CHAPTER I

INTRODUCTION

Life is energy. No energy, no life. Energy is a basic prerequisite for all social and economic activities in all walks of life, for existence and development. Man has needed and used energy at an increasing rate for his sustenance and well being ever since he came on the earth a few million years ago. Man first started taking energy in the form of food by eating plant and animals, after the discovery of fire the energy requirement was increased and he started burning wood and other biomass based fuels. With the start of agriculture the energy use was further expanded by way of utilizing human and animal energy. With further development, the wind and water power was used in the form of sailing boats, windmills and water wheels etc. The sun was, however, constantly supplying energy in direct and indirect form, thus the energy use at these stages of development was completely confined to renewable sources.

The industrial development started from the era of nonrenewable sources of energy with the introduction of steam engine (1700 AD) using coal as a conventional fuel. After a long gap the I.C. engine was developed (1870 AD). Consequently

the era of conventional sources of energy developed very rapidly, as the petroleum based fuels used in the I.C. engines were available in the concentrated form and could be used according to the man's will. The use of energy was further enhanced by the invention of electricity and the development of power generating stations based on conventional fuels. After the second world war, nuclear power station based on uranium fuel made another contribution to the development of conventional energy sources.

The present energy scenario is undergoing a period of transition as the inevitability of exhaustion of fossil fuel is understood by more and more energy users. The fossil fuel era of nonrenewable resources is gradually coming to an end where oil and natural gas will be depleted first followed eventually by coal. Present estimates put the recoverable world crude oil reserve near 2000 billion barrels and at present trend of energy consumption, a critical balance between supply and demand is forecasted around 1985-95. It is also being debated that synthetic fuels produced from coal would not meet energy requirement after the year 2000[27].

In India, the energy problem is also rather critical. In spite of discoveries of new oil and gas fields off the west coast and in the Kaveri-Godavari basin, the import of crude oil is continuously increasing. The price paid for crude oil

and petroleum products now dominates all other expenditure and forms a major part of India's import bill. The figures regarding the crude reserves, production, consumption, import along with high speed diesel production, consumption and import are shown in Fig. 1.1. According to 1983-84 estimates, crude reserves of 527 million tonnes and consumption of 26.02 million tonnes, forecast the availability for another 20 years[77]. In 1985-86, the crude oil production was in the order of 29.94 million tonnes and in order to meet the demand of refineries in the country an additional quantity of 14.3 million tonnes of crude oil was proposed to be imported but the actual import was in the order of 15.14 million tonnes. The consumption of petro-products during the same year was 41.54 million tonnes with the growth rate of 7.9% over previous year. The growth rate for kerosene was 12.7% and for HSD 7.6%, to meet the demand, 2.9 million tonnes of aviation turbine fuel and kerosene as well as 1.1 million tonnes of HSD and light diesel oil were imported[4].

In 1987-88 country plans to import 17.34 million tonnes of crude and 3 million tonnes of petro-products. The higher import of crude and petro-products had been necessitated by the growing demand which is expected to rise by 7%. The total consumption of crude is expected to be 47 million tonnes. Among the petro-products HSD and kerosene accounts for more than 50% of total consumption of petro-products in the country. Meanwhile

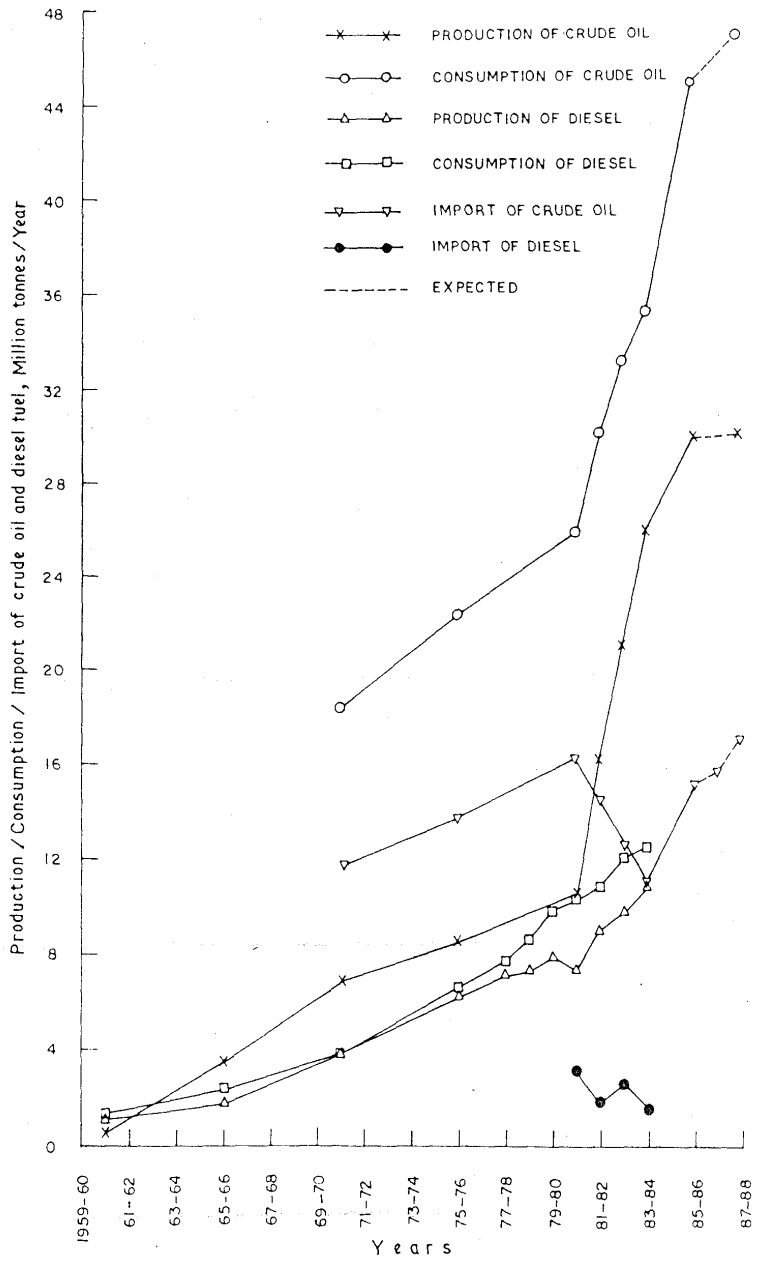

FIG. I.I ANNUAL PRODUCTION, CONSUMPTION, IMPORT OF CRUDE OIL AND DIESEL IN INDIA

the indigenous production of crude in 1987-88 is expected to be only a little over 30 million tonnes. This is almost the same as that of the previous year. This means an increase in the import by more than 2 million tonnes and thereby increasing the total import bill for crude oil and petroleum products to about Rs. 54000 million. This is nearly Rs. 18000 million more than that of the previous year. Further, no significant increase in domestic oil production is envisaged in near future despite the repeated claims by the ONGC about new oil and gas finds according to official sources[3,5].

The Energy Advisory Board of the Government of India forecasted that the requirement of crude oil will be touching in the range of 94 to 123 million tonnes in the year 2004-05 with the upper level correspond to rise in the economy by 5%. If additional geological reserves are established with the exploratory drilling programme during the seventh plan period, indigenous oil production may touch only 50 million tonnes in 2004-05. A huge deficit is, therefore, likely to occur in the oil sector[126] and this would play a crucial role in shaping the country's energy policy in the years to come, as the estimated deficit of about 73 million tonnes will increase the import bill to more than US $ 8500 million. For a developing country like India this situation will be very critical.