

Chapter 2

Oil Strategic Pricing in Myanmar

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Chapter 2

Oil Strategic Pricing in Myanmar

1. Current Situation of Oil Market in Myanmar

1.1. Oil Supply and Demand

Table 2.1 shows supply and demand of Myanmar petroleum products in 2019, with total consumption of petroleum products in 2019 is 5.937 Mtoe, and mostly covered by product import.

Of the 5.860 Mtoe imported, diesel oil accounted for 3.887 Mtoe (66.3%) and gasoline for 1.781 Mtoe (30.4%), and these two products accounted for 97% of the total.

Table 2.1. Oil Supply and Demand in 2019
(Unit: 1,000 tonnes)

	Gasoline	Jet fuel oil	Diesel oil	Fuel oil	Total
Import	1,781	192	3,887	0	5,860
Production	50	11	95	20	176
Export (banker)	0	69	1	0	70
Statistical difference	3	0	-32	0	-29
Consumption	1,834	134	3,949	20	5,937

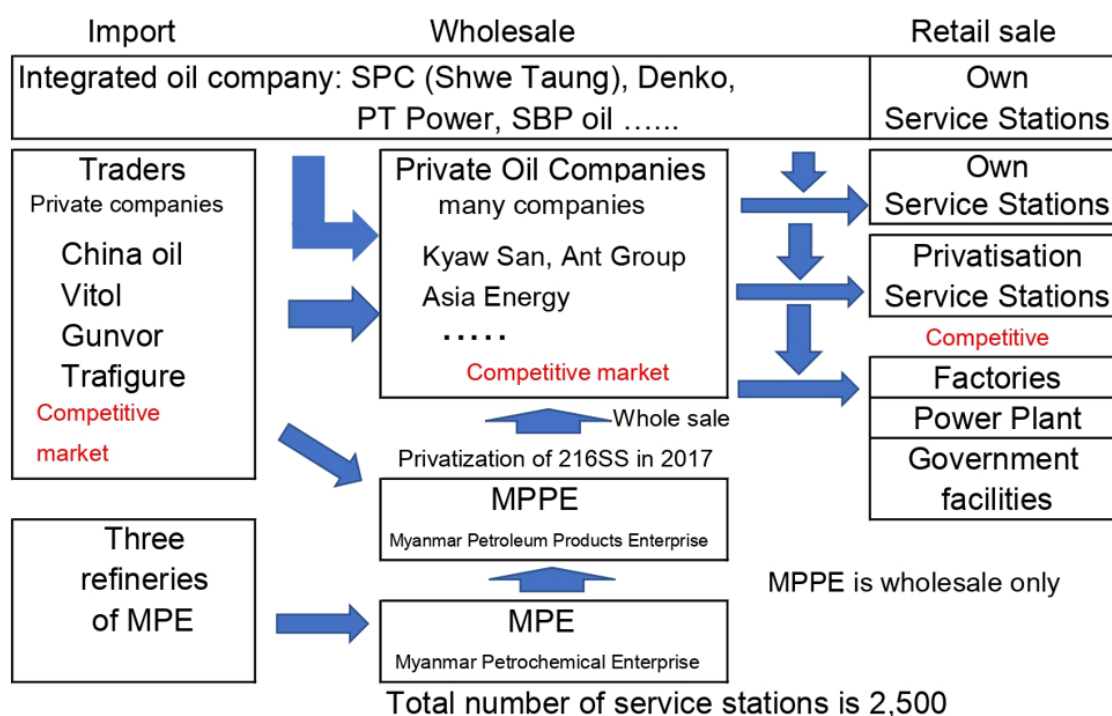
Source: Energy Balance Table (IEA, July 2021).

The petroleum product production of domestic refineries is small at 176 ktons in total, accounting for 3% of consumption.

1.2. Structure of the Oil Industry in Myanmar

Figure 2.1 shows the structure of the oil industry in Myanmar.

Figure 2.1. Structure of Oil Industry in Myanmar



SPC = Singapore Petroleum Company; SBP = Shwe Byain Phyu; MPPE = Myanmar Petroleum Products Enterprise; MPE = Myanmar Petrochemical Enterprise.

Note: An integrated oil company is a company that comprehensively operates import, wholesale, and retail operations.

Source: Authors.

Amongst the oil importers, there are integrated companies that own storage tanks, tank trucks, and service stations and also act as wholesalers; others serve only one of these functions.

The state-owned Myanmar Petroleum Products Enterprise (MPPE) also procures petroleum products from MPE and foreign oil traders, and wholesales them to oil dealers and service stations.

When a new refinery enters the petroleum market, it will require efficient logistics according to the location of the refinery:

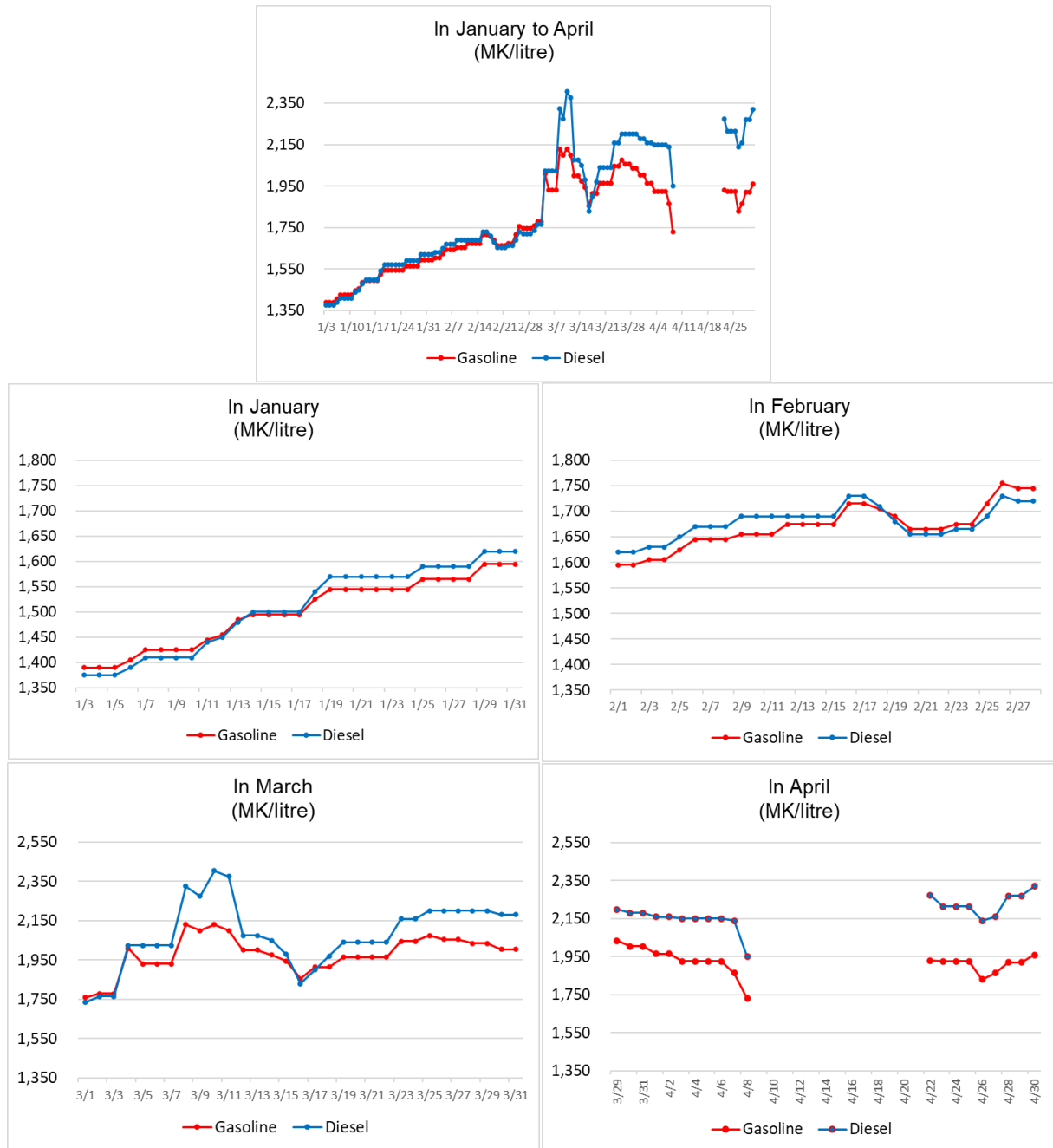
1. Oil-importing companies transport existing petroleum products to the new refinery.
2. The new refinery itself transports petroleum products to their destinations.

2. Pricing of Petroleum Products in Myanmar

2.2.1. Retail Price of Gasoline and Diesel Oil

Figure 2.2 shows retail price of gasoline and diesel oil in Yangon from January to April in 2022.

Figure 2.2. Retail Price of Gasoline and Diesel Oil in Yangon from January to April 2022



Source: Published prices of a major oil company.

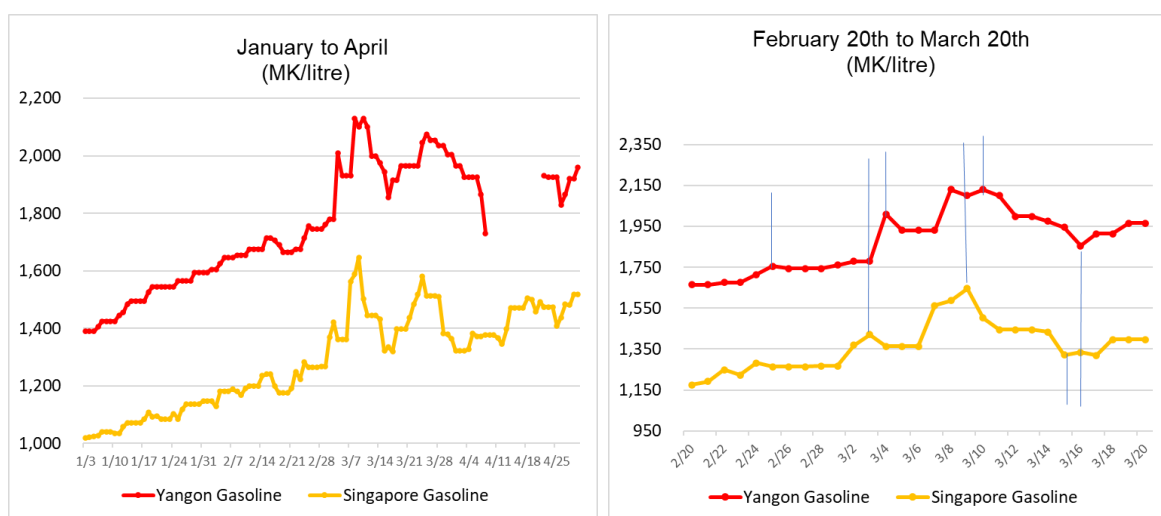
Gasoline prices in Yangon rose from MK1,390 on 3 January to MK2,130 on 10 March. Diesel oil price in Yangon rose from MK1,375 on 3 January to MK2,405 on 3 January.

After that, they fell slightly, but no price information was available between 9–21 April. There seems to be some confusion in the market. In May, the gasoline price was around MK2,200, and the diesel oil price around MK2,300. In June, there was no change in the gasoline price, but diesel was around MK2,500. Prices remained high in July and August; moreover, the MK/\$ rate fell from 1,860 to 2,100 on 12 August, and gasoline prices at the end of August were around MK2,400 and diesel oil prices were around MK2,800. Note that diesel oil prices are higher than gasoline prices.

2.2. Relation between the Retail Price and Singapore Spot Price

The fluctuations of the retail price of gasoline are linked to the Singapore spot price. Changes in Singapore spot prices appear to be reflected in retail prices after a few days. The discrepancies reflect the Singapore spot price because of import and other tax increases. Figure 2.3 shows the changes in the retail gasoline price in Yangon and the spot price in Singapore from January to April 2022. To see the relationship in detail, the graph on the right shows the transition from 20 February to 20 March. If there is a change in the Singapore spot price, it will be more clearly understood that it will be reflected in the Yangon retail price after a few days.

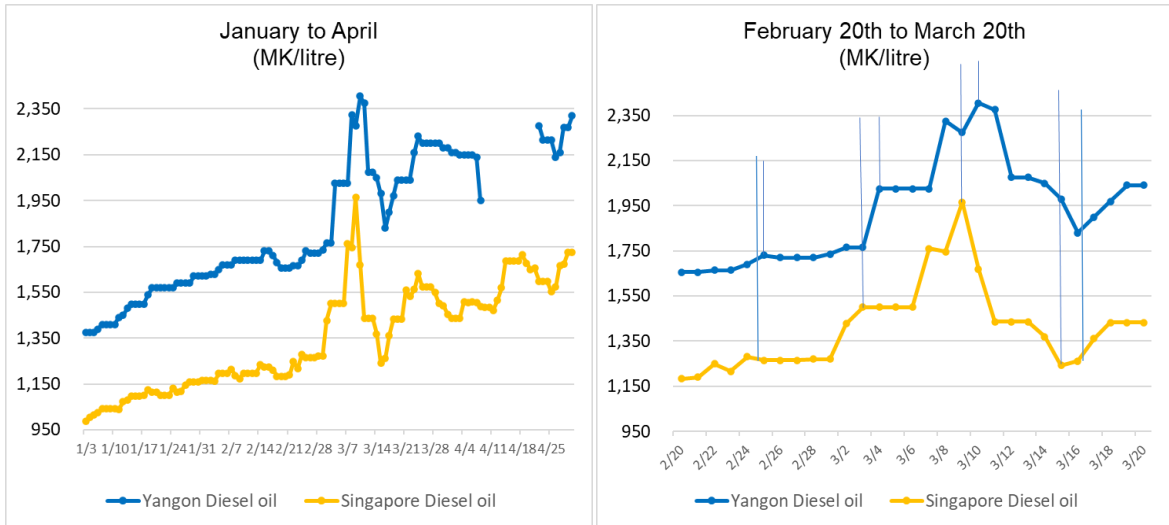
Figure 2.3. Yangon Retail Price and Spot Price of Singapore of Gasoline



Source: Authors.

The relation between the retail price of diesel oil and the Singapore spot price is the same as with gasoline, as shown in Figure 2.4. Changes in Singapore spot prices appear to be reflected in retail prices after a few days.

Figure 2.4. Yangon Retail Price and Spot Price of Singapore of Diesel Oil

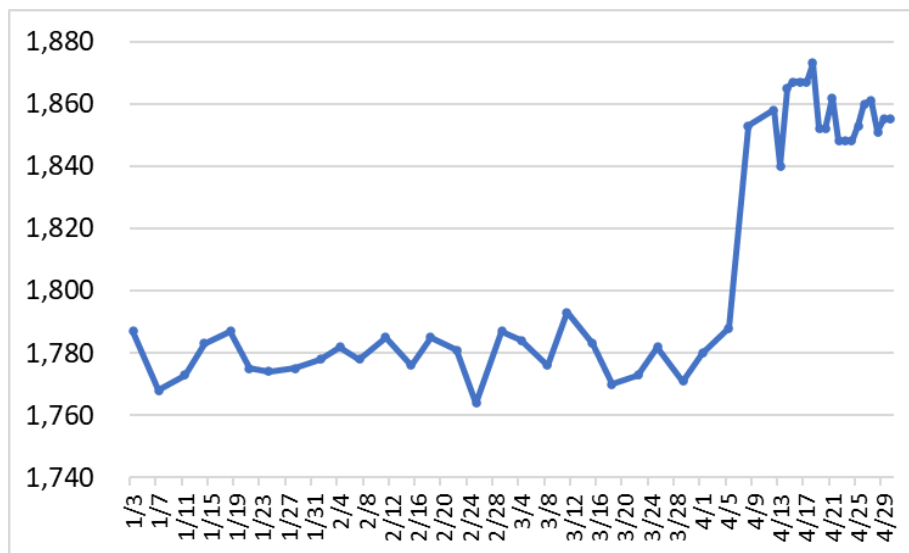


Source: Authors.

Since Singapore spot prices are denominated in dollars, fluctuations in the Myanmar kyat rate affect retail prices. In other words, when the kyat falls, the retail price rises.

Figure 2.5 shows the trend of exchange rate from January to April. The drop in the kyat since the beginning of April has been a factor in rising retail prices. Since August 12, the kyat has fallen further to MK2,100/\$1 (as of October 6).

Figure 2.5. Exchange Rate (MK/\$)



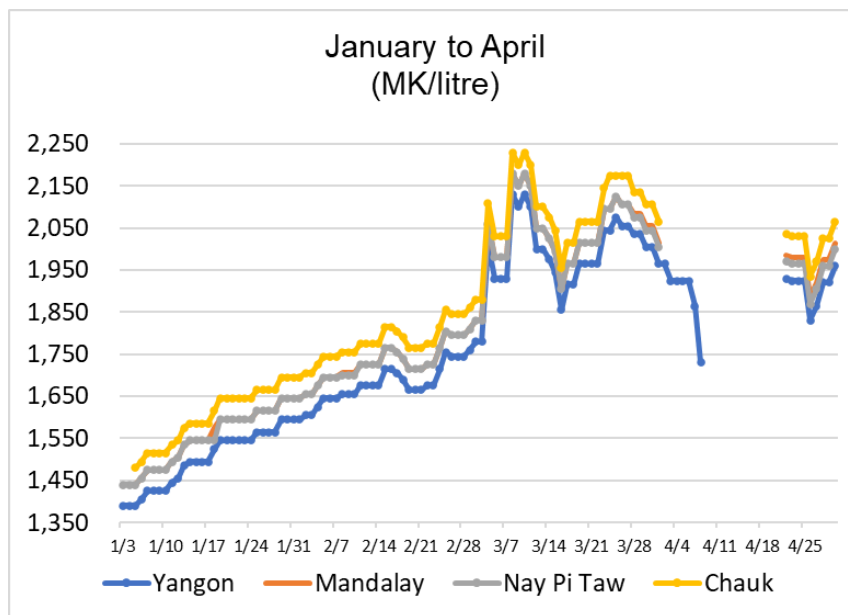
Source: Exchange-Rates.org, (2022) MBH Media, Inc. <http://mbhmedia.com/>.

2.3. Difference of Retail Price by City from Yangon

2.3.1. Gasoline Price

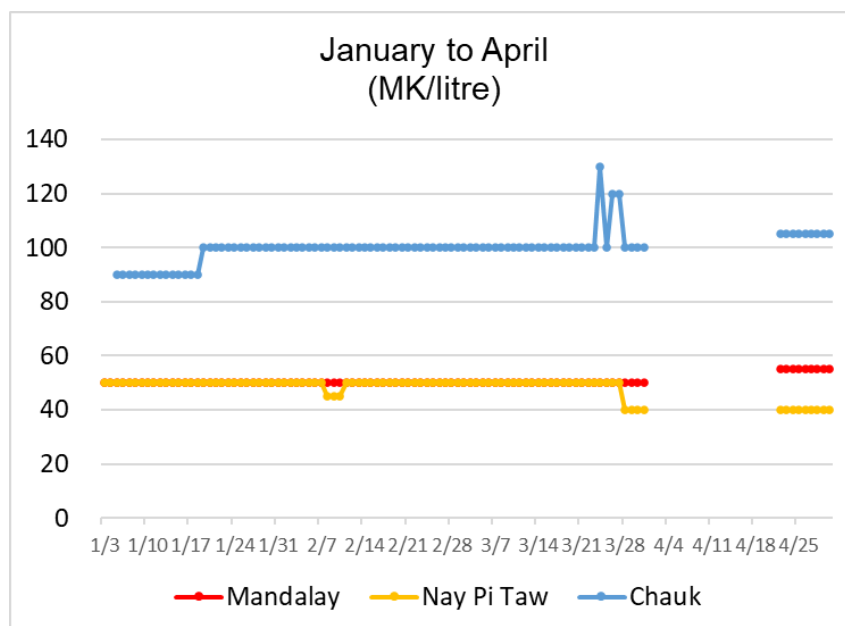
Figure 2.6 shows how gasoline retail prices fluctuate by city in the same way. The difference in gasoline price by city is almost constant compared with the price of Yangon (Figure 2.7). The reason seems to be the difference in transportation cost.'

Figure 2.6 Gasoline Retail Price by City



Source: Authors.

Figure 2.7 Difference of Gasoline Retail Price by City from Yangon

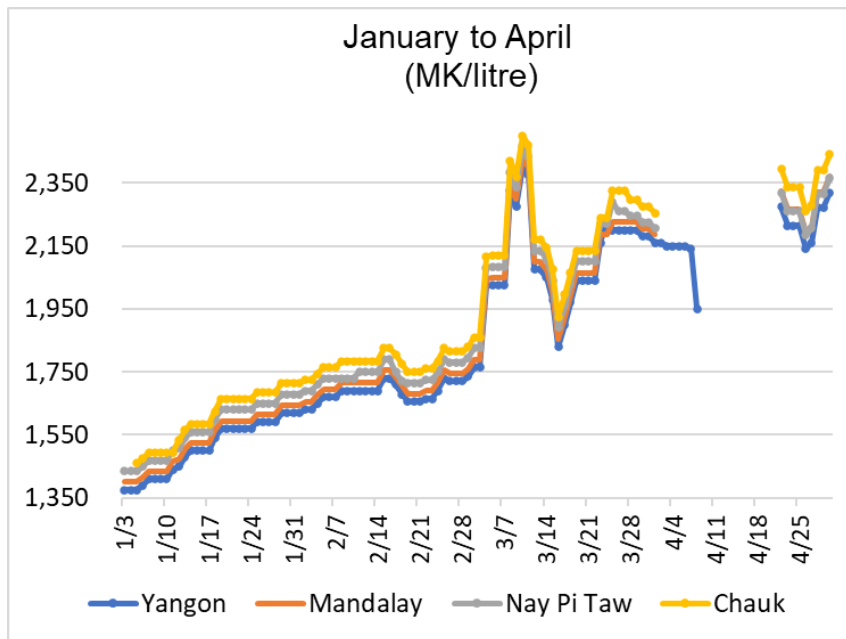


Source: Authors.

2.3.2. Diesel Oil Price

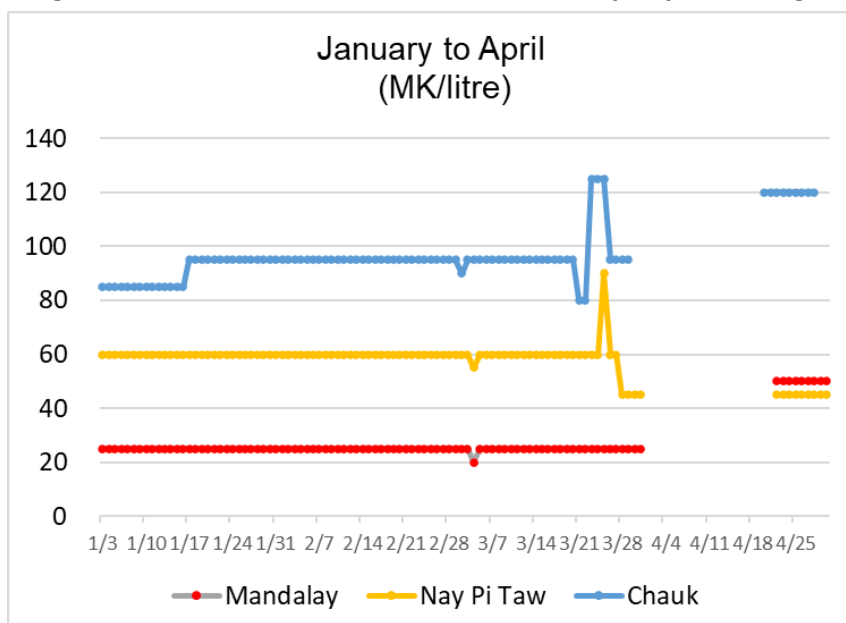
Figure 2.8 shows changes in diesel oil retail prices by city, and how they fluctuate in the same way. The difference of diesel oil price by city is almost constant compared with the price of Yangon (Figure 2.9). As with gasoline, the reason seems to be the difference in transportation cost.

Figure 2.8. Diesel Oil Retail Price by City



Source: Authors.

Figure 2.9. Difference of Diesel Oil Retail Price by City from Yangon



Source: Authors.

2.4. Ceiling Price System

If the domestic oil market is in a competitive state, retail prices will settle at an appropriate level, but when the import prices rise sharply or exchange rates fluctuate sharply, policies such as a ceiling price system may be effective. It is conceivable for the Government to announce the ceiling retail price on a weekly basis. Since it is difficult to inform ceiling retail price to all service stations every day, a weekly basis is preferable.

The basis of the calculation is the Singapore spot price or the average weekly cost with insurance and freight (CIF) price of gasoline and diesel oil. The Singapore spot price is that at the time of spot purchase, not the actual purchase price of the term contract. However, it can be used as an indicator. The ceiling price includes import tax, cost and margin, specific goods tax, and commercial tax. Costs and margins are set based on fact-finding, but they may be difficult to ascertain.

Service stations or oil companies with small sales volumes have large per-litre costs. The problem is that cost savings only go toward reducing labour and safety costs. It is impossible to set a ceiling price that all service stations and oil companies are satisfied with since they all have to cut costs. Whether or not to set a ceiling price for each major city is an issue.

Table 2.2 shows the structure of ceiling retail price, while Table 2.3 shows the total costs and margins calculated from average CIF prices and average retail prices for January and February.

Table 2.2. Structure of Ceiling Retail Price

Singapore spot price (Platts Singapore) or CIF price (FOB+Insurance+Freight)		S&P Global Platts
		Information from customs
Import tax: CIF×1.5%		Calculated
Cost and margin	Wholesale cost and margin	Based on a fact-finding survey
	Transportation cost from oil terminal to SS	
	Retail cost and margin	
Specific goods tax : 5%		Calculated
Commercial tax : 5%		Calculated
Total		Calculated

CIF = Cost, Insurance, and Freight (conditions including freight and insurance).

Note: S&P Global Platts is a fully independent and neutral information distribution company that provides index prices for energy and commodity markets.

Source: Authors.

Table 2.3. Retail Price Structure
(MK/litre)

		January		February	
		Gasoline	Diesel	Gasoline	Diesel
CIF price (FOB+Insurance+Freight)		1,139	1,133	1,278	1,269
Import tax: CIF×1.5%		17	17	19	19
Cost and margin	Wholesale cost and margin	207	220	226	241
	Transportation cost				
	Retail cost and margin				
Specific goods tax : 5%		68	69	76	76
Commercial tax : 5%		68	69	76	76
Total (Average of retail price)		1,499	1,507	1,675	1,682

Source: Authors.

3. Competitive Conditions for a New Refinery

Currently, two plans are being made to build the following new oil refinery projects, which will give priority to gasoline and diesel oil (Table 2.4).

Table 2.4. New Refinery in Myanmar

No	Refinery name	Capacity	Place
1	Thanlyin Refinery Petrochemical Complex	10 million tonnes of crude oil per year (200,000 barrels per day)	Yangon Division
2	Thanbayakan Petrochemical Complex	5 million tonnes of crude oil per year (100,000 barrels per day)	Magway Division

Source: Ministry of Electricity and Energy (2022).

3.1. Overview of the New Refineries

3.1.1. Thanlyin Refinery

Issues with building the Thanlyin Refinery include dismantling and site cleaning the current refinery, insufficient freshwater resources, its location in a crowded area, and accessibility (water depth of the Thanlyin Refinery Harbour is only about 7 m, meaning less practical single point

mooring methods will be needed to accommodate Very Large Crude Carriers [VLCCs]). The Thanlyin refinery is located in the Yangon division, close to a large consumption area, but at the same time it will compete with existing petroleum product import bases, so logistics competitiveness is also necessary.

3.1.2. Thanbayakan Refinery

Issues with building the Thanbayakan Refinery include its size (the current harbour jetty will need to be expanded to accommodate it), its location on the Irrawaddy River, which may have transport difficulty in summer, and the need to buy land to build a rail route or whether a right of way is needed in case the product pipeline is connected to the demand centre. Safety must be considered because of the proximity of the new refinery and the original refinery. While Thanbayakan Refinery is 550 km away from Yangon, it is located near Nay Py Taw and Mandalay, where demand is high. Therefore, it will have an advantage over Thanlyin Refinery in terms of supplying petroleum products to inland areas. Regarding crude oil supply to the Thanbayakan Refinery, it may be conceivable to utilise China's crude oil pipeline from the ocean side.

3.2. Competitiveness of the New Refineries

The new refineries need to supply petroleum products at prices comparable to imports. Depreciation costs, utility costs, maintenance costs, labour costs, etc., are important for the competitiveness of a refinery. In addition, competitiveness can be enhanced by increasing the ratio of secondary equipment, which increases the yield of high-value-added products such as gasoline and diesel oil. In short, the equipment configuration of a refinery is the basis of competitiveness.

Since the details of the new refineries have not yet been determined, this study used the Nelson Index to propose a facility configuration that would be as competitive as the Singapore refineries. The index compares the secondary conversion capacity of a petroleum refinery with the crude distillation unit capacity, furnishing a simple number for quantifying and ranking the complexity of refineries. To calculate the index, it is necessary to assess the capacities of the refinery. In addition, increased production of basic petrochemicals has recently increased refinery competitiveness; however, the Nelson Index does not take this into account.

3.3. Example of Nelson Index for New Refineries

The Nelson Index of the three Singapore refineries in 2020 is 3.08, and the sample equipment configuration for the new refineries to achieve the same Nelson index is shown in Table 2.5.

Table 2.5. Nelson Complexity Index
(Barrels per day)

Name of equipment	New Refinery (1)	New Refinery (2)	Complexity factor	Singapore	Japan
Crude distillation unit	100,000	200,000	1.0	1,514,000	3,519,000
Vacuum distillation	25,000	50,000	2.0	343,000	1,559,000
Catalytic reforming	15,000	30,000	5.0	199,000	685,000
Fluid Catalytic Cracking	15,000	30,000	6.0	85,000	983,000
Catalytic hydrocracking	5,000	10,000	6.0	72,000	179,000
Alkylation			10.0	13,000	105,000
Thermal processes			2.8	142,000	141,000
Oxygenates			10.0	–	–
Isomerisation			15.0	–	–
Lubes			60.0	–	–
Complexity factor	3.45	3.45		3.08	5.25

Note: Σ (Complexity factor \times unit capacity / crude distillation unit capacity) = Nelson Complexity Index
Source: Authors.

3.4. Production Yield of Singapore Refineries

Table 2.6 shows the change in the production yield of the Singapore refineries. The Catalytic Cracking Reformer (CCR) increased the production of high-octane base material from naphtha, so naphtha yield decreased, and gasoline yield increased. Further, Fluid Catalytic Cracking (FCC) increased the production of gasoline and diesel oil, and the heavy crude oil was reduced to decrease the production of fuel oil. Since the price of fuel oil is less than crude oil, all refineries intend to reduce fuel oil production.

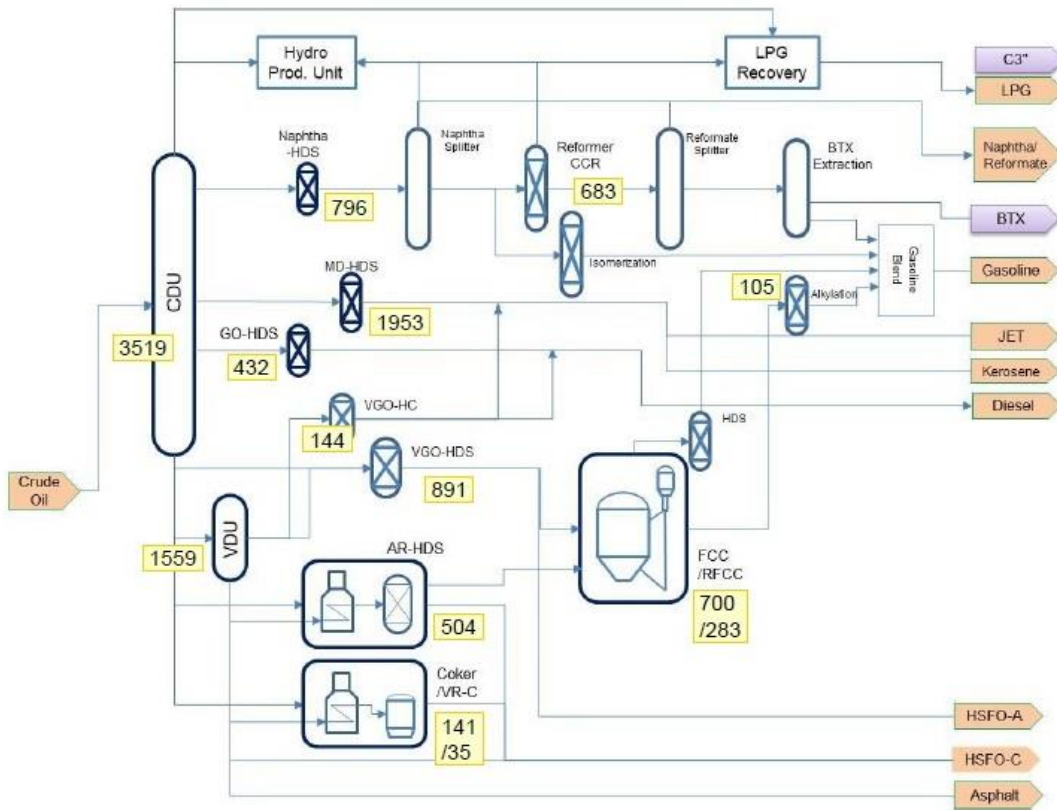
Table 2.6. Production Yield of Singapore Refineries
(Unit: %)

	2015	2020
Naphtha	17.0	7.0
Gasoline	11.0	23.0
JET	20.0	21.0
Diesel Oil	28.0	31.0
Fuel oil	11.0	5.0

Source: JPEC Report (2020) <https://www.peci.or.jp/>.

For reference, Figure 2.10 shows the equipment configuration and refining flow of Japanese refineries.

Figure 2.10. Refinery Equipment Configuration in Japan



Source: JPEC Report (2022) <https://www.pecj.or.jp/>.

4. Appropriate Strategic Pricing of the New Refinery

Because the domestic wholesale price of the new refinery will compete with the import price of petroleum products, and the price fluctuation will be the Singapore spot price link, oil companies that own storage tanks in Yangon for imported petroleum products and tank trucks for wholesale and retail sale may not purchase from the new Thanlyin refinery in Yangon without some incentives. Possible incentives are transportation from the new refinery to the oil-importing companies' storage tanks, or oil-importing companies that pick up petroleum products at the new refinery receiving a lower price than import price, or the new refinery itself transporting petroleum products to their destinations with appropriate cost.

In any case, there will be discretion between imported products and refinery products. Equity participation by several major oil companies in new refineries may solve the problems. If the new refinery is located in Thanbayakan, the discount price will be requested considering the transportation cost to Yangon. However, since the Thanbayakan Refinery is close to the inland

area, the difference in transportation costs from Yangon to the inland area is an advantage.

For reference, the method of notification wholesale prices in Japan is as follows. Since Japan is an island country far from the US, Southeast Asia, and the Middle East, it imports crude oil using large tankers and produces petroleum products at domestic refineries. Product imports are a measure to adjust excess and deficiency. Currently, Japanese oil companies notify distributors of wholesale prices on a weekly basis. This reasoning is mainly based on crude oil price fluctuations, foreign exchange fluctuations, and overseas/domestic market price fluctuations, and they notify and negotiate changes from the previous week. When a new refinery enters the Myanmar market, which relies on imports for all petroleum products, it will be necessary to offer the wholesale prices equivalent to the import price. Therefore, the profitability of the new refinery will be calculated based on those prices.

5. Advantages and Disadvantages of Having a Domestic Refinery

5.1. Advantages

- Since the price of petroleum products is higher than the price of crude oil, the difference can be reserved in Myanmar as an added value, and the domestic refinery can increase employment, domestic consumption, etc.
- Since the crude oil market is larger than the products market, the impact of tight supply and demand caused by conflicts, disasters and accidents is small.
- Table 2.7 shows the prices of gasoline, diesel oil, bunker oil and Oman crude oil from January to March. Oman crude oil has the lowest rate of increase.
- In addition, as the price of crude oil rises, the spread with product prices widens.
- Figure 2.11 shows that bunker oil is lower than crude oil price. Reducing bunker oil production increases refinery margins.

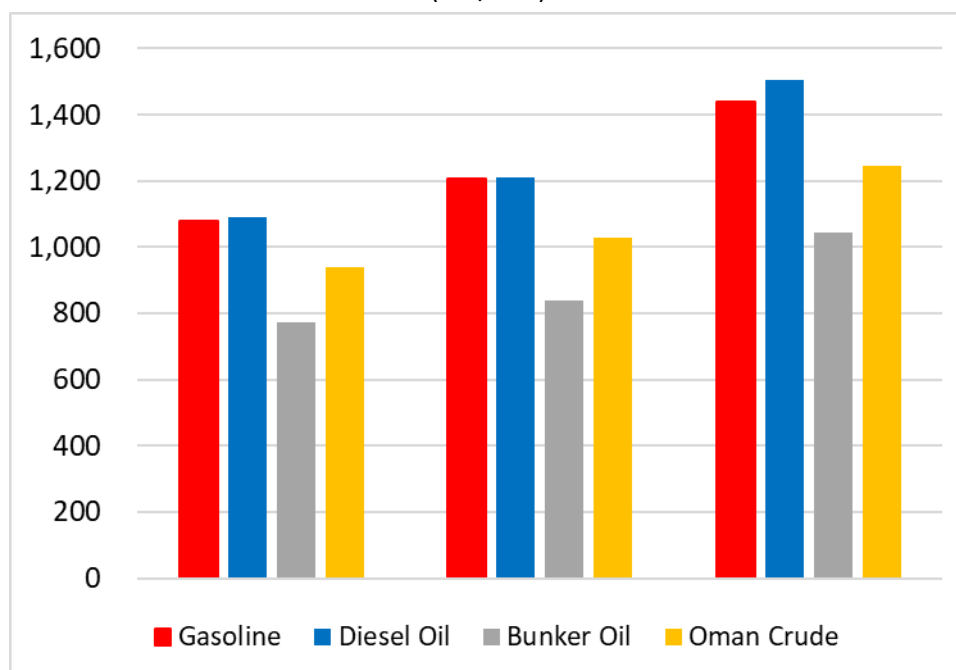
Table 2.7. Singapore Spot Price
(MK/litre)

	January	February	March	Multiple Mar / Jan
Gasoline	1,078	1,205	1,438	1.33
Diesel Oil	1,089	1,210	1,506	1.38
Bunker Oil	774	840	1,046	1.35
Oman Crude	939	1,027	1,244	1.32

	Spread from crude oil price		
	January	February	March
Gasoline	139	178	194
Diesel Oil	150	183	262
Bunker Oil	-165	-187	-198

Source: Authors.

Figure 2.11. Singapore Spot Price
(MK/litre)



Source: Authors.

- Long-term stockpiling of petroleum products has a problem of deterioration, but crude oil can be stockpiled for a long time, and there is no problem of quality.
- Crude oil can be imported by large tankers such as VLCCs, and the fare is cheaper than product tankers.
- Considering the demand composition of petroleum products in Myanmar, a condensate refinery using domestic natural gas is also a candidate.

5.2. Disadvantages

- Since the production volume of each petroleum product is set in advance and the properties of the processed crude oil and the equipment configuration are determined, it is difficult to respond if the demand composition changes significantly.
- When the domestic demand in product-exporting countries declines, oversupply of petroleum product export markets will appear, and product prices will go down. Under such circumstances, product imports will be more advantageous and domestic refineries will lose their competitiveness.

5.3. Points to Note

- **Operator training**
Although the use of computers is advancing, skill is required for the operation of the refinery. Particularly in refineries equipped with many secondary devices, the coordination between devices is complicated, requiring operators to be highly skilled.

- **Regularly maintenance**

As equipment deteriorates over time, it is necessary to develop a maintenance plan and system. Shut Down Maintenance every 4 or 5 years is also important. It also requires daily inspections by field operators. Early detection of abnormal vibrations, abnormal sounds, oil leaks, etc., can prevent major accidents. If proper maintenance is performed regularly and equipment is repaired or replaced, the refinery can operate semi-permanently.

- **Quality management**

It is necessary to establish a quality inspection system in order to continuously maintain the products. A laboratory with quality inspection equipment is required within the refinery. In addition, it is necessary to have a system for considering the introduction of additional equipment to improve quality.