Distribution, Transportation and Supply*

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Distributors

The bulk of the distribution of petroleum products in Japan is performed by the distributors or marketing companies. As of the end of 1961 there were 15 companies known as distributors. The distributors may be divided into these who possess their own refineries and those who have refineries through their affiliated refining companies. The refined petroleum products, both domestic and imported, are distributed throughout Japan by the distributors. The distributors have their agents and subdealers under their wing to distribute their products in each prefecture. The petroleum products, either produced in Japan or imported from abroad, are transported from the refineries where they are produced or from the unloading port in case of import, to their local storage facilities and from there to their agents or subdealers' storage facilities.

On Table 1 are listed the distributors and their chain, the refineries under their supervision, their refining capacities, their share of sales, and agents in 1961.

General Bussan and Nippon Gyomo began operating their own refineries in November 1960. Mitsubishi Oil Co. and Nippon Mining Co. each completed and began operating a new refinery in June 1961.

It is estimated that the demand for petroleum in 1970 will be 110 million kl or 3.5 times the demand of 1960. To meet this increasing demand, new groups are active in trying to enter the field of refining. For instance, the electrical power companies are planning to construct a topping plant to obtain their own fuel oil for power generation. The petrochemical companies, in order to secure their naphtha as gas manufacturing feedstocks, are planning to combine with the electrical power companies to construct refineries. The declining coal mining companies are trying to make inroads into the fields of petroleum refining and marketing

by themselves. Trading companies, previously specialized in the import of oil, are planning to set up their own refineries. Although in 1961 none of the proposed enterprises took shape, the huge demand for oil in the future can be foreseen and with the abolition of foreign exchange allocation system for petroleum at the end of Sept. 1962, it can be safely predicted that new oil companies will emerge. The Government, however, is considering the enactment of a law pertaining to petroleum industry after the liberalization of oil import during autumn of this year whereby a certain licensing system will be enforced for new installations.

Distribution

The sales of petroleum products in the fiscal year 1961 are estimated to be 38,486,000 kl, an increase of 23.5% over the previous year. (for details see Table 2). The quantity exported will be 3,926,000 kl, an increase of 30% over the previous year.

Of the products sold in the domestic market, the increase in the sales of motor-gasoline represents 15.8% which is an outcome of increase in motor vehicle registrations as a result of economic expansion. The same can be said for the increase of 28.5% in the sales of gas oil. Because of the unusual high tax rate for gasoline compared to gas oil in Japan, there is an increasing trend of heavy vehicles such as trucks and buses to use diesel engines, which has resulted in the high sale rate of gas oil.

The increase in the sales of naphtha is also notable. The petrochemical industry in Japan is mainly depended on the gas obtained from cracking of naphtha. With the number of cracking plants increasing every year, there has been a big jump in its demand. (Refer elsewhere on this subject)

The sales of kerosene have shown a big increase also. This increase is attributed to the increase in the sales of kerosene stoves for home heating and cooking. There has also been an increase in the sales of fuel oil. With the active production of mining manufacturing in-

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dustry the demand for heat and electrical energies has increased considerably year by year. Due to the high cost in the production of coal, however, its consumption has not increased in relation to the demand for heat energy. It can be safely predicted that Japan's heat energy will depend largely for its source on the fuel oil for the present and in the future. The sales of LPG have also increased tremendously. The source of LPG supply in Japan comes mainly from the recovery of propane-butane mixed gas in the refineries which make up about 89% of the total source. The recovery from natural gas makes up 2% and the remaining 9% comes from the gas recovered from cracking of naphtha in the petrochemical plants.

Japan's economic growth has been much favorable. Since 1949, when the independent economy policy was established, up to 1960, a period of 11 years, the growth of the gross national products averaged 9.6% which was rather high compared to other countries. In step with the economic growth, the energy consumption in Japan has increased every year (refer Table No. 4). Coal which is one of the source of energy has been fighting a losing battle against oil because the production of coal, from the economical standpoint when mined with the present technique, is barely from 50 million to 60 million metric tons per year. Hence, the future of heat energy will inevitably depend largely on oil.

In August 1961, the Government announced its plan of liberalizing the import of petroleum. The import of petroleum into Japan after the war has been controlled by the system of foreign exchange allocation. Together with the announcement of the Government to abolish the allocation system for petroleum by the end of September 1962, the Government is considering the problem which would arise with the liberalization such as the cheap import of petroleum which would menace coal industry, or the fierce competition among the oil companies which might hinder the healthy growth of the industry, or forcing the weak domestic crude oil producers to economic difficulties because of the stiff competition.

The announcement of liberalization of oil import has already incited the oil companies to cut down their prices to increase the volume of their sales. As a result, the income of the oil companies has fallen considerably in 1961 and their closing accounts for the same year have shown a loss.

On June 1, 1961 the customs duty for petroleum has been revised. The petroleum duty after the war had been an *ad valorem* duty, but as from June 1st, it has been changed to specific duty. In Japan the gasoline and gas oil tax are collected with the object of covering the expense for road improvement. The Government, in order to carry out its plan of improving the road, increased the gasoline tax by ¥3,400.00 per kl (3.57 ¢ per U.S. gal) as from April 1st so that the present gasoline tax is ¥26,100.00 per kl (27.44 ¢ per U.S. gal). The gas oil tax has been raised by ¥2,100.00 per kl (2.2 ¢ per U.S. gal) as from May 1st so that its present tax is ¥12,500 per kl (13.14 ¢ per U.S. gal).

The estimate of supply and demand of petroleum for fiscal year 1961 is given in Table 5. The supply of domestic crude oil is only 1.8% of total. Among the refined petroleum, which are imported and exported, aviation gasoline is imported while motor-gasoline is exported and small quantity of jet fuel, kerosene and gas oil are exported. As for fuel oil, 5,889,000 kl are imported while 2,492,000 kl are exported, leaving a balance of 3,407,000 kl excess import. The crude throughput for the fiscal year 1961 is estimated to be 675,600 barrels per day, which when compared to last year's 523,500 barrels per day will mean an increase of 29%. As can be seen from the above figures, 88% of the domestic demand for petroleum fuels is supplied with domestic refined product for the fiscal year 1961. However, 98% of the crude is to be supplied from overseas.

The tank capacities of refineries as of the end of 1960 and 1961 are given in the following table:

To cope with the tremendous increase in the crude throughput in recent years, the storage tanks of refineries are becoming to be of mammoth size. The 30,000 to 50,000 kl capacity floating tanks are becoming ordinary sizes of tanks. At the end of 1960 the storage capacity of crude oil tanks against crude oil refining capacity of 30,465,135 kl was an average of 30 days. The storage capacity of tanks at the end of 1961 was an average of 42 days even when the refining capacity had increased to 36,940,367 kl, showing the stability in supply.

There were 8,251 gasoline service stations throughout Japan at the end of 1960 with the number of fixed pumps 17,586 and the underground tank capacity 115,112 kl. However, by the end of 1961, with the increase in the registration of motor vehicles, it is estimated that

the number of service stations will increase to 10,100, the fixed gasoline pumps to 22,510 and the underground tanks capacity to 147,500 kl.

Transportation

Crude and fuel oils are transported by both Japanese and foreign ships. The Japanese vessels transport about 55% of the crude oil and 50% of the fuel oil. The lag in tanker building has caused the Government to consider plan for construction of additional tankers to keep pace with the big increase in demand for oil. As of April 1st, 1961, tankers were 102 in number and the total tonnage 2,457,634 D/W LT. Of this total, 76 tankers with total tonnage of 1,841,978 D/W LT (74.9%) are owned by shipping companies, 13 tankers with a total tonnage of 24,070 D/W LT (9.9%) are owned by whaling companies, and 13 tankers with a total tonnage of 371,586 D/W LT (15.2%) are owned by oil companies. There are no Government owned tankers. There are 8 tankers with a total tonnage of 353,250 D/W LT under construction for fiscal year 1961, which will have been on service by the earlier time of this year. The increase in quantity of oil imported has caused bigger tankers to be built so that tankers of 30,000 to 50,000 D/W LT are being classed as ordinary size tankers. The large refineries are using mammoth tankers of 80,000 to 100,000 D/W LT. In order to admit these mammoth tankers, improvement of harbor facilities has been carried on for the past few years. Up to a few years ago the standard depth was -12 meters which was the standard for dredging and facilities of the wharves. However, the new refineries under construction (100,000 to 150,000 bbls/day) are preparing their harbor facilities to a depth of -16 meters. Likewise the depots along the coast of Japan are preparing their harbor facilities to admit mammoth tankers.

The average tanker rate for 1960 was USMC-44%, but in 1961 it is expected that this rate will be USMC-47%.

As of the end of 1960, the number of tank cars owned by the oil companies amounted to 3,234, a total of 75,341 tons, those owned by National Railway Corporation 183, a total of 3,083 tons,

those owned by Ministry of Finance 55, a total of 1,100 tons, and those owned by other private companies 116, a total of 3,431 tons. Besides the above number, the U.S. Army Transportation Corps has 154 cars, a total of 4,620 tons. At the end of 1960 the tank trucks throughout Japan numbered 3,655 with a total capacity of 23,056 kl of which tank trucks for gasoline transportation numbered 2,188 with a total capacity of 14,089 kl.

As explained previously, of recent years there has been a sudden increase in the consumption of LPG. As a result production has not been able to keep up with the demand. For this reason plan has been made to import LPG from Middle East. In 1961, construction of three LPG tankers of refrigeration type was undertaken. Two of the tankers were for oil companies and one was for petrochemical company. One of the tankers of 46,100 D/W LT for an oil company was designed to carry 4,700 LT of LPG and 40,000 LT of crude oil. She was launched in November 1961 and already made her maiden voyage at the end of the year. The other tanker is of 22,400 D/W LT with the capacity to transport 14,500 LT of crude oil and 5,000 LT of LPG. She is expected to be completed by February this year. The third tanker of 30,000 D/W LT is being constructed to haul only LPG and she is expected to be completed by January this year. Besides these ocean tankers there are five LPG coastal tankers of 2,213 D/W LT.

Forecast

According to the forecast of Petroleum Association of Japan, the demand for petroleum products in 1970 will amount to 110,437,000 kl an increase of 3.5 times that of 1960. (Refer Table 6). The crude oil requirements are estimated to be 115,490,000 kl. This would require a crude thruput capacity of 3,076,000 bbl/day. The capital required for investment on facilities for next ten years will amount to 941,200 million yen (2,600 million dollars) of which 606,000 million yen (1,680 million dollars) would be for refining and 335,200 million yen (920 million dollars) would be used for distribution facilities.