

# Chapter 2

## Oil Stockpiling Development in Southeast Asia

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## Chapter 2

### Oil-Stockpiling Development in Southeast Asia

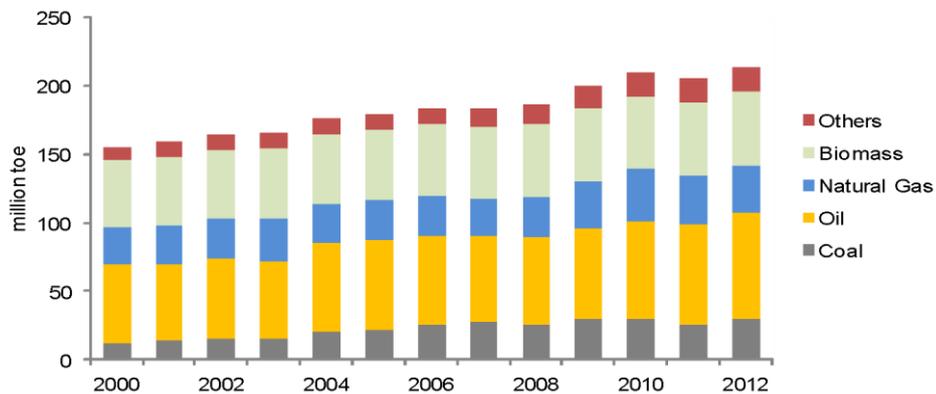
This chapter addresses the current situation and future challenges related to the development of oil stockpiling in ASEAN countries.

#### 2-1. Indonesia

##### 2-1-1. Energy supply and demand

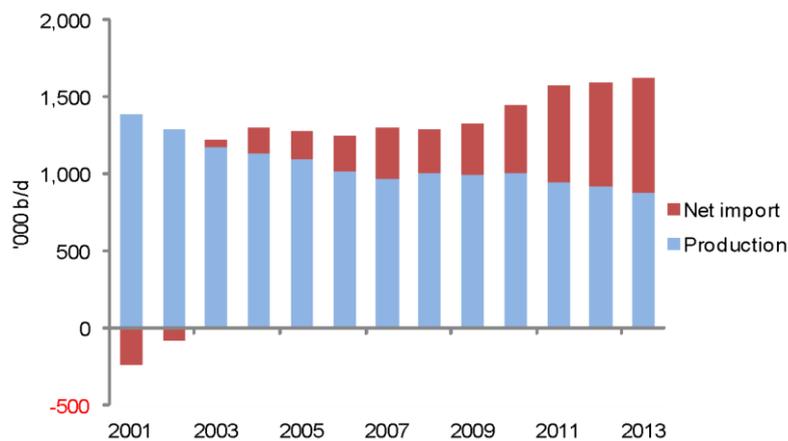
Indonesia's primary energy demand has increased robustly. Demand for oil and natural gas, amongst others, underwent a substantial growth rate. Although Indonesia became a net oil importer in 2003, it has continued exporting oil to other economies, such as Japan while importing inexpensive oil from the Middle East.

**Figure 2-1-1. Primary Energy Demand in Indonesia**



Source: International Energy Agency, 'Energy Balances of Non-OECD Countries' (Paris, 2014).

**Figure 2-1-2. Oil Supply–Demand Balance in Indonesia**



Sources: British Petroleum, 'Statistical Review of World Energy' (2014).

## **2-1-2. Overview of the oil-stockpiling system**

### **(1) Objective**

Indonesia is considered to be endowed with natural resources such as oil, natural gas, and coal. This does not mean, however, that these fossil fuels can be exploited indefinitely. In fact, the country became a net oil importer in 2003. As of 2012, imports of petroleum products, which have recently increased, have reached 500,000 barrels per day (b/d) due to the shortage in Indonesia's domestic refinery capacity. Under such circumstances, the purpose of Indonesia's oil stockpiling is to secure the oil supply in areas like Jakarta where oil consumption is substantial.

### **(2) Institutional Framework**

Under the Ministry of Energy and Mineral Resources, the Badan Pengatur Hilir Minyak dan Gas Bumi (Oil and Gas Downstream Regulatory Agency) is responsible for formulating oil-stockpiling policies while the Directorate General of Oil and Gas is in charge of energy policy development and implementation. Badan Pengatur Hilir Minyak dan Gas Bumi was established under the new Oil and Gas Law which took effect in November 2001. It supervises the supply and distribution of petroleum products as well as the transport of natural gas through pipelines. It also monitors the actual supply of petroleum products weekly.

### (3) Regulatory Overview

Although the government's responsibility to prepare strategic petroleum reserves (SPR) is prescribed in the 2001 Oil and Gas Law, government oil stocks have not yet been developed. Article 8 of the law stipulates:

(1) The government shall prioritise the exploration of natural gas for domestic needs and be tasked with preparing strategic petroleum reserves to support the supply of fuel oil in the country, which is further stipulated by government regulation.

(2) The government shall guarantee the availability and smooth distribution of fuel oil being a vital commodity and controlling the life of [the] public at large throughout the territory of the Unitary State of the Republic of Indonesia.<sup>3</sup>

Article 46 identifies 'b. national fuel oil reserves' and 'c. utilisation of fuel oil transport and storage facilities' as tasks of which the regulatory agency is in charge. Since detailed rules were necessary in order to implement the 2001 Oil and Gas Law, Government Regulation No. 36/2004 on Oil and Gas Downstream Business was issued in 2004.<sup>4</sup> Article 59 under this regulation requires the minister to stipulate the policy on the quantity and type of SPR.

**Table 2-1-1. Overview of the Oil Stockpiles in Indonesia**

| <b>Subjects</b>                            | <b>Oil-stockpiling systems</b>          | <b>Measures</b>                           |
|--|---|---|
| <b>Oil stockpiling body</b>                | Government                              | No requirement                            |
|  | Agency                                  |   |
|  | Private                                 | Private oil stock by authorised companies |
| <b>Standards of oil stockpiles</b>         | International Energy Agency (IEA) rules | Non-IEA member country                    |
| <b>Crude oil and/or petroleum products</b> | Share of crude oil                      | No obligation                             |
|  | Share of petroleum products             | Equivalent to 22 days                     |

Source: The Institute of Energy Economics, Japan.

<sup>3</sup> Law No. 22/2001 on Oil and Natural Gas

<sup>4</sup> Government Regulation No. 36/2004 on Oil and Gas Downstream Business

With regard to private oil stockpiles, oil companies authorised by the Ministry of Energy and Mineral Resources and Pertamina are obliged to maintain operation stocks equivalent to at least 22 days of domestic demand. Pertamina plans to more than double its gasoline and gasoil storage capacity from 2.5 million kilolitres to 6.1 million kilolitres within one to two years, which will expand auto fuel supplies from the current 18 to 20 days to nearly 30 days.

#### (4) Oil-Stockpiling Entities and Facilities

There is no organisation in charge of SPR in Indonesia. Oil companies such as Pertamina work as an entity for private oil stockpiling.

#### (5) Mandatory Oil Stockpile

The authorised oil companies have a legal obligation to hold a minimum of 22 days of gasoline, kerosene, and diesel. As of the end of 2013, Pertamina, the NOC, has been maintaining oil stocks of 31 days, larger than the mandatory level.<sup>5</sup>

#### (6) Emergency Response and its Regulatory Basis

In Indonesia, the Ministry of Energy and Mineral Resources and Pertamina have developed an emergency response system for urgent situations such as earthquakes and accidents at oil facilities. No details, however, have been revealed.

#### (7) Challenges to Oil-Stockpiling Development<sup>6</sup>

Oil-stockpiling development has made slow but steady progress as 31 days of oil stockpiles have been recently recorded. Nevertheless, it will still be challenging for Indonesia to maintain political willingness and secure funding to develop its oil stockpile. Indonesia could face difficulty in looking for new funding to develop oil stockpiles because the subsidy on petroleum products would be cut if more financial support was provided to oil-stockpiling development. Although the financial burden caused by the subsidy policy has been recognised as a serious problem that needs to be tackled, this issue is too politically sensitive to touch on. Therefore, finding a new financial source for

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<sup>5</sup> From an interview with the experts conducted in February 2014 in Siem Reap, Cambodia.

<sup>6</sup> Ibid.

oil-stockpiling development would not be an easy task.

### 2-1-3. SWOT analysis

Table 2-2-2 shows the SWOT (strengths, weaknesses, opportunities, and threats) analysis of Indonesia’s oil-supply security. A major strength of the country is its domestic oil production. Strong political leadership to reduce oil product subsidies is also a strength of its oil-security policy development. A major weakness is its insufficient refining capacity and the lack of a stockpiling system like other countries have. Pertamina’s recent efforts to revamp existing refineries are a great opportunity to enhance the oil-supply infrastructure. The unexpected disruption of product imports is a major threat.

**Table 2-1-2. SWOT Matrix of Indonesia’s Oil-Supply Security**

|  |   |
|--|---|
| <p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Domestic hydrocarbon resources</li> <li>• Political leadership of new president</li> <li>• Smaller subsidies</li> </ul> | <p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Insufficient refining capacity</li> <li>• Lack of a stockpiling system</li> <li>• High dependence on oil-product imports</li> </ul> |
| <p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Refining joint ventures</li> <li>• Lower prices of crude oil</li> </ul>   | <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Product-import disruption</li> <li>• Large fluctuations in oil prices</li> </ul>   |

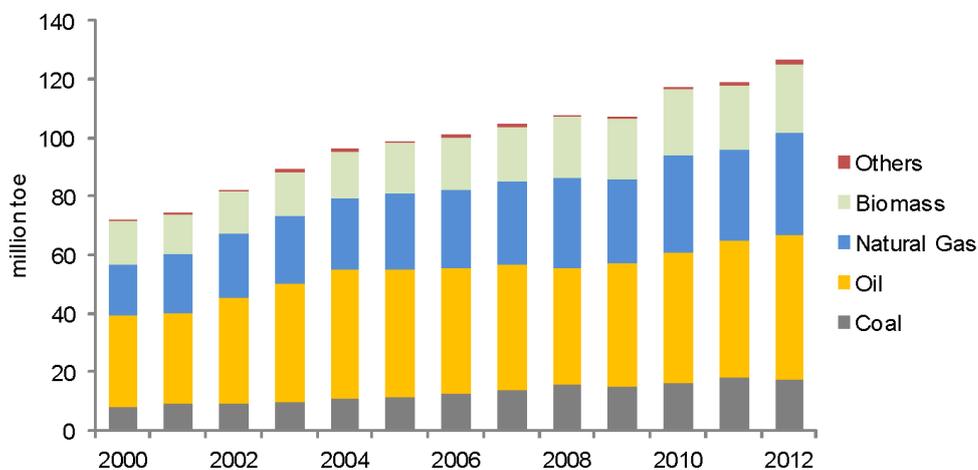
Source: The Institute of Energy Economics, Japan.

## 2-2. Thailand

### 2-2-1. Energy supply and demand

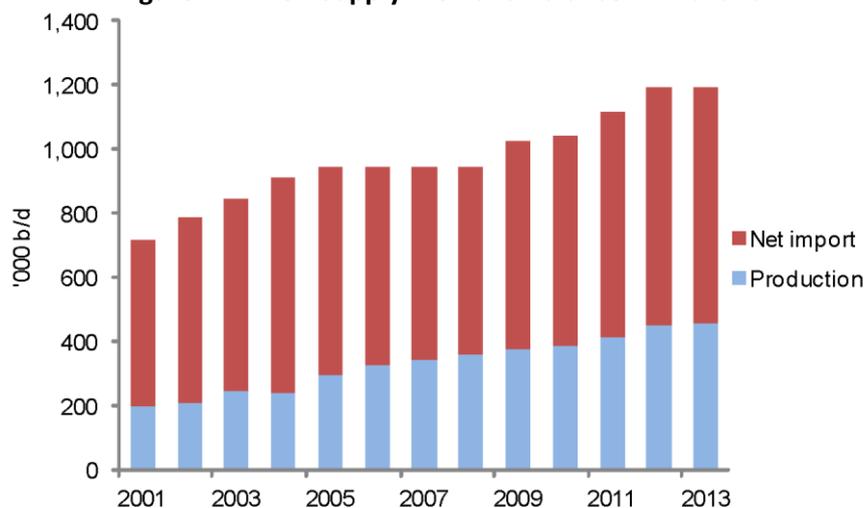
Oil production reached 440,000 b/d and natural gas deposits yielded 41 billion cubic metres in 2012, accounting for 39 percent and 26 percent, respectively, of the primary energy demand. Nevertheless, Thailand is a net importer of oil and natural gas. Imports of oil and natural gas have continuously increased to meet growing domestic demand.

**Figure 2-2-1. Primary Energy Demand in Thailand**



Source: International Energy Agency, 'Energy Balance of Non-OECD Countries' (Paris, 2014).

**Figure 2-2-2. Oil Supply–Demand Balance in Thailand**



Source: British Petroleum, 'Statistical Review of World Energy' (2014).

## 2-2-2. Overview of the oil-stockpiling system

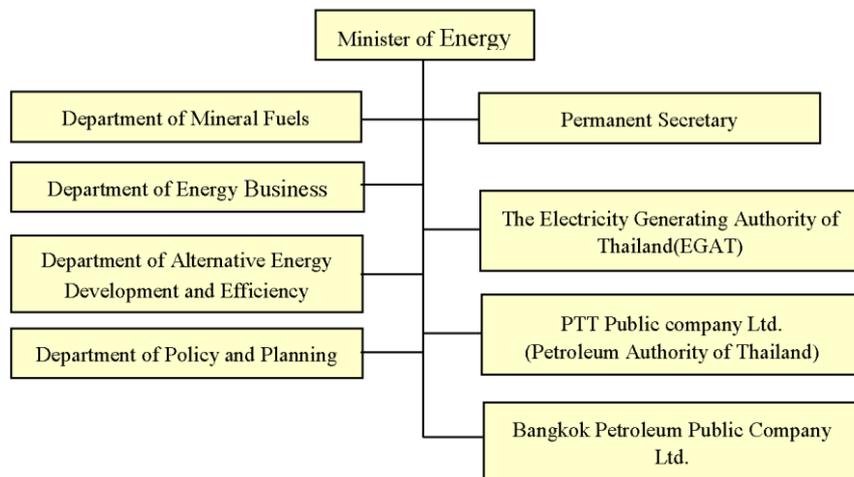
### (1) Objective

Thailand is aware that any disruption in oil supply would severely damage the economy due to the country's heavy dependence on imported oil, which constitutes more than half of its oil supply. This perception led to the requirement, established in 1978, that the private sector has to have an oil stockpile.

### (2) Institutional framework

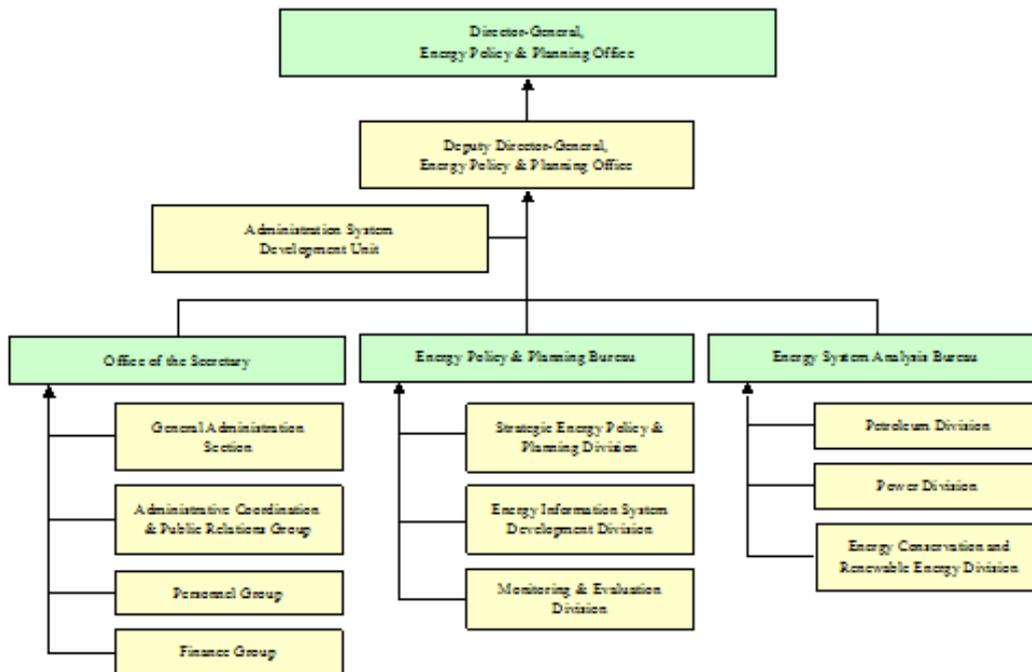
Since its establishment in October 2002, the Ministry of Energy has been in charge of the oil policy, including oil stockpiling. The Energy Policy & Planning Office is responsible for developing an oil-stockpiling policy while the Bureau of Fuel Trade and Stockpile of the Department of Energy Business under the Energy Policy & Planning Office oversees the private oil stockpile.

**Figure 2-2-3. Organisational Chart of Thailand's Ministry of Energy**



Source: Website of Thailand's Ministry of Energy.

**Figure 2-2-4. Organisational Chart of the Energy Policy & Planning Office**



Source: Website of the Energy Policy & Planning Office.

### (3) Regulatory overview

Oil is considered an essential resource for the Thai economy. The Emergency Decree on the Remedy and Prevention of Shortage of Fuel Oils (B.E. 2516) was implemented in 1973 to prepare a system that adjusts according to oil supply and demand and controls the oil price if supply plunges as a result of disruptions. The Fuel Act of 1978 requires all refiners, importers, and retailers in the private sector to have oil stockpiles. Private-sector parties are not allowed to use their oil stocks at their discretion without governmental permission even if their oil stockpile levels exceed the minimum requirement.

When the financial crisis occurred in 1997, the Thai government eased the oil-stockpiling obligations imposed on refiners and retailers. This measure was considered temporary and the mandatory level was supposed to be ratcheted up if the economy revived. Contrary to expectations, however, the oil companies that were obligated to hold oil stockpiles requested the government to further loosen it. Nevertheless, the government decided not to reduce the required oil-stockpile levels given the looming risk of oil disruption after the terrorist attacks in the US on 11 September 2001.

**Table 2-2-1. Overview of the Oil Stockpiles in Thailand**

| Subjects                            | Oil stockpiling systems                 | Measures  |
|-------------------------------------|---|---|
| Oil stockpiling body                | Government                              | No requirement  |
|                                     | Agency                                  |   |
|                                     | Private                                 | Refiners, importers, and retailers in the private sector  |
| Oil stockpile standards             | International Energy Agency (IEA) rules | Non-IEA member country  |
| Crude oil and/or Petroleum products | Share of crude oil                      | Refiners: 6% of yearly sales of crude oil and petroleum products<br>Importers: 6% of import planning                |
|                                     | Share of petroleum products             | Refiners: 6% of yearly sales of crude oil and petroleum products<br>Importers and retailers: 12% of import planning |

Source: The Institute of Energy Economics, Japan.

The Thai government has considered establishing government oil stockpiles instead of adding to the responsibility borne by the private sector. Exposed to the increasingly intense competition in the Asian economy, the private sector could lose market competitiveness if it was obligated to maintain a higher level of oil stockpiles which would further increase its burden. Meanwhile, at the time of this study, it did not appear that remarkable progress had been made in planning the government oil stockpile because its development entailed a tremendous financial burden for the government, which was especially challenging in a situation where oil prices were high.

(4) Oil-stockpiling entity and facility

In Thailand, private oil stocks are the only required system and there is neither government nor agency oil stockpiling. This required that private oil stocks be jointly maintained in a tank where a company holds oil for sale; that is, mandatory oil stocks are required to be physically separated from other stocks in different tanks.

(5) Mandatory oil stockpile

The government obligates refiners to hold 6 percent of their yearly sale of crude oil and petroleum products, importers and retailers to hold 6 percent of their crude oil, and 12 percent of the petroleum products of an import plan submitted to the Ministry of

Energy. Petroleum products to be stored include gasoline, kerosene/jet oil, diesel oil, and fuel oil.

**Table 2-2-2. Mandatory Ratio in Private Oil Stockpiling**

|                     | <b>Refiners (%)</b> | <b>Importers and Retailers (%)</b> |
|---------------------|---------------------|------------------------------------|
| <b>Crude oil</b>    | 6                   | 6                                  |
| <b>Gasoline</b>     | 6                   | 12                                 |
| <b>Kerosene/jet</b> | 6                   | 12                                 |
| <b>Diesel</b>       | 6                   | 12                                 |
| <b>Fuel oil</b>     | 6                   | 12                                 |

Source: Presentation from the ASEAN+3 2nd Oil Stockpiling Roadmap (OSRM) Workshop held on 25 February 2014.

(6) Emergency response and its regulatory basis

The Emergency Decree on Remedy and Prevention of Shortage of Fuel Oils (B.E. 2516) implemented in 1973 stipulates that the Ministry of Energy adjust oil supply and demand and control prices if supply plunges due to disruptions.

(7) Challenges to oil-stockpiling development<sup>7</sup>

Thailand has prepared for the steady development of oil stockpiling but recent political turmoil might make it difficult for the country to move the plan forward. Therefore, Thailand will not be needing foreign assistance in achieving an oil- stockpiling development road map. Thailand, however, would like Japan to share its experiences in developing an oil-stockpiling system and hopes that Japan will engage in bilateral cooperation in areas such as capacity building.

One critical issue that Thailand faces is securing a site for the government oil stockpile, which has been difficult due to local opposition. To overcome this hurdle, Thailand has looked into the possibility of a floating oil-storage base as suggested by the Ministry of Land, Infrastructure, Transport and Tourism of Japan.

<sup>7</sup> From an interview with experts conducted in February 2014 in Siem Reap, Cambodia.

### 2-2-3. SWOT Analysis

Table 2-2-3 shows a SWOT analysis of Thailand's oil-supply security. Thailand's major strengths are its large refining capacity and the product inventory in its refineries. The country's regular emergency drills also enhance its capability to respond unexpected events. Its notable weakness is the high oil consumption it requires to generate a unit of economic growth. Lower international crude oil prices since the summer of 2014 have provided an opportunity for the country to reduce its oil-import bills but its high import dependence continues to make it vulnerable to unexpected disruption in its oil supply.

**Table 2-2-3. SWOT Matrix of Thailand's Oil-Supply Security**

|   |  |
|---|--|
| <b>Strengths</b> <ul style="list-style-type: none"><li>• Large refining capacity</li><li>• Emergency-response drill expertise</li></ul> | <b>Weaknesses</b> <ul style="list-style-type: none"><li>• High oil intensity</li></ul>   |
| <b>Opportunities</b> <ul style="list-style-type: none"><li>• Lower oil prices</li></ul>   | <b>Threats</b> <ul style="list-style-type: none"><li>• Disruption in oil import</li><li>• Large fluctuations in oil prices</li></ul> |

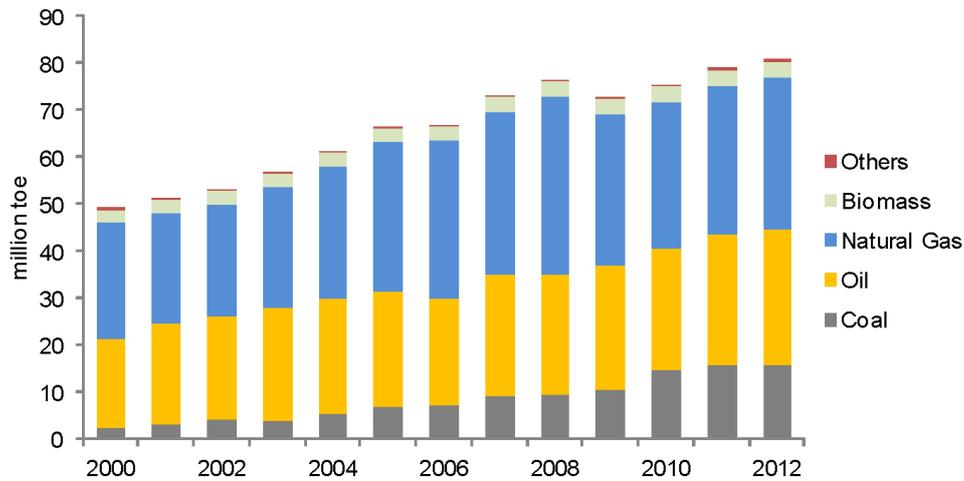
Source: The Institute of Energy Economics, Japan.

## 2-3. Malaysia

### 2-3-1. Energy supply and demand

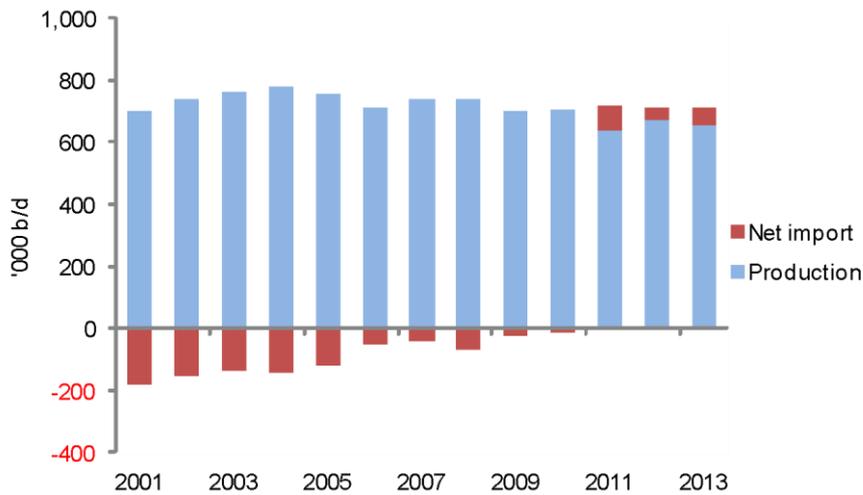
While oil and natural gas are produced domestically and satisfy the bulk of Malaysia's primary energy demands, attention should be paid to the country's increasing coal consumption. Most of the coal used in Malaysia is imported and is mainly consumed for power generation. After reaching 780,000 b/d in 2004, Malaysia's oil production has continuously decreased, making it a net oil importer in 2011.

**Figure 2-3-1. Primary Energy Demand in Malaysia**



Source: International Energy Agency, 'Energy Balance of Non-OECD Countries' (Paris, 2014).

**Figure 2-3-2. Oil Supply–Demand Balance in Malaysia**



Source: British Petroleum, 'Statistical Review of World Energy' (2014).

### 2-3-2. Overview of the oil-stockpiling system

(1) Objective

No information is available as Malaysia has not implemented an oil-stockpiling policy.

(2) Institutional framework

Energy issues are administratively segmented amongst the four ministries as follows. The Economic Planning Unit of the Prime Minister’s Department is in charge of

upstream activities and Petronas. The Ministry of Domestic Trade and Consumer Affairs is responsible for licensing marketing and retail of petroleum products and petrochemical products and for coordinating the policies and regulations related to petroleum products, petrochemical products, and natural gas safety. The Ministry of International Trade and Industry administers licenses for refineries. The Ministry of Energy, Green Technology and Water oversees the power industry as well as the distribution of natural gas because Malaysia relies heavily on natural gas for power generation.

(3) Regulatory overview

Malaysia has no mandatory requirement for government or private oil stockpiling. Oil companies maintain commercial oil storage if they have a corporate strategy to follow. The Malaysian government neither considers it necessary to hold a government oil stockpile nor obligates the private sector to store oil at a certain level because oil-stockpiling development requires a huge initial investment along with maintenance costs.

**Table 2-3-1. Overview of Oil Stockpiles in Malaysia**

| <b>Subjects</b>                     | <b>Oil stockpiling systems</b>          | <b>Measures</b>                                   |
|-------------------------------------|---|---|
| Oil stockpiling body                | Government                              | No requirement                                    |
|                                     | Agency                                  |   |
|                                     | Private                                 | No requirement but oil companies hold oil storage |
| Oil stockpile standards             | International Energy Agency (IEA) rules | Non-IEA member country                            |
| Crude oil and/or Petroleum products | Share of crude oil                      | No obligation                                     |
|                                     | Share of petroleum products             |   |

Source: The Institute of Energy Economics, Japan.

(4) Oil-stockpiling entities and facilities

No information is available.

(5) Mandatory oil stockpile

No information is available.

(6) Emergency response and its regulatory basis

No information is available.

(7) Challenges to oil-stockpiling development<sup>8</sup>

At the time of this study, oil dependency was relatively low in the energy mix and Malaysia did not consider it necessary to hold oil stockpiling. Therefore, no particular issues have been raised about oil stockpiling in this economy.

### 2-3-3.SWOT analysis

Table 2-3-2 shows a SWOT analysis of Malaysia's oil-supply security. Malaysia's self-sufficiency in oil is its major strength while its weakness is its lack of a stockpiling system. The ongoing refining and petrochemical project (the RAPID Project) will strengthen its oil- supply security. The largest threat toward the country at the moment is its declining domestic oil production.

**Table 2-3-2. SWOT Matrix of Malaysia's Oil-Supply Security**

|  |  |
|--|--|
| <b>Strengths</b> <ul style="list-style-type: none"><li>• Domestic hydrocarbon resources</li><li>• Self-sufficiency in oil supply</li></ul> | <b>Weaknesses</b> <ul style="list-style-type: none"><li>• Lack of stockpiling system</li></ul> |
| <b>Opportunities</b> <ul style="list-style-type: none"><li>• Expansion of refining capacity</li></ul>                                      | <b>Threats</b> <ul style="list-style-type: none"><li>• Declining oil production</li></ul>      |

Source: The Institute of Energy Economics, Japan.

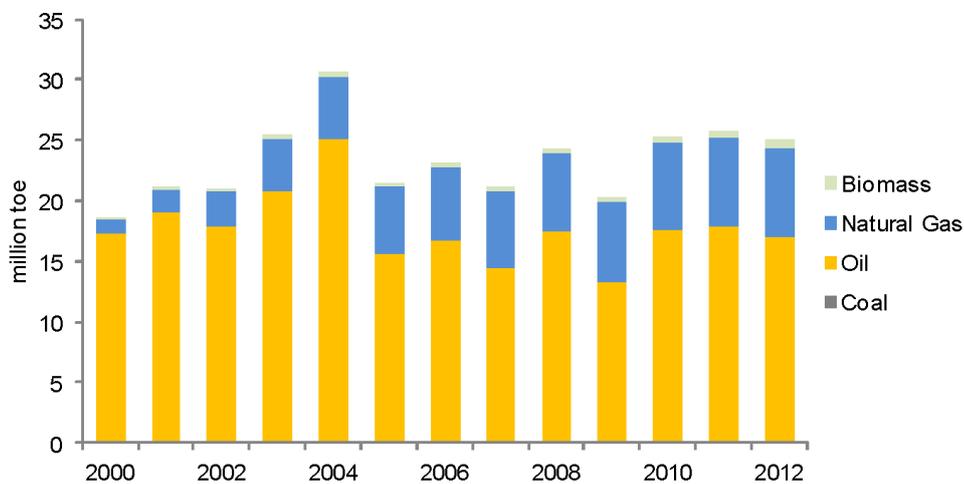
<sup>8</sup> From an interview with experts conducted in February 2014 in Siem Reap, Cambodia.

## 2-4. Singapore

### 2-4-1. Energy supply and demand

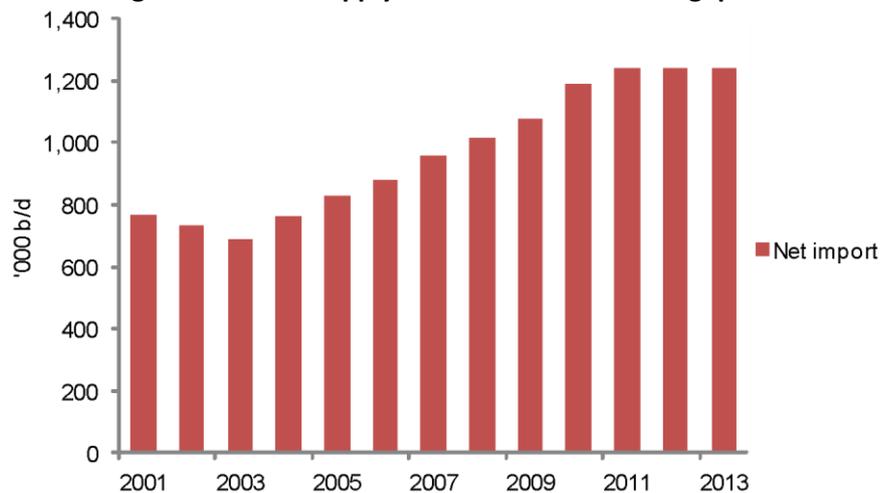
Singapore's primary energy demand is dominated mostly by oil and natural gas, all of which are imported. Singapore is the Asian hub for petroleum product trading. Singapore's total refining capacity is 1.35 million b/d and it has highly developed storage terminals, leading to an oversupply of petroleum products. As for natural gas, Singapore imports natural gas from Indonesia via pipeline. In May 2013, it started obtaining liquefied natural gas (LNG) in order to diversify supply sources.

**Figure 2-4-1. Primary Energy Demand in Singapore**



Source: International Energy Agency, 'Energy Balance of Non-OECD' (Paris, 2014).

**Figure 2-4-2. Oil Supply–Demand Balance in Singapore**



Source: British Petroleum, 'Statistical Review of World Energy' (2014).

## 2-4-2. Overview of the oil-stockpiling system

### (1) Objective

Singapore has no specific objective to develop an oil stockpiling system.

### (2) Institutional framework

Energy policy and planning is implemented by the Ministry of Trade and Industry. Under the ministry, the Energy Market Authority sets up a regulatory framework for electricity and natural gas and monitors the fuel inventory of oil-fired power plants on a monthly basis.

### (3) Regulatory overview

There is no government oil stockpile in Singapore since the obligatory crude-oil stockpile was abolished in 1983 although the Singapore National Oil Company established in 1979 maintained crude-oil stockpiling until then. It is required, however, that power-generating companies hold fuel oil stocks as backup for oil-fired power plants.

**Table 2-4-1. Overview of Oil Stockpiles in Singapore**

| Subjects                            | Oil stockpiling systems                 | Measures  |
|-------------------------------------|---|---|
| Oil stockpiling body                | Government                              | No requirement  |
|                                     | Agency                                  |   |
|                                     | Private                                 | 90 days of fuel oil stocks are required for oil-fired power plants. |
| Oil stockpile standards             | International Energy Agency (IEA) rules | Non-IEA member country  |
| Crude oil and/or Petroleum products | Share of crude oil                      | No obligation   |
|                                     | Share of petroleum products             |   |

Source: The Institute of Energy Economics, Japan.

(4) Oil-stockpiling entities and facilities

There is no oil-stockpile association.

(5) Mandatory Oil Stockpile

Power-generating companies are obligated to hold 90 days of fuel oil stock as backup for oil-fired power plants.

(6) Emergency Response and its Regulatory Basis

The government monitors real-time security developments through entities such as the Risk Assessment Horizon Scanning programming office. An appropriate interagency government committee will be organised to manage the situation depending on the risk level.

(7) Challenges to Oil-Stockpiling Development<sup>9</sup>

At the time of this study, there were no particular measures where the government took the initiative in developing oil stockpiling.

### **2-4-3. SWOT analysis**

Table 2-4-2 shows a SWOT analysis of Singapore's oil-supply security. Singapore's major strengths are its surplus refining capacity and its ample oil inventory. Its major weakness is its high import dependence, which makes unexpected supply disruption a major threat. A recent expansion of oil-storage capacity in Singapore should raise oil inventory and cushion against supply disruption.

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<sup>9</sup> From an interview with experts conducted in February 2014 in Siem Reap, Cambodia.

**Table 2-4-2. SWOT Matrix of Singapore's Oil-Supply Security**

|   |   |
|---|---|
| <p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Open and competitive oil market</li> <li>• Surplus refining capacity</li> <li>• Ample oil inventory</li> </ul> | <p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• High dependence on oil imports</li> </ul> |
| <p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Expansion of storage capacity</li> </ul>   | <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Oil-supply disruption</li> </ul>             |

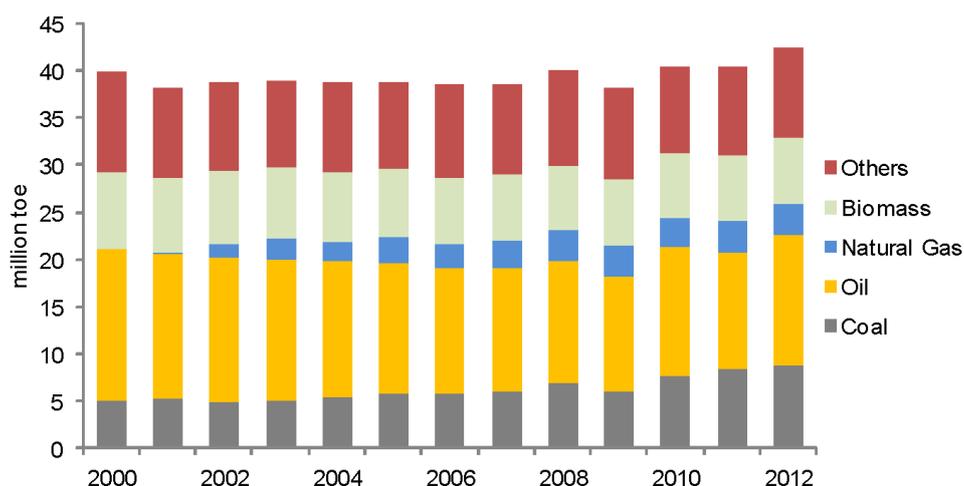
Source: The Institute of Energy Economics, Japan.

## 2-5. The Philippines

### 2-5-1. Energy supply and demand

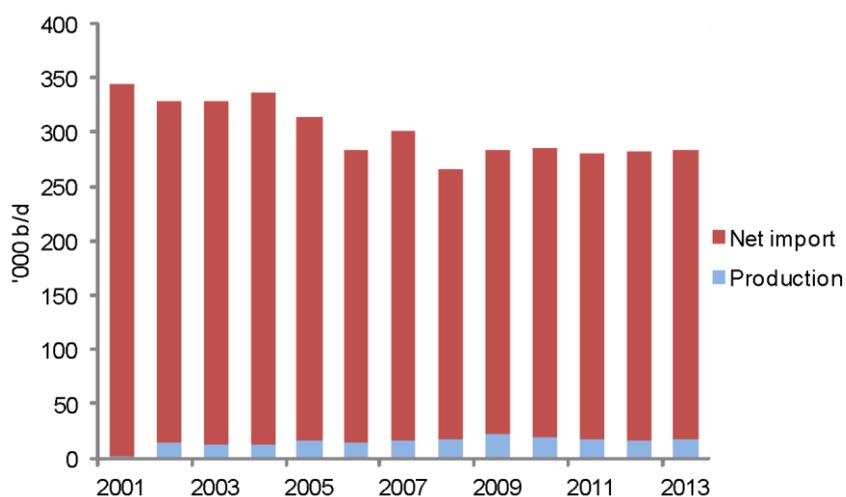
Primary energy demand in the Philippines has not increased as much as in other Asian countries while coal consumption for power generation has increased steadily. The Philippines relies on imported oil to meet almost all of its oil demand although this demand has been stagnant recently.

**Figure 2-5-1. Primary Energy Demand in the Philippines**



Source: International Energy Agency, 'Energy Balance of Non-OECD Countries' (Paris, 2014).

**Figure 2-5-2. Oil Supply–Demand Balance in the Philippines**



Sources: British Petroleum, 'Statistical Review of World Energy' (2014); International Energy Agency, 'Energy Balance of Non-OECD Countries' (Paris, 2014).

## 2-5-2. Overview of the oil-stockpiling system

### (1) Objective

The Philippines aims to prepare an oil stockpile to deal with oil-supply disruptions caused by international events such as terrorism and the Iraq War.

### (2) Institutional Framework

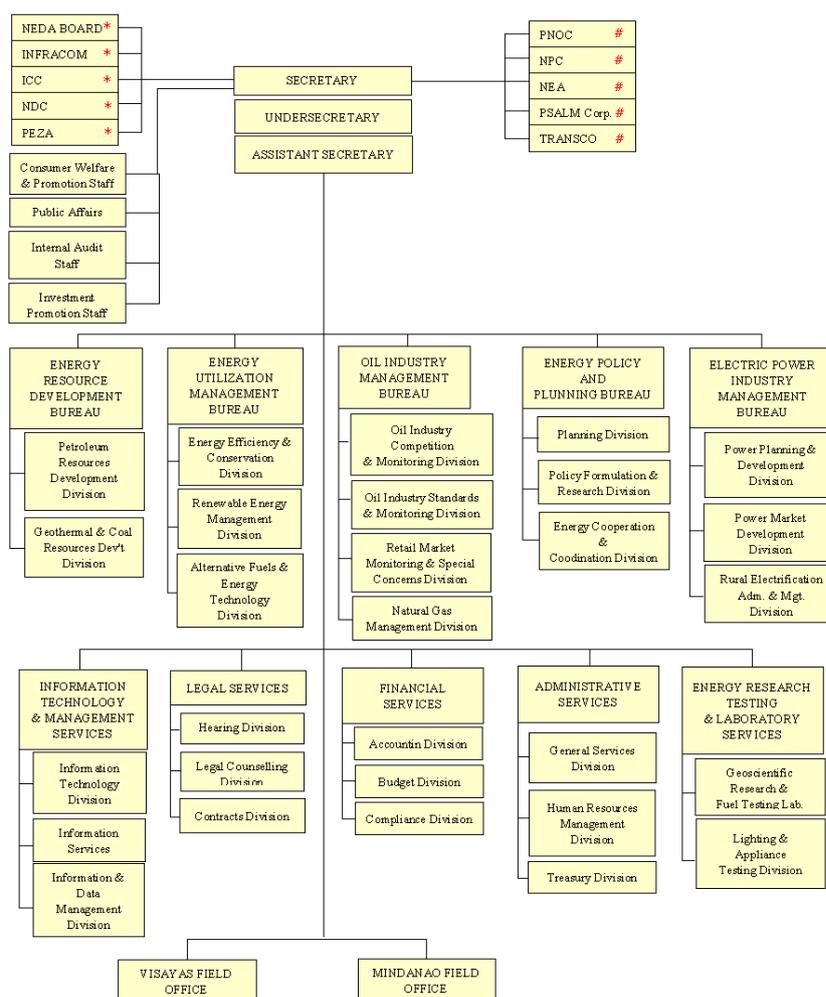
The Oil Industry Administration Bureau under the Department of Energy formulates and implements policies for the downstream oil industry, including oil stockpiling. The Department of Energy is responsible for the energy policy of the state overall. It is mandated to formulate energy policy, to revise or abolish rules and measures, to handle the privatisation of the publicly managed energy business, to develop and implement energy exploration planning, and to promote energy efficiency. The duties of the Department of Energy also include examining the appropriateness of the minimum inventory level based on Presidential Executive Order No. 134 of October 2002 and monitoring the fuel inventory of oil companies.

### (3) Regulatory Overview

The Downstream Oil Industry Deregulation Act of 1996 (Republic Act No. 8180) stipulates that refiners and importers must maintain a minimum inventory equivalent to 10 percent of their respective annual sales volume or 40 days of supply, whichever is lower. However, this requirement was criticised because it served as a barrier to new players wishing to enter the oil market. Remedial legislation (RA No. 8479) enacted in February 1998 specified the abolishment of the oil-stockpiling obligation, resulting in all refiners and importers having nothing but the private oil stockpile necessary to run their business.

Presidential Executive Order No. 134 promulgated in October 2002 required refiners and importers to hold a minimum inventory. This was followed by regulations passed in January 2003 that required 40 days' worth of supply for refiners and 30 days for importers. The Department of Energy then eased the minimum inventory requirement in March 2003. The current requirement is 30 days' worth of in-country stocks of crude/petroleum products for refiners, 15 days of in-country stocks of finished products for importers, 7 days for bunkering companies, and 7 days for distributors of liquefied petroleum gas (LPG).

**Figure 2-5-3. Organisational Chart of Department of Energy, Philippines**



Source: Website of the Philippine Department of Energy.

**Table 2-5-1. Overview of Oil Stockpiles in the Philippines**

| Subjects                | Oil-stockpiling systems                 | Measures                               |
|-------------------------|---|--|
| Oil stockpiling body    | Government                              | No requirement                         |
|                         | Agency                                  |  |
|                         | Private                                 | Minimum inventory of 15 days of supply |
| Oil stockpile standards | International Energy Agency (IEA) rules | Non-IEA member country                 |

Source: The Institute of Energy Economics, Japan.

#### (4) Oil-Stockpiling Entities and Facilities

Private refiners and other oil companies hold oil stockpiles.

#### (5) Mandatory Oil Stockpile

The minimum inventory required by the government is 15 days' worth of supply for refiners, seven days for bunkering companies, and seven days for LPG distributors. They are obligated to store crude oil and petroleum products but there are no specific requirements for each product. While the Department of Energy monitors the inventory level that the domestic refiners (Petron and Shell) are required to report every month, quality control and specification changes in the stocks of the petroleum products are left to the discretion of private companies.

#### (6) Emergency Response and its Regulatory Basis

In accordance with Republic Act No. 7638, the Department of Energy shall control the demand, distribution, and prices of oil only in case of emergencies, such as a presidential decree being proclaimed. The Philippines is a member economy of the ASEAN Petroleum Security Agreement (henceforth, APSA), which was established in 1986 to cope with situations involving oil-supply shortage and oversupply.<sup>10</sup> In the event of an oil-supply shortage, the APSA would be exercised if the oil supply available was less than 80 percent of the domestic requirements of the oil-importing member countries such as the Philippines and Thailand. In that case, the oil-exporting members of the ASEAN--Indonesia, Malaysia, and Brunei Darussalam--would be committed to supply them with oil as priority. The APSA, however, has never been issued before.

### **2-5-3. SWOT analysis**

Table 2-5-2 shows a SWOT of the Philippines's oil-supply security. The major strengths of the country are its open oil market and its market pricing of oil products. This combination will help secure oil supply from abroad through a market mechanism in case of an emergency. The county's high dependence on oil imports is the major weakness in

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<sup>10</sup> Association of Southeast Asian Nations. 'ASEAN Petroleum Security Agreement Manila', 24 June 1986. <http://www.asean.org/communities/asean-economic-community/item/asean-petroleum-security-agreement-manila-24-june-1986> (accessed on 10 November 2014).

its oil- supply security. Lower international crude oil prices since the summer of 2014 provide an opportunity for the country to reduce its oil-import bills but its high import dependence continues to make it vulnerable to unexpected disruptions in oil supply.

**Table 2-5-2. SWOT Matrix of the Philippines’s Oil-Supply Security**

|   |   |
|---|---|
| <p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Open oil market</li> <li>• No subsidies given to oil products</li> </ul> | <p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• High import dependence</li> </ul>   |
| <p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Lower oil prices</li> </ul>  | <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Disruption in oil imports</li> <li>• Large fluctuations in oil prices</li> </ul> |

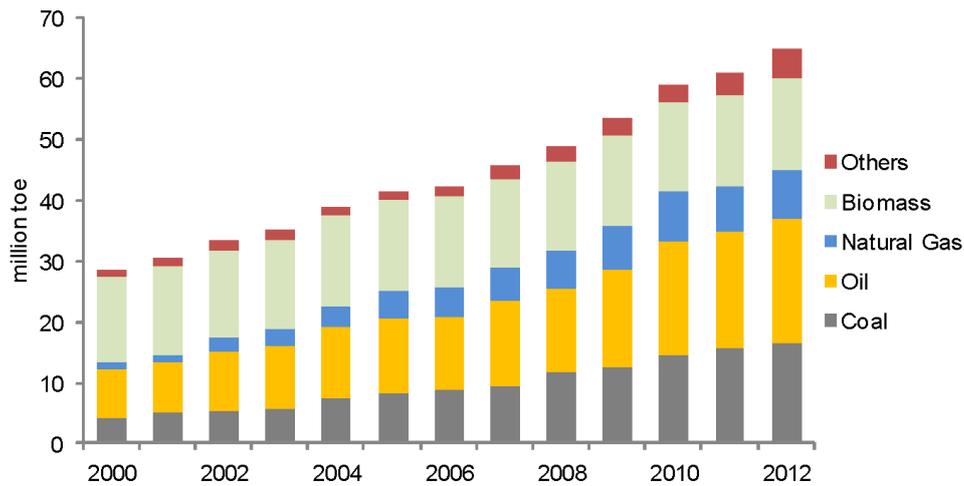
Source: The Institute of Energy Economics, Japan.

## **2-6. Viet Nam**

### **2-6-1. Energy supply and demand**

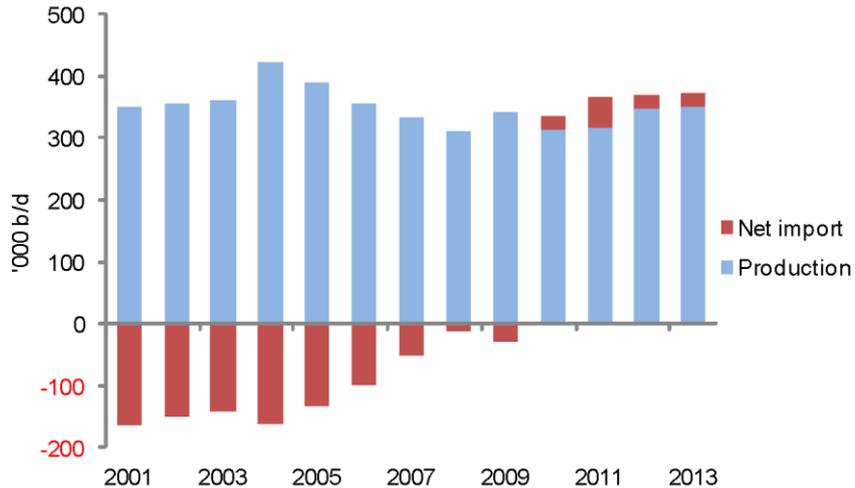
Viet Nam’s primary energy demand for all energy sources demonstrates robust growth. Viet Nam’s oil production is about 300,000 b/d, half of which is exported. Viet Nam imports most of its oil requirements to meet its demand for petroleum products but this demand is expected to decline since the first refinery built in Dung Quat (in the central region of Viet Nam) began operation in 2009. Furthermore, there are plans for some refinery-building projects.

**Figure 2-6-1. Primary Energy Demand in Viet Nam**



Source: International Energy Agency, 'Energy Balance of Non-OECD Countries' (Paris, 2014).

**Figure 2-6-2. Oil Supply–Demand Balance in Viet Nam**



Source: British Petroleum, 'Statistical Review of World Energy' (2014).

## 2-6-2. Overview of the oil-stockpiling system

### (1) Objective

Viet Nam aims to develop its oil-stockpiling system to stabilise its domestic oil-consuming market and the productive capacity of its oil refineries, enhance energy security, and keep up with the development of the domestic oil market as the country anticipates rising demand for domestic oil and dependence on imports of crude oil and petroleum products. Viet Nam also intends to minimise any negative impacts on its economy if the global supply of crude oil suddenly declines. Likewise, it also seeks to

improve economic efficiency to protect against sudden increases in the price of crude oil.

## (2) Institutional Framework

The Ministry of Industry and Trade is responsible for the management of government oil stockpiling. Other concerned ministries include the National Stockpiling Department under the Ministry of Finance, which consists of central and regional offices and the National Stockpiling Units.

## (3) Regulatory Overview

The Law on the National Reserve (No. 22/2012/QH13) prescribes the formation, management, administration, and use of the national reserves of strategic and essential commodities, including oil. Article 3, titled ‘Objectives of the National Reserve,’ stipulates that ‘the State forms and uses the national reserve to proactively meet unexpected and urgent requirements in the prevention, combat, and remedy of consequences of natural disasters, catastrophes, fires and epidemics and to serve national defence and security.’ The national reserves are to be used to stabilise the economy and to cope with emergency situations.

**Table 2-6-1. Overview of the Oil Stockpiles in Viet Nam**

| <b>Subjects</b>                            | <b>Oil-stockpiling systems</b>          | <b>Measures</b>                 |
|--|---|---------------------------------|
| <b>Oil stockpiling body</b>                | Government                              | No requirement                  |
|  | Agency                                  |                                 |
|  | Private                                 | Importers of petroleum products |
| <b>Oil stockpile standards</b>             | International Energy Agency (IEA) rules | Non-IEA member country          |
| <b>Crude oil and/or Petroleum products</b> | Share of crude oil                      | Not mandatory                   |
|  | Share of petroleum products             | 100%                            |

Source: The Institute of Energy Economics, Japan.

In July 2009, the prime minister approved the 'Development Planning of Reserve System of Crude Oil and Petroleum Products of Vietnam to the Year 2015, A Vision Toward 2025 (Decision No. 1139/QD-TTg).' According to this decision, there are plans for the commercial petroleum reserve to be equivalent to about 66 days of net import in 2015 and the national reserve of crude oil to reach 2.2 million tons by 2025.

(4) Oil-Stockpiling Entities and Facilities

At the time of this study, only oil companies maintain oil stockpiling in their own facilities. There are plans for government crude oil terminals to be built near or adjacent to domestic petrochemical refineries.

(5) Mandatory Oil Stockpile

Oil companies are obliged to maintain a volume of reserve amounting to at least 30 days' worth of net imports.

**Table 2-6-2. Viet Nam’s Road Map and Scale of Crude Oil and Oil-Product Stockpiling System**

| Type of stocks        |           | Unit                | 2015 | 2020 | 2025 |
|-----------------------|-----------|---------------------|------|------|------|
| Commercial stock      |           | Million tonnes      | 1.6  | 2.6  | 3.6  |
|                       |           | Days of consumption | 30   | 30   | 30   |
| Processing stock      | Crude oil | Million tonnes      | 0.2  | 1.5  | 1.5  |
|                       |           | Days of consumption | 10.2 | 12.2 | 9.2  |
|                       | Products  | Million tonnes      | 0.6  | 0.7  | 0.7  |
|                       |           | Days of consumption | 10.3 | 8.1  | 6.2  |
| National stock        | Crude oil | Million tons        | -    | 0.7  | 2.2  |
|                       |           | Days of consumption | -    | 5.8  | 12.4 |
|                       | Products  | Million tons        | 0.4  | 0.4  | 1.3  |
|                       |           | Days of consumption | 7.1  | 5.0  | 10.4 |
| Total oil stockpiling |           | Million tons        | 2.8  | 5.9  | 9.3  |
|                       |           | Days of consumption | 58   | 61   | 68   |
|                       |           | Days of net import  | 126  | 90   | 90   |

Source: Viet Nam’s Ministry of Industry and Trade.

#### (6) Emergency Response and its Regulatory Basis

The build-up and release of national reserve commodities is regulated in Section 1 of Chapter IV under the Law on the National Reserves. In principle, build-up and release of national reserve commodities must conform to plan and competence (Article 33). Article 35 specifies that the prime minister will decide on the build-up and release of national reserve commodities in the following circumstances: (i) an occurrence of natural disasters, catastrophes, epidemics or fires, and preventing and overcoming the

consequences of such unexpected situations; (ii) when market prices soar or plunge significantly; or (iii) to meet defence or security requirements. Not only the prime minister but also the ministers for finance, national defence, public security, and agriculture and rural development are authorised to decide on the build-up and release of national reserve commodities under Article 36 with provisions for (i) temporarily delivering national reserve supplies and equipment to accomplish tasks in a timely manner and recovering such commodities for maintenance, rebuild-up, and preservation immediately after the tasks are completed and (ii) building or releasing a free supply of national reserve commodities with a value that is within the budget expenditure.

#### (7) Challenges to Oil-Stockpiling Development<sup>11</sup>

In addition to the existing commercial tanks of petroleum products, Viet Nam is in the process of building a terminal for the government stockpile of crude oil near or adjacent to the refineries in four regions where a refinery is already in operation or will be built in the future; namely, Dung Quat, Nghi Son, Long Son, and Van Phong. The Government of Viet Nam is indifferent to having an oil stockpile abroad, such as oil stock tickets or joint oil storage, but it is rather interested in attracting investments and receiving technical assistance from abroad. Viet Nam is focused on the development of oil stock terminals based on the National Stockpile Master Plan. It also appears that Viet Nam would like Japan to share its know-how and information on the maintenance costs for the different types of bases and the management of oil-stockpiling bases.

The government is deliberating on which type of facility would be suitable for the national stockpile of crude oil. Since on-ground tanks have been the most commonly used thus far to store petroleum products in commercial oil stocks, the next task for the government is to decide what type of terminals should be built for Viet Nam. Korea National Oil Corporation (KNOC) is involved in the underground Dung Quat oil-storage project in cooperation with PetroVietnam Oil Stockpile Company Ltd.

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<sup>11</sup> From an interview with experts conducted in February 2014 in Siem Reap, Cambodia.

### 2-6-3. SWOT analysis

Table 2-6-3 shows a SWOT analysis of Viet Nam’s oil-supply security. The major strengths of the country are, of course, its hydrocarbon resources. The country’s well-established oil stockpiling roadmap also provides a good guide for its stockpiling policy. Its insufficient refining capacity is notable as a weakness but the country is planning to significantly expand its refining capacity. Viet Nam’s very high oil intensity is another weakness. Lower international crude oil prices since the summer of 2014 provide an opportunity for the country to reduce its oil-import bills but its high import dependence continues to make it vulnerable to any unexpected disruption in the oil supply.

**Table 2-6-3. SWOT Matrix of Viet Nam’s Oil Supply Security**

|   |  |
|---|--|
| <p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Domestic hydrocarbon resources</li> <li>• Well-established oil-stockpiling road map</li> </ul> | <p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Insufficient refining capacity and tank storage</li> <li>• Lack of stockpiling base</li> <li>• High oil intensity</li> </ul> |
| <p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Refining construction projects</li> <li>• Lower oil prices</li> </ul>                      | <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Disruption in oil import</li> <li>• Large fluctuations in oil prices</li> </ul>   |

Source: The Institute of Energy Economics, Japan.

## 2-7. Brunei Darussalam

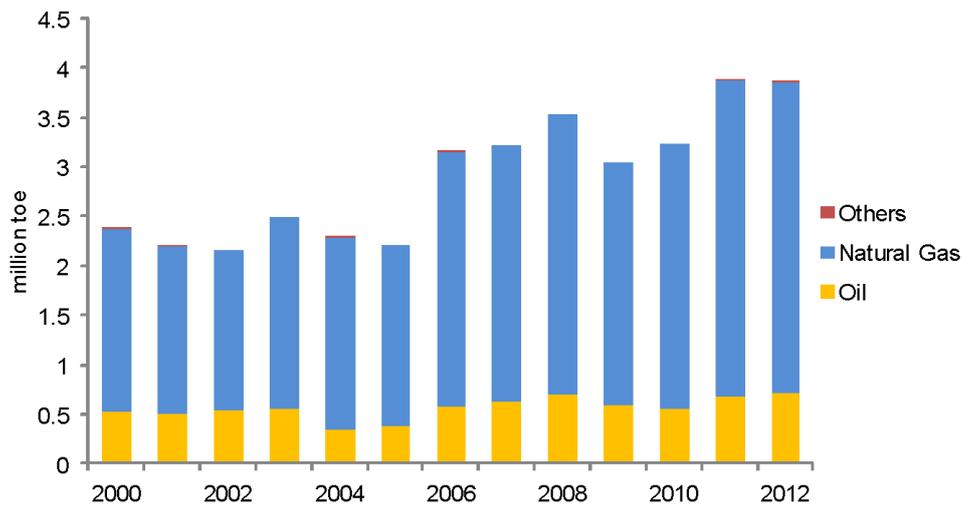
### 2-7-1. Energy supply and demand

The primary energy demand of Brunei Darussalam is dominated by natural gas and oil due to the fact that the economy is endowed with hydrocarbon resources. Natural gas accounts for 99 percent of the electricity generation mix in Brunei.

Brunei is a net exporter of oil and natural gas and the fourth-largest exporter of LNG in the Asia–Pacific region. Although the economy exports approximately 90 percent of its crude oil, petroleum products have to be imported due to the limited capacity of the country’s sole refinery, Seria, which currently stands at 8,600 b/d. Excess demand for

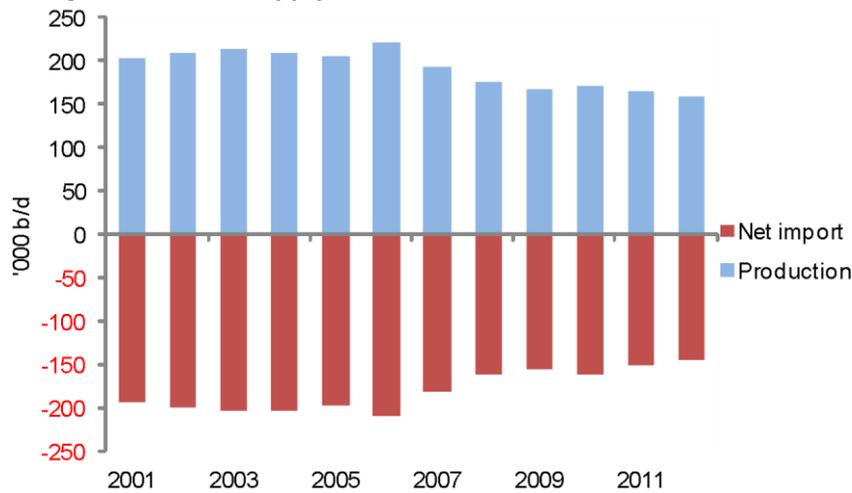
petroleum products is likely to continue in the medium term.<sup>12</sup> In the future, however, this situation may change as the Chinese petrochemical firm Zhejiang Hengyi Group Co., Ltd is undertaking a project to construct a refinery and aromatics cracker plant with a capacity of 160,000 b/d on Pulau Muara Besar Island. This plant is expected to start operation in late 2017.

**Figure 2-7-1. Primary Energy Demand in Brunei Darussalam**



Source: International Energy Agency, 'Energy Balance of Non-OECD Countries' (Paris, 2014).

**Figure 2-7-2. Oil Supply–Demand Balance in Brunei Darussalam**



Sources: British Petroleum, 'Statistical Review of World Energy' (2014) and International Energy Agency, 'Energy Balance of Non-OECD Countries' (Paris, 2014).

<sup>12</sup> 'Country Report Brunei Darussalam: Petroleum Products Stockpiling' was presented at the 2<sup>nd</sup> Workshop of the ASEAN+3 Oil Stockpiling Road Map in Siem Reap, Cambodia, on 25 February 2014.

## 2-7-2. Overview of the Oil-Stockpiling System

### (1) Objective

Brunei has no specific objective to develop an oil-stockpiling system since it is a net oil exporter.

### (2) Institutional Framework

The energy department under the Prime Minister's Office is responsible for formulating energy policies and presiding over energy matters.

### (3) Regulatory Overview

Brunei's Energy Contingency Plan for Refined Petroleum Product Imports sets the obligatory level of stockholding at 31 days for the industry.<sup>13</sup> The emergency stock is called the Countrywide Stock.

**Table 2-7-1. Overview of the Oil Stockpiles in Brunei Darussalam**

| <b>Subjects</b>                     | <b>Oil-stockpiling systems</b>          | <b>Measures</b>  |
|-------------------------------------|---|--|
| Oil stockpiling body                | Government                              | No requirement   |
|                                     | Agency                                  |  |
|                                     | Private                                 | Oil companies are requested to maintain a stockholding level of 31 days. |
| Oil stockpile standards             | International Energy Agency (IEA) rules | Non-IEA member country   |
| Crude oil and/or petroleum products | Share of crude oil                      | No obligation  |
|                                     | Share of petroleum products             |  |

Source: The Institute of Energy Economics, Japan.

<sup>13</sup> International Energy Agency (2014), 'Energy Supply Security 2014', Paris: IEA.

(4) Oil-Stockpiling Entities and Facilities

There is no oil-stockpile association.

(5) Mandatory Oil Stockpile

Oil companies are directed to hold petroleum products for domestic requirement on an operational basis.<sup>14</sup>

(6) Emergency Response and its Regulatory Basis

In the event of emergency, the government has a preferential right to purchase crude oil and petroleum products produced domestically.

(7) Challenges to Oil-Stockpiling Development

It is necessary for Brunei to develop legislation that obligates oil companies to stockpile for a certain period of time. The economy currently has the directive to make requests to the industry about oil stockpiling but the legal terms need to be upgraded to make it more persuasive.

### **2-7-3. SWOT analysis**

Table 2-7-2 shows a SWOT analysis of Brunei's oil-supply security. A major strength is, of course, its domestic hydrocarbon resources and the country's self-sufficiency in its oil supply. A weakness is the lack of refining capacity and of a stockpiling system. The recent expansion of refining and tank capacity is undoubtedly an opportunity for Brunei while the unexpected disruption of product imports will remain a major threat.

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<sup>14</sup> 'APEC EWG 40 Brunei Darussalam - Short-Term Energy Security Initiative Measures' is available at [http://apecenergy.tier.org.tw/database/db/ewg40/02/PU\\_short\\_term\\_initve.pdf](http://apecenergy.tier.org.tw/database/db/ewg40/02/PU_short_term_initve.pdf) (accessed on 1 December 2014).

**Table 2-7-2. SWOT Matrix of Brunei Darussalam’s Oil-Supply Security**

|  |  |
|--|--|
| <p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Domestic oil and gas production</li> <li>• Smaller population and demand</li> <li>• Self-sufficiency in its oil supply</li> </ul> | <p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Lack of refinery</li> <li>• Lack of product stockpiling system</li> </ul>      |
| <p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Expansion of refining capacity and tank-storage capacity in neighbouring ASEAN countries</li> </ul>                           | <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Disruption in product imports</li> <li>• Large fluctuations oil prices</li> </ul> |

Source: The Institute of Energy Economics, Japan.

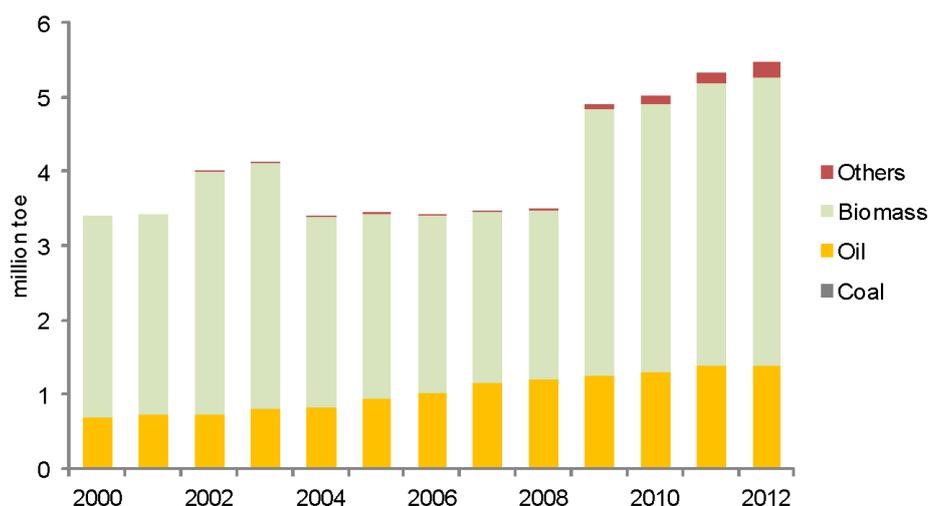
## **2-8. Cambodia**

### **2-8-1. Energy supply and demand**

In Cambodia, biomass accounts for approximately 71 percent of the primary energy demand followed by oil; that is, petroleum products. The primary energy demand for petroleum products almost doubled from 694 kilotonnes of oil equivalent (ktoe) in 2000 to 1,374 ktoe in 2012. ‘Other’ indicates hydro and electricity imports from Thailand and Viet Nam.

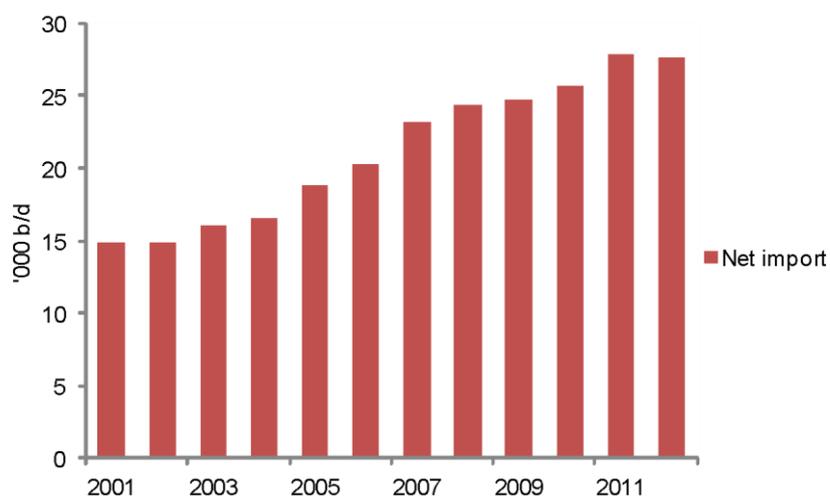
As shown in Figure 2-8-1, Cambodia is totally dependent on imports of petroleum products, which comes primarily from Singapore, Thailand, and Viet Nam. The major imported petroleum products are diesel and gasoline. Petroleum products are important in power generation in Cambodia, accounting for 60 percent of the energy-generation mix in 2012.

**Figure 2-8-1. Primary Energy Demand in Cambodia**



Source: International Energy Agency, 'Energy Balance of Non-OECD Countries' (2014).

**Figure 2-8-2. Oil Supply–Demand Balance in Cambodia**



Source: International Energy Agency, 'Energy Balance of Non-OECD Countries' (2014).

## 2-8-2. Overview of the oil-stockpiling system

### (1) Objective

Considering the fact that Cambodia relies on imports to meet all of its oil-product demand as well as for electricity, the country has only recently recognised the importance of energy security.

(2) Institutional Framework

The Ministry of Mines and Energy is responsible for developing, implementing, and managing government policy and strategy with regard to three sectors: mineral resources, energy, and petroleum. The General Department of Petroleum is responsible for managing the development of the Cambodian petroleum industry, both upstream and downstream.

(3) Regulatory Overview

Cambodia has no regulatory framework that requires oil stockpiling.

**Table 2-8-1. Overview of Oil Stockpiles in Cambodia**

| <b>Subjects</b>                            | <b>Oil-stockpiling systems</b>          | <b>Measures</b>  |
|--|---|--|
| <b>Oil stockpiling body</b>                | Government                              | No requirement   |
|  | Agency                                  |  |
|  | Private                                 | Oil companies are requested to have a stockholding level equivalent to at least 30 days of domestic oil consumption. |
| <b>Oil stockpile standards</b>             | International Energy Agency (IEA) rules | Non-IEA member country   |
| <b>Crude oil and/or Petroleum products</b> | Share of crude oil                      |  |
|  | Share of petroleum products             | 100%   |

Source: The Institute of Energy Economics, Japan.

(4) Oil-Stockpiling Entities and Facilities

No information is available.

(5) Mandatory Oil Stockpile

In Cambodia, the oil industry is obligated to hold oil stockpiles equivalent to at least 30 days of domestic oil consumption.

(6) Emergency Response and its Regulatory Basis

No information is available.

(7) Challenges to Oil-Stockpiling Development

The legal environment in Cambodia is not yet well developed. It is necessary to establish a comprehensive legal framework to regulate oil-industry activities in Cambodia. The Petroleum Regulations of 1991 have been used so far to attract investments in oil exploration and development. In addition, a draft of a petroleum law expected to provide clear investment conditions in accordance with international standards is expected to be finalised by the end of 2015. Still, Cambodia will need a rationale to help develop the oil- stockpiling system.

### **2-8-3. SWOT analysis**

Table 2-8-2 shows a SWOT analysis of Cambodia's oil-supply security. A major strength of the country is its open market policy in the oil market. It is expected that its market mechanism and the presence of various players, including foreign oil companies, will function well in the event of an emergency. Its largest weaknesses are its lack of domestic production and its high dependence on oil product imports. This makes an unexpected disruption of product imports the major threat to oil-supply security. Recent investments from China in the refining sector as well as the international cooperation with the Japan Oil, Gas and Metals National Corporation are great opportunities for the country to enhance its oil-supply security.

**Table 2-8-2. SWOT Matrix of Cambodia's Oil-Supply Security**

|   |   |
|---|---|
| <p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Open and competitive market</li> <li>• No subsidies</li> </ul>   | <p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Lack of refining capacity</li> <li>• Lack of stockpiling system</li> <li>• No domestic oil production and high dependence on imports</li> </ul> |
| <p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Foreign investments in refinery</li> <li>• Planning and technical cooperation with the Japan Oil, Gas and Metals National Corporation</li> </ul> | <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Disruption of product imports</li> <li>• Large fluctuations in oil prices</li> </ul>   |

Source: The Institute of Energy Economics, Japan.

## **2-9. Lao People's Democratic Republic**

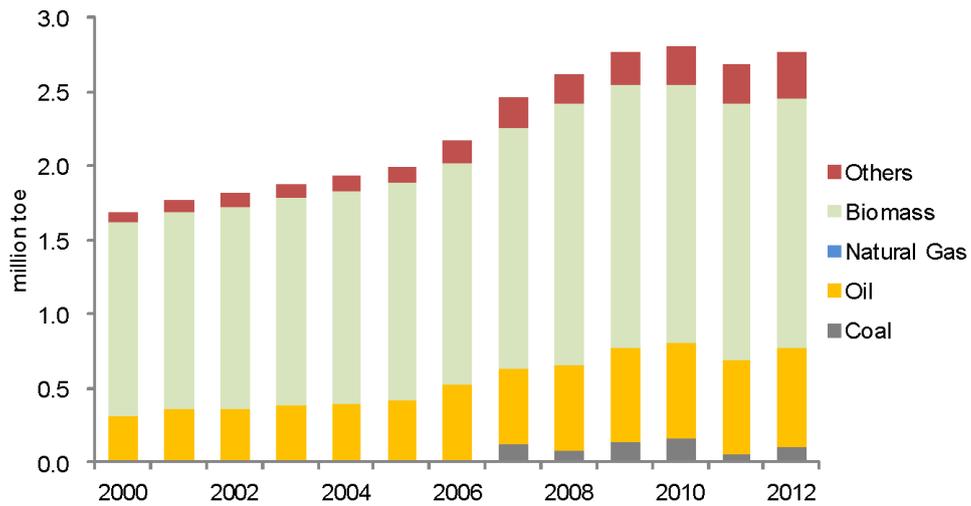
### **2-9-1. Energy supply and demand**

In the Lao PDR, biomass (e.g. firewood, charcoal) has been dominant in the primary energy mix. 'Other' includes hydro and electricity exports to neighbouring countries.

Lao PDR is not engaged in the exploration or production of hydrocarbons and has no refinery. Therefore, it imports all its petroleum products from Thailand and Viet Nam. As of September 2014, diesel accounted for 60 percent of the imported products followed by gasoline at 33 percent.<sup>15</sup>

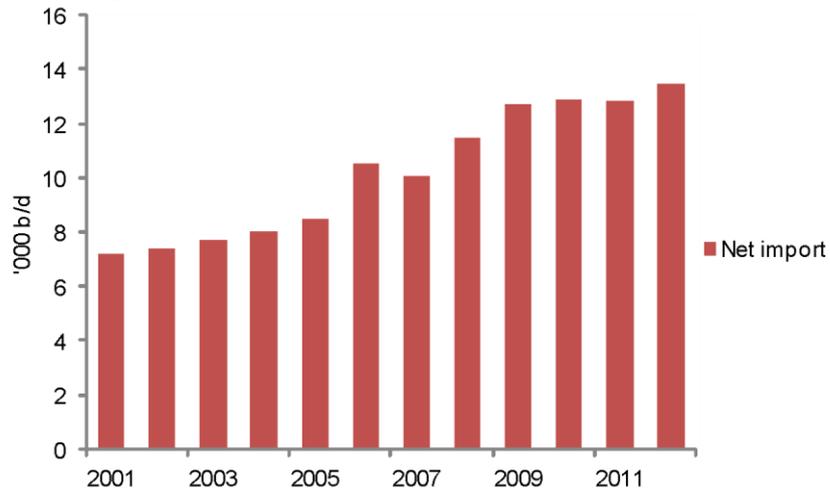
<sup>15</sup> 'The Latest Development on Oil and Gas in Lao People's Democratic Republic' was presented at the 4th ASEAN+3 Oil Market and Natural Gas Forum, 5 February 2015, Bangkok, Thailand.

**Figure 2-9-1. Primary Energy Demand in Lao PDR**



Source: Lao Ministry of Mines and Energy.

**Figure 2-9-2. Oil Supply–Demand Balance in Lao PDR**



Source: Lao Ministry of Mines and Energy.

## 2-9-2. Overview of the oil-stockpiling system

### (1) Objective

Lao PDR has no specific objective to develop an oil-stockpiling system.

### (2) Institutional Framework

The Ministry of Energy and Mines under the Prime Minister's Office is the central agency in charge of the energy sector.

### (3) Regulatory Overview

Clause 5 under Prime Minister's Decree No. 76/PM dated 12 June 2014 specifies that by the year 2020, government petroleum reserves must be available in the quantity of 60 million litres, which is equivalent to 30 days of consumption.<sup>16</sup>

**Table 2-9-1. Overview of the Oil Stockpile in Lao PDR**

| <b>Subjects</b>                     | <b>Oil-stockpiling systems</b>          | <b>Measures</b>   |
|-------------------------------------|---|---|
| Oil stockpiling body                | Government                              | No requirement  |
|                                     | Agency                                  |   |
|                                     | Private                                 | The oil industry is requested to maintain at least 15 days' worth of oil imports. |
| Oil stockpile standards             | International Energy Agency (IEA) rules | Non-IEA member country  |
| Crude oil and/or Petroleum products | Share of crude oil                      |   |
|                                     | Share of petroleum products             | 100%  |

Source: The Institute of Energy Economics, Japan.

### (4) Oil-Stockpiling Entities and Facilities

No information is available.

### (5) Mandatory Oil Stockpile

The oil industry is obligated to hold at least 15 days' worth of oil imports. As the aforementioned regulation states, the government aims to establish public petroleum reserves of 60 million litres, which is equivalent to 30 days of consumption.

### (6) Emergency Response and its Regulatory Basis

No information is available.

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<sup>16</sup> Ibid.

## (7) Challenges to Oil-Stockpiling Development

While Lao PDR seems to have an interest in establishing government oil stockpiling, there may be some work to do for that purpose. For instance, it is necessary to clarify which entity would be responsible for the oil-stockpiling development project as doing so would help coordinate the related parties and move things forward. Also, more detailed regulations or procedures may be needed to define how an oil stockpile would be developed and used. Last but not least, it is critical to secure the financial resources to build an oil-stockpiling base. These costs vary depending on what kind of oil-stockpiling base the country desires. Being a landlocked country, Lao PDR faces the possibility of oil-supply disruptions if a transport route is blocked. Therefore, it would be beneficial for it to expand its oil-stockpiling capacity to prepare for an emergency event.

### **2-9-3. SWOT analysis**

Table 2-9-2 shows a SWOT analysis of Lao PDR's oil-supply security. A major strength of the country is that its oil intensity is the lowest amongst ASEAN economies, making its economy more resilient to oil-supply disruption. Its weaknesses are almost the same as other ASEAN countries. Its geological condition of having no naval transportation routes may limit options to secure the oil supply in the event of an emergency. Because neighbouring countries such as Viet Nam and Cambodia are currently working to expand their oil-supply infrastructure, such capacity expansion will indirectly benefit Lao PDR's oil-supply security, too. A major threat toward the country is the unexpected disruption of product imports.

**Table 2-9-2. SWOT Matrix of Lao PDR's Oil Supply Security**

|   |  |
|---|--|
| <p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Smaller market size</li> <li>• Low oil intensity</li> </ul>                              | <p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Lack of refining capacity</li> <li>• Lack of stockpiling system</li> <li>• Lack of naval transportation means</li> <li>• High dependence on oil-product imports</li> </ul> |
| <p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Expansion of refining capacity and tank storage in neighbouring countries</li> </ul> | <p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Disruption in product imports</li> <li>• Large fluctuations in oil prices</li> </ul>  |

Source: The Institute of Energy Economics, Japan.

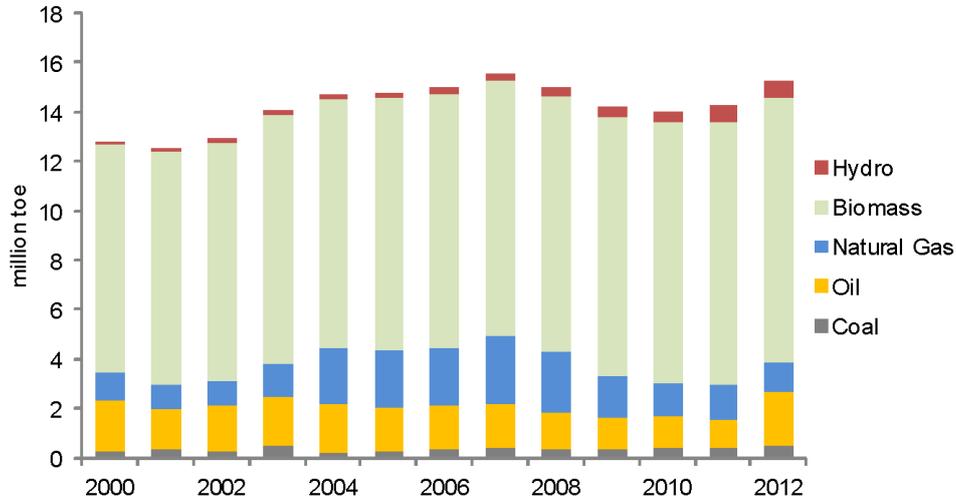
## **2-10. Myanmar**

### **2-10-1. Energy supply and demand**

Myanmar is heavily dependent on biomass such as fuel wood, which accounted for 70 percent of the primary energy demand in 2012. Hydro is the major source for power generation and accounted for 72 percent of electricity output in 2012.

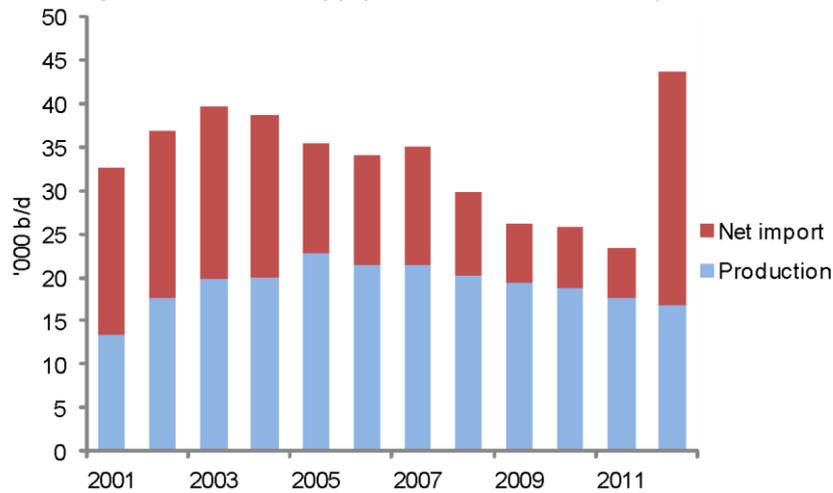
Petroleum products are imported to make up for declining oil production as well as limited refinery capacities due to aging. Myanmar has attempted to replace petroleum products with natural gas to suppress oil demand in the industry and transport sectors. In 2012, however, oil demand increased significantly, driven by robust economic growth.

**Figure 2-10-1. Primary Energy Demand in Myanmar**



Source: International Energy Agency, 'Energy Balance of Non-OECD Countries', (Paris, 2014).

**Figure 2-10-2. Oil Supply-Demand Balance in Myanmar**



Source: International Energy Agency, 'Energy Balance of Non-OECD Countries', (Paris, 2014).

## 2-10-2. Overview of the oil-stockpiling system<sup>17</sup>

### (1) Objective

Myanmar's oil-stockpiling development plan will be implemented and progressed to achieve the target of the ASEAN. The plan may need to be revised in accordance with the country's economic development and financial situations.

<sup>17</sup> Interview with the Energy Planning Department of the Ministry of Energy conducted at Nay Pyi Taw, Myanmar, on 9 December 2014.

## (2) Institutional Framework

The National Energy Management Committee (NEMC) formed in January 2013 to coordinate amongst the ministries related to energy is supposed to take over the role of the energy planning department within the Ministry of Energy..

## (3) Regulatory Overview

Necessary laws, rules, regulations, and procedures regarding oil stockpiling are expected to be approved in 2015. In addition, the NEMC is working on a draft of a National Energy Security Strategy that will cover oil stockpiling. Specifically, the strategy is anticipated to include plans for when emergency stocks are added and for any changes to the stockholding regime.

**Table 2-10-1. Overview of the Oil Stockpiles in Myanmar**

| <b>Subjects</b>                            | <b>Oil-stockpiling systems</b>          | <b>Measures</b>   |
|--|---|---|
| <b>Oil stockpiling body</b>                | Government                              | The MOE/NEMC is required to hold 2.7 million bbl of crude oil.                                      |
|  | Agency                                  | No requirement  |
|  | Private                                 | Commercial stocks   |
| <b>Oil stockpile standards</b>             | International Energy Agency (IEA) rules | Non-IEA member country  |
| <b>Crude oil and/or petroleum products</b> | Share of crude oil                      | The government will hold mainly crude oil whereas the private sector will stock petroleum products. |
|  | Share of petroleum products             |   |

Source: The Institute of Energy Economics, Japan.

## (4) Oil-Stockpiling Entities and Facilities

The Ministry of Energy (or the NEMC in the future) is responsible for oil stockpiling and is required to hold 2.7 million bbl of crude oil. The government holds oil stocks in a storage tank which the state-owned oil company uses as inventory but there is no public stock purely for emergency purposes. Other oil stocks are mostly commercial stocks needed for regular operation.

There is a plan to establish a joint venture between the country's refinery sector and foreign investors. It is believed that if this joint venture is created and successfully

managed, it would enhance the storage capacity of crude oil and petroleum products.

#### (5) Mandatory Oil Stockpile

An oil-stockpiling development road map is laid out in the draft of the Energy Security Plan. According to the plan, the oil-stockpiling capacity target is to achieve 30 days reserve by 2020, 45 days by 2030, and 90 days by 2050. It is still not clear whether this oil-stockpiling target road map would be carried out by the government alone or with the cooperation of private companies. Although private companies have storage-capacity expansion targets for 2025, it does not necessarily mean that they are mandated by the government. It could mean that the private sector would need the increased storage for commercial purposes.

**Table 2-10-2. Oil-Stockpiling Target Road Map**

| Type of stock                     |           | Stock quantity      | Target |      |      |      |      |
|-----------------------------------|-----------|---------------------|--------|------|------|------|------|
|                                   |           |                     | 2013   | 2014 | 2015 | 2020 | 2025 |
| Commercial stock                  |           | Million bbl         | 0.14   | 0.24 | 0.28 | 0.41 | 0.61 |
|                                   |           | Days of consumption | 3      | 4    | 6    | 8    | 12   |
| Government oil stockpiling system | Crude oil | Million bbl         | 0.75   | 0.80 | 0.80 | 0.75 | 0.65 |
|                                   |           | Days of consumption | 10     | 12   | 12   | 10   | 9    |
|                                   | Products  | Million bbl         | 0.52   | 1.37 | 1.40 | 1.50 | 1.68 |
|                                   |           | Days of consumption | 11     | 23   | 28   | 30   | 33   |
| Total oil stockpiling             |           | Million bbl         | 1.41   | 2.41 | 2.48 | 2.66 | 2.94 |
|                                   |           | Days of consumption | 24     | 39   | 46   | 48   | 54   |
|                                   |           | Days of net import  | 11     | 21   | 26   | 28   | 32   |

Source: Interview with the Energy Planning Department of the Ministry of Energy conducted at Nay Pyi Taw, Myanmar, on 9 December 2014.

#### (6) Emergency Response and its Regulatory Basis

In terms of measures to deal with oil-supply disruptions, the Myanmar government considers 14 days of emergency oil stockpiling to be necessary. If the oil stock is not enough, Myanmar would rely on imported petroleum products.

## (7) Challenges to Oil-Stockpiling Development

Myanmar needs a data management system for oil-stockpiling development. Data management is essential to make the system work properly. If a data management system is efficiently applied, the performance of the oil-stockpiling system would improve.

### 2-10-3. SWOT analysis

Table 2-10-3 shows a SWOT analysis of Myanmar's oil-supply security. A major strength of the country is its low dependence on oil in its energy mix, which is the lowest amongst the ASEAN countries. Its weaknesses are its insufficient refining capacity and its lack of a stockpiling system like many other ASEAN countries. Ongoing projects to introduce foreign investments into the refining and marketing sectors will enhance oil-supply security. A major threat for the country is any unexpected disruption of oil-product imports.

**Table 2-10-3. SWOT Matrix of Myanmar's Oil Supply Security**

|   |   |
|---|---|
| <b>Strengths</b> <ul style="list-style-type: none"><li>• Lower oil dependence</li></ul>   | <b>Weaknesses</b> <ul style="list-style-type: none"><li>• Insufficient refining capacity</li><li>• Lack of stockpiling system</li></ul>   |
| <b>Opportunities</b> <ul style="list-style-type: none"><li>• Ongoing project to form joint ventures in the refining and marketing sectors</li></ul> | <b>Threats</b> <ul style="list-style-type: none"><li>• Disruption in product imports</li><li>• Large fluctuations in oil prices</li></ul> |

Source: The Institute of Energy Economics, Japan.



