CHAPTER IV
ESTABLISHMENT OF REFINERIES WITH AND WITHOUT FOREIGN INVESTMENT

Till almost the end of fifties, when the Indian Refineries Ltd was registered in 1958, the Indian Oil Industry was very much controlled from abroad. The three major foreign groups operating in India were Esso-Standard, replacing the Stanvac Group (Standard Vacuum Oil Company Ltd); Burmah Oil including the Assam Oil Company Ltd, Burmah Oil Company (India Trading) Ltd. Burmah Shell Oil Storage and Distributing Company of India Ltd, and Burmah Shell Refineries Ltd; and Caltex, including Caltex (India) Ltd and Caltex Oil Refining (India) Ltd.1

Very early on the Government had started showing signs of concern at the foreign companies' large claims on Indian resources. About the time of independence, the Government was reported to be considering an intensive oil prospecting program with the aid of up-to-date machinery and experts from America and Russia, contacting [the] Russian authorities - to find out if and how imports of Russian oil could be revived, securing a share in the management and control of oil companies and in the distribution and fixation of prices for petrol and obtaining facilities for Indians to receive training in the business as well as the operational side of the oil industry. However, it narrowed its aims to inviting the companies active in India to build refineries.2

2. Ibid., p.167.
In the pre-independent India, the Assam Railways and Trading Company had erected a small refinery at Margherita to refine the crude oil discovered at Makum and Digboi in Assam. This refinery was the first of its kind in the Indian subcontinent and operated for a few years. Technical details of the Margherita refinery are lacking but following the practice of all refining operations of those days, it is certain that the "shell" or "bench still" principle was applied there to produce comparatively very few products then in local demand mainly lamp oil, fuel oil and greases. Petrol driven vehicles had not appeared till then on the Indian roads. The venue of the refinery was subsequently changed from Margherita to Digboi in Upper Assam. The construction of the new refinery at Digboi was taken up in 1900 by the Assam Oil Company Ltd — registered on April 29, 1899 in the U.K. to look after oil operations in India. Assam Oil Company became a wholly owned subsidiary of the Burmah Oil Company in 1921. All the issued share capital was held by Burmah Oil Company Ltd. The total capital employed was four million pounds.

The refinery was commissioned in 1901 with a refining capacity of 0.525 million tonnes per annum (m.t.p.a). The excitement is so evident in the Report dated December 11, 1901 sent to the Company's headquarters by S.S. Hawkins, General Manager of the Assam Oil Company, "You will be glad to hear that we have got our first still running at Digboi, and by the end of next week we should be sending away our first kerosine oil made..."
in the new refinery."

Digboi refinery appeared in the market on January 2, 1902. Digboi refinery can be termed as the oldest refinery in our country. This refinery actually supplanted the mini refinery built at Margherita in 1893, by the Assam Railways and Trading Company. Digboi succeeded Margherita as the home of refining in India. A plant with a capacity of 500 barrels or 20,000 gallons per day and with an annual throughput of 88,000 metric tonnes was constructed. In its subsequent expansion and growth, the refinery was almost completely rebuilt in 1923 with an increase in its capacity. The Digboi refinery processed 76,269 metric tonnes of crude oil in 1926.

As output from the Digboi oilfield rose, the refining capacity was stepped up accordingly. Burmah Oil Company brought in the much needed technical know-how, financial backing and modern equipment. Over the years several plants were added and improvements were made continuously through installation of new equipment and ancillaries. The emphasis was on adaptation of Western technology to the local environment as well as on development of indigenous know-how. Various new units were added to diversify the product pattern and efforts were made to increase flexibility and efficiency of operations. Digboi gradually evolved into a modern unit incorporating the latest


processing techniques then available. It remained the only refinery in the country till 1954.

Initially, only Digboi crude was processed in the refinery. Processing of crude oil from Oil India Ltd's oilfield at Nahorkatiya along with Digboi crude commenced in 1954 because of the progressive fall in the availability of Digboi crude. Thus, the throughput of 0.530 m.t.p.a. could be maintained on a steady basis. The refinery turned out a wide range of products like motor spirit, superior kerosene, high speed diesel oil, light diesel oil, raw petroleum coke, bitumen, wax, lubricating oils and several speciality products. Till very recently it was the only refinery in India which produced finished waxes. In fact, production of paraffin wax had started as early as in 1931.

It is interesting to observe that in 1942 the British Government had asked the Assam Oil Company to actively push up oil production in Digboi for the Second World War requirements, although its output was averaging around 7,000 barrels per day. Nevertheless, the oil was of unusual importance because of Digboi's strategic location, it being closer to the scene of fighting. Consequently, Digboi refinery was able to fully support the requirement of petroleum products in the eastern sector during the Second World War. Assam Oil Company was an integrated company engaged in oil exploration, production and refining as well as in marketing and distribution of petroleum products in the Assam area.

Thus, at the time of independence, India had only a tiny integrated Assam Oil Company owned and operated by foreign oil
interests with about a quarter million tonnes of crude production and refinery capacity/throughput and meeting less than 10 percent of the country's requirement of petroleum products. The country's consumption level which was only 2.7 million tonnes per annum in 1947-48, had risen only to about 3.5 million tonnes per annum in 1950-51. Assam Oil Company processed small quantities of crude oil and its products were distributed in the Assam area by Burmah Oil Company (India Trading) Ltd. The production of refined products by Assam Oil Company formed about 5 percent of the total requirements of the country at that time. Until the beginning of 1950s, the Digboi refinery continued to have a capacity to process around 0.530 MTFA. In the later years substantial refining capacity had been built up in the country, but until then, almost the entire requirement of petroleum products was imported and distributed by three major international private oil companies, namely Standard Vaccum, Burmah Shell and Caltex.

Pioneered by the United States of America through the discovery of the first oil well in Pennysylvania by Colonel Edwin L.Drake, the stage was set for an oil rush similar to the gold rush which had occured a decade earlier. John D.Rockefeller and two emigrants had formed their own refining business in 1863 and by 1870, they had turned the business in to Standard Oil Company. With the addition of a few refineries, the Company owned ten percent of the entire oil refining industry of the USA by the end of 1871.

Towards the end of the century, oil was discovered in other parts of USA, notably in Texas in 1901. New refineries were established and new names such as Gulf and Texaco went up in lights. When the American Government joined the battle, Standard Oil Company was split up into thirty regional companies. One of these is still the largest oil company in the world - Standard Oil of New Jersey, better known as Esso. The former Standard Oil Company of New York became Mobil. Exxon or Esso, for most of its existence as Standard Oil is a company which transformed the world in which we live. This company for the following sixty years or so maintained its position by assets, as the biggest oil company in the world with 300,000 shareholders, and with its subsidiaries operating in a hundred countries. In 1973, its profits were a world record for any company in history - $2.5 billion. As oil was discovered in other parts of the world, more companies emerged.

The second largest oil company in the world is Shell. Royal Dutch Shell began as a trader and importer of oil for its home countries, U.K. and Holland. It was certainly very cosmopolitan with shareholders as 39 percent British, 19 percent American and 18 percent Dutch. Formed in 1907, it is an amalgamation of British and Dutch firms. They were the pioneers of oil exploration in the Far East and Venezuela and soon became a force to be reckoned within the oil industry. Referring to these two companies in particular Winston Churchill had observed

in June 1914, "Look out upon the wide expanse of the oil regions of the world! Two gigantic corporations - one in either hemisphere - stand out predominantly."

The two giants, Shell and Standard Oil or Esso literally shared the world between them. These companies had built up the international oil industry to grow into some of the biggest corporations in the world. Sampson very accurately pointed out, "Shell oil was pumped from Shell oilfields into Shell tankers, onto Shell refineries, into Shell storage tanks and through Shell pipelines to Shell filling stations. They were the first of global giants."

British Petroleum was formed in 1914 when the British Government bought the controlling interests in the firm which had opened up the oil fields in Persia (Iran). The main marketing network of British Petroleum covered much of Europe, Africa, the Middle East, India and Australia before the Second World War. Standard Oil (California) took up the option in Bahrain, Gulf Oil in Kuwait and Pacific Western Company in Saudi Arabia. The President of the Pacific Western Company, J. Paul Getty observed, "If one is to be anybody in the world oil business, one must have a footing in the Middle East."

The South East Division of the Standard Vacuum Oil Company (STANVAC) was a branch of the parent company incorporated in New York with limited liability to look after the marketing and distributing activities in Burma, Ceylon (Sri Lanka) and India. It was a world wide organisation. From January 1933 to

---

9. Ibid., p.6.

95
November 1960, Standard Vacuum Oil Company's shares were held equally between the Socony Vacuum Oil Company, New York and the Standard Oil Company, New Jersey. In order to bring about more flexibility in operations and control, the South East Asia Division was taken over by the Standard Oil Company, New Jersey. The Division office of the Company was located in Bombay, with four territorial offices in Bombay, Calcutta, Madras and Delhi. In 1957, the Company had 9 main installations at the ports of Bombay, Madras, Eranakulam, Calcutta and Kandla. The upcountry distribution of different petroleum products was carried out through a network of about 142 inland relay depots. It had 2525 retail pump outlets for distribution of specific petroleum products like motor spirit, high speed diesel oil, kerosene and lubricants. The Company had a total of 20 Aviation Service Stations.11

From January 1934 to March 30, 1962 Standard Vacuum Oil continued with marketing and distributing activities in India, Burma and Ceylon. Standard Vacuum was reorganised and the name of the company was changed into Esso Standard Eastern Inc. with effect from March 31, 1962. Esso - originated from the initials S.O. of Standard Oil and from April 1, 1962 rose on to become a household name. In addition to marketing and distribution of petroleum products, the Company was engaged in exploration and refining activities. As per the Indo-Stanvac Oil Exploration Project, the company had surveyed the Bengal Basin covering a concession area of 10,000 square miles from 1951 and went on to

test drilling in 1953. They also had a shot at the Rajasthan border region around Jaisalmer. Both came to nothing, the Bengal concession was abandoned in 1960 after ten dry holes and an expenditure of seven crore rupees.12

The compulsions of rapid economic growth called for industrialisation at a faster pace. This in turn meant greater energy consumption. Oil was the obvious answer, because even though coal was the main energy product in the late forties, it had already started giving way to petroleum. Increase in energy consumption called for increased imports of refined petroleum products. The country needed its own refining capacity. Consequent to progressive increase in demand for refined petroleum products and the need for meeting the same from indigenous sources, the Government of India in early 1950s called upon the three foreign oil companies for the setting up of three more refineries with foreign venture capital. The Refinery Agreements were signed with Stanvac, Burmah - Shell and Caltex between 1954 and 1957 for the two refineries to be established at Bombay and for the Caltex refinery to be set up in Visakhapatnam.13

The first Refinery Agreement was signed with Stanvac in November 1951, and was immediately followed by the Agreement with Burmah Shell in December 1951, and later with Caltex in March 1953. It is important to note that these Agreements quarantined the companies from nearly all the regulatory legislation and

13. Text in Appendices B,C,and E.
rules promulgated since independence, particularly with reference to the participation issue. The Agreements reserved a maximum of 25 percent for Indian participation and that too in preferred, non-voting shares only. It is clear that many regulations formulated by the Government were of a precautionary nature, unlikely to be used under normal circumstances. If found to stand in the way of production, they were willingly sacrificed, as became abundantly clear on the conclusion of the Refinery Agreements, final negotiations for which began on October 10, 1951. The companies were guaranteed against nationalization for 25 years from commencement of operations and "reasonable compensation" thereafter. Their imports of crude were exempted from customs duty and their machinery imports assigned a special, low five and a half percent ad valorem duty. They were specifically excluded from many provisions of the Industries Act. And the Agreements were of indefinite duration.14

These Agreements indeed marked the apex of the companies' fortunes. With the nationalization of the Abadan refinery in Iran, conditions changed radically for some time. Prices rose anyway; the Government of India wanted an assured supply of products, and the companies became interested in alternative refining capacity.

In terms of the Refinery Agreement of November 30, 1951 between the Government of India and the Standard Vacuum Oil Company, a public limited company was incorporated on July 5, 1952 in Bombay to run and operate a refinery. This Company was

converted into a public company on May 11, 1953. The refinery with an initial investment of Rs. 17.5 crores was to be located on a 300 acre plot at Trombay, Bombay. It went on stream on July 29, 1954 with an initial capacity of 1.25 million tonnes per annum (25,000 barrels per day). The refinery purchased crude oil by arrangements made through Esso International, a wholly owned subsidiary of Standard Oil Company, New Jersey. It initially processed only Aramco Safaniya crude oil but subsequently Ankleshwar crude too was fed into the refinery for processing.

This fuel refinery, the forerunner of modern refineries in India, answered an important need at a time when India was poised to take the first major step, after independence, towards rapid economic development. As a result of the spurt in industrial growth, the demand for commercial energy had grown rapidly. To stem the drain on foreign exchange and to ensure indigenous supply of petroleum products, it was necessary to start a refining industry in India. The refinery which was set up at Trombay was an important step in that direction.

Over the years the capacity of the refinery was found to be inadequate and was expanded to 3.5 million tonnes. To begin with, it started mixing six fuel products but subsequently the pattern was diversified to include the whole range of petroleum products. The refinery started manufacturing liquefied petroleum gas and jute batching oil in 1958; in July 1959, the asphalt plant was commissioned and in 1962 it began the manufacture of solvents used by the vegetable oil, textile, paint and rubber
This was in addition to the manufacture of motor gasoline, kerosene, high speed diesel oil, light diesel oil, fuel oil and bitumen. Since the product motor gasoline was not so much in demand locally, it was exported in 1956. In 1957 Stanvac started hot heavy stock fuel supplies to the adjoining Tata Trombay Thermal Power Station. In the same year duty protection on motor gasoline was given up by the Company and by 1960, duty protection on other petroleum products was also surrendered. By 1961, Stanvac started exporting some quantities of asphalt followed by naphtha exports in 1962. This year is significant because the name of the Company was changed to Esso in addition to commencement of processing of indigenous Ankleshwar crude with effect from November 16, 1962. For the first time in India, Esso Standard manufactured special boiling point spirit and hexane. This was followed by the production of mineral turpentine oil and aviation turbine fuel in 1965 and axle oil in 1966. By now naphtha was being supplied as a raw material for the new Trombay fertilizer plant of the Fertilizer Corporation of India as well as for the new petrochemicals plant of Carbide Chemicals Company.

On September 15, 1965 a Lube Refinery Agreement was signed between the Government of India and Esso Eastern Inc. for construction of a jointly owned lubricating base oil refinery. In 1969, new facilities were commissioned for supply of feed stocks to Lube India Ltd, an equal partnership enterprise of the Government of India and Esso Standard. Lubricating oils have a

unique place in modern industry. Without lubricants, all machines ranging from the giant steel mill to the time works in a watch - would come to a halt. In the sixties the demand for lubricants had increased substantially in India. Most of the requirements of lubricants were imported or blended from imported stocks. The lube refinery located adjacent to the fuel refinery in Bombay was inaugurated in February 1970. Originally designed to produce 145,000 metric tonnes per year of lube oil base stocks, it is capable of manufacturing nearly 200,000 tonnes per year of lube oil base stocks and other products. Most of these are motor oil base stocks and industrial oil base stocks. By 1970, other products like industrial asphalts, speciality products, petroleum ether, propane and carbon black feed stock too were manufactured by this refinery.17

Burmah Shell Oil Storage and Distributing Company, incorporated as a private limited company on January 6, 1928 in England, took over the marketing operations in India of Burmah Oil Company Ltd (B.O.C.Ltd) and the Asiatic Petroleum Company (India) Ltd. later known as Shell Company of India Ltd. The shares were held equally by B.O.C.Ltd and Shell Transport and Trading Company Ltd. on behalf of the Royal Dutch Shell Group. The Head Office was in Bombay with four branch head offices in Bombay, Madras, Calcutta and New Delhi. Burmah Shell became one of the leading dealers and distributors of petroleum products in India. Burmah Shell's marketing area covered the whole of India except Assam, Manipur and Tripura which were catered by Burmah

Oil Company Ltd. The Company in 1957 had 7 portwise offices, 24 divisional offices, 502 inland storage depots, 48 airfield outlets and 3,554 retail pump outlets. The Burmah Shell Refineries Ltd. was incorporated as a private limited company on November 3, 1952 following an Agreement signed by the Government of India with Shell Petroleum Company Ltd. and the Burmah Oil Company Ltd. of UK on December 15, 1951 for the establishment of an oil refinery at Bombay. It was converted into a public limited company on August 26, 1954.

The refinery site development commenced in February 1953 and the refinery went on stream on January 30, 1955 initially designed to process 2.2 million tonnes of crude oil per annum. It was able to process 1.8 million tonnes of crude in 1955. It refined crude oil consigned to it by Burmah-Shell Oil Storage and Distributing Company of India Ltd. and was designed to process both imported (Light Iranian) and indigenous (Ankleshwar) crude oils, the latter with effect from the year 1962. The end products included motor spirit, kerosene, aviation turbine fuel, light speed diesel oil, jute batching oil, light diesel oil, furnace oil, bitumen and liquified petroleum gas. Like Esso, duty protection on motor gasoline was surrendered on October 1, 1956 and on diesel oil, furnace oil and bitumen with effect from July 1, 1959. With the commissioning of new units within the refinery, it progressively expanded its capacity and variety of products.

to include motor spirit, inferior kerosene, 93 octane motor spirit, mineral turpentine oil, hexane and aviation gasoline. By August 1965, gas supply by pipeline had commenced for the use of Fertilizer Corporation of India Ltd. A six inch pipeline for delivery of naphtha to the National Organic Chemicals Industries Ltd. was commissioned in March 1968. Since its attainable capacity was to process crude oil upto 5.25 million tonnes per annum, the Company had agreed to utilize excess capacity to refine Middle Eastern crude on behalf of Indian Oil Corporation, the Government - owned Company which imported the same to meet the deficit in local production. The full refinery capacity was achieved for the first time in 1969.20

Caltex India Ltd. one of the Caltex Group of oil Companies incorporated in the Bahama Islands in 1937 started operations in India in the same year by taking over the business of Texas Oil Company. The entire share capital of the company (Rs. 4.73 crores) was held by Caltex Petroleum Corporation (New York) owned by Standard Oil Company of California (SOCAL) and Texaco of U.S.A. It obtained oil from its associate Caltex (UK) Ltd. for distribution in India. With its Head Office in Bombay, it had four district offices in Bombay, Calcutta, Madras and Delhi. It had its distribution network throughout India with six port installations at Kandla, Bombay, Cochin, Madras, Calcutta and Visakhapatnam; 2 lube oil blending plants, 86 major bulk depots and about 1,623 retail pump outlets.21

In terms of the Refinery Agreement dated March 28, 1953 between the Government of India and Caltex (India) Ltd., a public limited company was incorporated on February 23, 1955 in Bombay for the erection and operation of the Caltex Oil Refining (India) Ltd., i.e., CORIL. The shares of CORIL were held by Caltex Petroleum Corporation, New York and its nominated directors. Located on a 515 acre plot at Vishakhapatnam, the refinery went on stream on April 15, 1957 at an estimated cost of rupees fifteen crores. The initial licenced capacity was 0.675 million tonnes per annum (13,500 barrels per day) but was later raised to 1.60 million tonnes per annum. The requirements of Light Iranian crude for processing at the refinery were met by imports through Caltex Trading and Transport Company as agents for Caltex (U.K) Ltd.

The Company was engaged in marketing of petroleum products manufactured/produced from its own associate refining company - CORIL in Vishakhapatnam. In 1957 itself exports of motor gas and fuel oil were undertaken. The product yield included petrol, superior kerosene, diesel oils, liquified petroleum gas, mineral tupentine oil and naphtha. Both naphtha and asphalt were exported. Like the Burmah-Shell refinery, this refinery too was processing imported crude on behalf of and for Indian Oil Corporation. The crude oil was transported by World Bank Tankers and transhipped into smaller vessels for discharge into the refinery storage tanks.

These three foreign private oil companies reigned supreme on the Indian oil scene for a long time both in the

---

refining activities as well as in the marketing and distribution of petroleum products. These oil companies which were in foreign hands enjoyed complete monopoly in the oil sector in India till early 1960s. With the growth in consumption, the annual import bill for oil was increasing alarmingly. In spite of these refineries, oil prices were not falling. The foreign companies continued to make enormous profits. In August 1956, Swaran Singh, Minister for Works, Housing and Supply told the Lok Sabha that refinery profits would be scrutinized to ensure that no avoidable drain occurred. The Government decided in August 1957 that the then existing pricing procedure should be revised. The broad basis for pricing should be actual (and not assumed) cost plus reasonable profit. All the three marketing companies were informed in May 1958 that the Government considered it necessary to examine the quantum and propriety of all charges included by them in their selling prices of each product. In spite of various efforts, no real dent could be made in the companies' pricing formula until alternative supplies were found. In practice, this meant augmenting indigenous crude with imports, building State refineries with Eastern Bloc aid initially, and breaching the companies' monopoly of marketing - all of which the Government proceeded to do.

Faced with the serious problem of pricing anomalies, the Government considered several alternatives. One was to persuade

23. Kidron, Foreign Investments in India, p.169.
the three foreign oil companies to reduce the prices paid to their overseas affiliates for the imported oil. This approach met with little success. The second alternative was to suppress the growth in oil demand either through the price mechanism or through limiting imports. This obviously would have had a very detrimental effect on industrial development. A third alternative was to explore for oil within the country. Keeping this in mind, in May 1956, a Directorate of Oil and Natural Gas (ONGC) had already been set up as a wing of the Government. In 1959 this body directorate was converted into an autonomous body.

The Government plans formulated to extend its efforts in exploration through ONGC to Jaisalmer region in Rajasthan, Saurashtra, the Cauvery Basin, Madras; the Jawalamukhi area of north-east Punjab; and the Borsad region, Gujarat. Russian and Rumanian crews featured largely in these plans. The importance of oil in the industrial and domestic fields was evident to the leaders of the nation. The Industrial Policy Resolution of 1956 brought oil under the purview of the State.* The Resolution specifically declared the future development of mineral oil as the exclusive responsibility of the State.25

Besides oil exploration, it was decided to set up indigenous refining capacity in the country to process Indian crude. The dependence on foreign oil companies was becoming a sore point with the Government and in March 1959, Malaviya stated, "It will be our effort to control and have a fair share in the work of oil distribution and at the same time to examine

it and consult the foreign companies to see that a reasonable scheme is produced so that this work of distribution and refining might be taken up by Government in a satisfactory manner." 

However, direct assault on the companies' monopoly was clearly ruled out. They shared 95% of the market whereas the Government at that time had no regular or alternative supplies, lacked storage, transport and marketing facilities too. The Government planned to have the distribution of petroleum products in the public sector but this was to be in due course and in agreement with the oil companies.

Realising the growing importance of the strategic oil sector, the Government of India set up the Indian Refineries Ltd. registered on August 22, 1958 followed on June 30, 1959 by a marketing organisation, the Indian Oil Company Ltd. both in the public sector to undertake refining and marketing activities in the country. Indian Oil Company was floated with the immediate purpose of supplying Government requirements, or about one tenth of the total. One September 1, 1964 these two companies were merged and a new public sector company under the name of Indian Oil Corporation Ltd (IOC) came into being in order to secure an effective co-ordination and control between refining and marketing activities of the two companies. It was to be wholly managed by the Government of India and the Refineries Division was vested with the responsibility of managing the refineries, lube oil plant projects and pipelines. Since then the story of

the Indian Oil Corporation, be it in refining, pipeline transportation or marketing and distribution, has been one of spectacular growth.

The three refineries built and operated by the foreign oil companies were all port-based because of almost total dependence on imported crude oil but several other refineries set up later were located inland. In October 1958, K.D. Malaviya, Minister for Mines and Fuel returned from a four-week tour of Eastern Europe with a firm agreement for a refinery at Nunmati, near Gauhati in Assam, to be built and financed by Rumania. Until January 1, 1962 when the first State-owned refinery came on stream at Gauhati, the oil refining industry had been shared by four foreign plants: Assam oil's fifty year oil refinery at Digboi in Assam, Burmah - Shell's and Esso Standard's refineries in Bombay, and Caltex refinery at Visakhapatnam. 27Officially, more than half of the expanded refining capacity was to be in the public sector by 1966. The Government proceeded to realize this objective so that the public sector refineries could breach the full monopoly of the foreigners in this core sector.

No wonder since 1962, when Indian Oil Corporation commissioned its first refinery at Nunmati, the growth in the country's refining capacity has been very rapid. The Nunmati refinery with an initial capacity of 0.75 million tonnes per annum, went on stream on January 1, 1962 to process crude oil produced in Assam. Built at a total cost of Rs 17.29 crores including the cost of the township, the refinery was set up with the technical and financial collaboration of the Rumanian

Government who also made available a long term credit of Rs 5.6 crores.\textsuperscript{28} The refinery units were designed to produce gasoline, kerosene, diesel oil, fuel oil, and coke but subsequently other products like aviation turbine fuel, liquified petroleum gas, naphtha, motor spirit, low sulphur heavy stock were also manufactured.

The Government of India continued with its efforts to increase indigenous refining capacity with the Eastern Bloc aid. On June 16, 1961 a contract was signed with M/s Tiajpromexport, Moscow for the design and supply of equipment and the supervision for the erection and operation of a refinery to be set up at Barauni in Bihar for processing Assam crude. The Russian collaborators provided technical and financial aid for the Barauni refinery which was commissioned on July 14, 1964 when the first one million tonne per year unit (Atmospheric Vacuum Unit) went on stream. This was followed by the Coking Unit in October 1964 and the Kerosene Treating Unit in January 1965. The refinery built at a cost of Rs 49.4 crores including the cost of the township was formally inaugurated on January 15, 1965.\textsuperscript{29}

The second stage comprising another one million tonne capacity was commissioned in February 1966 followed by the third stage comprising of the Lube Oil Unit which was completed in November 1967. The initial capacity had expanded to 3 million tonnes per annum. The units yielded gasoline including liquified

\textsuperscript{29} Ibid., p.18.
petroleum gas, aviation turbine fuel, kerosene, diesel oils, fuel oil, lube oil, bitumen and coke.

A contract was signed with the Soviet authorities for the expansion of the refinery to 3 million tonne capacity of crude throughput. The expansion was completed on January 21, 1969. Subsequently, construction of the Coke Calcination Plant was started and completed in 1971. The Coke Calcination Unit was added at an additional cost of Rs 63 lakhs to produce calcined coke and raw petroleum coke. In June 1971, the Government approved for the revamping of the refinery for processing imported crude and a further expansion of the refinery capacity was obtained by the Indian Oil Corporation. It started the processing of imported crude by December 1972.30

One never stops building a refinery, say the refiners. A refinery keeps growing and it is ever so true about the Barauni refinery. An additional coking unit is being set up at an estimated cost of Rs 48.83 crores to produce middle distillates from the present long residue (low sulphur heavy stock) stream.

The successful commissioning of the two refineries at Gauhati and Barauni by the Indian Oil Corporation had been made possible with the Eastern Bloc aid which substantially benefitted India. A trade pact signed on December 2, 1953 between Russia and India was quickly followed by a first small shipment of oil products in January 1954. November 1955 saw the Indian Government examining an offer of two oil tankers and by November 1956, a preliminary agreement was reached covering the manufacture of

30. Indian Petroleum and Petrochemicals Statistics, 1983-84, Department of Petroleum, New Delhi, 1984, p.27.
heavy machinery, coal-mining equipment, fertilizer plants and an oil refinery which was set up in Barauni.

At long last, the Indian Government had found an alternative. They insisted, too, on their right to break any foreign (western) private monopoly in the country. Eastern Bloc aid was invaluable over and above its importance in helping to plug the foreign exchange gap. By the beginning of the Third Five Year Plan, Eastern Bloc aid covered between seven and eight of the sixteen Central Government projects carried over from the Second Plan, and twelve of the twenty-two new projects for which external credits were already assured. For example for the Nunmati Oil refinery, out of a total foreign exchange investment of Rs 9 crores, Rs 5 crores was forthcoming from the Rumanian collaborators. Similarly for the Barauni oil refinery, Rs 8 crores out of a total of Rs 23 crores was pooled in by the Russians apart from loans and technical aid that these countries provided. For the Gujarat oil refinery, the Russians had assured an investment of Rs 15 crores out of a total estimated cost of Rs 30 crores. The Eastern Bloc aid accounted for more than half the foreign exchange expected to be spent on all the projects (some Rs 270 crores out of a total of Rs 435 crores) and nearly one third of the total investment envisaged (Rs 794 crores). They were key items in India's programme of heavy industrialization.31

Indian Oil Corporation was making rapid strides both in the marketing as well as in the refining activities. The immediate threat to the three major oil companies lay in the Government's stated intention to operate through Indian Oil Corporation even before the public sector refineries came on stream. The other threat was the growing leanings of the Government towards Russia. Following the conclusion of an Indo-Soviet Agreement on February 21, 1961 providing inter-alia, for the establishment of a two-million tonne per year oil refinery to be set up in Gujarat, a site for the refinery at Koyali near Bajwa situated 10 kilometers from Baroda was selected on April 17, 1961. The Project Report jointly produced by the Soviet and Indian engineers was ready in March 1963. The Soviet authorities signed another contract for the supply of equipment and materials for the refinery in June 1963. The Rs 30 crore refinery project was to process and refine crude oil from the nearby Ankleshwar, Kalol and Navagam oil fields, to be supplied through a cross-country pipeline starting in the Gulf of Kutch in Gujarat. The control of the refinery built by Oil and Natural Gas Commission with Soviet technical and financial aid was later taken over by the Refineries Division of Indian Oil Corporation in April 1965. The pre-commissioning tests started in August 1965, while the actual commissioning of the first phase occurred in October 1965.\footnote{The Indian Petroleum Handbook 1966, p.19.} The second million tonne unit went on stream in May 1966.
and the third million tonne unit on September 28, 1967.

It was also decided to install an Udex Plant in the refinery premises in collaboration with Nuove Pignonne S.P.A. of Italy for the purpose of extracting benzene, toluene and other compounds as basic raw materials for the petrochemical industry. This was commissioned on December 17, 1968 at a cost of Rs 2.50 crores. The refinery was built at a total cost of Rs 26 crores. The capacity was increased to 4.3 million tonnes per annum through debottlenecking measures whereby constraints are removed in order to increase production capacity. This was followed by new crude oil tanks, low sulphur heavy stock despatches, production of liquified petroleum gas, naphtha, special cut kerosene and bitumen. The refining capacity was further increased in October 1978 from 4.3 to 7.3 million tonnes per year at a cost of Rs 56.07 crores. The significant point is that this expansion project completed in February 1979 was made possible largely through indigenous expertise provided by Engineers India Ltd. in addition to local material supplies. In September 1979, processing of Bombay High crude was started in a bid to reach the goal of self-sufficiency in oil production and refining. The project for secondary processing facilities at a cost of Rs 69 crores was commissioned in December 1982 with a Fluid Cat Cracker Unit as an important addition to the Koyali refinery.

Meanwhile, the Oil and Natural Gas Commission (ONGC)

actively engaged in implementing programmes for the development of petroleum sources, initially with foreign technicians and equipment; in Assam, with Russian help, where promising strikes were made at Rudrasagar, near Sibsagar; in Gujarat, with Russian and Rumanian help where three oil fields were struck at Cambay, Ankleshwar and Kalol; in the Jawalamukhi area, with Russian help where a promising gas find was reported in June 1958. The French collaborators helped in exploration activities in the Jaisalmer area in Rajasthan. Russian help was again forthcoming in the Cauvery Basin in Madras whereas the Gangetic basin was explored with Italian help. Negotiations for Yugoslavian assistance in prospecting the promising area along the Himalayan foothills between Jammu and Uttar Pradesh were also going on. By March 1965 the ONGC had completed drilling of 300 wells.

At the advent of independence, India had only 4 million tonnes of recoverable reserves of oil in Assam. With the entry of Oil and Natural Gas Commission and Oil India Ltd on a 50 : 50 partnership with the Government of India in the late 1950s, in the field of oil exploration and production, hydrocarbons in commercial quantities were found and the recoverable reserves of oil progressively went up to 128 million tonnes by January 1, 1970. The indigenous crude oil production was 6.82 million tonnes per annum but 11.68 million tonnes of crude was still being imported to cater to the demand. The total refinery throughout was 18.38

34. Kidron, *Foreign Investments in India*, p.191.
million tonnes. Therefore, the need to increase the total refining capacity was considered to be very vital especially since the offshore oil wells off Bombay coast were proving to be commercially productive. Drilling of the first offshore deep oil well off Tarapur structure in the Arabian Sea adjoining the Gulf of Cambay commenced in October 1973 with actual production starting from 1976 onwards. This was in addition to the crude oil being imported for the country's requirements. The total refinery throughput had to be accordingly augmented.

In view of the above, a decision was taken in September 1967 to set up a refinery with French and Rumanian collaboration. Once again, Indian Oil Corporation was to take charge. Contracts for design supplies and rendering of technical assistance were executed separately with M/s Technip of France and M/s Industrial Exports of Rumania in 1969. The following year contracts for fabrication and erection of all welded storage tanks were finalised and work commenced in June 1970.

The refinery, located on the banks of River Hooghly at Haldia in West Bengal was designed to process 2.5 million tonnes per annum of Middle Eastern crudes. The refinery completed at a cost of Rs 83.67 crores was set up with two sectors, one for producing fuel products and the other for lube base stocks. The fuel sector was built with French collaboration and the lube sector with Rumanian collaboration. The former went into

35. Indian Petroleum and Petrochemicals Statistics 1983-84, p.49.
commercial production from January 1, 1975. Production of jute batching oil, mineral turpentine oil and naphtha began immediately. The lube sector units were completed during 1977 when production of various grades of lube base stocks commenced.\textsuperscript{36} This was the first refinery in India to include facilities for the production of bright stock, the requirement of which was wholly met through imports earlier. The refinery was built largely through Indian expertise and full use of indigenous equipment was made.

While these new refineries at Barauni, Koyali and Haldia were being set up under the aegis of Indian Oil Corporation, the major international companies pressed the Government for permission to increase production. In June 1959, Burmah Shell offered to forego the tranche of 'duty protection' in exchange for an additional 300,000 tonnes a year throughput. This was accepted. A similar bargain was struck with Stanvac as from October 1, 1959. An Agreement with Caltex in the same vein followed in November 1960. However, the Burmah Shell offer to exchange the Refinery Agreement for permission to raise throughput from 2.75 million tonnes to 4 million tonnes a year was rejected.\textsuperscript{37} It was declared much to the chagrin of the foreign oil companies that the Government owned refineries would continue to claim priority over the expansion of the foreign oil companies. But pressure was being put on the Government to modify

\textsuperscript{36} Performance Budget - 1985-86, Ministry of Petroleum and Natural Gas, New Delhi, 1986, p.90.
\textsuperscript{37} Kidron, \textit{Foreign Investments in India}, p.171.
its oil policy, particularly by the World Bank Mission and the Oil Companies diplomats. K.D. Malaviya, the Minister for Mines and Fuel negotiated and stated that the Government would consider offers for new refineries on condition that the foreign share would be a minority one.

The policy of establishing new refineries wholly in the public sector came in for liberal reinterpretation. An agreement to build and operate a new 2.5 - 3.5 million tonnes per year plant at Cochin was concluded with Phillips Petroleum of the United States in April 1963. The Government was to hold more than 51 percent of the shares, 25 percent was to go to Phillips, 2 percent to Duncan Brothers of Calcutta and the rest to the Indian public. For ten years after the formation of the new company or until such time as all foreign exchange debts were returned, whichever is the later, Phillips would appoint the managing director; they would act as purchasing agents of crude for fifteen years, as chartering agents (using Indian flag tankers if and when available at competitive freight rates ) and as construction agents; would receive a high processing margin of $1.35 per barrel, declining to $1.30 after ten years, irrespective of the price paid for the crude.38 This agreement known as the Formation Agreement dated April 27, 1963 set the pattern of negotiations between the Government and some eight foreign companies towards the end of 1963 including one for

another refinery to be set up in Madras.

Cochin refinery was the first refinery to be set up in South India and the fourth in a chain of public sector refineries being set up in India. This was a different kind of experiment in collaboration for the development of the public sector in oil. So far oil refineries were either wholly private-owned or Government-owned. This was the first instance where, in addition to the Government of India with major shareholding, the Kerala Government, M/s Phillips Petroleum Company of U.S.A. as collaborators, and the Indian public also held shares. It was the first refining venture in which the private sector participated with the public sector. Cochin Refineries Ltd. was incorporated as a public limited company and formally registered on September 6, 1963 at Ernakulam with an authorised capital of Rupees 15 crores. The site for the refinery was chosen in a hilly area, 8 miles from the harbour, locally called Ambalamugal. Construction began in March 1964. The Company entered into a refinery construction contract with Phillips Petroleum International Corporation, Panama, Republic of Panama and a technical services agreement with Phillips Petroleum Company of the State of Delaware, U.S.A.39 The first unit came on stream in late August 1966. All the process units were in operation as of September 18, 1966.

The refinery was formally inaugurated by the then Prime Minister of India, Smt Indira Gandhi on September 23, 1966. She

said in her inaugural speech, "Cochin Refineries Limited is the first joint venture in the refining field. India is becoming increasingly self-sufficient in refining capacity. I am glad to learn that this refinery has been commissioned in less than thirty months."40

The refinery with an initial annual capacity of 2.5 million tonnes per annum was so designed that it could be expanded at a relatively low cost to an annual capacity of 3.5 million tonnes, if and when required. The refinery was initially fed with Light Iranian crude called Agha Jari from the name of the producing oil field in Iran. The Agha Jari crude combined with the processing scheme was particularly well adapted to conforming to the needs of the South Indian market, particularly for the production of kerosene, diesel fuel and furnace oil. The products of the refinery were marketed by Indian Oil Corporation for ensuring co-ordination. The Formation Agreement was modified in 1968 to include an expansion of the refinery which was completed in August 1973. The Secondary Processing Scheme with a capacity of 1 million tonne was approved on November 5, 1979. Later, on September 18, 1981 it was agreed to further increase the refining capacity to 4.5 million tonnes per annum.41

Cochin Refineries Ltd. was a unique enterprise of its time. The foundation of its corporate structure and mode of operation rested principally in the document called the Formation

40. Text provided by Press Information Bureau, Government of India, New Delhi.
Agreement. However, the general terms of the financial programme were defined even before the Formation Agreement was executed. Indications at that time were that a capitalization of Rupees 17 crores would finance completion of the refinery and requisite ancillaries. Included in this estimate was a dollar component comprising of $18 million in loans from private American Banks and $3.8 million in equity from Phillips Petroleum Company. The Company issued 7 lakh shares of Rupees 100 each in February 1964 for a total equity capital of Rupees 7 crores. The Government of India owned 52.4% of shares; Phillips Petroleum 26.4%; Duncan Brothers 2%; Government of Kerala 7.1%; Life Insurance Corporation 6.6% and the public owned 5.5% of the same.42

Madras Refineries Ltd was incorporated on December 30, 1965 as a company under the Indian Companies Act, 1956 with an authorised capital of Rupees 9 crores, pursuant to the Formation Agreement between the Government of India, National Iranian Oil Company and Amoco India Inc. of U.S.A. The agreement for setting up of the Madras refinery was signed in November 1965. The refining company with 74 percent of the equity capital being held by the Government of India and 13 percent each by the two foreign collaborators was to build and operate a refinery with a designed capacity of 2.5 million tonnes per annum. In addition to the usual products, it would produce 200,000 tonnes of lube base stocks.

The refinery, located near Manali village in Chingelpet district, about 10 miles from Madras was estimated to cost Rupees 25 crores. The entire foreign exchange component of the cost was to be met by foreign equity and foreign loan. The contract for the construction of the main plant was awarded on November 26, 1966 to M/s Snam Progetti, an Italian firm. A long-term contract for supply of crude oil for the refinery was concluded between the Government of India, National Iranian Oil Company and Pan American International Oil Company (later Amoco Overseas Oil Company) in 1965.43

Construction activities began with effect from April 1967 and the project was completed in a record time of 27 months despite a number of operational problems and delay in the arrival of some equipment due to the closure of the Suez Canal. The refinery went on stream in June 1969 with a final project cost of Rupees 43.01 crores.44

By 1973, the refinery had developed new products like rubber processing oils, ink oil and axle oil. In the same year asphalt was exported to Indonesia and lubricating oil base stock to Bangladesh. Subsequently, in November 1978 licence and engineering services agreements for paraffin wax plant were executed with M/s Union Oil Company of California, U.S.A. On March 20, 1980 the Government approved the project to double the refining capacity from 2.8 million tonnes to 5.6 million tonnes

44. Ibid.
per annum with matching facilities for secondary processing. M/s Engineers India Ltd. were assigned the task of the expansion work for which construction activities began in 1981.

With improvement in technology in the refining process, many new products were developed including raw materials from petroleum sources which were used for the petrochemical industry in India. In fact, the rapid growth of this industry is due to the cheap substitutes it provides in place of chemicals hitherto obtained from conventional sources. A wide range of industries such as plastics, synthetic rubber, dyestuff intermediates, nitrogenous fertilizers, synthetic detergents, synthetic fibres, automotive chemicals and printing inks have benefitted from the developments in the field of petrochemicals. The first public intimation of plans for a petrochemical industry had came at one of Malaviya's press conference in July 1961. While a number of negotiations were reported immediately afterwards with the Italian ENI, with Esso-Standard and Phillips Petroleum, these remained in abeyance for sometime. It was expected to be overwhelmingly a private-sector industry controlled from abroad, particularly at the processing end where Esso-Standard Eastern and Union Carbide were to be the major producers.\footnote{Petroleum Press Service, Volume 29, London, November 1962, p.429.} A Petrochemicals Division was created as part of the Oil and Natural Gas Commission in 1963 and by March 1967, this Division submitted a detailed project report regarding the Gujarat

Aromatics Project to the Government. Indian Petrochemicals Corporation (IPCL) was incorporated in March 1969 and the Government assigned the Gujarat Aromatics Project to IPCL.

To achieve coordination in the refinery and petrochemical processes, Bongaigon Refinery and Petrochemicals Ltd. (BRPL) was incorporated in Assam on February 20, 1974 as a fully owned Government undertaking with an authorised capital of Rs 50 crores. In November 1977, the authorised capital of the company was increased to Rupees 100 crores. The Feasibility Report was prepared by Indian Oil Corporation and Indian Petrochemicals Corporation Ltd. BRPL was established with the objective of installation of a refinery having a processing capacity of 1 million tonnes per annum crude throughput. Petrochemical projects included among others Xylenes and Polyester Staple Fibre Units.

Civil work for this complex set up in Assam started in 1977 and the mechanical completion of the crude distillation unit and offsite facilities was completed by April 1978. The first module of the Capitive Power Plant (CPP), Crude Distillation Unit (CDU) and offsites was commissioned in February 1979. On April 25, 1979 the CDU commenced commercial production and by December in the same year, the Kerosene Treating Unit was mechanically completed and put on trial runs in March 1980. Simultaneously work progressed on the petrochemicals projects like Xylenes Unit,

46. Indian Petroleum and Petrochemical Statistics 1983-84, Department of Petroleum, Economics & Statistic Division, New Delhi, 1984, p.35.
Polyester Staple Fibre Plant, Polyester Filament Plant and Nitrogen Plant. All the units of BRPL were commissioned by 1984.

The total approved cost of the refinery worked out to be Rupees 106.29 crores and for the petrochemicals complex Rupees 302.84 crores. The financing for the refinery as well as the petrochemical projects was partly made by equity and the balance was met by loans taken from the Central Government, Oil Industry Development Board and Oil and Natural Gas Commission.47

With the Cochin Refineries Ltd. and Madras Refineries Ltd. having majority Government participation, the Government had by 1970-71 acquired control over about 60 percent of the refining throughput and 53 percent of the marketing operations of petroleum products in the country. The Government had already declared its objective of acquiring effective control over the oil industry not only in refining and marketing but also in oil exploration and production. The purpose obviously was to bring this strategic industry under national control not only because it was not to be left in the hands of foreign oil companies but also because it was felt that optimisation of petroleum production and utilisation were of crucial importance to the Indian economy. With this objective in view, the Government proceeded to take over the shares of the foreign companies in order to completely nationalise the oil industry. While it proceeded with negotiations to do so, it was also actively

engaged in oil exploration and in building up matching refining capacity. All efforts were being made to utilise Indian expertise and indigenous products but latest technology was still required to be imported.

A protocol on economic and technical co-operation between India and Soviet Russia was signed in July 1973 for the construction of a six million tonne per annum capacity refinery to be set up in Mathura. A contract for deputation of Soviet specialists for preparing a Memorandum of Instructions was signed between Indian Oil Corporation and Neftechimpromexport, Moscow in September and by December 1973, a contract for preparation of a detailed project report, analysis of crude oil, supply of equipment/material, deputation of Soviet specialists for rendering technical assistance in setting up the refinery was finalised.48

The Mathura refinery situated 60 kilometers from the world famous Taj Mahal in Agra is India's latest and most modern refinery. In the construction of this refinery, maximum use was made of indigenous capabilities in engineering, equipment and materials. The entire construction was entrusted to Indian contractors. The refinery was commissioned on January 18, 1982 at a high cost of Rs 253.92 crores. The Fluid Cat Cracking and Sulphur Units were commissioned later in January 1983. The refinery was formally inaugurated on May 14, 1983. It has in-

built capability to raise its processing capacity to 7 million tonnes per year. It processes both Bombay High and imported crudes pumped along the 1200 kilometers long cross-country pipeline from Salaya on the west coast.\textsuperscript{49} The refining at Mathura was conceived to meet the growing demand of petroleum products in the north-west areas. This is the area where the requirement of petroleum products was growing at a much faster rate. It was felt that the railway and road infrastructure would be grossly inadequate if the products were to be moved from any coastal location to meet this growing demand. Apart from meeting the increasing demand of petroleum products in the north and north-west parts of India, the refinery also helps to ease many logistics problems of feeding this part of the country.

Petroleum industry in India has made rapid strides during the last two decades or so. Starting from a modest level of indigenous crude production of 0.5 MMT, refinery throughput of around 6 MMT and consumption level of a little over 8 MMT per annum in 1960-61, Indian's crude oil production by the end of 1981-82 reached a level of around 16 MMT per annum, the refining capacity at 37.80 MMT and consumption level at around 32 MMT. Out of the twelve refineries with an annual refining capacity of 37.80 million tonnes per annum, six -- Digboi, Gauhati, Barauni, Koyali, Haldia and Mathura, with an annual refining capacity of about 20 million tonnes, are owned and operated by

\textsuperscript{49} Performance Budget 1985-86, Ministry of Petroleum and Natural Gas, p.90.
the Indian Oil Corporation. This remarkable growth has been possible due to the priority given by the Government to this industry and the patronage extended to the public sector. India's oil scenario thus, between the late fifties and the present eighties has undergone a dramatic change. It would be no exaggeration to suggest that it was the emergence of Indian Oil Corporation on India's oil map and the capacity and efficiency it demonstrated to handle refining, distribution and marketing operations on an ever expanding scale, that led to the nationalisation of the major foreign oil companies in the seventies.