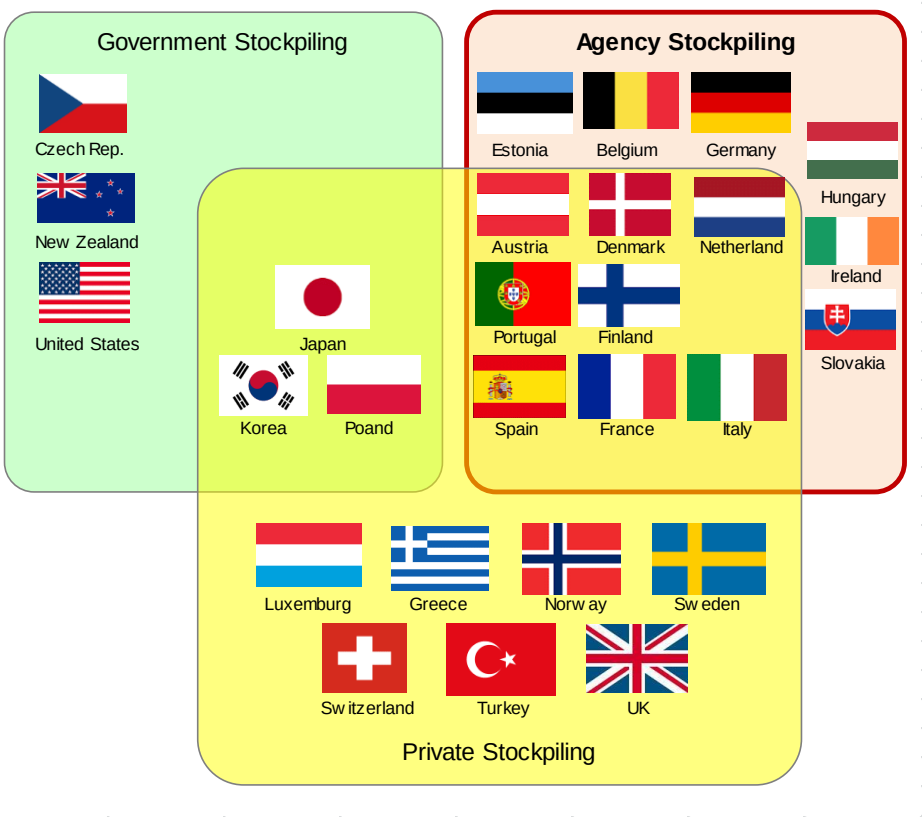
Figure 3-1. Ownership of Oil Stockpiling



Source: IEA (2014).

Agency stockpiling is managed by an agency specialised in oil stockpiling maintenance and operations. The agency is managed primarily a public organisation under the applicable laws and regulations, with the member companies providing funds to promote stockpiling business. The legal status and operation style vary slightly from country to country, according to the structure of the oil market and the concept of oil supply security. This is a system common in Europe and is often combined with private stockpiling (see Figure 3-2).

Figure 3-2. Stockpiling Type by Country



Source: JOGMEC website.

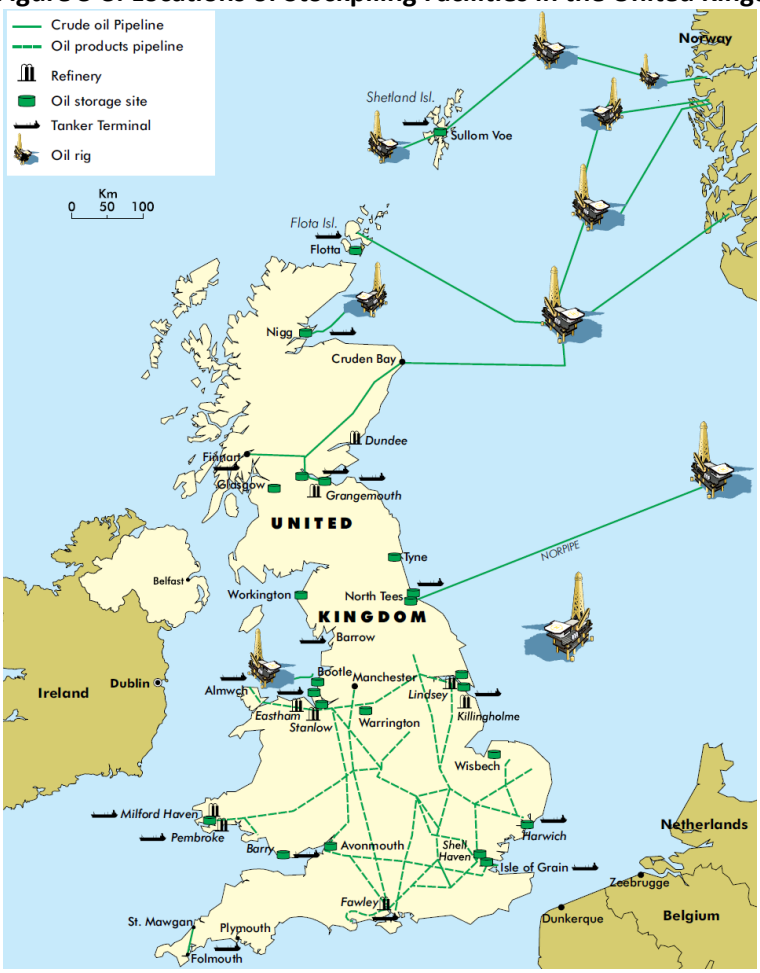
3-3 Case Studies in Developed Countries

This section presents examples that are useful in considering the advantage of partnerships with industry in building stockpiles. Specifically, it discusses the UK (private stockpiling only), Germany (agency stockpiling only), France (private and agency stockpiling), Japan (private stockpiling, government stockpiling, and third-party joint stockpiling), and Australia (which is gearing up for stockpile targets, though has yet to achieve the 90-day stockpiles recommended by the IEA).

3-3-1 United Kingdom

The UK is fully dependent on private stockpiling. All oil companies operating in the country, domestic and foreign, are privately owned. The Energy Act (instituted in 1976) and the Oil Stockpiling Order (issued in 2012) mandate them to maintain sufficient stockpiles; 67.5-day stockpiles for oil refiners and 58-day stockpiles for importers and traders with an annual handling of over 50,000 kilo tonnes, both based on the supply over the last 12 months. As there are no consolidated oil stockpiling facilities in the UK, all stockpiles are stored at private refineries or tank yards.

Figure 3-3. Locations of Stockpiling Facilities in the United Kingdom



Source: IEA (2014).

Of particular note is the use of international ticket stockpiling. Around 30 percent of the national stockpiling is held abroad as ticket stockpiling (see Table 3-1).

Table 3-1. Stocks Held by Product and Location

(Crude oil equivalent)

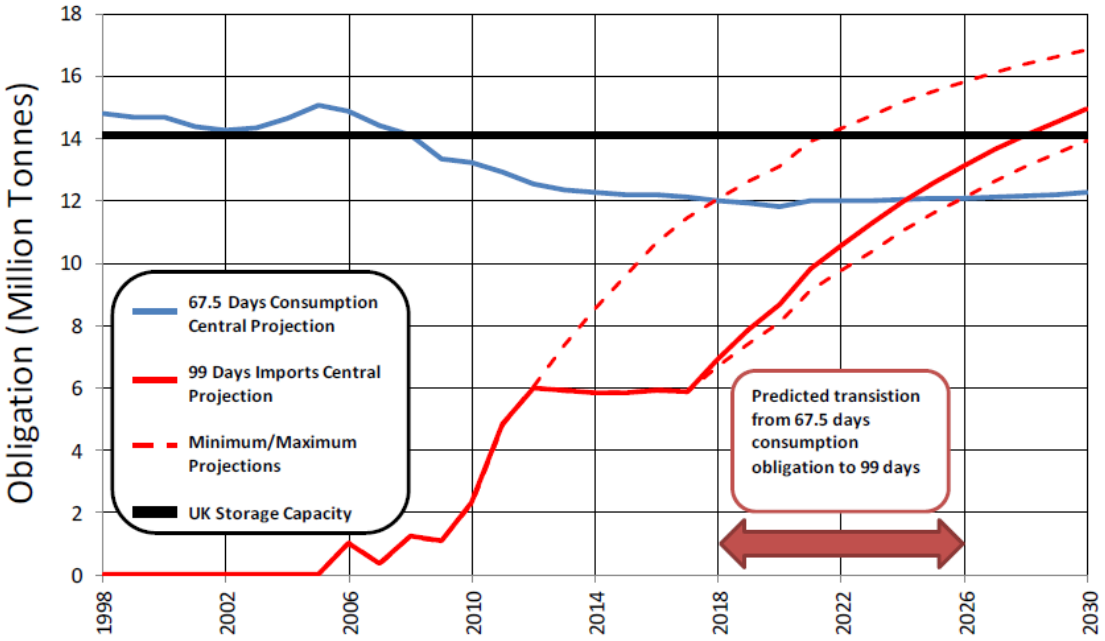
	Gasoline	Diesel/Gas Oil	Jet/Kerosene	Any Oil, Total	Total
Held abroad*	259 (26%)	639 (32%)	208 (26%)	2,570 (33%)	3,676 (32%)
Held in the United Kingdom	724 (74%)	1,346 (68%)	577 (74%)	5,177 (67%)	7,824 (68%)
Total	983	1,985	784	7,748	11,500

* Overseas ticket stockpiling.

Source: Department of Energy and Climate Change (2013).

There is no specific support provided for oil stockpiling in the UK. This is partly because the UK is capable of producing nearly 1 million b/d of oil (as of 2014), which results in low levels of stockpiling obligations, and overseas ticket stockpiling is not capped, which reduces the burden on private businesses.

Figure 3-4. The United Kingdom's Projected Oil Demand and Stockpiling Obligation



Source: Department of Energy and Climate Change (2013).

The recent decline in domestic oil production, however, is resulting in an increase in stockpiling obligations imposed on each oil company (see Figure 3-4) and the UK government is concerned about the relatively high rate of overseas ticket stockpiling of above 30 percent. Discussions are thus underway to establish agency stockpiling and cap overseas ticket stockpiling. The UK government published a report on the country's future stockpiling policy, which proposed an agency stockpiling system given the following facts (Department of Energy and Climate Change, 2013).

- Economies of scale can be expected for stockpiling.
- The amount of buffer stock can be minimised, compared to cases where each company holds stock to meet its stockpiling obligations.
- Funds for stockpiling and capital investment can be easily procured.
- With domestic demand remaining sluggish, it is difficult for private companies to

invest in the plant and equipment needed to meet stockpiling obligations.

- A further increase in overseas ticket stockpiling is not recommended in view of energy security.

- Determining the UK's stockpiling costs makes it easier to plan future capital investments and pass the costs on to end consumers.

3-3-2 Germany

In Germany, the Oil Stockpiling Law, which was instituted in 1978, provides the framework for the country's stockpiling system, Erdölbevorratungsverband (EBV), which was established in the same year according to the law and is the sole agency managing the country's stockpiles. The EBV has underground stockpiling facilities at four locations in the country in addition to tank storages on the ground at 130 locations. The stockpiles, which are about 90 days' worth of domestic consumption, consist of 15 million tons of crude oil and 9.5 million tons of petroleum products. Most crude oil is stored in salt cavern storage sites located in the northern part of the country and supplied through pipelines to refineries in times of emergency.

Figure 3-5. Locations of Stockpiling Facilities in Germany

Source: IEA (2014).

The EBV is funded by its member oil companies and importers, which each contribute €3.56 euros per tonne of oil they deal with (corresponding to 0.030 euro cents per litre of gasoline). The Oil Stockpiling Law mandates all refiners and oil importers to join the EBV.

The origin of German oil stockpiling dates back to the mid-1960s. As domestic oil demand kept increasing and the OECD recommended building stockpiles in 1962, the government imposed stockpile obligations in 1965 on domestic refiners and petroleum product importers. Following the first oil crisis, moreover, refiners were mandated to hold 90-day stockpiles and petroleum product importers 70-day stockpiles, in accordance with the International Energy Program agreement made in 1974 with the IEA.

While the German oil industry has been passive in building stockpiles, oil majors and independent oil companies operating in the country submitted a joint proposal to the government in 1975, recommending that oil stockpiling be managed by a public agency consisting of all domestic oil companies. Having learned lessons from the first oil crisis and in view of the establishment of the IEA, the German oil industry made an about-face in its stockpiling policy regarding how oil stockpiles should be built. The German government carefully examined the proposal, which led to the institution of the Oil Stockpiling Law and the establishment of the EBV in 1978.

There are several reasons why oil companies made the recommendation. The main reason is that consolidating domestic stockpiling capacity produces economies of scale and minimises burdens on the oil industry. At the same time, establishing a sole stockpiling agency and mandating all oil companies to join it provides competitive equality. Delegating stockpiling to an independent organisation, moreover, obviates the need for oil companies to put stockpiles on their balance sheets. At any rate, the key to success of the G-I relationship in Germany lies in the fact that the oil industry devised a constructive stockpiling system that was put into practice by the government.

3-3-3 France

While the UK is fully dependent on private stockpiling and Germany on agency stockpiling, France is positioned in between these two countries, using both options. Its private stockpiling system is based on the Oil Industry Law (Law 92-1443, instituted in 1992), which mandates French oil companies (refiners, importers, and distributors) to hold stockpiles equivalent to 29.5 per cent of the previous year's domestic consumption. Oil company percentages, however, are optional and can be either 44 percent or 10 percent, with the rest delegated to a stockpiling agency, called Société Anonyme de Gestion de Stocks de Sécurité (SAGESS). Oil companies that have refineries usually opt for 44 percent, while distributors dealing with significant amounts of low-cost gasoline choose 10 percent. The rest is taken care of by SAGESS.

SAGESS is a private stockpiling agency that was established in 1988 according to a French oil companies' initiative and with the support of the French government. National stockpiles amounted to 163 million barrels as of April 2013, about two-thirds (108 million barrels) of which were held by SAGESS. Unlike Germany's EBV, SAGESS leases French oil company storage facilities for stockpiling at 120 locations nationwide.

SAGESS is monitored by Comité Professionnel des Stocks Stratégiques Pétroliers (CPSSP), a government agency established in 1992. Oil companies belonging to SAGESS pay fees to CPSSP, which are then allocated to SAGESS for its operation. CPSSP functions as a mediator between SAGESS and oil companies to ensure payment to SAGESS (see Figure 3-6).

Figure 3-6. Financing of SAGESS Operations

Source: SAGESS website.

France has a long history of oil stockpiling. Its origins trace back to the Oil Import Law, which was instituted back in 1928, mandating all oil importers to hold emergency oil stockpiles. In 1951, refiners were also obliged to hold 10-day stockpiles, which were raised in 1958 and 1975, resulting in the current 90-day stockpiles. As France raised its stockpiles significantly before the first oil crisis when oil prices were still low, it had fewer cost problems in building stockpiles than other developed countries. Another factor that made it easier was the presence of the then national oil company, Total, which played a central role in the stockpiling initiative. Unlike in Germany, private oil companies were not exempted from stockpiling obligations even after the establishment of SAGESS, which may be due to 'dirigisme', the French government's powerful influence over the industry.

The oil industry's involvement in France's stockpiling development is certainly attributable to the traditional approaches taken to ensuring the oil supply and the government's powerful influence over the domestic industry, particularly over the then national oil company, Total, which is now a private company. As in the case in Germany, lessons learned from the first oil crisis and the IEA's subsequent initiative to build stockpiles also served as driving forces.

Figure 3-7. Locations of Stockpiling Facilities in France

Source: IEA (2014).

3-3-4 Japan

Japan provides a good example of government stockpiling combined with two other types of private stockpiling. As of November 2015, Japan held 49.3 million kilolitres of government stockpiles, 35.9 million kilolitres of private stockpiles, and 1.2 million kilolitres of third-party lease stockpiling, jointly held with Saudi Arabia and the UAE, totalling 86.4 million kilolitres (equivalent to 173-day stockpiles). Private stockpiles are stored in tanks owned by oil companies and importers, and government stockpiles are held at national storage stations at 10 locations nationwide and in tanks leased by private oil companies (see Figure 3-8). The Japanese government, moreover, has been building third-party joint stockpiling since 2009 in cooperation with Saudi Arabia and the UAE.

Figure 3-8. Oil Storage Bases in Japan

Source: International Energy Agency (2014).

As Japan became more dependent on oil for its energy supply in the 1960s, there was a growing awareness of the importance of oil stockpiling. While many European countries held 90-day stockpiles at the time, Japan's stockpiles stood at less than 60 days' worth of domestic consumption, with the supply of oil heavily dependent on imports. There was thus a pressing need to increase stockpiles, but the oil industry voiced concerns about the costs involved, which hampered the stockpiling initiative.

The situation, however, changed dramatically in the 1970s as resource nationalism gained momentum worldwide and Japan's economy was hit by two oil crises. In 1972, the 60-day Stockpiling Expansion Plan started under the supervision of the then Ministry of International Trade and Industry. The first oil crisis in 1973 was a major turning point for Japan's stockpiling development. The crisis caused panic throughout Japan, raising awareness of the vulnerability of the oil market to geopolitical factors and oil's extensive impact on the domestic economy. As a result, Japan's oil industry, which had been reluctant to increase stockpiles, had no choice but to acknowledge the importance of oil stockpiling. Under these circumstances, the Oil Stockpiling Act was instituted in 1975, which set the framework for national stockpiling policy, making private stockpiling mandatory. The two oil crises were severe enough to prompt the government to create a robust oil stockpiling system.

Obligations or recommendations imposed by international organisations also played a pivotal role in improving Japan's stockpiling system. In the wake of the first oil crisis, which dealt a severe blow to the world economy, 18 Western countries signed the International Energy Program in November 1974, established by the IEA under the OECD. The IEA, meanwhile, aimed to build stockpiles equivalent to 90 days' worth of net oil imports by 1980, requesting each member country to hold the same levels of stockpiles so that they could help each other in times of emergency. As a member of IEA, Japan, too, was obliged to hold 90-day stockpiles by 1980.

To build 90-day stockpiles, the following were implemented in order:

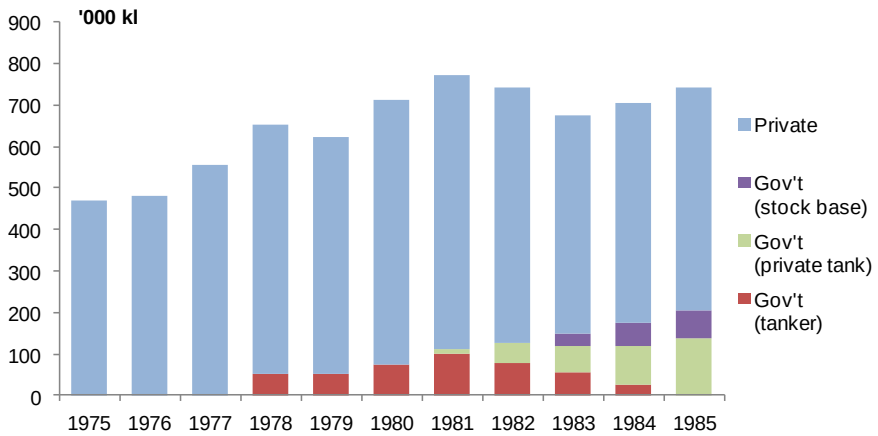
(1) Expansion of industry obligations

(2) Phased expansion of national stockpiles

(3) Relaxation of private stockpiling obligations

First, measures such as low-interest loans were adopted according to the Oil Stockpiling Act to construct storage facilities and procure oil for stockpiling purposes, thereby increasing industry obligation stockpiling. As a result, industry obligation stockpiling (including commercial stockpiling) increased by 5 days' worth of domestic consumption annually from 1975, showing an increase by as much as one-third in 1980 (see Figure 3-9).

Figure 3-9. Stockpile Increases in the 1970s and the 1980s



Source: IEEJ based on Ministry of Economy, Trade, and Industry website.

In 1978, the government concluded that it should build stockpiles on its own to supplement private stockpiling, as the world's oil demand was projected to increase and the 90-day stockpiling target was likely to be achieved. Specifically, Japan National Oil Corporation (currently reorganised as Japan, Oil, Gas, and Metals National Corporation) began to stockpile oil in September 1978 using redundant, privately owned oceangoing tankers as an emergency measure to increase government stockpiles. Subsequently, the government leased domestic oil company tankers for stockpiling purposes, which gradually gave way to stockpiling stations being developed in the country. Stockpiling in tankers, however, was abolished at the end of 1985 as the government had secured enough stockpiles. As national stockpiling stations expanded, the government relaxed stockpiling obligations in 1993 from 90 days to the current 70 days from the viewpoint of competitiveness among private oil companies.

As a new development in oil stockpiling, Japan started government stockpiling of oil products. It introduced 4-day stockpiling of diesel and kerosene as a part of its government stockpiling. This was due to the Great East Japan Earthquake in 2011, when several quake-hit areas experienced serious oil product shortages. Before the disaster, Japan's stockpiling was heavily weighted toward crude oil because it was assumed that a sudden disruption of crude oil supply due to geopolitical reasons in oil producing countries was the largest risk. Experience from the earthquake suggested that an oil supply disruption could happen due to domestic factors, and in such a case, the prompt supply of oil products would be critically important. The Japanese government therefore decided to maintain a certain volume of oil products and started government stockpiling of oil products.

3-3-6 Australia

Australia is a valuable example for ASEAN countries, as its refining capacity falls short of domestic demand, requiring it to import petroleum products, and it has no distribution infrastructure linking it to neighbouring countries, as a result of its geographical conditions.

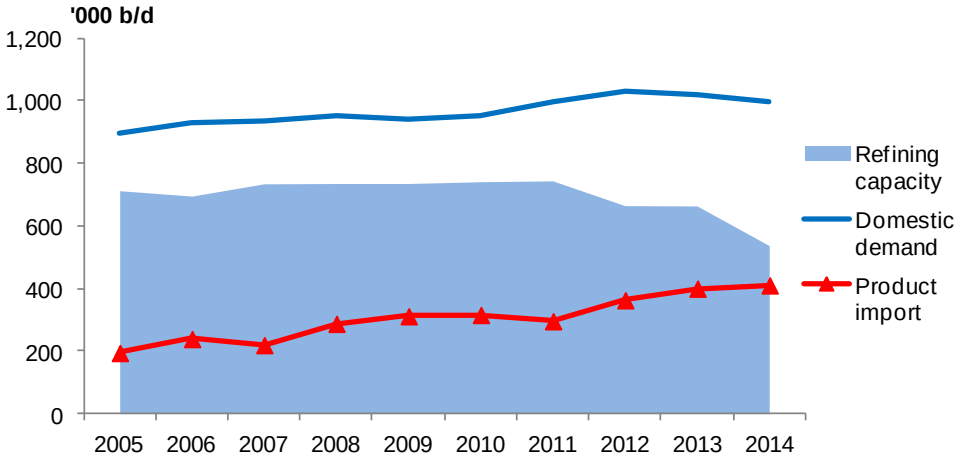
Figure 3-10 shows Australia's oil demand, refining capacity, and petroleum product imports. While oil majors have scaled down their refining capacities, domestic oil demand has remained relatively stable, resulting in an increase in petroleum product imports, which stood at 400,000 b/d in 2014, or about 40 percent of the domestic market.

Australia is an oil-producing country. Its production stood at 450,000 b/d in 2014, nearly 70 percent of which was produced in the Carnarvon Basin (located in the northwest region) and destined primarily for exports. The rest is produced in the Gippsland Basin (located in the southern region), most of which is processed at nearby refineries.

There are four refineries in Australia, each operated by BP, Caltex, ExxonMobil, and Vitol. The total refining capacity stands at about 442,000 b/d. In addition to domestic production, crude oil is sourced primarily from Malaysia, Indonesia, Nigeria, and the UAE. Since all the country's refineries were built 50–60 years ago and hence are less competitive than large-scale, modern refineries in the Asian region, many have been closed or have been sold. Shell closed down its Clyde Refinery (opened in 1928) in October 2012 and sold off its oil refining and distribution business (including the Geelong refinery and 870 filling stations) to Vitol in February 2014.

Caltex's Kurnell refinery, which started operating in 1956, was also closed down in October 2014 for conversion into a large-scale petroleum product terminal. BP followed suit, closing down its refinery in Bulwer Island in May 2015. As a result, the domestic market for petroleum products is growing; Singapore accounts for more than 50 percent of total imports, followed by Korea and Japan.

Figure 3-10. Australia's Oil Demand, Refining Capacity, and Petroleum Product Imports



Source: BP (2015); IEA Energy Balances of OECD Countries.

Figure 3-11. Oil Infrastructure in Australia

Note: Bulwer refinery and Clyde refinery in the map have been closed as of April 2016.

Source: International Energy Agency (2014).

Table 3-2. Australia's Refineries

('000 barrels per day)

	Capacity	Location	Status	Date
Caltex Lytton	109	Queensland	Operating	
BP Kwinana	138	Western Australia	Operating	
Geelong	120	Victoria	Sold by Shell to Vitol-led consortium	2014
ExxonMobil Altona	80	Victoria	Operating	

Source: IEEJ based on Energy Intelligence Group.

Australia is fully dependent on commercial stocks and has no national stockpiling system in place. Domestic commercial stockpiles had been enough to meet the IEA stockpiling standards, as Australia was a net oil exporting country until 2000 (imports, if any, were negligible). Domestic oil production, however, has been on the decline since around 2000, resulting in a gradual increase in imports. According to the IEA, Australia is the only IEA member country that is fully dependent on commercial stockpiling for its strategic stockpiles, with available commercial stockpiles of less than 90 days. The IEA is thus requesting Australia to immediately meet its strategic stockpiling obligations.

In the medium-to-long term, however, petroleum product imports are most likely to increase as domestic oil production declines and domestic demand continues to grow, and obsolete refineries discontinue operations, losing competitiveness against their advanced counterparts in Asia. Thus, discussions are underway to determine the ideal stockpiling system. A report entitled *National Energy Security Assessment (NESA) Identified Issues: Australia's International Energy Oil Obligation* was issued in July 2012 and presents and examines four options: government ticket stockpiling, government physical stockpiling, private ticket stockpiling, and private physical stockpiling (Hale and Twomay, 2012). It concludes that government ticket stockpiling is the most cost-effective, flexible, and secure option.

The need to improve the stockpiling system is being recognised to some extent in Australia. This may be due to the fact that refineries in Australia are being closed down and increasing private stockpiling is not a viable option. Government stockpiling is the most probable option, given that oil company involvement is costly and requires complex procedures, such as the development of legal systems.

Table 3-3. Options for Stockpiling in Australia

	Model 1	Model 2	Model 3	Model 4
Responsibility	Government	Government	Government and Industry	Industry
Stock type	Ticket only	Physical stock and tickets	Physical stock and ticket	Physical stock and ticket
Funding	General budget or levy	Probably levy	Budget or levy + industry pass through	Industry pass through
Improve domestic security	Poor - average	Good	Good	Good
Estimated capital required as of 2022 (AUD milions)	0	9,738	9,722	9,695
Per litre charge (AU cpl)	1.1	1.2 - 2.2	1.3 - 2.2	2.2 - 3.1
Flexibility	Good (but volume required)	Good	Good	Average
Complexity to implement	Good (not complex)	Average	Complex	very complex
Legislation required	Levy	Some	Lots	Lots

Source: Hale & Twomay (2012).

3-4 What is Needed for a Successful Government-Industry Relationship?

This section discusses what is needed to create a successful G-to-B relationship based on the examples presented above.

3-4-1 Legislative regulations

Developing domestic legal systems is essential in encouraging the oil industry to cooperate in building stockpiles. Every country discussed in this chapter, except for Australia, has its own oil stockpiling law. Oil stockpiling legislation is imperative for developing a comprehensive stockpiling system as well as in encouraging the oil industry's involvement. Accordingly, the objectives and procedures for domestic stockpiling and the sharing of responsibilities between governments and industry should be determined. While oil stockpiling can take a variety of forms, such as government, private, agency, and ticket stockpiling, as discussed previously, legal systems of some sort are key to define the role of each player. Such legal systems imposing obligations on the oil industry are only possible through close communication between governments and industry.

3-4-2 International agreements

International agreements, preferably binding agreements, are also key to encouraging the domestic oil industry to cooperate in building stockpiles. The developed countries addressed

in this chapter are all IEA members, and the IEA's 90-day stockpiling obligations are a major driving force in engaging the oil industry in stockpiling development in each country. It goes without saying that lessons learned from the first oil crisis prompted the IEA to impose the obligations. In the meantime, OECD recommendations to build stockpiles, which started in the 1950s, contributed to gradually increasing stockpiles in the original member countries.

For European countries, the 90-day stockpiling obligations imposed by the European Union Minimum Stocks of Crude Oil and/or Petroleum Products Directive (issued in 2009) and its requirement that one-third of the existing stockpiles should consist of petroleum products (which can be consumed directly without being processed) drove them to build stockpiles. Both the IEA and the European Union impose the same stockpiling obligations on all their member counties without exemption, which helps them gain consensus from industry, as such obligations do not create competitive gaps among companies.

The ASEAN Petroleum Security Agreement (APSA), meanwhile, is expected to transform itself into a more practical framework, eventually imposing similar types of stockpiling obligations or other binding requirements on its member countries, which will drive them to cooperate in the initiative.

3-4-3 Significance of communication

Smooth communication between governments and industry is indispensable in creating a successful G-I relationship. Specifically, the two parties should foster a trusting relationship through opportunities such as regular and informal meetings. Such opportunities are also key to designing a system that enhances the incentives for industry.

In this respect, Finland's emergency response system may serve as a good example, as there is close communication between businesses and the government and its agencies. They have built solid, trusting relationships with each other. The National Emergency Supply Agency (NESA), a government agency responsible for emergency response, takes the lead in sharing information on emergency response between the Finnish government and businesses. Specifically, the Council for Security of Supply, a high-level government agency consisting of ministerial executives and the chief executive officers of major domestic companies, facilitates communication between the government and businesses for oil supply security. This council controls a working group consisting of NESA staff members and the emergency response managers of businesses. They hold meetings 4–6 times a year to discuss recent oil supply security situations and problems, along with possible countermeasures.[8]

Likewise, the Japanese government and industry jointly conduct an emergency drill every year in regret that the government and oil industry could not communicate smoothly with each

[8] For details, see the NESA website: http://www.nesa.fi/

other in the wake of the Great East Japan Earthquake of 2011. This includes cross-functional approaches involving the country's self-defence force.

While it may be difficult for ASEAN to directly establish similar response systems at this stage, the governments and businesses of the region should have more opportunities to exchange opinions on emergency response and, by extension, encourage industry involvement in stockpiling development.

3-4-4 Incentives for industry involvement

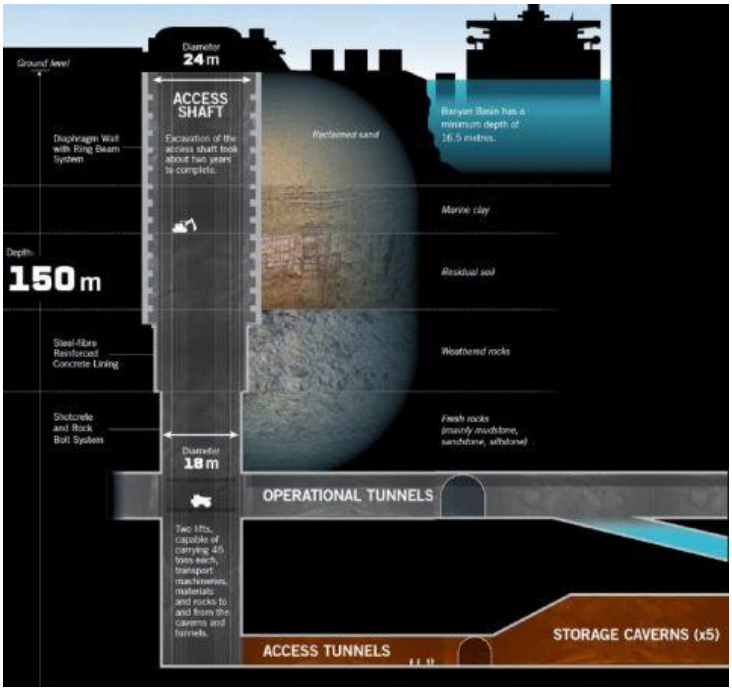
It is also important to provide incentives that encourage industry participation, particularly commercial advantages for oil companies. Such incentives make their involvement sustainable. To this end, it is essential that oil companies are involved in the planning stages to develop a system that is acceptable to them, not a malfunctioning system designed unilaterally by a government. It should be designed taking into account oil company opinions and should identify the opportunities that would generate profits for them. One possible option is to pursue economies of scale and allocate the resulting gains to oil companies. In particular, the costs of building new facilities can be compared with those of other options, with the resulting gains shared among the parties involved.

Although it is not oil stockpiling in a strict sense, the underground stockpiling system in Jurong Island, built by the JTC Corporation, provides a good example of the successful involvement of private companies. JTC Corporation, a Singaporean government agency established in 1968, has control over the development of infrastructure in Singapore, including Jurong Island, which is home to the heavy chemical industry. The construction of the storage facilities started in 2007 and was completed in July 2014, followed by the construction of 1.47 million kl underground rock caverns.

These underground rock caverns, which were built due to land constraints on Jurong Island, are designed to store oil deep underground in a solid stratum. They are the first of their kind built in Southeast Asia, saving 60 hectares of land on the island, according to JTC. They are located 130 metres below the ground and oil is stored in 8 kilometre-long tunnels. CNN estimated their construction cost at S$950 million.[9]

[9] CNN Travel, 25 May 2011. (http://4.bp.blogspot.com/-0LSRjqXNwtI/VBelOGFD1XI/AAAAAAAAZKs/GlbYl9Bv3LM/s1600/The%2BNew%2BPaper%2Bgraphics%2B-Jurong%2BRock%2BCaverns.jpg)

Figure 3-12. Jurong Rock Cavern



Source: JTC Corporation website.

The operation of the facilities has been delegated to Vopak,[10] a Dutch company, as a joint venture in which Vopak has a 40 percent stake through a 15-year contract. This JTC project is a good example of oil storage facilities that have been built primarily for private company use, but that also contribute greatly to the inventory of the country. While robust demand for oil storage facilities in Singapore (the hub of the Asian petrochemical market) is a prerequisite for this project, its business model will be a good reference in building stockpiling facilities in ASEAN as the operation of storage facilities, including those designed primarily for commercial use, can be delegated to private companies while ensuring stable revenues and recovery of construction costs.

3-4-5 Government support for private stockpiling

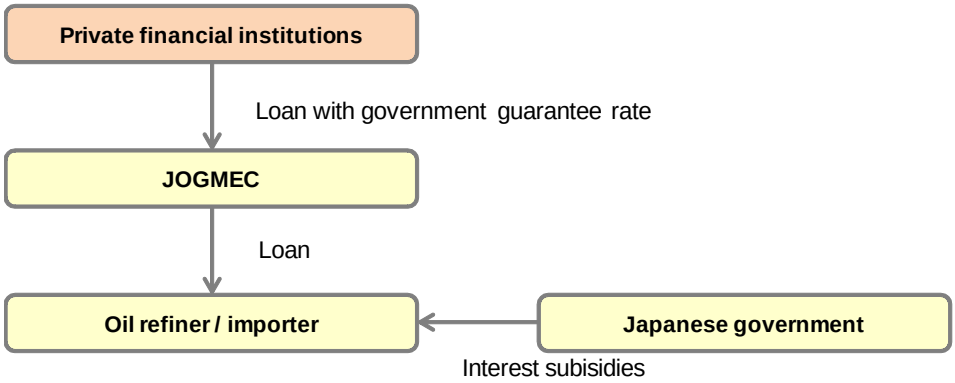
Direct and indirect government support for the oil industry will greatly promote cooperation in stockpiling development. One such example is the Japanese government's financial support for private oil companies, which helps them build private stockpiles. Government-affiliated financial institutions provide low-interest loans for the construction, operation, and maintenance of stockpile stations, while supporting oil companies to increase and hold stockpiles by providing funds and interest subsidies.

For example, the Development Bank of Japan finances up to 50 percent of the construction, operation, and maintenance costs of tanks at low interest rates. As for facilities in Okinawa

[10] Vopak press release, 15 January 2014. (https://www.vopak.com/newsroom/news/jtc-corporation-awards-contract-vopak-terminals-singapore-and-partners-operate-jurong)

Prefecture, the Okinawa Development Finance Corporation finances up to 70 percent of the costs, also at low interest rates. The government, meanwhile, subsidises interest above 5.5 percent in addition to a system launched in 2002 to subsidise interest on loans for additional stockpiling procurement imposed by the government on private oil companies. This system is provided by the government-affiliated Japan Oil, Gas and Metals National Corporation. While the Oil Stockpiling Act mandates 70-day stockpiles on oil companies, up to 80 percent of the costs required for procuring 25-day stockpiles are financed based on the assumption that 45-day stockpiles would be just enough for regular operations, with interest on the loans subsidised by the government. Thus, the government financial support consists of fund loans from government-affiliated financial institutions and interest subsidies (see Figure 3-13).

Figure 3-13. Structure of the Japanese Government's Financial Support



JOGMEC = Japan Oil, Gas and Metals National Corporation.
Source: Ministry of Economy, Trade and Industry website.

The Swiss government also subsidises private stockpiling. With no government stockpiles available, Switzerland is fully dependent on stockpiling by private oil companies (which started in 1938, long before the establishment of the IEA). Specifically, the government mandates 4.5-month stockpiles. Stockpiles for gasoline and heating oil are allocated according to oil company imports in the last 3 years and those of gas oil and jet fuel are based on their market shares. Oil importers in Switzerland must be members of CARBURA, which issues import permits, monitors domestic stockpiles, and manages guarantee funds. CARBURA is authorised to keep track of stockpiles on behalf of government agencies and punish those who fail to meet their obligations.

With the private stockpiling system in place, the Swiss government requires the guarantee funds, which are collected from oil importers, to bear the mandatory stockpiling costs on the grounds that they should not be passed on to private companies; importers holding stockpiles are onsubsidised with the funds. The subsidies amount to as much as €50 million a year. As the funds are collected from all oil importers, they can be secured and allocated without undermining each importer's competitiveness, in contrast with the UK, where such taxation and allocation are non-existent.

3-5 Conclusion

As discussed, cooperation between governments and the oil industry is key to building stockpiles. At the same time, close communication among the parties involved should be maintained to solicit cooperation from the oil industry, while stockpiling systems should be introduced in a way that minimises impacts on business and competitive conditions. Overseas case studies show that the most practical way to build stockpiles is to first impose stockpiling obligations on the oil industry and then transfer them to governments as national stockpiles build up.

Successful G-I relationships facilitate not only stockpiling development but also smooth day-to-day operations and release actions in cases of emergency. Building such a relationship should be regarded as a cornerstone for effective stockpiling development and operation.