



The Challenges and Future Prospects of India's Petroleum Products Refineries

KEYWORDS

An Overview of Petroleum Refining In India, Challenges of Petroleum Refining In India: Need to Invest, Effect of Subsidies on Product Pricing, Cost of Product Refining, Quality of Petroleum Products, Opportunities of Petroleum Refining in India.

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ABSTRACT

The petroleum refining industry is a vital link in the energy chain in many developing and industrialized countries as it plays a key role in providing energy for all sectors of any economy. The structure, economic conditions, and developments in the industry are therefore important matters of national interest. In recent times, significant changes have taken place in India's refining industry with resultant challenges. This paper seeks to evaluate the challenges faced by India's petroleum refining industry in view of its recent performance and discuss the industry's future outlook. Pricing is identified as a most important challenge which if addressed and combined with other complementary remedies could help maximize the industry's potentials.

Introduction:

The oil refining industry is the cornerstone of a modern economy. Refined Petroleum products remain fundamental to our economic life – in everybody's daily life and economic activities of the nation ranging from domestic cooking to transportation, employment, etc. Rapid economic growth in many developing countries has led to increased demand for oil products. As such, the refining industry has grown rapidly in such countries whether or not there is crude oil production in the domestic scene.

Asian developing nations have experienced significant growth in petroleum product demand and refinery expansion over the years. Between 1976 and 1993 for instance, oil product demand and refinery capacity expansion recorded average annual increases of 5.2% and 4.3% respectively. Though in comparison with world figures, there was in effect no change recorded for the same period, the considerable gains in the region's crude oil production in the 1970s are believed to have also facilitated refinery expansion.

This trend of rising demand for petroleum products coupled with the concentration of petroleum reserves in few geographical areas as well as the difference in crude quality and environmental legislations amongst other factors pose challenges as well as opportunities for the global petroleum refining industry as a whole. The ability of India's refining industry to meet its economic challenges will likely determine, in part, the nature of the energy challenges facing India, taking cognizance of the fact that it is a developing country with growing demands.

An Overview of Petroleum Refining In India:

India's downstream refining sector has the eighth largest refinery capacity in the world. India's oil refining sector is dominated by state-owned enterprises, though the market share of private companies has increased of late. The Indian Oil Company is the largest state-owned company, and it operates 10 of India's 18 refineries. Reliance Industries, a private Indian firm opened India's first privately-owned refinery in 1999, and has gained a significant market share in India's oil sector.

As of January 2008, the country had 2.26 million bbl/d of crude oil refining capacity according to the Oil and Gas Journal. Reliance Industries, a privately owned petroleum company in India has the largest refining complex in the world with a capacity of 1.24 million barrels per day – the Jamnagar

refinery. India plans to add 1.6 million bbl/d of refining capacity through 2015 based on current proposed projects. Anticipated high demand for petroleum products in the region makes further investments in India's refining sector likely.

India is steadily emerging as an international destination for oil refining with investment requirements lesser by 25% to 50% compared to its Asian counterparts. Being the fifth biggest nation in the world in terms of refining capacity, it enjoys 3% of international capacity share and is expected to enhance its refining competence by 45% in the next 5 years. In a bid to make their presence felt strongly in the global market, Indian petroleum firms are also considering increasing their refining capacity from the existing 149 Million tonnes per annum (mtpa) to 243 mtpa by 2011 and 2012.

Challenges of Petroleum Refining In India:

Key changes faced by the refining industry have come with challenges alongside. First is the increase in demand for light petroleum products – gasoline, diesel, jet fuel and kerosene. Regulations on product specifications are also stricter. Specifications on sulphur, aroma and olefin for gasoline and sulphur, cetane number and poly-aroma for diesel are strengthening. The changes and challenges of Asia's refining industry revealed that sharp increases in demand for light petroleum products as a result of advances in the transport sector has been recorded over the years.

1. The Need to Invest:

The need to invest in capacity expansion for the future in India is important considering expected demand increase and current capacity utilization at about 90%. India's refining capacity based on Institute of Electrical Engineers of Japan report is expected to increase to 4472 thousand bbl/d in 2015. There is also need to invest in all-inclusive approaches like the DuPont acid plant to equip refineries with a twofold capability to process acid gas and sulphuric acid regeneration which would enable maximizing a refinery's sulphur recovery unit capability, emissions reduction, and direct manpower and capital towards hydrocarbon processing projects.

2. Effect of Subsidies on Product Pricing:

The process of price and market liberalization is another issue to be addressed. Petroleum products prices in India like in many developing countries are controlled through subsidies. Petroleum product prices in India were regulated through the Administered Pricing Mechanism. The Indian government introduced measures designed to deregulate the downstream

oil sector. This enabled private refiners to directly trade petroleum products to customers.

The APM operated such that refineries, Oil Marketing Companies and pipelines were assured a 12% post tax return on net worth and were reimbursed for operating costs. A self balancing oil pool account was used to balance prices of petroleum products as well as to protect customers from volatility in international crude prices. The oil pool account however ran into deficit whenever domestic prices were not raised in line with prolonged international crude price increases. The assured 12% post tax return however did not promote efficiency or the most efficient investment decisions.

The consequence of the price controls being that private companies are unable to sustain operations when international crude prices are very high thus having to shut down their retail operations, and those who have restarted have no confidence to invest in capacity expansion or upgrade their operations as crude price increases could render them unprofitable since they have no protection from international crude price changes.

3. Cost of Product Refining:

The cost of refining petroleum products is of concern, as can be seen from data presented in earlier sections. India's oil consumption exceeds what is available or produced locally and this is a pointer to the fact that in order to maintain the same level of consumption, it has to resort to imports which have got their cost implications. Historically, refining has been significantly less profitable than other segments of the petroleum industry. As such, refiners have had to be careful to control costs to make a profit. In some countries, refineries are not productively utilized. Since refineries make low profits, investors may not be willing to engage in competition. This affects both investments in infrastructure as well as in refinery capacity expansion.

Government controlled low prices also cause another problem. This is because in order to sell refined petroleum products at a better price, national oil companies tend to export as much as they can, and this can cause supply shortage on the domestic market. Though, to combat this, the government has issued emergent policies such as imposing export taxes to limit export, the situation depicts pricing not being reflective of the true cost of product refining. It is a further indication that the prevalent pricing need be addressed. The supply and demand balance therefore shows random fluctuations which inhibits the market's ability to represent fundamental demand and supply.

4. Quality of Petroleum Products:

The quality of petroleum products is also of concern. In line with climate change objectives and environmental legislations, every country is to cut down its Carbon dioxide emissions and make fossil fuels more environment-friendly. The quality of crude oil imports to India mainly 'sour' is a challenge as a result of the stringent product quality requirements currently in place. A reorientation of consumption towards light fractions, or installation of hydro cracking plants for heavy fractions is thus required.

Opportunities of Petroleum Refining in India:

There are ample opportunities abounding in India's petroleum refining industry. The creation of additional refining capacity during the near future of 110 million tonnes per annum will require an investment of over US\$ 22billion. This will cause a remarkable growth in the refinery sector, transfer of technologies and export of capital goods etc., to India. It is designed that the technologies will be for upgrading the bottom of the barrel and to meet the pressing demand for middle distillates which will improve the quality of petroleum products to make them globally competitive and environment-friendly. The strategy behind the new capacity addition is to locate the new refineries on the coasts while

the main centers of demand for the petroleum products are in the inland locations, particularly in North/North-West regions. This leaves India with the opportunities of building inland refineries. The government also allowed the existing refineries forward integration in the fields of petrochemicals etc., for better value addition, which opens up another area for investment.

India also is adopting strict measures that will increase the quality of fuels which will make them environment friendly. These measures include phasing out lead, reducing benzene in gasoline, cetane improvement of diesel and sulphur reduction. Although the up gradation of fuels will require huge investments of about US\$ 2.5billion, it has added advantages considering that refinery operating cost are low. This will make India's refineries to be economically attractive for the domestic markets as well as for exports. Government promotion of joint sector and private sector participation could also potentially lead to growth in the refining industry.

Conclusion:

The challenges mentioned above leave much uncertainty towards the optimization of India's refining industry. The pricing regime in particular needs to be addressed not because it is the only solution to the several challenges faced by petroleum refiners, but because it appears to be the most weighty with multifarious effects. The existing low petroleum prices in India are gravely affecting the investment returns and profitability of the national oil companies which invariably restrain investment to broaden and optimize refining capacity. In most instances, prices are set far below what prevails in the global crude oil market. Therefore, prices appeared to be inconsequential in the pattern of demand for oil products in India. These capped fuel prices also make financial losses inherent in the domestic market for private refiners who unlike the state-owned retailers have no support from government. An indication that the right pricing signals are not sent to consumers and that government's pricing policy in practice has been a huge influence on the demand for petroleum products in India.

Therefore, it is recommended that the government regulated pricing policy should be gradually reduced and eventually eliminated within the shortest time possible. In addition to this, should come a host of complementary remedies, such as encouraging energy conservation; further building regional cooperation, streamlining market supply and demand, etc. If this broad array of policy considerations is implemented, India's refining industry could be healthy enough and well able to maximize its potentials.