Exports or Imports -
- The Future of Asian Refining

Abstract

The Asia-Pacific region has traditionally been a major importer of refined products. However, thanks to almost 12 million barrels per day (MMbpd) of refining capacity added since 1995, the region now has surplus distillate and gasoline production. Yet, despite apparently plentiful supplies in the region, many countries are still planning additional capacity. The concept of building domestic refining capacity based on strategic considerations (security of supply etc.) rather than solely economic ones is, of course, not new. However, as many refiners target exports and markets that will pay top prices, some countries may need to build refining capacity rather than want to build it. Price subsidies decrease the attractiveness of private investment in refining capacity for some markets, whilst the subsidies on products themselves exacerbate rapid demand growth.

This article assesses the future for Asian refining by examining the oil demand outlook, the location of newly built refineries, and the companies that are undertaking these investments. The strategic and economic drivers for investments in new refining capacity will be examined to understand the underlying business model. This will be applied to the case of the countries that still import oil products.

This article examines the potential future for Asian refining and begins to answer the following questions:

Will the region be short of refining capacity or will products be in over supply?

Can the region’s refineries effectively be separated into those that are economically viable and those that are effectively strategic investments?

Can countries with high price subsidies attract new investment to the refining sector?

Introduction

During the past decade, there has been a steady growth in refining capacity1 in the non-OECD countries where nearly all growth in global oil product consumption has occurred. Asia-Pacific (APAC) has had the largest growth in refining capacity of any region, almost 8 MMbpd since 20022. However, within APAC, there have been differing trends. Most of APAC’s new refining capacity growth has been in China and India. Industrialized APAC3 experienced no growth in refining capacity while there were some refining capacity additions in the remaining APAC countries.

The additional refining capacity has allowed China and India to remain self-sufficient in supplying oil products to their domestic market4. Most APAC countries with domestic oil product demand in excess of 200 thousand barrels per day (Mbpd) are self-sufficient in refining capacity. The notable exceptions have been Malaysia, Indonesia, Pakistan, and Vietnam where refining capacity is below oil product demand. Since 2003, of these four countries, only Vietnam has added more incremental refining capacity than growth in oil product demand.

1 Primary crude oil distillation capacity
2 Source: BP Statistical Review of World Energy, June 2013
3 Comprises Japan, South Korea, Taiwan, Singapore, and Australia
4 Comparing refinery distillation capacity to overall oil products consumption
1. Outlook for Asian Refining

Over the next five years (2014-2018), APAC refining capacity additions of 6.0 MMbpd are expected. Again, most of these crude distillation unit (CDU) capacity additions will be in China (55%), India (24%) and Rest of Asia (21%), as shown in Figure 1.

Greenfield refinery additions account for half of the total refinery capacity additions planned in APAC for the next five years. Twenty new refineries are expected to start up during this period including seven in China and three in India.

The projected growth in refining capacity seems to defy simple commercial explanation. However, we postulate that the answer is in the different business models being used to justify investment.

2. Business Models for Refining Capacity Additions

After World War II, the major oil companies (majors) based in Western Europe and the US controlled most of the world’s oil production through private ownership and concession arrangements. During this period of time, refining investment was made by the majors in response to rising demand from their marketing operations. Crude oil supply was plentiful so the only way to produce more crude oil was to sell more oil products (“Move the Crude”). Refining-marketing or Downstream was required to break even while production or upstream made the profits in such integrated companies.

This business model changed with the advent of OPEC and the nationalization of oil reserves in those countries in the early 1970s. Crude oil supply became scarce as a result of production quotas. The Downstream business was expected to become profitable and earn a return (“Profit Model”) since the large integrated oil companies no longer had excess crude oil to move. With higher product prices (in part from higher excise taxes), consumers in the industrialized countries reduced their demand for oil. The over-capacity in refining in the US, Europe, and Japan, led to closures of the least competitive refineries. The large integrated oil companies also divested refineries to independent operators.

The developing APAC countries have proceeded on a different path since the early 1970s because of the growth in their domestic economies. Oil consumption grew with economic growth and new refineries were needed to supply the oil products. The majors invested in refineries in Singapore, thereby establishing an oil products supply hub for Southeast Asia. The refining sectors in China and India were developed by National Oil Companies (NOCs), at first by Sinopec and Indian Oil respectively, and then expanded by other NOCs. Since the NOCs were the only investors in their countries, downstream business was operated more like a public utility with regulated prices that effectively capped margins (“Public Utility Model”). Although the majors had downstream businesses throughout Southeast Asia, the Public Utility Model has become dominant in the refining sectors of Indonesia, Malaysia, Thailand, and recently, Vietnam.
3. **Refining Capacity Additions in APAC**

Under the Profit Model, refiners have the responsibility for revenue collection. As refining margins improve, refiners gain the incentive to add additional capacity. International Oil Companies (IOCs) and Local Private Companies will typically wait for the margins to improve in the marketplace before making investments.

Under a Public Utility model, the NOC must invest to ensure that the nation’s oil products’ demand is met. The return that the NOC receives on this investment is managed by the state. As long as the NOCs have the funding (internal and government sources) to make the necessary investments, the required investment return is not an issue. The NOCs will continue to invest as long as there is a market for the output. The problem for governments arises when there is a shortage of funding for refining investment that causes the state/NOC to invite investment from foreign or local private sources; these parties will then seek government support that provides them with a “market rate of return”.

Traditionally, refining margins incentivized refining capacity additions under the Profit Model. These incentives would have been strongest during the high margin period during 2004-2008. Given the long lead time to design and build a refinery this would have led to the greatest capacity expansion after 2008. Since 2008, Asian refining margins (based on spot market transactions in Singapore) have decreased to an average of US$2.27 per barrel of crude oil processed over the past five years, and are currently lower than the average of the previous 15 years, which is highlighted in historical refining margins shown in Figure 3. The refining margins shown are for generic conversion refineries applicable to Singapore, for Medium sour Hydrocracking configurations.

**Figure 3: Historical Refining Margins in Singapore**

However, Asian refining capacity additions steadily increased, driven by China, during the past 20 years, as shown in Figure 4, despite the volatility in the refining margins. This indicates that governments were applying the Public Utility model to meet the domestic growth in fuels consumption and to achieve supply security.

**Figure 4: Asia Refining CDU Capacity Additions**

Source: BP Statistical Review, 2013, GlobalData

For foreign/private sources of capital, the low margin in recent years has dampened enthusiasm for refining investment that would rely on the marketplace without government support. In countries following the Public Utility business model, the governments and NOCs have had to promise greater margin support to new refining capacity hoping that the market will improve.

**Asian Retail Fuel Prices**

A particular problem for foreign or local private investors considering refinery investment is that downstream margins are based heavily on governmental support when domestic product prices are regulated below the international market. Malaysia and Indonesia are no longer self-sufficient in refining capacity as a result of increasing domestic consumption. These countries have proposed new refinery projects, which would reduce reliance on imported oil products. However, both countries have below-market retail prices for gasoline and diesel, as shown in Figure 5 (on next page), and must fund pricing below international imports. Thailand and India (and possibly The Philippines) have chosen to price diesel below international market prices when the additional costs involved in fuels distribution and retailing are added. The governments in these countries must provide more funds to the refining sector to maintain downstream margins and attract investment for expansions.
India presents a more complex picture. On an aggregate, India imports refined products for its domestic consumption and exports refined products produced by local private refiners. The unique nature of regulation, which allows local private companies to set-up export-oriented refineries to take advantage of higher international margins, offers a positive climate for refining capacity additions. Local private refiners, Reliance and Essar, responded by building 1.2 MMbpd of capacity, which was half of the total refining capacity additions in India during the 2004-2012 period.

5. Closing Remarks

The future of refining depends largely on the pricing policies and capital allocation models implemented by governments. Refining investments by NOCs, which are supported by government to accomplish strategic policies, are a major feature of the Asian marketplace. Government programs to sell oil products domestically below international price benchmarks depend on covering feedstock, manufacturing, and distribution costs, and are unlikely to be sustainable. Attracting foreign and local private refinery investments depends on the establishment of a pro-investment climate through either, or both, deregulated pricing and government tax support.

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