CHAPTER IX

CONCLUSION

Petroleum has been in use for hundreds of years in the countries of the Middle East and Burma. It has been found from the evidences of the Archaeological studies that the people of Persia used to make house walls with some sticky black substances which they used to get from oil seepages. The Red Indians of North America used to apply crude oil in their body to increase their strength. In the middle half of the nineteenth century man started to use petroleum as energy source and in 1859 first oil well was dug at Titusville in Pennsylvania of U.S.A. Industrial Revolution of Europe also increased the demand for petroleum. But at that time the techniques of production were primitive and the production was small.

In 1913 the cracking process of the petroleum refining, was invented and multidimensional uses of petroleum started. At the end of the twentieth century petroleum has become an indispensible item in the life of man. Its availability and scarcity can even create big wars. Petroleum is also a fascinating subject for intensive study and can play havoc in the economic life of a country.

While studying the Indian Oil industry it has been found that India is an energy starved country and an
accelerated growth of the economy will be greatly facilitated only through increased availability of energy. Indian energy resources are of five types. Four of these can be grouped under the 'Commercial energy'. These are coal, oil and natural gas, hydroelectric power and nuclear fuels. The fifth category comprises of various kind of resources, which provide 'Non Commercial Energy'. These are mainly forest resources, vegetable waste and dried cow-dung. Among the Commercial energy resources coal is mainly used in the industries and its availability is also much higher than the other two resources, whereas transport sector has accounted for the largest oil consumption. Electricity is being increasingly used in the industrial and agricultural sector.

Since independence the country has made commendable achievements in the production of energy. Still the demand far exceeds the supply. Projections on the energy demand by the end of the century are alarming with coal, petroleum and power requirements estimated at 400 million tonnes per year, 100 million tonnes per year and 100,000 MW respectively. The energy scenario poses a great challenge to our technical and managerial abilities.

Oil crisis at present is the country's most challenging problem in the energy front, as India is spending highest amount of foreign exchange to meet the ever
increasing demand for oil. Hence the present study on the oil industry of India has highlighted on the characteristics, and problems of the industry in the present economic setting.

The current pattern of energy supply and use across the globe exhibit disparities and imbalances.

Table below shows the oil refining capacities of the major producing countries of the world.

TABLE 24. World Oil refining capacities, 1981 and 1989

(Million tonnes per annum)

<table>
<thead>
<tr>
<th>Countries</th>
<th>1981</th>
<th>1989</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.A.</td>
<td>911</td>
<td>785</td>
</tr>
<tr>
<td>Canada</td>
<td>107</td>
<td>94</td>
</tr>
<tr>
<td>France</td>
<td>161</td>
<td>85</td>
</tr>
<tr>
<td>Italy</td>
<td>199</td>
<td>115</td>
</tr>
<tr>
<td>U.K.</td>
<td>118</td>
<td>90</td>
</tr>
<tr>
<td>West Germany</td>
<td>147</td>
<td>79</td>
</tr>
<tr>
<td>Japan</td>
<td>283</td>
<td>210</td>
</tr>
<tr>
<td>Indonesia</td>
<td>26</td>
<td>39</td>
</tr>
<tr>
<td>Singapore</td>
<td>51</td>
<td>51</td>
</tr>
<tr>
<td>Other South East Asia</td>
<td>96</td>
<td>106</td>
</tr>
<tr>
<td>India</td>
<td>31.8</td>
<td>51.8</td>
</tr>
<tr>
<td>Mexico</td>
<td>76</td>
<td>96</td>
</tr>
</tbody>
</table>

This scenario implies a major increase in investments in energy supply in the developing countries. These would call for improvement in the performance of the energy supply industries in these nations. The countries of the Persian Gulf region would assume greater political power, since they would be controlling a vital resource, the value of which to the world economy is expected to increase, with declining production in other parts of the world. The decreased amount of refining capacity in the developed countries, is mainly due to lower consumption in these countries. The energy intensities of many countries have declined sharply since the first oil crisis in 1970.

While per capita energy consumption in India has been one of the lowest, the energy per unit of GDP is one of the highest even in comparison with other developing countries. In fact the energy - GDP ratio in India has been increasing faster than in several other developing countries.

The Indian oil refining industry has been studied in the present work on the basis of the demand pattern and the refinery locations and their productivity and demand relationship. The following conclusions may be drawn from the above study.
1. In order to minimise the gap between demand for petroleum products and the refining capacity, a number of projects are envisaged in the Eighth Plan. These include new refineries (Karnal, Mangalore and another one in Assam) for about 12 million tonnes capacity and expansion of existing refineries by about 8.7 million tonnes by 1994-95. With an overall deficit for production of middle distillates for which there is an ever-increasing demand, there is an urgent need for creating new capacity.

2. In view of the increasing demand it has become essential to examine whether this should be met by import of products or by creating additional refining capacity, or both. However, the choice will depend largely on their relative economics and structure of crude oil and petroleum product markets.

Whereas the U.S.A., Japan and Western Europe imported middle distillates but restricted the same to less than 12 per cent of their requirements, in India dependance on import has been as high as 13 per cent.

Hence the following scenarios need to be examined:

1) No additional refining capacities are created World wide in recent years.
Further, various countries will have to resort to restrictive policy measures to curb their requirements. Perhaps developed countries such as Japan may be able to do so, since their per capita consumption is high. But developing countries like India whose per capita consumption is low either will have to pay higher prices or curtail economic development, both of which will be undesirable.

ii) Developing countries with increasing deficits in petroleum products to establish additional refining capacity.

iii) The discharge charge of crude is less in the ports of India than that of the petroleum products.

Thus, it will be more advantageous in the long run to import crude and process it in Indian refineries. This will decrease the transportation cost, as the cost for movement of crude oil in large tankers will be much lower than the import of petroleum product in smaller tankers.

3. It will be desirable if the new refineries (whether coastal or inland) are set up near major consumption centres, so that the inland distribution cost is minimum.

Additional refining capacities are suggested in
the western refineries of India like Koyali and Bombay as this region has the highest demand concentration.

It is suggested to increase the capacity of Barauni and Haldia refineries in eastern India than Assam refineries because Assam is not an important consumer. The crude oil supply by pipelines to Barauni and transportation of products by railways from the refinery will be more economical as transportation of crude is cheaper than the transportation of the derivatives. All the southern region refineries also must have more refining capacities as they will be utilising more imported crude as suggested earlier.

4. Based on the demand pattern the broad objective for optimising the product pattern, the refineries should maximise the LPG, gasoline, middle distillate production and minimise furnace oil output to reduce foreign exchange outgo. For this several processing options are available such as asphalt residue treating, heavy oil cracking, delayed coking, visbreaking, hydrocracker fluid catalytic cracker etc. These secondary processing schemes will indicate maximum value addition.

5. The location policy of the Government need not be solely based on the maximum efficiency of the refining industry but it should also take into consideration other
factors like the geographical viability of the area and other economic considerations of the location.

The refinery programmes must be implemented in such a way that there should not be any delay in completion of the planned expansion or erection of new grassroot refineries, as it occurred in the past for Haldia refinery.

6. A programme of self-sufficiency for each region, in order to minimise distribution costs, should also consider the problem of regional product imbalance. The furnace oil requirement of the Bombay region exceeds its supply whereas in the Vishakhapatnam region fuel oil is in surplus. This imbalances must be regulated properly by consumption management.

7. Oil consumption must be checked to save the country from import burden. There are examples of several countries which have proved that conservation can be achieved. Japan's energy consumption per unit of GNP has improved by about 30 per cent from 1973 to 1985. The efforts of energy intensive industries is of great significance in this regard.

The oil refining industry in India has various problems but its growth in the country over the past four decades has created favourable conditions for other industries based on oil which could in the long run contribute significantly to the industrial progress of the country. The problems must be carefully handled, so that the future prospect become more bright.