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## Key Players in the Asia Pacific Oil Market

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## Executive Summary

- The Key Players—China, India, Indonesia, Japan and South Korea—dominate almost all aspects of the Asia-Pacific oil market. Clearly, future developments in the oil markets in these countries will have major strategic and commercial implications. China and India will play a particularly large role as their economies continue to develop.
- Following a period of rapid regional demand growth from the mid 1980s to the mid 1990s, the past several years have been characterized by relatively stagnant overall demand. This stagnation came at a time when approximately 2.5 mmb/d of CDU capacity came on line, leading to a precipitous drop in refining margins.
- Among the policy trends that will drive the oil industry in the Key Players in the future is continued deregulation and privatization, as well as environmental regulations resulting in ever-tightening product specifications.

## China

- The petroleum industry is one of the most protected industries in China. However, this is changing, especially with China's entry into the World Trade Organization (WTO) at the end of 2001.
- In spite of slow progress in China's WTO implementation, the government appears to be determined to comply with the WTO rules as much as possible. As a result, delay is very likely, but in the end the state oil companies will eventually subject themselves to more competition in a freer market under WTO.
- A 1998 reorganization, restructured CNPC/PetroChina and Sinopec into integrated oil companies, although CNPC/PetroChina still dominates upstream production and Sinopec controls a larger portion of the refineries. Downstream activities are divided along geographical lines, with CNPC/PetroChina controlling the North and West, and Sinopec dominating the South and East.
- Since October 2001, petroleum prices have been linked to a basket of Singapore, Rotterdam, and New York prices. Changes take place when prices move outside a defined band. CNPC/PetroChina and Sinopec have some flexibility in setting prices as they can set their own

specific final prices within 16 percent of the baseline retail price (8 percent above and 8 percent below the baseline price).

- A combination of rapid growth in petroleum product consumption and slow growth in oil production will lead to a rapid rise in imports, especially from the Middle East. Because of this, China is under pressure to increase its sour-crude processing capacity to deal with increasing Middle East crude imports and the declining availability of sweet crudes within the Asia-Pacific region.
- China has pushed hard to promote overseas oil investments by state oil companies. The leader in this area is CNPC, but other state oil companies are catching up. It is part of the Chinese government's overall strategy to deal with growing concerns over the country's energy security.

## India

- Over the past several years, India has initiated a number of oil industry reforms. In April 2002 the government dissolved its administered pricing mechanism (APM), which in principle resulted in a partial decontrol of domestic product prices. In practice, however, the oil marketing companies still require the government's agreement to adjust prices.
- The process of privatizing state-owned downstream oil companies was also initiated in 2002. To begin, IBP Ltd. was sold to Indian Oil Corporation, which is state-owned, so this could hardly be considered a case of privatization. Plans to privatize Bharat Petroleum Corporation Ltd. (BPCL) and Hindustan Petroleum Corporation Ltd. (HPCL) have been a subject of much debate, but they look to be moving forward. The government has invited bids for the sale of a 35 percent share and management control of HPCL. There are also indications that a public offering of BPCL will be executed through both foreign and domestic channels, but the exact details have not been formalized.
- India's refining capacity doubled between 1995 and 2001, transforming the country from a major importer of middle distillates to a net exporter. While demand growth has slowed, Indian refiners continue to prosper under the umbrellas of tariff protection, which currently amounts to an effective rate of approximately 7 percent.



- Over half of India's crude is sourced from the Middle East. Domestic crudes account for about 30 percent of the total crude requirement, and the remainder is imported from the Atlantic Basin and other Asian countries. Although the pricing mechanism is still a subject of controversy, with deregulation, state-owned Oil and Natural Gas Corporation Ltd. (ONGC) should be able to align the price of domestic crudes more closely to global prices.
- Historically India's overseas investment strategy has been quite limited, but in recent years it has become much more aggressive. ONGC is in the midst of a major push abroad, as evidenced by participation in Sakhalin I, Sudan, and negotiations in a wide array of countries, including Iran. This should help offset declines in ONGC's domestic production, which has dropped from a peak of 630 kb/d in the mid-1990s to approximately 500 kb/d.

## **Indonesia**

- In October 2001 Indonesia passed the Oil and Gas Law which ended Pertamina's monopoly over the nation's oil market. The new law ended Pertamina's control over upstream licensing rights and production-sharing contracts are now overseen by a government body, BP Migas. It also sets the stage for the deregulation of the downstream oil industry.
- Among the challenges the country faces is bringing petroleum prices more in line with the global market. Price subsidies are a drain on government revenue and also distort consumption patterns, making it hard for Indonesia to satisfy a domestic demand slate which is heavily skewed toward more expensive "spec" products, such as gasoline and middle distillates. It should be noted that while there is no tariff on imported crude, the tariff on imported finished products is 5 percent.
- Because of security problems in some producing areas, and the fact that new finds have not off-set declines in older producing fields, Indonesia's crude and condensate production has been in decline since the mid 1990s. With mature fields and fewer attractive prospects available, Indonesia will likely have to offer more attractive production-sharing terms to encourage investment and increase production.

## **Japan**

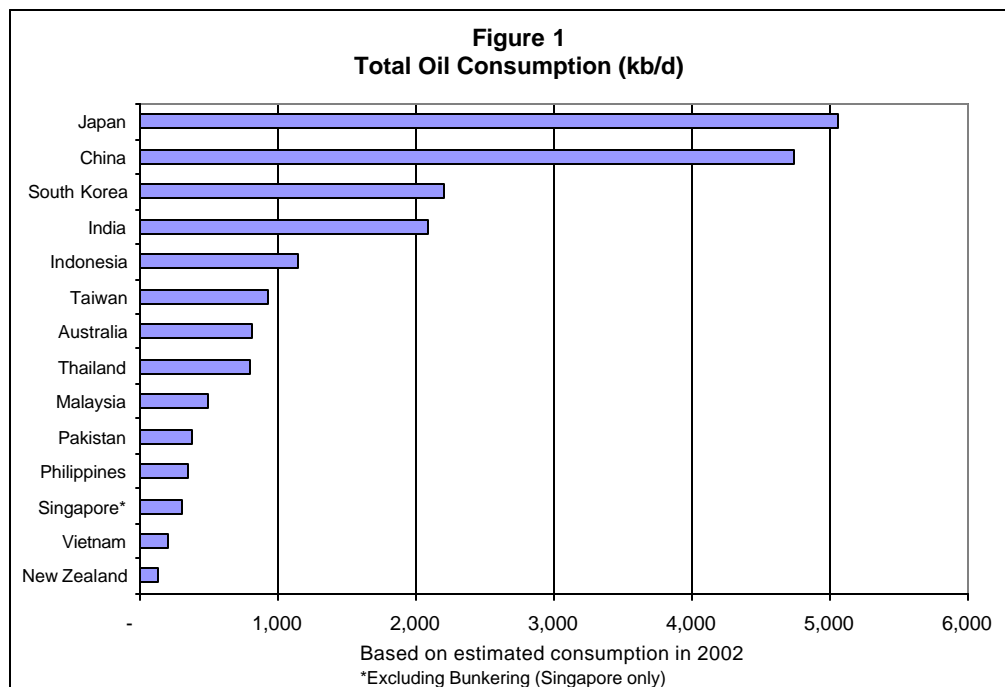
- In 2002, Japan posted its third consecutive year of negative growth in petroleum product consumption. This is obviously a poor environment for Japan's refiners, which have slowly adjusted to the fact that closures are necessary. Some progress has been made, including a recent deal between Nippon Oil Corporation (NOC) and Idemitsu that will result in the closure of the Hyogo refinery, but refiners are hesitant to shut down on their own because others will simply take the market share. In the long-run, the move toward stricter specifications could force closures which could rationalize the industry.
- While the situation appears to be bleak for Japan's refiners, it could be worse—there are several characteristics of the Japanese market that give domestic refiners built-in protection from outside competition: (1) Like all domestic refiners, the freight differential between crude and product imports provides some support. (2) The fact that the country has relatively small product receiving terminals, coupled with hefty storage requirements for product importers, acts as a major brake on competition. (3) Japanese refiners enjoy favorable tariffs, particularly for fuel oil. While the market is nominally deregulated and open, this gauntlet of obstacles makes it difficult for competitors to penetrate that market.
- The state-run Japan National Oil Company (JNOC) is scheduled to be dismantled by 2005, but Japan is continuing its drive to secure more equity oil. The Ministry of Economy, Trade and Industry (METI) is playing a key role in recent talks with Russian ministries and oil companies, as well as in negotiations surrounding access to the Azadegan field in Iran.
- The details of the JNOC dissolution are still in the works, but it is understood that the assets held by INPEX, JODECO and SODECO will be merged into an internationally competitive flagship company. This company will eventually be privatized, but safeguards will be put in place to ensure that it is not taken over by an international oil company. JNOC affiliate JAPEX is to be listed separately by the end of this year. Most of JNOC's other assets would be disposed of over time, except for some of the more valuable assets which may be taken over by the merged flagship company.

## **South Korea**

- Beginning in 1991 South Korea product prices were adjusted to ensure profitability so that refiners could invest to become internationally competitive prior to deregulation. In 1996 formal price controls were abandoned and replaced with competitive Singapore pricing plus a hefty “Korea factor.” On January 1, 1997 prices were fully deregulated, but they did not change, possibly due to market sharing agreements. Since 1999 new entry and imports have been allowed and a few independent retailers are putting some pressure on prices. Indeed, around 10 percent of the market is now controlled by independents, as opposed to 1 percent in 1999.
- Current import tariffs are 5 percent for crude oil and 7 percent for products, which provides a small level of protection for domestic refiners. In the face of low profitability, the industry has requested that the tariff on products be increased to 12 percent. It remains to be seen whether the new administration will support this change.
- Overcapacity is likely to dissuade potential market entrants from building new refineries. It has also resulted in Korean refiners flooding the international products market.
- While the market shares of the major players have remained roughly the same since price deregulation in 1997, there have been some changes. For example, Hanwha was acquired by Hyundai Oil and 50 percent of Hyundai Oil’s equity was purchased by Abu Dhabi’s IPIC (International Petroleum Investment Company). Hanwha, now renamed Incheon, is in bankruptcy and is being offered for sale. Existing Korean refiners want to buy it so independents and foreign companies cannot purchase it and use the facilities for storage to satisfy the law requiring 60 days storage of product imports.
- The state-owned Korea National Oil Company (KNOC) continues to push forward in pursuing overseas equity stakes in exploration and production. The South Korean government has charged KNOC with the goal of providing 10 percent of South Korea’s oil by 2010. Currently KNOC is a shareholder in production in fields in Yemen, Argentina, Peru, and the U.K.

## Introduction<sup>1</sup>

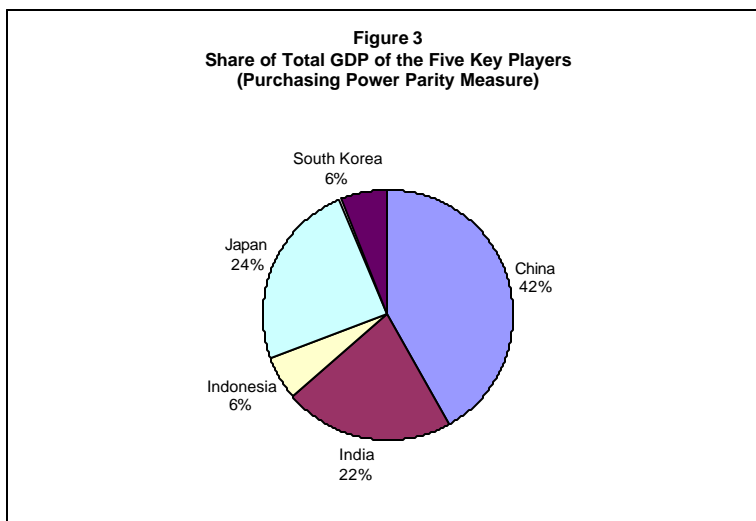
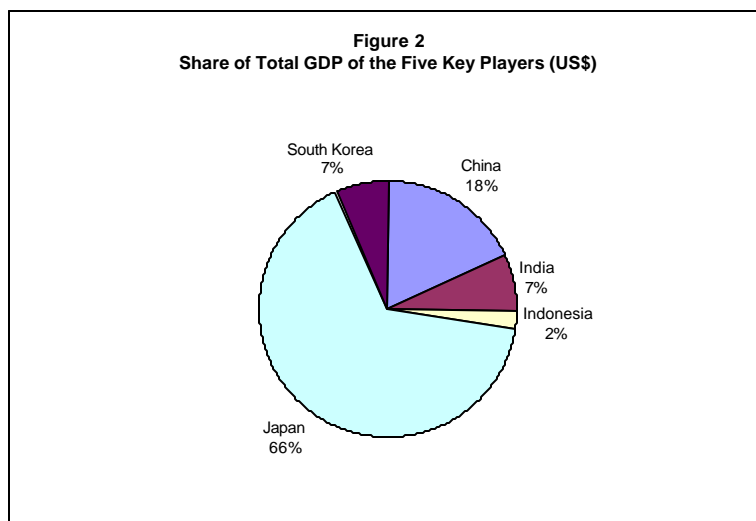
China, India, Indonesia, Japan and South Korea dominate the Asia-Pacific oil market. As illustrated by Figure 1, this group includes the region's top five consumers and several of its major producers. Clearly, future developments in energy and economic policy among these "Key Players" will have major strategic and commercial implications. This study evaluates the Key Players' role in the region, and also provides special insights into the current and future issues that will affect the oil market in each of these countries. It begins with a regional economic and energy outlook, followed by a discussion of the regional refining picture, crude and product balances, and regional policy trends—all with an emphasis on the Key Players. The study then dissects some of the important issues that are driving the oil market in each of the Key Players. Overall, this is an exciting and tumultuous time as the Key Players struggle to adjust to the uncertainty surrounding shifting consumption patterns and moves toward deregulation and privatization. Understanding these important changes is critical to policy-makers and commercial players interested in the Asia-Pacific region.



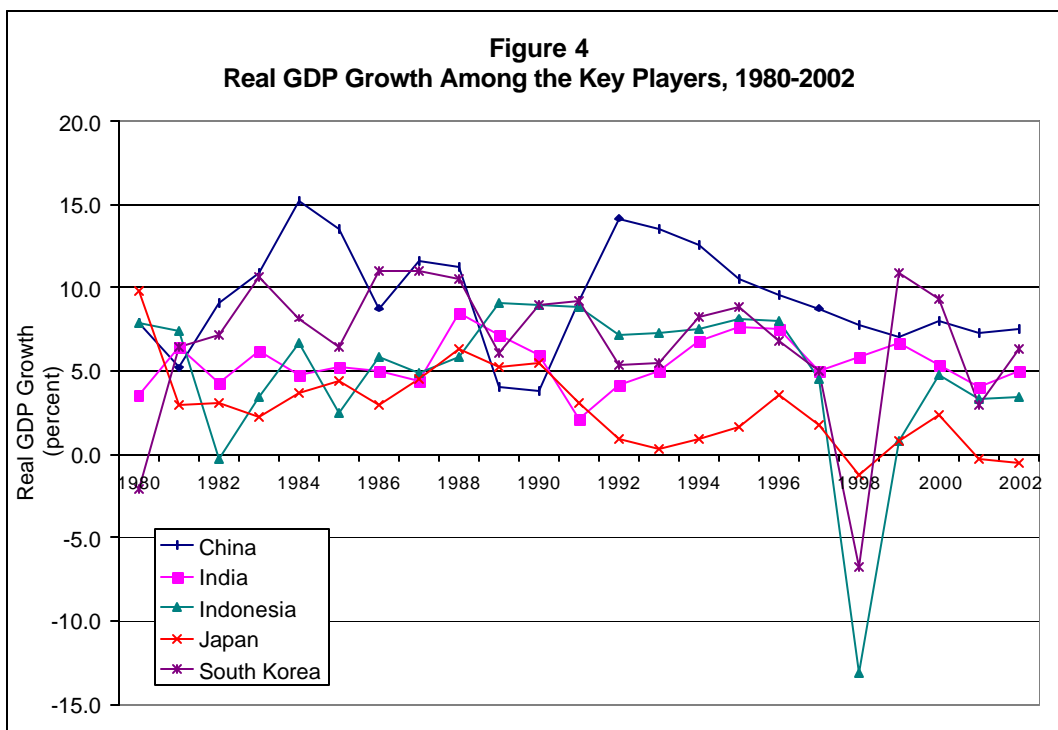
<sup>1</sup> This report draws on the East-West Center and FACTS Inc. database and conversations with industry contacts.

## Regional Economic Outlook

Over the past several decades the Asia-Pacific economies have been among the most dynamic in the world, and the economies of China, Japan, India, Indonesia and South Korea dominate the region. For comparison, Figures 2 and 3 illustrate the share of GDP of the Key Players using two common measures: (1) *GDP in U.S. dollars*, which reflects the vagaries of exchange rates and the high cost of living in Japan, and (2) *GDP in terms of Purchasing Power Parity*, which reflects the true cost of living in a country and the immense purchasing power of countries like China and India.



Comparing economic growth rates among the five key countries over the past several decades reveals a large amount of variation across the economies, as illustrated by Figure 4. Overall, the economies experienced robust growth throughout most of the 1980s. In the early 1990s the Japanese economy stagnated while the rest of the region continued to post relatively rapid economic growth. In 1997-98 the regional economic crisis sent the economies of Indonesia and Korea into a tailspin, while China and India remained relatively unscathed. In recent years, while positive growth has returned to Indonesia, it is subject to a wide variation as it lurches from one political crisis to the next. In contrast, Korea's economy has posted strong growth, driven largely by buoyant domestic demand and, more recently, exports. China's growth has also remained remarkably robust, led by strong public investment and export growth. India's growth has declined somewhat, as the benefits of earlier structural reform efforts are beginning to fade. At the same time, Japan has continued along the path of stagnation and/or decline and it is experiencing its third recession in the past decade.



Among the less developed of the Key Players, China and India look set to continue to drive economic growth in the region. China's future growth will depend, in large, on continued structural reforms, including developing a commercially oriented banking system and pushing forward with the restructuring of its state enterprises. While China's entry into the WTO may come at the cost of some short- to medium-term adjustments, it should be a boon to its long-term growth prospects. India's growth prospects are tied to continued progress toward privatization, strengthening the financial system, further opening to trade and foreign investment, and removing restrictions on agricultural and industrial activity. The country's fiscal deficit, which is among the highest in the world, is also a source of concern. If progress toward reform does not continue, India's economy could continue to slow. Finally, Indonesia is the true wild card in this picture, as its future growth prospects are tied to its precarious political situation. We count ourselves among those who are cautiously optimistic about Indonesia's future growth prospects.

Turning towards the more developed economies among the Key Players, South Korea should continue to post solid growth, but it is likely to slow as it transforms itself from an economy playing "catch-up" into a more mature economy where GDP growth on the order of 5-8 percent is much harder to come by. Most project that Japan will return to modest growth, but there is a danger that it will disappoint, as it has in the past. To ensure a return to growth, Japan needs to take decisive action to deal with long standing structural impediments, particularly in the banking sector, where unrecognized nonperforming loans make banks unwilling to lend. These problems are well-known, but unfortunately action has been limited.

## **Regional Oil Demand Outlook**

Robust economic growth is generally linked with increased energy consumption, and this has certainly been the case in the Asia-Pacific region. Petroleum product demand grew in the range of 5-6 percent per year between the mid 1980s and the mid 1990s, before dropping off with the 1997-98 regional economic crisis. Demand growth has not recovered to these levels, and looking forward it is likely to remain in the range of 1.5-3 percent per annum, as reflected in Figures 5 and 6. It should be noted that

part of the region’s slowdown in the growth of oil consumption can be traced to a drop-off in economic growth in some countries, but part of it must also be attributed to deregulation and important changes in market structure that has left consumers much more exposed to relatively high oil prices than they were in the past—a trend that is likely to continue. Consumers are responding to the recent high oil prices as might be expected, by reducing demand.

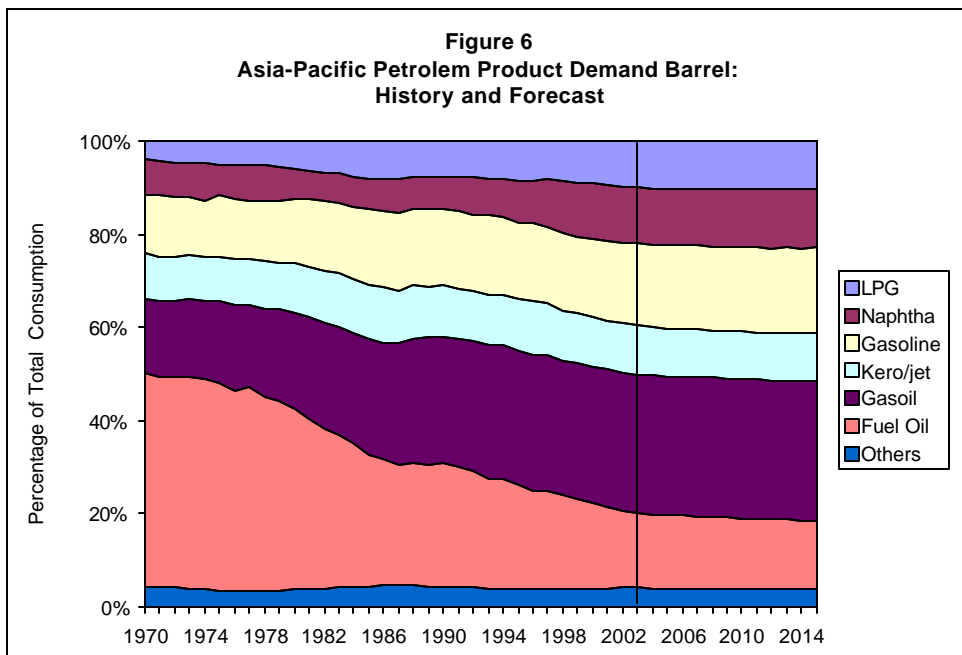
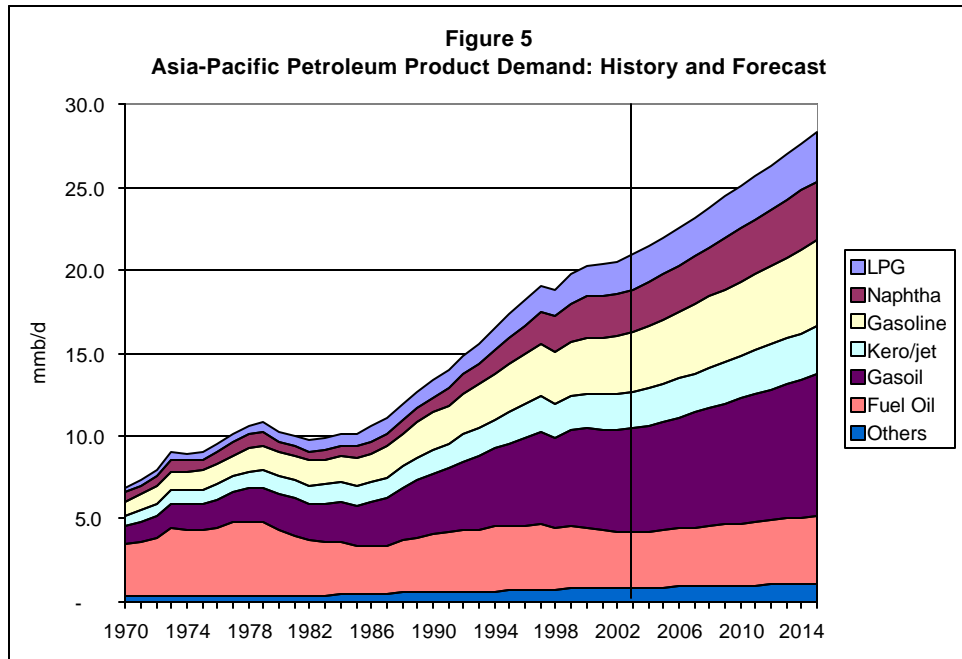
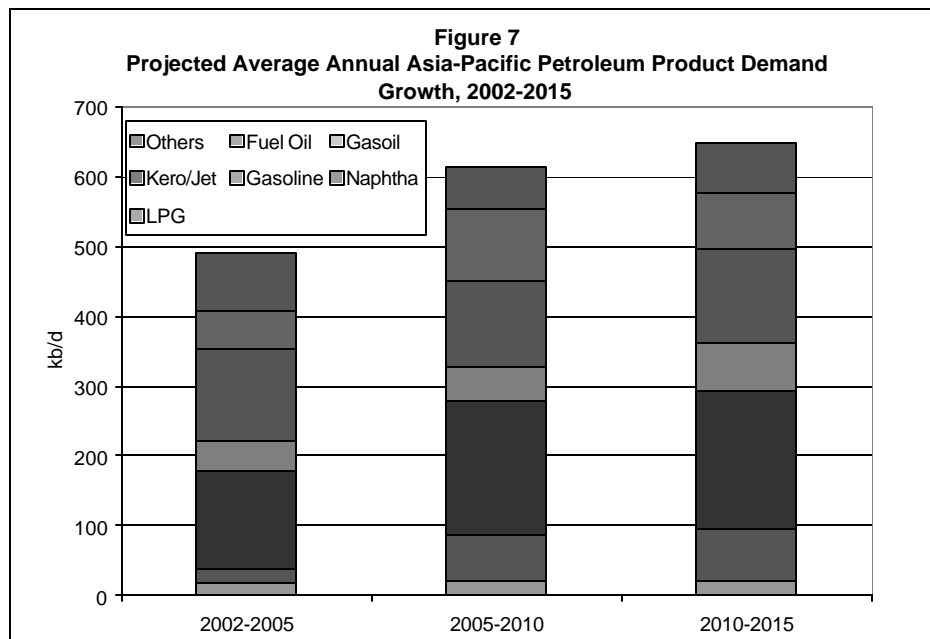




Figure 7 highlights the outlook for incremental demand growth for each product. It shows that the consumption of LPG and naphtha is projected to slow somewhat from the extremely high growth rates that these products had posted over the past several decades. As would be expected as the region's economies grow and mature, consumption of transport fuels will grow faster than overall consumption. Gasoline and gasoil account for 55.6, 51.3 and 51.2 percent of incremental growth over the periods 2002-05, 2005-10 and 2010-15, respectively. Finally, in contrast to other areas of the world, fuel oil consumption will continue to grow, albeit slowly.



Turning the focus towards individual countries, aside from China, the performance of the Asia-Pacific petroleum market has been disappointing over the past several years. This year regional demand growth is projected to return to more “normal” levels, but Japan is the wild card. If it continues to decline, regional growth will remain stagnant. Looking further forward, China, India and Indonesia are set to lead future growth. As reflected by Figure 8, these countries currently consume less than 0.05 barrels/person/day, so obviously there is a lot of room for growth in the developing countries of the region. At the same time, Japan and South Korea average over eight times as much consumption per capita. Because their markets are more mature, Japan and South Korea's role in incremental growth is likely to be smaller than in the past. However, as major consumers they still have the potential to substantially affect the market.

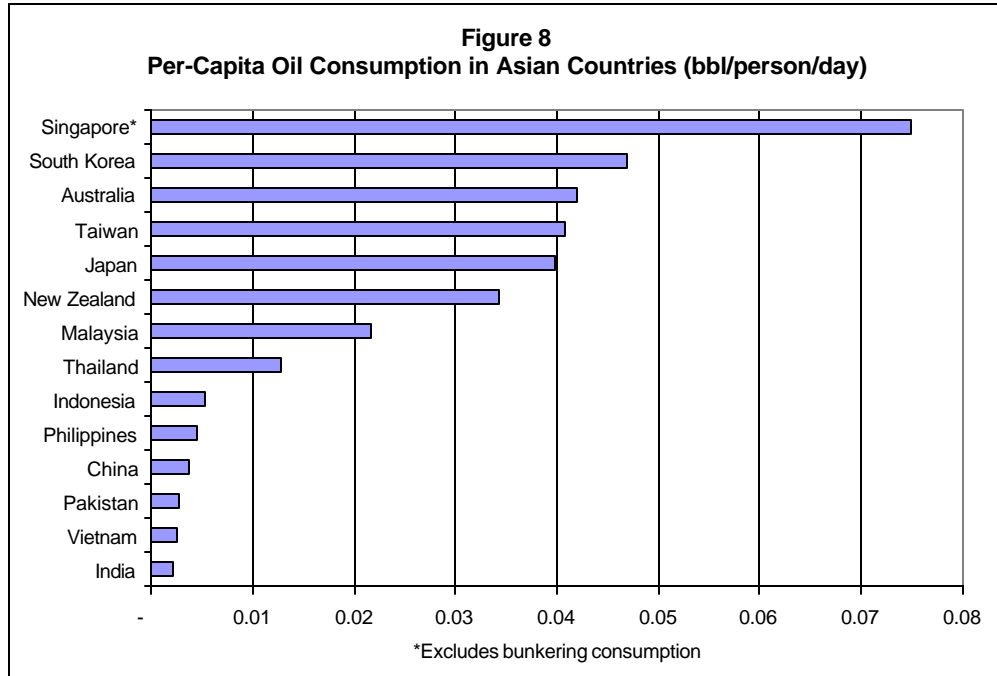
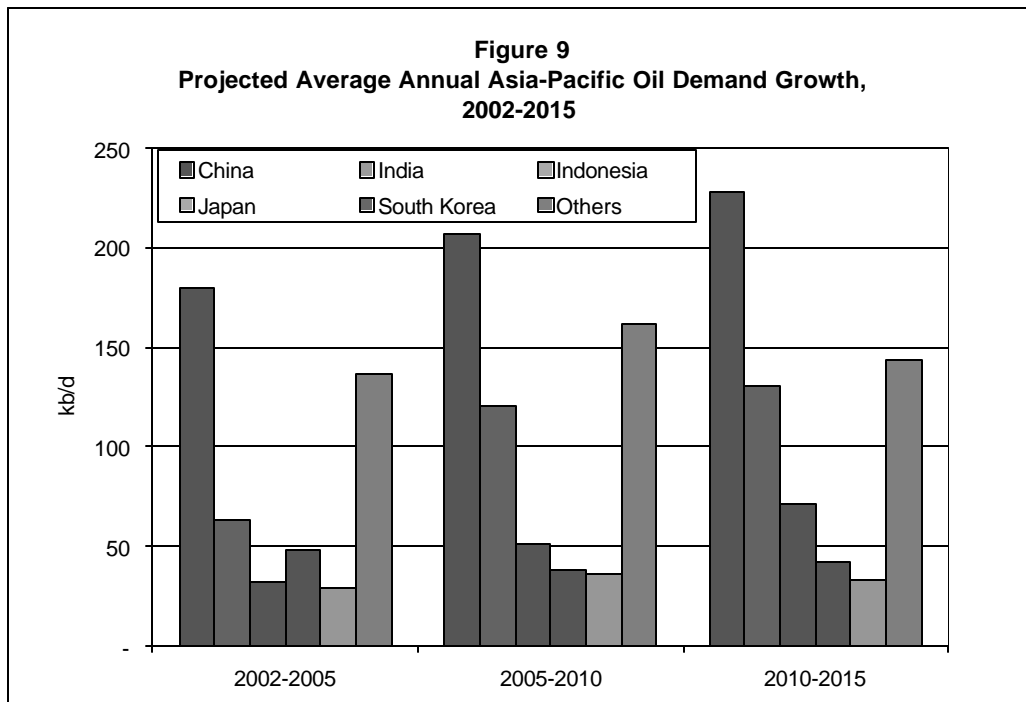


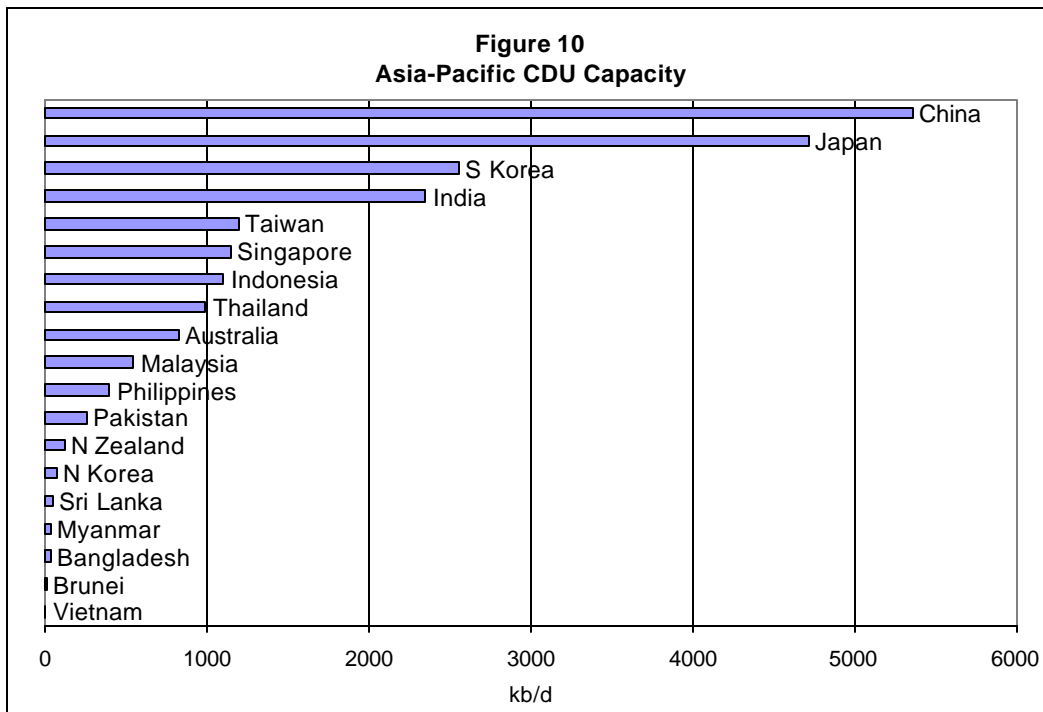
Figure 9 shows projected incremental demand growth among the Key Players. China and India are projected to account for between 50 and 55 percent of regional demand growth over the periods 2002-2005, 2005-2010, and 2010-2015.

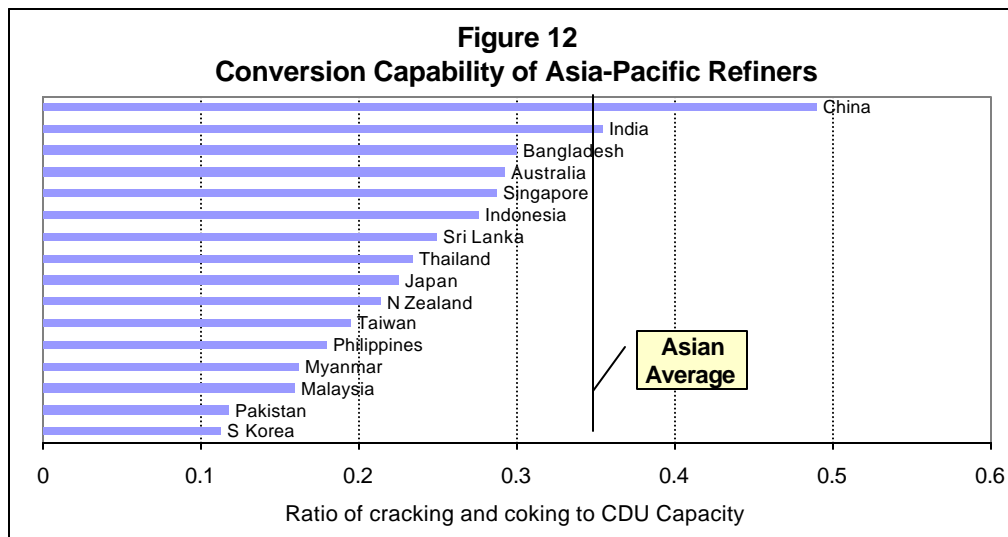
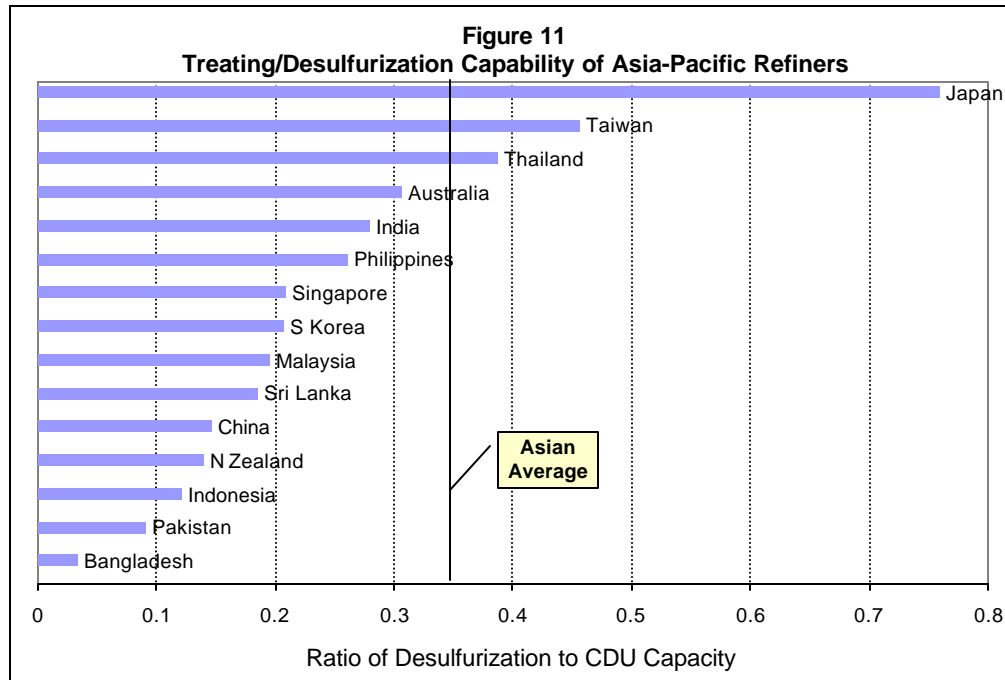


## Regional Refining Outlook

Over the past several years the Asia-Pacific region has witnessed dramatic developments in the downstream sector. Between 1999 and 2001 approximately 2.5 mmb/d of CDU capacity came on line, mostly in China, India and Taiwan. These additions coincided with relatively high crude prices and weak product demand, and consequently they had a tremendous negative impact on refining margins in the region.

Figure 10 shows that the Key Players dominate the regional refining scene. Japan's high ratio of desulfurization to CDU capacity, as illustrated by Figure 11, can be traced to the fact that it imports large volumes of sour Middle Eastern crudes. In contrast, China's refineries are geared towards heavy sweet domestic crudes, and thus the cracking to CDU ratio is almost double the Asia average, as indicated by Figure 12.





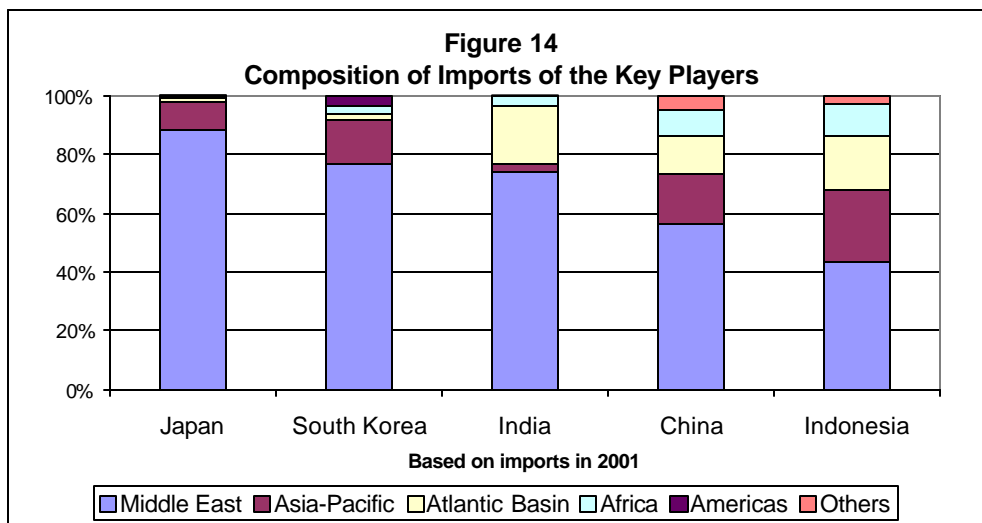
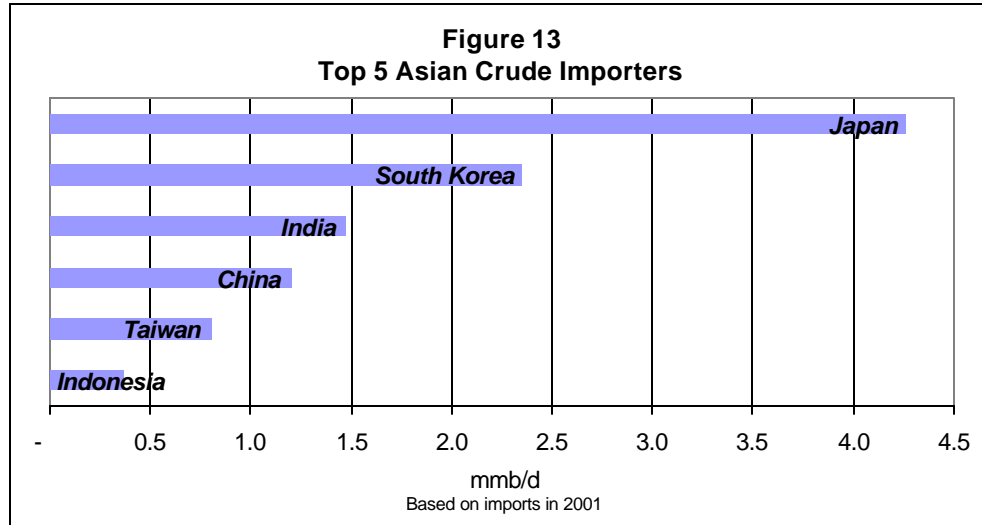
It is important to remember that while steps have been taken towards deregulation, most of the Asian refineries continue to operate in protected conditions, as discussed in detail in the country sections. For example, in China and India, refiners receive protection via the structure of import duties on crude and products, where the duty on crude is lower than products. As a consequence, they often enjoy healthy margins, even when refining margins are negative for those operating in the free market. In Indonesia

there is also heavy market intervention in that Indonesian refiners enjoy a guaranteed rate of return. Japan and South Korea's refiners do not enjoy the protection of a formal tariff-based mechanism, but their market structures make it very difficult for outside competitors to establish refineries or import products.

## **Regional Crude and Product Balances Outlook**

Most Asia-Pacific producers consume their crude production domestically. For example, in 2002 almost 70 percent of the crude produced in the various Asian countries was consumed within the same country. China is by far the region's largest producer, at 3,401 kb/d in 2002, followed by Indonesia at 1,318 kb/d. Among the other Key Players, India is the region's fourth largest producer (659 kb/d). Looking forward, China's production is projected to increase, but this increase will be counteracted by declines in Indonesia, Australia and Malaysia, so that overall regional crude output is projected to decline. India's production is stable, but growth will remain sluggish unless India adopts a more open foreign investment policy in the upstream oil sector.

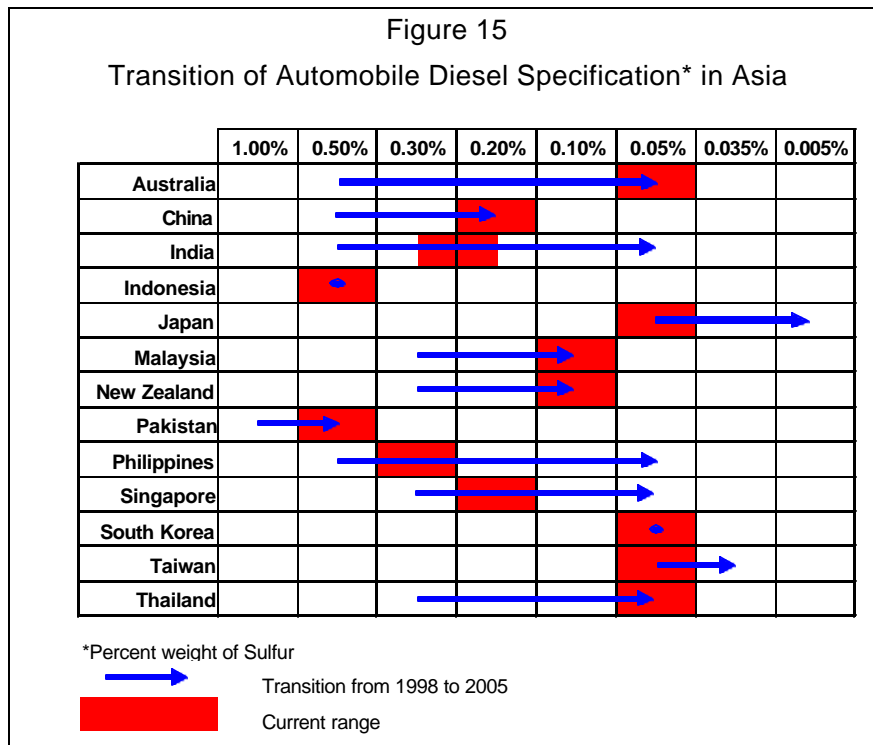
Currently, the Asia-Pacific region imports approximately 11 mmb/d of oil. With domestic production projected to remain flat, Asian imports will grow in the future—imports of 14-16 mmb/d are possible towards the end of the decade. Japan is the region's largest importer, followed by South Korea, India, and China. Indonesia sits in the number six position, as indicated by Figure 13. Of this group, Japan has the heaviest dependence on Middle Eastern oil and Indonesia has the lowest, as reflected in Figure 14. Overall, Middle Eastern oil accounts for over 75 percent of the region's imports. At the same time, Asia is the Middle East's largest customer, accounting for over 60 percent of the crude exported from the region. Given current trends in production and consumption, it is clear that these two regions will become increasingly intertwined in the future.



## Regional Policy Trends

Among the policy trends that will drive the oil industry in the Asia-Pacific region are continued deregulation and privatization, as discussed in the individual country sections, as well as ever-tightening product specifications. Figure 15 highlights changes in diesel specifications. Some of the Key Players, such as South Korea and Japan, have already attained .05 percent sulfur for automotive diesel, and Japan aims to move to .005 percent by 2005. At the same time, while China and Indonesia are content

to remain at .20 and .50 percent, respectively, through 2005, India has ambitious plans to lower sulfur to .05 percent.



Based on recent developments in treating/desulfurization infrastructure, Asian refiners are generally capable of achieving these specifications. A longer-run impact of tightening product specifications is that inter-regional trade of products could emerge as Asia's specifications converge with the U.S. and European markets. This could help ease the product surplus which currently prevails in the Asia-Pacific market.

## China

By any standard, China's energy sector is huge. The world's most populous country ranks second in total primary commercial energy consumption after the United States, and third in primary energy production after the United States and Russia. China's primary energy consumption declined for two consecutive years in 1997 and 1998, mainly because of a drop in coal consumption. Although coal

consumption continued to decline in 1999 and 2000, due to strong demand for oil and natural gas, the overall growth of total primary energy use was positive between 1998 and 2001.

	1995	1996	1997	1998	1999	2000	2001	2002*
Crude Production (million b/d)	3.00	3.14	3.21	3.21	3.21	3.24	3.30	3.41
Oil Consumption (million b/d)	3.16	3.41	3.79	3.87	4.22	4.54	4.65	4.81
Annual Growth Rate	8.0%	7.9%	11.1%	2.3%	8.8%	7.6%	2.4%	3.4%
Refining Thruput (million b/d)	2.19	3.01	3.32	3.31	3.67	4.20	4.20	4.39
Crude Oil Imports (kb/d)	342	457	709	546	732	1,399	1,205	1,388
Crude Oil Exports (kb/d)	377	407	397	312	143	208	151	144
Product Imports (kb/d)	364	422	593	624	620	522	592	646
-LPG	74	113	115	152	176	153	155	199
-Gasoil	125	94	152	103	26	21	15	15
-Fuel Oil	121	175	252	299	323	260	333	303
-Others	43	40	74	70	95	88	89	129
Product Exports (kb/d)	110	120	157	146	176	220	247	266
-Gasoline	43	31	42	42	96	106	134	143
-Kero/jet	8	16	16	20	27	38	34	34
-Gasoil	27	32	47	20	12	12	5	26
-Others	32	41	53	63	41	63	74	63

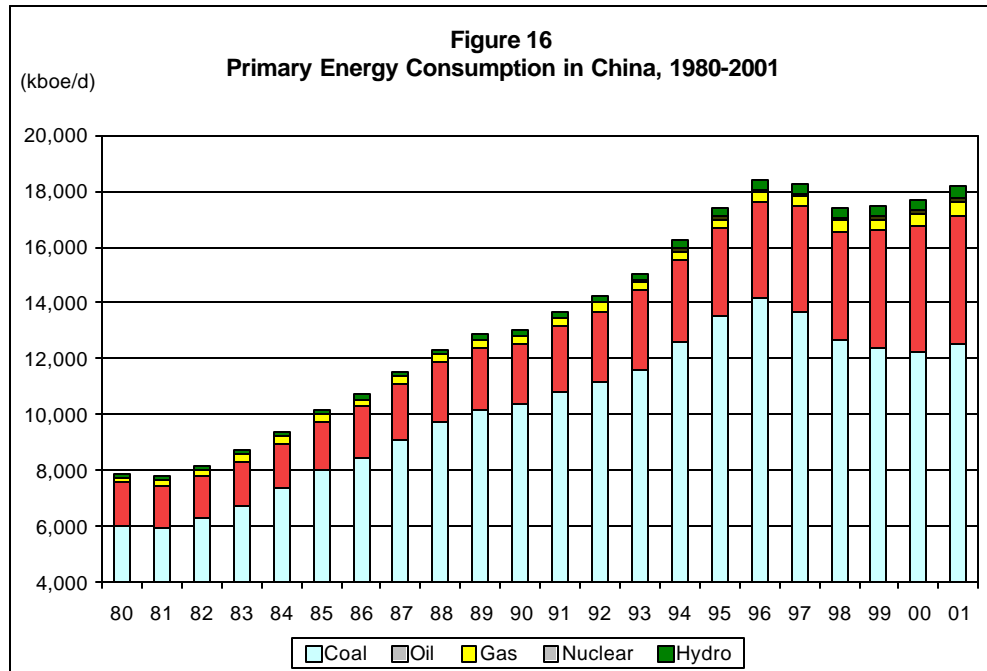
Notes: \*Preliminary

Overall, coal dominates China's primary energy consumption, as indicated by Figure 16. Oil is the second-largest source of primary energy consumption in China, and it is obviously extremely important to the economy. China's growing dependence on imported oil is of increasing concern to the Chinese government, and it has led to a hot debate over China's future energy security. Natural gas currently has a minor share of total primary energy consumption in China, but its importance is growing. In comparison to other countries, nuclear power was a late starter in China's energy development, but it has expanded rapidly in recent years. Finally, hydropower has traditionally been given priority status, and thus construction of hydropower plants has proceeded relatively quickly over the past several decades.

With five decades of development, China has established a full-fledged oil industry that plays an important role in China's social, economic, and energy development. Globally, China is one of the largest oil producers, refiners, and consumers in the world. It ranks fifth in crude oil production (after



the United States, Saudi Arabia, Russia, and Iran) and third in both petroleum product consumption (after the United States and Japan) and oil refining capacity (after the United States and Russia).



Although structural and market reforms started in the early 1980s and much progress has been made, the petroleum industry is still one of the most heavily protected industries in China. Until the late 1990s, progress in reforming the management system overseeing China's petroleum industry had been slow. Through the state oil companies, the government continued to have a firm grasp on the entire petroleum industry—ranging from upstream exploration, development, and production to downstream refining and marketing. Recently this has changed, as reform has accelerated since the late 1990s, particularly with China's entry into the World Trade Organization (WTO) at the end of 2001.

## Oil Production

Prior to 1998, China's upstream and downstream sectors were largely split between CNPC/PetroChina and Sinopec, respectively. Although the 1998 reorganization has restructured CNPC/PetroChina and Sinopec into two integrated oil companies, China's onshore oil production is

still dominated by CNPC/PetroChina. In 2001, China produced 3.3 million b/d of crude oil, up from 2.1 million b/d in 1980 and 2.8 million b/d in 1990.

The majority of China's crude oil is produced onshore, but the share of offshore production has been increasing rapidly, from 1.0 percent in 1990, to 5.7 percent in 1995 and 11.4 percent in 2001. Offshore crude production accounted for about two-thirds of the country's net incremental output during the period of 1990-2001.

In 2001, about 31 percent of crude production was from the Daqing oil field. At present, the second largest oil field is the Shengli oil field and the third largest is the Liaohe oil field. Altogether, output from these three fields accounted for 56 percent of China's total oil production in 2001, down from 74 percent in 1990.

Crude output from Xinjiang Autonomous Region in the West, which includes production from three major basins—Tarim, Junggar, and Turpan-Hami—increased from 139 kb/d in 1990 to 339 kb/d in 2001. In fact, Xinjiang was the largest contributor to China's incremental onshore production during this period, followed by the Ordos basin in the Northwest.

## **The Refining Sector**

Prior to the 1998 reorganization, Sinopec dominated China's refining sector, but CNPC/PetroChina had a sizable refining capacity comprised mainly of small to medium refineries. After the reorganization, CNPC/PetroChina's downstream position has been enhanced.

At the start of 2002, China had approximately 5.6 million b/d of crude distillation capacity (although up to 300 kb/d of locally-owned small refineries cannot be fully identified), up from 3.1 million b/d at the beginning of the 1990s. In 2001, crude runs in China reached 4.2 million b/d, up from 1.6 million b/d in 1980 and 2.2 million b/d in 1990.

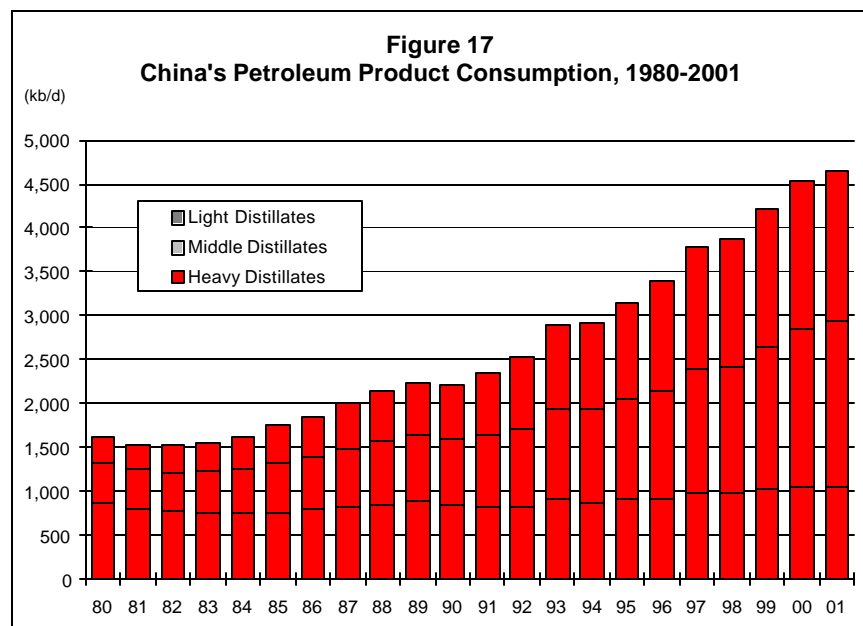
As far as refinery configurations are concerned, the Chinese refining sector is distinguished by the following characteristics: (1) large overall crude distillation capacity, but relatively small refineries; (2) high fluid catalytic cracking (FCC) and resid catalytic cracking (RCC) capacity; (3) uneven distribution

of refining facilities among different regions; (4) low catalytic reforming capacity; and (5) low utilization rate. Several of these characteristics are much more pronounced at CNPC/PetroChina, since the markets within its geographical area are much smaller than that of Sinopec.

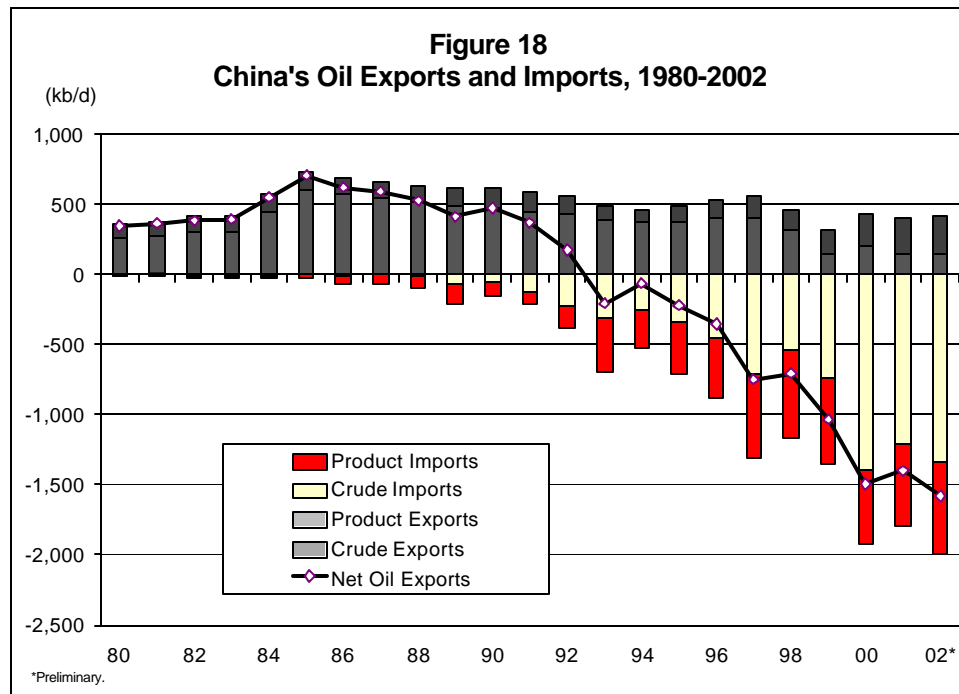
It is important to note that China is under pressure to increase its sour-crude processing capacity to deal with increasing Middle East crude imports and the declining availability of sweet crudes within the Asia-Pacific region. Under these circumstances, Sinopec has a huge government-approved plan underway to upgrade its refineries and increase its sour-crude handling capacity by 400-600 kb/d over the next five years.

### Petroleum Product Demand and Oil Trade

China's petroleum product demand is characterized by spectacular growth—especially since the early 1990s—and a radical transformation of the consumption pattern, as illustrated by Figure 17. In 2001, China's petroleum product demand of 4.6 million b/d (including the direct use of crude oil in the industrial sector and for power generation) was the second largest in the Asia-Pacific region after Japan. Over the past two decades (1980-2001), petroleum product demand growth has averaged 5.2 percent per annum, and most recently growth has accelerated to 7.0 percent per year, on average, since the 1990s.



China's crude and product exports peaked in the mid 1980s at 600 kb/d and 125 kb/d, respectively, but have since declined. In the meantime, imports of crude, and to a lesser extent, products have rapidly increased. China has become a net overall oil importer since 1993. In 2001 net imports reached just under 1.4 million b/d and surged to over 1.6 million b/d in 2002, as indicated by Figure 18. China is still a crude exporter, but the volume is much smaller today than it was a decade ago.



## Oil Price Reform

China's oil price reform efforts date back nearly twenty years, when the first moves were made to raise prices that were well below the international market. The current pricing regime took root in June 1998 when China established a formula to link domestic gasoline and diesel prices with Singapore market prices. However, China, failed to implement the pricing formula for over a year, until October 1999. Full implementation of the new pricing regime on a monthly basis started only in May 2000, and from May 2000 to September 2001 China's prices were largely linked to the formula. Starting in October 2001, China modified the price formula to include elements of market prices in New York and Rotterdam, in addition to Singapore prices. The new price system has resulted in less frequent adjustments of domestic prices.

Prior to October 2001, the pricing regime had the following features: (1) The State Development Planning Commission (SDPC) set baseline retail prices, as well as baseline ex-refinery prices which applied to direct supplies of refined products to large and state designated special users, including the railway companies and the military, among others. (2) CNPC/PetroChina and Sinopec set their final specific retail prices within a 10 percent band of the baseline retail price (5 percent above and below the baseline). (3) CNPC/PetroChina and Sinopec also set their ex-refinery prices to the market, which in most cases was the same as the SDPC-set price at the refinery gate. (4) CNPC/PetroChina and Sinopec set the wholesale prices, where the retail-wholesale differential was a minimum of 5.5 percent. (5) SDPC's baseline retail prices were adjusted every month based on the previous month's Singapore price changes.

Since October 2001 baseline prices have been calculated based on a basket of Singapore, Rotterdam, and New York prices, with the weights of the three markets kept secret and changing. Instead of monthly changes, SDPC now keeps the retail baseline prices within a band. Only when large enough changes occur to the basket price will SDPC opt to change the baseline retail gasoline and diesel prices. CNPC/PetroChina and Sinopec also have more flexibility. They can now determine their own specific final prices within 16 percent of the baseline retail prices set by SDPC (8 percent above and 8 percent below the baseline price).

## **WTO and China**

Following China's entry into WTO in December 2001, the country's major concessions and obligations for reform in the petroleum sector are in the areas of oil trade and domestic oil marketing. These include:

- Crude imports (tariff): Effective January 1, 2002, the import tariff was reduced from 16 Yuan (US\$1.93) per metric ton (tonne) to zero.
- Crude imports (import quota): Starting in 2002, China agreed to increase the crude import quota by 15 percent for ten years and renegotiate thereafter. For 2002, a minimum 144 kb/d

crude oil import quota needs be allocated to non-state oil companies (the actual allocation was 165.6 kb/d).

- Product imports (tariff): In varying degrees, import tariffs have been reduced since January 1, 2002. The tariff rates are: LPG: 3 percent (down from 6%); Naphtha: 6 percent (unchanged); Gasoline: 5 percent (down from 9%); Kerosene and jet fuel: 9 percent (unchanged); Diesel: 6 percent (unchanged); Fuel oil: 6 percent (unchanged).
- Product imports (import quota): Starting 2002, the refined product import quota is to be increased by 15 percent for two years and abolished by January 1, 2004. In 2002 and 2003, a minimum of 20 percent of the import quota is to be allocated to non-state oil companies. After the quota is abolished, only licensed and qualified traders, including foreign traders, can import major refined products.

The specific situation for 2002 and 2003 can be summarized as follows:

- For 2002, China issued 165.6 kb/d of crude oil import quota to ten non-state oil companies. It also issued a total refined product import quota of 420 kb/d, 80 percent assigned to the designated state oil trading companies and the rest to non-state oil companies.
- For 2003, China issued 190.4 kb/d of crude oil import quota to ten non-state oil companies, up 15 percent from the non-state oil company quota in 2002. It also issued a total import quota of about 483 kb/d for major petroleum products, up 15 percent from the quota in 2002. As in 2002, 20 percent of the quota will be allocated to non-state oil trading companies.

China's major concessions and obligations under the WTO for retail market entry, include the following:

- The retail market for oil products will be open to foreign firms after the first three years under the WTO.
- The wholesale market for refined products will be open after five years under WTO.
- During these three and five year transitional periods, gradual opening may be implemented.

Our overall assessment regarding China's implementation of the WTO obligations is that in general the process will be slow. The state oil companies will find every chance to fight the implementation, particularly when their interest is at stake. In spite of this opposition, the process will steadily move forward as the government appears to be determined to comply with the WTO rules as much as possible. In the end, a delay in fully complying with WTO rules is likely, but the state oil companies will eventually subject themselves to increased competition in a freer market under WTO.

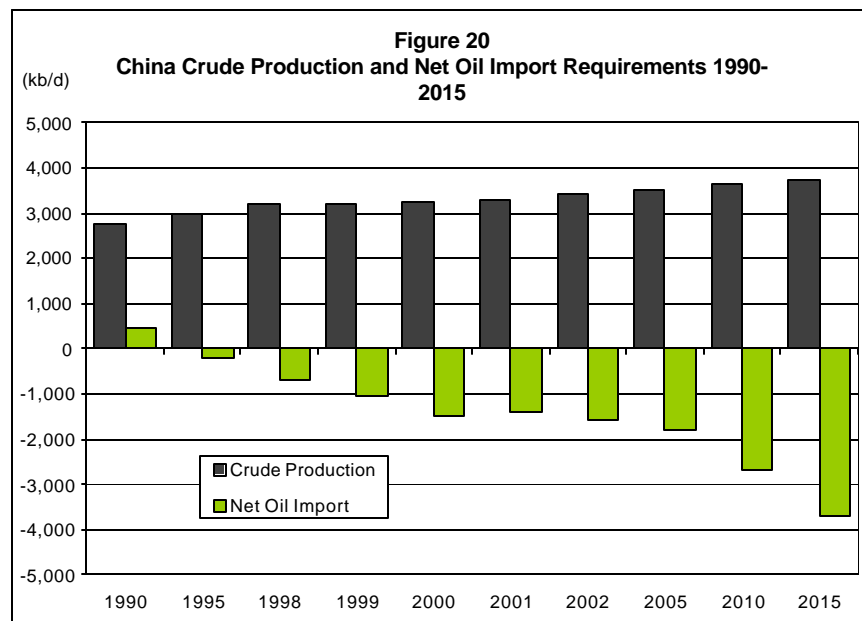
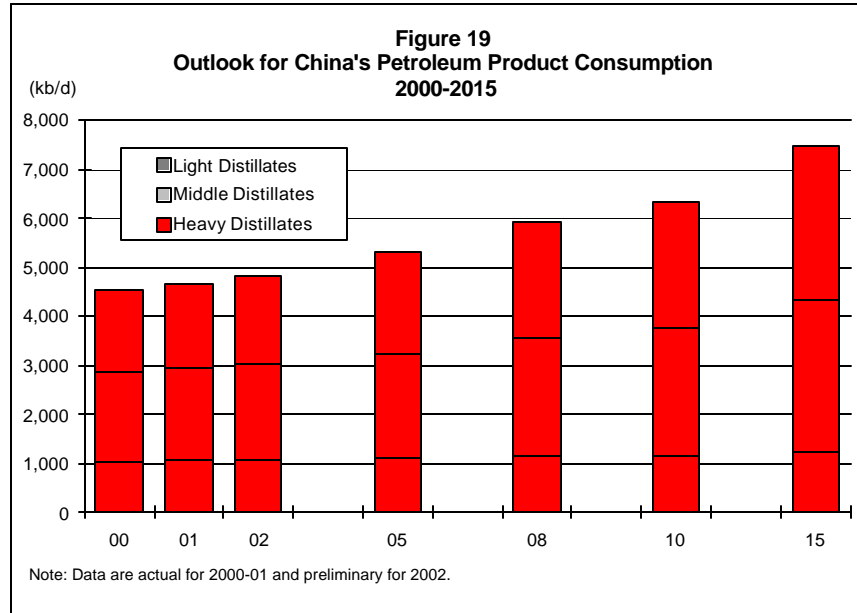
### **Outlook for Oil Demand, Supply, and Trade**

Looking forward, China's petroleum sector is expected to change dramatically over the next ten to fifteen years. On the supply side, crude production growth within China is expected to be flat. At the same time, petroleum product demand growth is likely to be strong. The net result is a continuously rising import requirement for oil over the long term.

Our base-case forecasts indicate that total oil consumption (petroleum product demand plus direct use of crude) in China will grow at an average annual rate of 3.4 percent during the period 2000-2015. Consumption is projected to reach 6.3 million b/d in 2010 and 7.4 million b/d by 2015, as indicated by Figure 19. Of course, these projections are sensitive to alternative assumptions under different scenarios.

As for the refining industry, expansion is under way to raise the country's capability to handle sour crude from the Middle East. In recent years, because of concerns about the low utilization rate of the existing refineries, the government has imposed restrictions on new refinery projects and foreign investment in the refining sector. However, foreign investment in refinery-petrochemical integration projects is still encouraged.

Overall, as domestic production continues to lag behind demand, China's net oil (including both oil and products) import requirement is expected to surge to 1.8 million b/d in 2005, 2.7 million b/d in 2010, and 3.7 million b/d by 2015, as shown by Figure 20. Between 70 and 85 percent of the imports are likely to be crude while the rest will be refined products. The role of the Middle East in producing imports, which is already important, will steadily increase.



## Overseas Investment Strategy

Because of a continuous rise in oil imports and price volatility in the global oil markets, energy security is an increasing concern among Chinese energy policy makers. While China has not yet established a full-ranged energy security policy framework, the following has emerged as the main elements of the policy:

- To enhance domestic oil and gas E&P activities and maximize oil and gas production.



- To diversify sources of oil and gas imports, increasing the share of oil and gas imports from Russia and Central Asia.
- To strengthen overseas investment by state oil companies, particularly in the Middle East, Asia-Pacific, Russia, and Central Asia.
- To undertake different trading methods to avoid transaction risks.
- To increase investment in an oil and gas infrastructure and open more channels to imports.
- To establish a national or strategic petroleum storage.

Of these policy elements, the promotion of overseas oil and gas investment by state oil companies has taken center stage at present. China's overseas upstream oil and gas investment began in the early 1990s and increased dramatically in 1997 when CNPC signed a series of investment contracts in Venezuela, Kazakhstan, and Sudan. The search for investments cooled during the 1998-99 period because of depressed international oil prices, but it has surged again since 2000.

Currently, six state-owned oil companies plus one state-owned non-oil company in China have overseas upstream departments: CNPC, PetroChina, Sinopec, CNOOC, Sinochem, and CITIC (China International Trust and Investment Corp.). CNPC is dominant in China's overseas oil and gas investments, but CNOOC is also active. Sinopec and PetroChina are trying to catch up and Sinochem is a late comer, followed by CITIC. The state oil companies are active in a number of areas, including:

- CNPC: Kazakhstan, Peru, Sudan, Venezuela, and possibly Iraq, etc.
- CNOOC: Indonesia and others.
- Sinopec: Iran and others.
- CITIC/Sunwing Energy JV: Interest in the Middle East and Africa.

With massive investment (often overspending), CNPC has managed to establish 250 kb/d of overseas crude and 71 mmcf/d of natural gas producing capacity. In 2001, CNPC's equity oil reached 166 kb/d, up from 110 kb/d in 2000. CNPC's target is to have 360 kb/d of overseas equity oil by 2005. Sinopec plans to invest up to US\$10 billion in the overseas upstream oil sector during the first half of

this decade, raising its overseas equity oil to 40 to 60 kb/d by 2005. On an overall basis, it is estimated that up to 600 kb/d of overseas equity oil may be acquired by all Chinese state oil companies by 2005.

## India

Turning to India, it should be emphasized that almost 40 percent of India's energy needs are currently fulfilled by combustible waste/renewable forms of fuel, which includes burning wood and biomass. As the country develops and moves away from these types of fuels, the potential for growth in oil consumption is huge. This section of the report provides a brief overview of India's oil industry, including highlights of the progress that has been made towards deregulation and privatization.

	1995	1996	1997	1998	1999	2000	2001	2002*
Crude Production (kb/d)	707	665	682	665	658	645	648	666
Oil Consumption (kb/d)	1,529 6.5%	1,660 8.5%	1,765 6.4%	1,878 6.4%	2,031 8.2%	2,059 1.4%	2,062 0.1%	2,065 0.1%
Refining Thruput (kb/d)	1,169	1,241	1,301	1,336	1,589	1,996	2,152	2,190
Crude Oil Imports (kb/d) <sup>1</sup>	627	579	624	597	931	1,351	1,504	1,524
Crude Oil Exports (kb/d)	0	0	0	0	0	0	0	0
Product Imports (kb/d)	390	451	488	516	438	271	196	154
-LPG	20	36	40	54	61	34	26	44
-Gasoil	226	278	285	233	138	35	0	0
-Fuel Oil	17	25	15	27	18	29	19	31
	0	0	0	0	0	0	0	0
Product Exports (kb/d)	61	62	53	24	24	102	159	182
-Gasoline	0	0	0	0	2	13	49	64
-Gasoil	4	4	5	0	6	44	55	60

Notes: \*Preliminary; <sup>1</sup>1999 onwards is calculated from crude runs and domestic production

## **Transforming an Industry: Deregulation and Privatization**

Over the past several years India's oil industry has initiated a number of major reforms with mixed results. In April 2002 the government dissolved its administered pricing mechanism (APM), which resulted in a partial decontrol of domestic prices of petroleum products. In principle, the oil marketing companies—all of which are government owned—are now allowed to revise their sale prices in line with international oil prices. In practice, however, they still require the ministry's agreement to do so.

In 2002 the process of privatizing state-owned downstream oil companies was also initiated. IBP Ltd., a small downstream operator, was the first to be sold, but it was sold to Indian Oil Corporation (IOC)—the country's largest government-owned downstream company—so this was really a case of one government company acquiring another, not privatization. Plans to privatize two state-owned downstream companies, Hindustan Petroleum Corporation Ltd. (HPCL) through a sell-off to a strategic partner, and Bharat Petroleum Corporation Ltd. (BPCL) through a public offering, were also announced at this time. Initially the process met little success due to controversy amongst various government departments and ministries, but recently it looks set to move forward. The government has invited bids for the sale of a 35 percent share and management control of HPCL. There are indications that the public offering of BPCL will be executed through both foreign and domestic channels, though the exact details have not been formalized.

It should be noted that an important issue for the private sector giant, Reliance Petroleum Ltd. (RPL), under deregulation, is to secure access to retail outlets for domestic sales, which makes RPL a front runner in bidding for a controlling share in HPCL. Another local contender is the state-run crude producer Oil and Natural Gas Corporation Ltd. (ONGC), which seeks to become an integrated oil major, although recent reports suggest that the government has banned state-owned domestic companies from bidding. ONGC has a monopoly on domestic production of crude and gained the right to market oil products after the April 2002 deregulation. Both ONGC and RPL satisfy the government's conditions on selling petroleum products in the country. This calls for a minimum investment of US\$450 million in the downstream sector. The investment must be in the form of refining or distribution infrastructure, and any investment in developing a retail network is not counted.

Alternatively, the company must produce at least 3 mmtpa. It is being recommended that IOC not be allowed to participate in the bidding for BPCL and/or HPCL in an effort to avoid an all-out monopoly.

An additional factor that will become increasingly important in a fully deregulated scenario is access to distribution and storage infrastructures. A company that has a monopoly on these facilities can gain an unfair advantage over other players. A major step in addressing this concern was the creation of Petronet India in 1998. This company will manage distribution and storage infrastructure developed after 1998. These facilities, will in principle, be managed under common-carrier rule, allowing access for all refiners in the country.

In summary, developments in India's privatization process are being watched keenly, as the stakes are high for everyone involved. For the government, its future credibility is at stake. For domestic players like Reliance Petroleum, this is an opportunity to gain access to the retail market. Finally, for foreign investors it is the chance to obtain a slice of the Indian market. Although these changes appear to be dramatic, it must be remembered that the government has no plans to cede control of IOC, ONGC and GAIL, which currently dominate the downstream oil, upstream oil, and gas sectors, respectively. Therefore, even with the loss of some control over HPCL and BPCL, the government will continue to exercise its influence over the country's oil and gas sector.

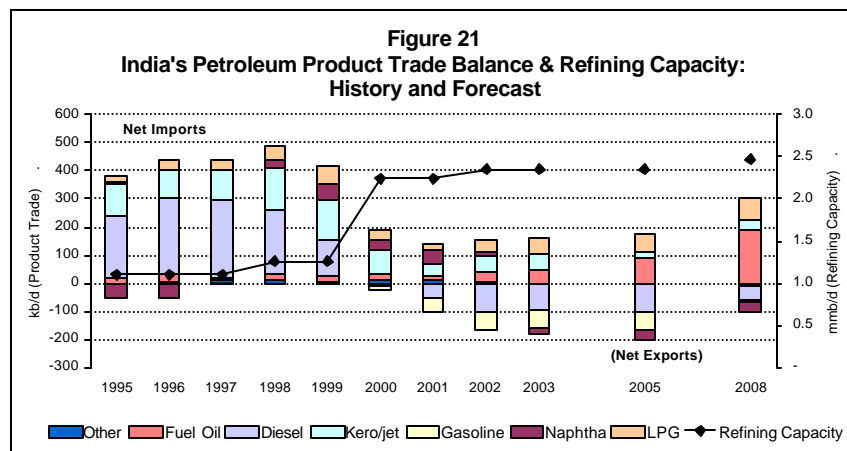
### **Downstream Facts and Issues**

Currently, over 2.2 mmb/d of refining capacity is installed in India (based on CDU capacity). Of this, 1.02 mmb/d is owned by IOC and 0.54 mmb/d is owned by RPL. The rest is distributed amongst HPCL, BPCL, and other companies.

RPL's Jamnagar refinery often enjoys a competitive edge over other players as the plant has substantial conversion and treating capacity, which gives it the flexibility to use a wide variety of crude grades. However, access to retail sites remains a major issue for privately held RPL, as all of the retail sites are owned by IOC, BPCL, and HPCL. IOC and RPL have a product off-take agreement, which RPL uses to sell products from its refinery. The original terms of the agreement were take-or-pay in favor of RPL, i.e., IOC was bound to buy specified volumes of RPL products and sell these through its retail

sites. IOC was unhappy with this situation, and in early 2002 the company renegotiated the terms of the contract. It is quite likely that this arrangement will be discontinued in the future, which creates a sense of urgency for RPL to find a way to market its domestic sales. One of the leading options is for RPL to develop its own retail network. Alternatively, RPL could purchase HPCL, as discussed previously.

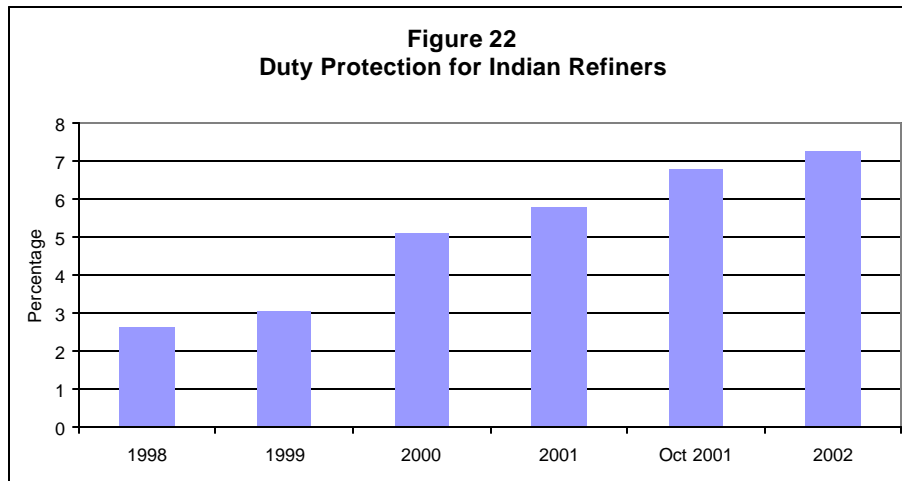
It is important to note that India's refining capacity (in terms of CDU capacity) doubled between 1995 and 2001, transforming the country from a major importer of middle distillates to a net exporter of these products, as depicted by Figure 21. Almost 1 mmb/d of refining capacity came online in 1999 alone. This includes the 540 kb/d Reliance refinery at Jamnagar, over 200 kb/d of IOC refineries across different locations, plus additions from Hindustan Petroleum Corporation Ltd. and Bharat Petroleum Corporation Ltd. Finally little over 100 kb/d of capacity was added at two IOC plants in 2001.



These refining capacity additions were planned at a time when oil product demand was growing at rates exceeding 5-6 percent per annum, but by the time the additions materialized demand growth had diminished to 1-2 percent per annum. This resulted in overall petroleum product surpluses, forcing existing refiners to find export markets for their products. Furthermore, this situation led to the cancellation and delay of some planned refineries, resulting in losses of millions of dollars.

While demand growth has slowed, Indian refiners continue to prosper under the umbrella of tariff protection, which is derived from the differential between petroleum product and crude import duties. Although the level of crude and product import duty has been reduced over the past few years, the differential has increased to over 7 percent overall, as illustrated by Figure 22. Since 1999 the import

duty on crude has been reduced from 22 percent to 10 percent. Similarly, the import duty on a number of products has been reduced from 32 percent to current levels of 20 percent.



These differentials have enabled Indian refiners to enjoy positive margins even at times when the market-driven Singapore margins have been negative. For instance, throughout 2001 Indian refining margins were at least US\$1.00/b and US\$1.50/b higher than Singapore margins for hydroskimming and cracking yields, respectively. This tax policy has far reaching effects. Due to the guaranteed high returns, Indian refiners operate under high utilization rates, which in turn worsens the regional product surplus.

It should be pointed out that the level of import duties and the crude/product differential has been a source of some debate among finance and petroleum ministries over the years. The finance ministry has pressed for lower differentials, which is in line with the overall policy of deregulation of the downstream sector. At the same time, it argues that the tariff level should be held at a reasonably high level to ensure revenue inflow, part of which is used to fund subsidies on petroleum products (LPG and kerosene). In contrast, the petroleum ministry has argued for higher differentials in an effort to support the industry.

In this context, the finance ministry's recently appointed advisory panel on taxes and tariffs is proposing a reduction in import duties on crude to 8 percent for the 2003/4 fiscal year, and further down to 5 percent for 2004/5. Similarly, the panel is advising a reduction of import duties for refined products to

15 percent and 10 percent for the same years. If approved, this could lower the effective rate of protection to 5 percent over the next two years.

### **Upstream Facts and Issues**

Currently, approximately 650 kb/d of crude is produced in India, half of which is the light Bombay High grade. In addition, approximately 100 kb/d comes from fields in Assam and 125 kb/d from fields in Gujarat—with the remaining production coming from various other fields. All of these crudes are refined domestically, as there are no exports. ONGC, which is the major producer of these grades, sells this crude mainly to state-owned refiners IOC, BPCL, and HPCL.

On the whole, over half of India's crude requirement is fulfilled through imports from the Middle East. Domestic crudes account for about 30 percent of the total crude requirement, and the remainder is imported from the Atlantic Basin and other Asian countries. The Atlantic Basin crudes include the relatively sweet grades from West Africa plus the heavier South American grades. RPL imports its complete requirement (approximately 600 kb/d) of crude and prefers heavier grades to take advantage of the high conversion capability at its refinery.

Under the APM, the price of domestic crude was capped at US\$16/b. It was thought that ONGC would be one of the instant beneficiaries of the April 2002 deregulation as it would, in principle, be allowed to price its crude at an international level. After deregulation ONGC raised prices by approximately US\$5/b, but 50 percent of this increment was taken away as a tax on domestic crude so parity with global crude prices was not realized. It is thought that over the next fiscal year ONGC will be able to realize complete parity with global crude prices.

This transition will not be straightforward, however, as refiners and ONGC have yet to reach a consensus over the formula for pricing domestic crude to the domestic refiners. ONGC seeks a quality-premium for its crude, and has indicated that it will revise crude prices on a monthly basis—in line with changes in international prices. Furthermore, ONGC is set on adding a freight component to the prices, based on freight cost from West Africa to India. It remains to be seen whether ONGC will be able to

push these changes through. In the meantime, ONGC is also lobbying for approval to export the crude it produces.

As a final note, India's oil industry deregulation has brought an end to IOC procuring crude on behalf of HPCL and BPCL. As a consequence, these two refiners can hunt for preferential deals on their own, which is certainly an added attraction for potential buyers.

### **Overseas Investment Strategy**

Historically India's overseas investment strategy has been quite limited, but in recent years the country has become much more aggressive in overseas exploration and acquisition. ONGC, which is India's largest state-owned exploration and production company, has ambitious plans for expansion both domestically and overseas (through its international arm, ONGC Videsh Ltd.). The company is moving to reverse its recent decline in oil production, which has dropped from a high of 632 kb/d in the mid 1990s to approximately 500 kb/d at present. ONGC aspires to double its reserves over the next five years, and to accomplish this goal it is aggressively moving to acquire assets from within India and abroad.

Among the deals that ONGC has in the works is a bid for some of the assets of Cairn Energy in both India and Bangladesh. ONGC is also in the process of acquiring a 25 percent share in Talisman Energy's Greater Nile Oil Project in Sudan for about US\$750 million, as well as a 20 percent share of Russia's Sakhalin I project for US\$1.7 billion. It was recently awarded an exploration block in Syria and is currently negotiating with a wide array of countries including Myanmar, Iran, Iraq, Libya, Kazakhstan and the U.S. for equity oil and gas.

### **Indonesia**

Indonesia has the lowest oil consumption among the Key Players, but as a major regional producer and the largest exporter, its central importance in the Asia-Pacific oil market is assured. In October 2001



Indonesia passed the new Oil and Gas Law which ended Pertamina's monopoly over the nation's oil market. Indonesia suffers from a variety of problems and challenges, many of which the Oil and Gas Law aims to correct. These challenges include: prices that are out of alignment with the world market; a demand barrel that is distorted relative to supply, with a major bulge in middle distillate demand; burdensome subsidies aimed at maintaining low product prices; and a legacy of investments that have arguably been misdirected, with investment capital now all but unavailable. Under these circumstances, the impetus for the new Oil and Gas Law is obvious.

	1995	1996	1997	1998	1999	2000	2001	2002*
Oil Production (kb/d)	1,605	1,601	1,581	1,556	1,500	1,414	1,344	1,272
- Crude Oil	1,434	1,428	1,418	1,401	1,351	1,272	1,214	1,142
- Condensate	171	173	163	155	149	142	130	130
Oil Consumption (kb/d)	820	882	979	923	978	1,050	1,076	1,096
Annual Growth Rate	8.0%	7.6%	11.0%	-5.7%	5.9%	7.4%	2.5%	1.8%
Refining Thruput (kb/d)	807	936	911	931	922	995	990	998
Crude Oil Imports (kb/d)	187	196	172	199	232	204	309	343
Crude Oil Exports (kb/d)	827	777	791	768	782	610	662	628
Product Imports (kb/d)	148	176	297	150	211	247	275	297
- Gasoil	68	97	152	87	104	112	136	166
- Kerosene	37	41	60	22	49	51	47	50
- HSFO	11	32	51	27	37	32	20	25
Product Exports (kb/d) <sup>1</sup>	164	166	175	143	152	183	152	161
- LSWR	141	138	140	123	109	125	98	98

Notes: \* Preliminary; <sup>1</sup> Excluding LPG.

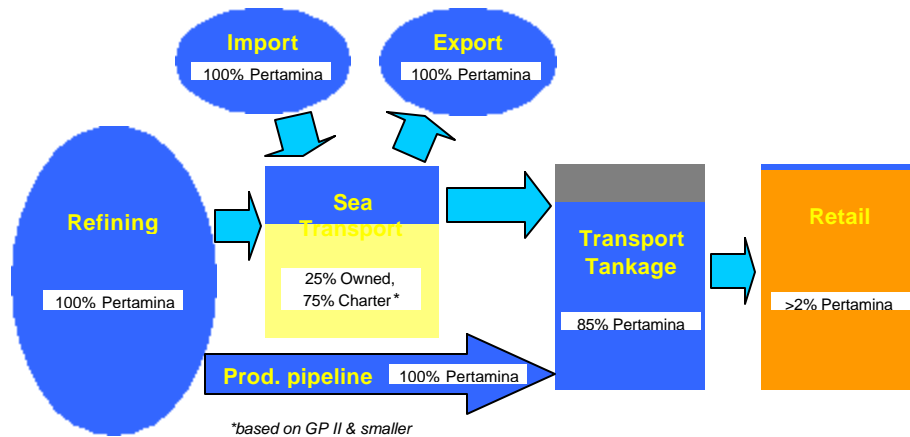
### Looking Forward: Important Issues

At present Pertamina has a monopoly on downstream oil activity in Indonesia from refining through the wholesale and distribution levels (with some minor exceptions, such as the lube oil market), as depicted in Figure 23. It should be noted that imports of finished products are subject to a tariff of 5 percent, while there is no tariff on imported crude.

In the retail market Pertamina's presence is relatively minor, accounting for less than two percent of the service stations. The remainder is owned by national companies, small firms, and individuals (all domestic). Although Pertamina owns relatively few retail outlets, as the only wholesaler and the entity that awards retail business licenses, its control is considerable. With the passage of the Oil and Gas

Law, Pertamina's dominant downstream position will soon be curtailed, although the exact nature of the reforms is still under discussion.

**Figure 23**  
**Pertamina's Role in Indonesia's Oil Industry**



On the upstream side, Pertamina's licensing rights ended with the passage of the Oil and Gas Law. Production-sharing contracts are now overseen by a government body, BP Migas.

When considering the potential for competition in the market under the new Oil and Gas Law it is important to focus on transport and storage. Although Pertamina is responsible for virtually all national transport of petroleum products, Pertamina's own fleet is small and most of the tonnage is chartered. Pertamina's position in shipping should not present a major barrier to new entrants, who are free to use their own shipping, or even to take over charters from Pertamina if Pertamina's fleet proves to be too large in the new market. While shipping itself may not present a barrier to new entrants, access to terminals, ports, buoying facilities, etc., may present significant barriers. Pertamina controls about 85 percent of product tankage at more than 200 depots and terminals around the country.

Both the IMF and the World Bank have identified energy pricing as the most pressing issue in the reform of Indonesia's oil and gas sector. It is clear that artificially low energy prices cause many distortions in the economy. Over the years, massive amounts of capital have been devoted to building the facilities needed to match Indonesia's demand pattern and government revenue has been forgone to

maintain low prices. Attempts to bring prices more in line with the global market have had mixed results, and the most recent price increases were abandoned under protest.

Looking downstream, Indonesia's refineries differ widely in size and sophistication. At one time, after major cracking expansions in the early 1980s, Indonesia had one of the most sophisticated refining sectors in the region. Today Indonesia is still ahead of much of the pack—including other ASEAN members—but its cracking capacity is now slightly below the regional average. At present, expansion plans are limited.

In gross terms, Indonesia's refining capacity is roughly equal to the nation's product demand. Through judicious crude selection and use of upgraded facilities, Indonesia manages to squeeze a GKD (gasoline, kerosene, diesel) yield of 70 percent from an average barrel of crude. Unfortunately, this is not enough to satisfy domestic demand—GKD is 81 percent of the demand barrel. Overall, there is a surplus of fuel oil, a large shortage of diesel, and moderate shortages of gasoline and kerosene. Thus, Indonesia is chronically short of expensive "spec" products, such as gasoline and middle distillates, and long on lower-value fuel oil, naphtha, and LPG.

On the upstream side, because new finds have not off-set the inevitable declines in the older producing fields, Indonesia's crude and condensate production have been in decline since the mid 1990s. This situation has been exacerbated somewhat by security problems in some producing areas, most notably the Riau provinces, where Indonesia's two largest crude oil streams—Minas and Duri—are located. New finds, such as the Belanak and Cepu fields, and enhanced security will help stem the decline. However, due to the uncertainty surrounding the new Oil and Gas Law and the potentially radical shifts in the market that may come with it, investment in new exploration and production activities has fallen. With mature fields and fewer attractive prospects available, Indonesia will likely have to offer more attractive production sharing terms to encourage investment and increase production.

## Overseas Investment Strategy

Indonesia does not have a government strategy for overseas investment. A local private company, Medco Energy International, has some limited operations outside of Indonesia, including Central Asia and Myanmar.

## Japan

While Japan plays an important role as a major oil consumer in the Asia-Pacific region, it is acting as a drag on the region's incremental demand growth. In 2002 the country posted its third consecutive year of negative growth in petroleum product consumption. Unless Japan emerges from its prolonged economic recession, demand growth—particularly in the industrial sector—is projected to remain stagnant. It should be noted that a series of nuclear reactor shutdowns related to safety concerns led to unexpected demand growth beginning in September 2002. However, because direct crude burning and fuel oil generally play a swing role in satisfying power demand fluctuations, demand will probably decline as the nuclear reactors come back online. If the reactors remain down for an extended period, LNG may be substituted for oil.

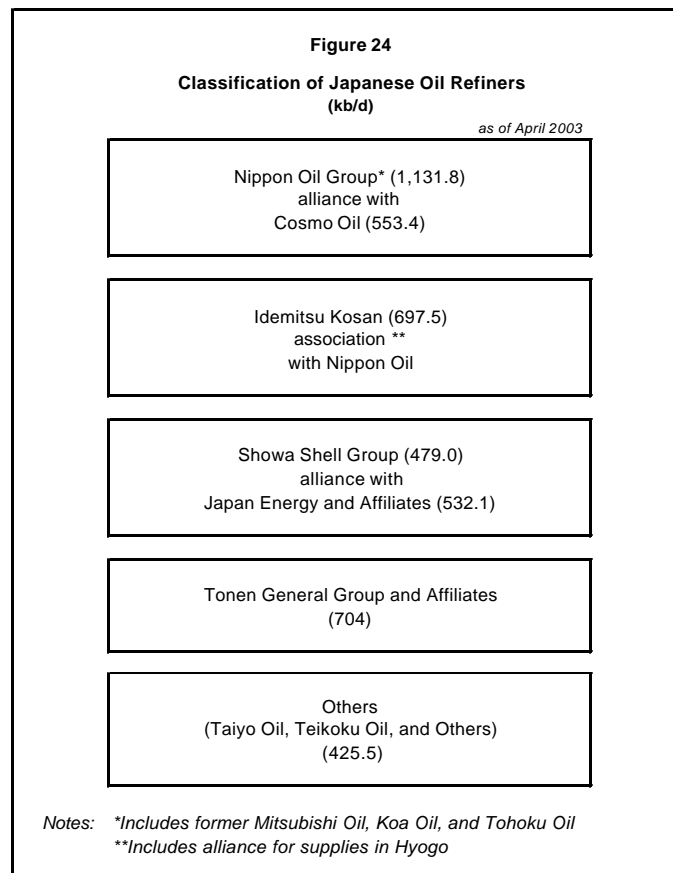
	1995	1996	1997	1998	1999	2000	2001	2002*
Oil Consumption (kb/d)	5,601	5,650	5,589	5,384	5,467	5,392	5,231	5,165
Annual Growth Rate	3.0%	0.9%	-1.1%	-3.7%	1.6%	-1.4%	-3.0%	-1.3%
Refining Thruput (kb/d)	4,169	4,180	4,319	4,213	4,150	4,145	4,108	4,043
Crude Oil Imports (kb/d)	4,598	4,540	4,681	4,391	4,315	4,307	4,257	4,060
Product Imports (kb/d)	1,278	1,320	1,235	1,141	1,223	1,233	1,134	1,131
-LPG	462	473	481	456	449	460	441	428
-Naphtha	473	497	487	469	517	535	485	502
-Gasoline	25	25	25	16	24	28	20	29
-Kero/Jet	121	142	98	89	93	70	51	54
-Gasoil	49	50	26	28	42	47	40	35
-Fuel Oil	77	68	43	19	32	28	30	31
Product Exports (kb/d)	184	152	176	147	108	74	91	78
-LPG	-	-	-	-	4	1	1	3
-Naphtha	6	6	6	3	5	3	1	2
-Gasoline	20	12	13	14	14	4	8	4
-Kero/Jet	9	11	5	19	15	10	14	15
-Gasoil	61	43	59	46	43	37	40	28
-Fuel Oil	74	73	79	54	15	15	13	13

Notes: \*Preliminary

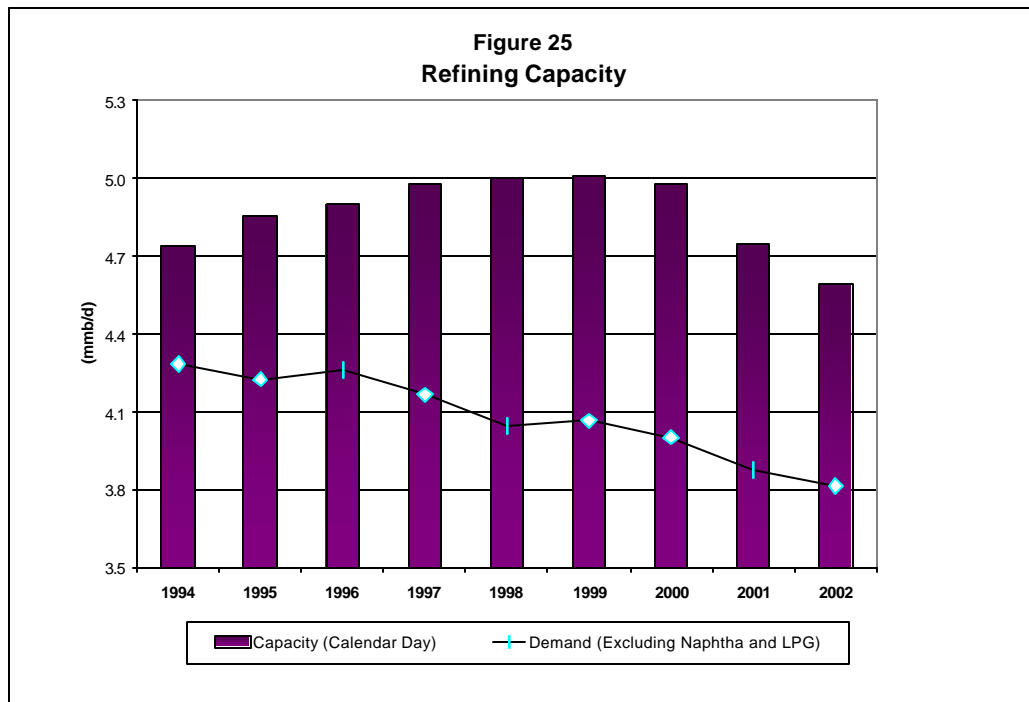
## Key Downstream Developments

Japan's downstream oil industry is suffering from several major problems which are crippling the industry. The first is stagnant demand, as discussed above. There is obviously little the refiners can do by themselves to rekindle the economy to encourage demand growth. The second challenge is a weak regional market with very low margins. Again, there is little that Japan's domestic refiners can do on their own to rectify this problem. The final set of challenges is a relatively high cost structure, a large debt burden, and a large number of small, inefficient refineries and retail stations—quite simply, a large part of Japan's downstream sector is not internationally competitive. Japan's oil industry has been moving to address this last set of challenges, albeit slowly and somewhat half-heartedly.

Following the crisis of 1998 the Japanese oil industry consolidated into four main groups, as presented in Figure 24.



As part of this consolidation, some refineries were shut down in an effort to improve margins. Since 1998 approximately 283 kb/d of CDU capacity has been closed and there has been an additional 160 kb/d reduction in nameplate capacity. It should be noted, however, that some of the reported closures were simply mothballing of individual units and/or a reduction in crude runs. In spite of these shutdowns, the industry still has excess refining capacity of at least 1,100 kb/d and a glut of service stations, as depicted in Figure 25.



Essentially, Japan's refiners are engaging in a game of tit-for-tat, where refiners shut down some capacity if others do the same. They are hesitant to shut down on their own because others will simply take the market share. Most recently, Nippon Oil Corporation (NOC) has concluded an alliance with Idemitsu which accompanies Idemitsu's decision to discontinue operations at its Hyogo refinery, which has a current capacity of 80 kb/d. Beginning in April 2003, NOC will supply approximately 40 kb/d of petroleum products to Idemitsu. At the same time, NOC will reduce the capacity of its refineries by 10 kb/d. Other examples of cooperative arrangements include Showa Shell's integration of its Kawasaki refinery (120 kb/d) operations with Toa Oil (60 kb/d). The combined operation is now officially under

the management of Toa Oil and roughly 200 of Showa Shell's staff were transferred to Toa, which offers a lower benefits package.

While the situation appears to be bleak for Japan's refiners, it must be remembered that it could be worse—there are several characteristics of the Japanese market that give domestic refiners built-in protection from outside competition. First, like all domestic refiners, the freight differential between crude and product imports provides some support. On top of this, the fact that the country has relatively small product receiving terminals, coupled with hefty storage requirements for product importers acts as a major brake on competition. Finally, Japanese refiners enjoy favorable tariffs, particularly for fuel oil. While the market is nominally deregulated and open, this gauntlet of obstacles makes it difficult for competitors to penetrate that market.

A future development that is on the horizon, that could radically alter the industry, is the change in product specifications. For example, refiners have already adjusted to a 50 PPM sulfur standard for diesel, but the next round of reductions, likely to be 10-15 PPM, will be much more difficult to satisfy. Some closures are inevitable. The timetable is uncertain, but given trends in the U.S. and Europe it is likely that 10-15 PPM will come by 2007-08. Zero PPM, which would cause even more closures, could come by 2010-2012. Some Ministry of Economy, Trade and Industry (METI) officials see stricter specifications as the only real way to rationalize the industry and have pushed for a more rapid tightening of specifications.

### **Overseas Investment Strategy**

The Japan National Oil Corporation (JNOC) was established by the government in 1967 to provide funding and other assistance to Japanese oil companies in an effort to aid in the acquisition of foreign oil assets, as well as to establish strategic stockpiles. The results have been disappointing, as in excess of US\$40 billion (in 1995 prices) has been spent with very little to show for it. A key problem is that JNOC's structure was seriously flawed from the start. Firms that borrowed money for exploration ventures did not have to repay the loans if they were not successful—as was often the case. By JNOC's own admission, Japanese companies lag behind in exploration and production, where they cannot compete effectively with foreign oil companies. JNOC also focused on establishing new finds

rather than acquiring existing assets, which would have often proved much more cost effective. On top of this lackluster performance, Japan recently lost the Arabian Oil Company's neutral zone concessions in Saudi Arabia and Kuwait.

In this context, negotiations surrounding access to the Azadegan field in Iran have taken on increased importance. Several Japanese companies—including INPEX, JAPEX and JNOC under the METI—delivered a master development plan on November 20, 2002. The Japanese companies proposed that Shell be included as a potential partner, and in return Shell has sold 20 percent of its share in a project to redevelop two large oil fields (Soroush and Nowruz) to a consortium of the same Japanese companies, led by JAPEX. There are a number of sticking points in the contract negotiations, including the terms of the buy back, rate of return, etc., and it is not clear that the deal will go through.

Given its poor track record, it is not surprising that the Japanese parliament approved legislation dissolving JNOC. It is scheduled to be completely dismantled by 2005. At the same time, Japan is continuing its drive to secure more equity oil outside of the Middle East, with METI playing a key role in recent talks with Russian ministries and oil companies, including Yukos, about the possibility of Japan taking part in the development of oil fields in eastern Siberia. Many of the plans that have been floating in recent years are economically dubious, but Japan's interest in the region is keen, and it is seen as the most promising way to reduce dependence on Middle East supplies. In addition, China has launched similar drives to develop eastern Siberia, which seems to have prompted Japan to take swifter action on the issue.

The details of the JNOC dissolution are still in the works, but it is understood that the assets held by INPEX (50% owned by JNOC), which produces over 100 kb/d—mostly in Indonesia, JODECO (90% owned by JNOC), which produces about 200 kb/d in the UAE, and SODECO (50% owned by JNOC), which has a stake in Russia's Sakhalin I, that is scheduled to come on stream in 2005 with a peak production of approximately 250 kb/d, will be merged into an internationally competitive flagship company. This company will eventually be privatized, but safeguards will be put in place to ensure that it is not taken over by an international oil company. JNOC affiliate JAPEX is to be listed separately by



the end of this year. Most of JNOC's other assets would be disposed of over time, except for some of the more valuable assets which may be taken over by the merged flagship company.

In 2003-04 the Japanese government plans to set up a new agency to continue JNOC's role in financing exploration. This agency will also take over the management of Japan's strategic oil stocks.

## South Korea

While it is still growing robustly, South Korea's economy and energy consumption are showing signs of maturation. South Korea's economy bore the full brunt of the 1998 economic crisis, but then bounced back rather quickly. Growth in oil consumption has been slower to recover, however, dropping off from the 1985-1995 period when overall demand grew by an average of 14 percent annually.

	1995	1996	1997	1998	1999	2000	2001	2002*
Oil Consumption (kb/d)	1,976	2,113	2,222	1,976	2,106	2,162	2,164	2,221
Annual Growth Rate	8.8%	6.9%	5.2%	-11.1%	6.6%	2.6%	0.1%	2.6%
Refining Thruput (kb/d)	1,729	1,970	2,389	2,263	2,391	2,439	2,356	2,148
Crude Oil Imports (kb/d)	1,712	1,978	2,393	2,244	2,395	2,449	2,354	2,158
Product Imports (kb/d)	544	564	403	484	504	560	561	625
-LPG	146	151	157	135	158	153	132	153
-Naphtha	177	193	103	288	277	305	328	341
-Gasoline	0	0	0	1	0	0	6	13
-Kero/Jet	64	88	53	17	18	23	15	20
-Diesel	88	51	9	6	6	8	18	35
-Fuel Oil	68	80	72	35	44	69	61	63
Product Exports (kb/d)	347	438	611	827	816	838	808	658
-LPG	8	10	13	29	37	22	13	8
-Naphtha	59	88	101	123	127	133	140	124
-Gasoline	1	7	27	42	31	41	44	44
-Kero/Jet	46	62	65	126	135	158	158	142
-Diesel	116	153	250	296	242	265	248	215
-Fuel Oil	110	114	138	209	226	198	184	93

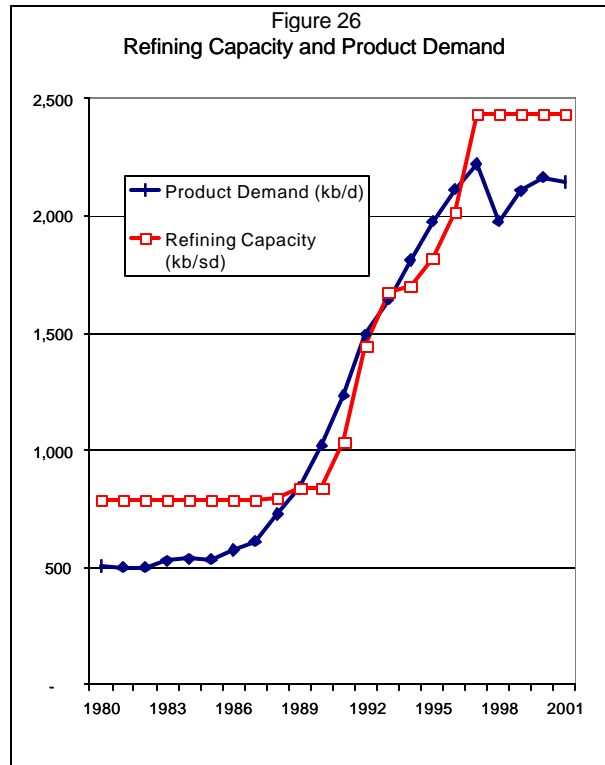
Notes: \*Preliminary

## Important Facts and Issues

The past decade has been a period of deregulation and adjustment for South Korea's downstream oil industry. Although official deregulation did not begin until 1996, deregulation plans have been contemplated since the late 1980s. The goal of the deregulation process was to eventually fully open

the market, but it was agreed among both government and industry that steps should be taken to ensure that the Korean refiners were internationally competitive before abandoning controls. Beginning in 1991, product prices were adjusted to ensure high profitability so the nation's refiners could invest in refinery expansions. In 1996 formal price controls were abandoned and replaced with competitive Singapore pricing, plus freight costs, plus a hefty "Korea factor" that was applied to ex-refinery prices. The "Korea factor" was added to allow the refiners to continue to accumulate sufficient capital to make major investments. Over this period, as directed, the Korean refiners launched a massive capacity expansion which serves as a barrier to potential entrants into the domestic refining business. The country now boasts two of the world's largest refineries.

On January 1, 1997 prices were fully deregulated, but to everyone's surprise they did not change. It is speculated that the Korean refiners had market sharing agreements and arranged to act as if price controls were still in effect. Since 1999 new entry and imports have been allowed in the downstream oil sector. A few independent retailers have entered and are putting some pressure on prices, but it is unlikely that anyone will want to enter the market to build new refineries due to the current capacity surplus (see Figure 26).



The overcapacity in the domestic market has resulted in the Korean refiners flooding the international product market, in large part because they are supported by relatively high margins in the domestic market. It should be noted that the refiners that match their output most closely to relatively high priced domestic demand are the best performers in the market (e.g., LG-Caltex). At the same time, as long as their exports do not incur losses, Korean refiners will run at very high utilization rates, as has often been the case in the past. More recently, depressed margins in the international market—which were in part attributable to Korean refiners' high utilization rates coupled with the entry of independent importers into the market, leading to increased exports—resulted in a reduction of utilization factors to around 80-85 percent.

The deregulation process was designed so that the entrenched players, namely SK (formerly known as Yukong), LG-Caltex (formerly Honam Oil), S-Oil (formerly Ssangyong), Hyundai (formerly Kukdong Oil) and Hanwha (formerly Kyung-In Energy) retained their domination of the market. In 1999 Hanwha was acquired by Hyundai under pressure from the government, as the former faced mounting debt problems after the economic crisis. Hanwha's retail stations were absorbed into Hyundai and its

successful IPP business was sold, but the refineries are run under two separate entities, namely Hyundai and Inchon refineries. After price deregulation in 1997 the market shares for each of these companies remained more or less the same, with SK, LG-Caltex, and S-Oil retaining their market shares and position as the top three refiners. The exception was the changing market shares of Hyundai and Hanwha, but this was a result of their merger, not any radical shift in the market.

Among other developments, it should be noted that 50 percent of Hyundai Oil's equity was purchased by Abu Dhabi's IPIC (International Petroleum Investment Company), a joint venture between ADNOC and the Abu Dhabi Investment Fund. The \$500 million purchase price gave IPIC 50 percent equity, 4 out of 7 directors, and effectively, control of the company. The merits of IPIC's investment appear to be limited, as Hyundai and Inchon (as well as other refiners) face major financial losses. Added to the burden are major fines from the Fair Trade Commission (FTC) resulting from a complaint by the Ministry of Defense alleging a bidding cartel among the refiners. IPIC has responded by removing the management of Hyundai Oil and allowing Inchon to fall into bankruptcy.

With the exception of S-Oil, all of the players are involved in product exchange agreements, which are applied to all products with the exception of LPG. There are two major product pipelines connecting Ulsan (where most of the refineries are located) to Seoul. One belongs to SK and LG-Caltex and the other belongs to S-Oil. Hyundai has a third, smaller pipeline. The governing body in using these pipelines is based on "equity shares" that are based on the volume that each company has transported. These companies include all refineries, two airlines (Korean Air and Asiana), and the Korean National Oil Company (KNOC). It should be mentioned that the domestic oil companies are under no obligation to cater to any particular area.

As for the retail sector, there were approximately 6,000 retail stations prior to the 1997 deregulation. This number has grown to approximately 10,600 retail stations, around 15 percent of which are owned or leased by the refiners. The majority of the private owners are affiliated with the oil companies. Although they are not obligated to stay with one refiner, they are usually loyal due to long-term relationships. The opening of the market has led to the rise of independent retailers that get their supply mainly from imports. As recently as 2000 their market share was insignificant, but they have now

secured a little under 10 percent market share, prompting a challenge to the entrenched players. The key independents include Samyeon, Tiger Oil, PetroKorea, EG, and Lidcoff. Samyeon is the largest importer, followed by Tiger Oil and the other three which are all about the same size. Tiger Oil is the only independent with branded service stations. It is unlikely that the independents will continue to expand at such a rapid clip as securing retail sites is getting more difficult and expensive. Moreover, importers are required to acquire storage facilities for up to 60 days supply, which will limit future expansions.

Currently, Korea's petroleum product prices are among the most expensive in Asia, especially for gasoline. This is the result of hefty taxation, which is intended to discourage the consumption of certain petroleum products. For example, at one time, the retail price of gasoline was almost three times higher than that of gasoil. In the late 1980s and early 1990s taxes on LPG were insignificant, which served to encourage its use as an alternative to the more heavily taxed kerosene. Current import tariffs are 5 percent for crude oil and 7 percent for products, which provides a small level of protection for domestic refiners. In the face of low profitability, the industry has requested that the tariff on products be increased to 12 percent. It remains to be seen whether the new administration will support this change.

### **Overseas Investment Strategy**

On the upstream side of the oil industry there is less action on the regulatory front, but the state-owned Korea National Oil Company (KNOC) continues to push forward in pursuing equity stakes in exploration and production, as well as fulfilling its duties in coordinating stockpiling. The South Korean government has charged KNOC with the goal of providing 10 percent of South Korea's oil, or about 270 kb/d, by 2010.

Currently KNOC is a shareholder in production in fields in Yemen (Marib—24.5%), Argentina (Palmarlargo—14%), Peru (Eight—40%), and the U.K. (Captain—15%). It has also been involved in the development of oil fields in Venezuela, Libya and Vietnam. In addition to the countries listed above, KNOC has been involved in exploration in a number of countries, including Angola, Algeria, Indonesia, Surinam, Ghana and China.

## **Conclusions**

Because they dominate the Asia-Pacific oil market, the Key Players are indicative of important trends in the region as a whole. In general, upstream oil production is projected to remain flat over the coming decades at the same time that oil consumption continues to rise at a rapid clip, albeit less rapidly than it did from the mid 1980s to the mid 1990s. The net result will be a dramatic increase in imports, especially from the Middle East. The Key Players are wary of this trend and several have sought to establish relationships with suppliers outside the Middle East, e.g., Russia, in an effort to ensure security of supply. In terms of overall demand, the impact of such move will be limited and it appears inevitable that the Key Players and the Middle East will become increasingly intertwined in the future.

Due to a combination of rampant capacity additions and relatively stagnant demand, Asia-Pacific refining margins have been in the doldrums in recent years. The situation varies somewhat among the Key Players, depending on the status of the domestic market, but in general the moves toward deregulation and open markets have left them exposed to lower margins. In the long-run the move toward deregulation and increased transparency will help to establish the correct incentives for adding capacity, but in the near term margins will remain low until the East of Suez refining capacity overhang disappears. We feel that 2002 was the low point and margins will begin to recover slowly in coming years.

A final important trend that has emerged over the past several years is the increasingly aggressive pursuit of overseas assets. China and India have been especially assertive, sometimes moving into areas where others are hesitant to tread for either political or public relations reasons, e.g., Iran and Sudan. This trend will most likely continue as the concern over increasing import dependence grows in these countries.