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Intelligence Memorandum

Japan's Growing Petroleum Needs And Its Search For Oil

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
October 1971

INTELLIGENCE MEMORANDUM

JAPAN'S GROWING PETROLEUM NEEDS AND ITS SEARCH FOR OIL

Introduction

1. Petroleum became Japan's major source of primary energy a decade ago. Without an adequate supply of crude oil or petroleum products, Japan's rapidly growing economy soon would be crippled. Consequently, Tokyo is particularly sensitive to developments in the world oil industry. The recent increase in world oil prices, the constant threat of interruptions in oil shipments from the Persian Gulf, which provides about 85% of Japan's supply, and the dependence on international oil firms for most of its crude oil, all have been of particular concern. This memorandum discusses the importance of oil to Japan, describes the industry's existing policy and practices, and assesses the options available to Tokyo during the 1970s to provide a secure source of crude oil.

Discussion

Petroleum's Growing Importance

2. The 1960s witnessed a tremendous growth in Japan's petroleum consumption as petroleum's share of total energy consumed rose from 30% in 1960 to about 70% in 1970. This was the largest share contributed by petroleum in any major developed country. By comparison, the United States derives 45% of its energy needs from petroleum, and other Free World developed countries average about 55%. Petroleum consumption will continue to grow rapidly. By 1975, Japan is expected to consume about 7.5 million barrels per day (b/d) of petroleum products, a nearly 83% increase over the 1970 level of 4.1 million b/d. Nuclear power and liquid natural gas are also expected to show substantial gains during the period but will still account for only a very small share of the total in 1975 -- probably not more than 4%. Coal, the most important source of energy

Note: This memorandum was prepared by the Office of Economic Research and coordinated within the Directorate of Intelligence.

until 1961, has declined steadily in importance and in 1975 probably will account for only about one-sixth of all energy consumed.

3. Demand for all major petroleum products increased sharply during the 1960s (see the table). The most rapid growth occurred in the consumption of naphtha which increased at about 40% annually between 1960 and 1970. By 1970, naphtha's share of total petroleum consumed had grown to 11% compared to only 3% in 1960. This increase reflects the tremendous expansion of the petrochemical industry which uses naphtha as a feedstock. Consumption of heavy fuel oil, used primarily by manufacturing and utility companies for heating and power generation, grew about 19% each year, rising to 1.8 million b/d in 1970. While demand for gasoline increased to 366,000 b/d, the rate of increase was much slower than for other petroleum products. As a result, gasoline's share of the petroleum market dropped from 19% in 1960 to 11% in 1970. About 259,000 b/d of kerosine were consumed in 1970 -- about the same share as in 1960. These trends are expected to continue over the next several years as naphtha consumption continues to expand rapidly and gasoline consumption grows rather slowly. Fuel oil's share of all petroleum consumed is expected to remain at about its present 60%.

Japan:
Domestic Demand for Major Petroleum Products

Million Barrels

Product	1960	1965	1970	1975
Gasoline	36.9	68.5	133.7	212.1
Naphtha	5.4	49.5	161.6	265.5
Kerosine	12.0	33.0	94.5	183.9
Gas oil	13.4	35.2	74.4	126.0
Heavy fuel oil	117.0	304.0	655.0	1,085.3

4. Japan's petroleum industry has expanded rapidly to keep pace with growing demand. Capacity for topped crude oil almost doubled -- from 1.7 million b/d in 1964 to about 3.3 million b/d in 1970 -- making Japan's refining industry the second largest in the Free World. In 1970 the Ministry of International Trade and Industry (MITI), which regulates the oil industry, approved an increase in capacity of 733,000 b/d to be completed by the

end of 1973. This was the largest single expansion program yet approved. Despite the industry's rapid growth, refineries have been hard pressed to meet demand, and construction programs are being pushed to completion ahead of schedule.

5. Japan must import crude oil to meet most of its needs (see Figure 1). Domestic crude oil production has averaged only about 16,000 b/d in the past decade, while crude oil imports soared from about 535,000 b/d in 1960 to more than 3.4 million b/d in 1970, valued at some $2.2 billion. In addition to imports of crude oil, net imports of petroleum products, valued at $510 million, were required to meet consumer demand. Persian Gulf countries accounted for about 85% of Japan's crude oil imports in 1970, with 43% coming from Iran alone. Indonesia, which has increased its share of Japan's market rapidly in recent years, now accounts for about 13% of Japan's oil purchases. Petroleum product imports come mainly from Singapore and the Persian Gulf.

Foreign Role in the Oil Industry

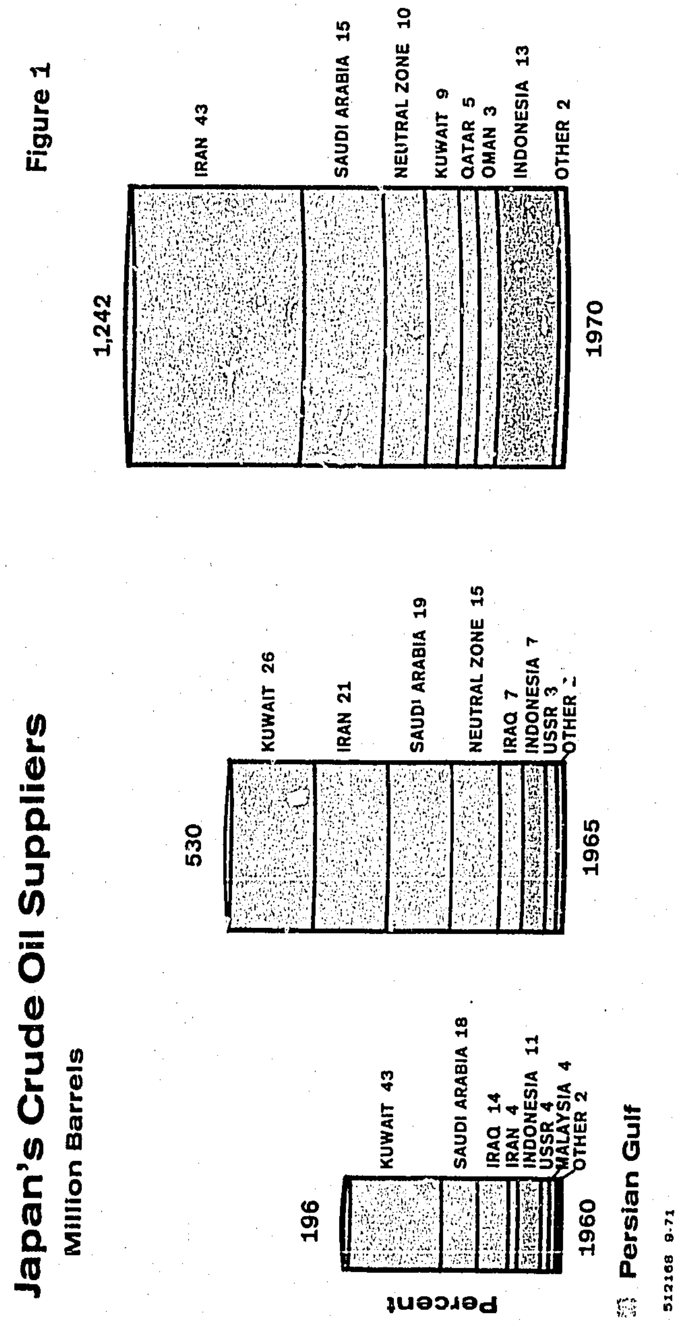
6. The petroleum industry is one of the few industries in Japan of which foreign companies own a significant share. Western participation began shortly after World War II, when large amounts of capital and advanced technology were needed to rebuild the devastated facilities. Foreign companies were the most obvious source of capital and technology and, in addition, controlled the supply of crude oil. Western companies, especially American companies, invested heavily.

7. Foreign participation grew rapidly in the 1950s, with relatively little direct effort by the Japanese government to discourage it. Government interference was directed principally to protecting the nation's coal interests, which were rapidly losing ground to the growing petroleum industry. Restrictions were placed on crude oil imports, and duties were put on fuel oil in an effort to force prices higher to make coal more competitive. The government also limited foreign exchange allocations for oil imports, and restrictions were placed on conversion of power generating boilers from coal to oil.

8. As foreign domination grew, however, the government became increasingly concerned. In the late 1950s, Tokyo restricted new foreign investment to joint ventures, limiting foreign participation to a maximum of 50%, and encouraged Japanese firms to prospect for oil abroad to lessen dependence on foreign suppliers. In a related move, the quantity of crude oil an affiliate could buy from its parent company was limited to the proportion of the parent company's equity in the firm.

9. The government assumed far reaching control of the industry in the early 1960s through MITI. While this may have been done in part

Figure 1


Japan's Crude Oil Suppliers
Million Barrels
Percent
196
KUWAIT 43
SAUDI ARABIA 18
IRAQ 14
IRAN 4
INDONESIA 11
USSR 4
MALAYSIA 4
OTHER 2
1960
530
KUWAIT 26
IRAN 21
SAUDI ARABIA 19
NEUTRAL ZONE 15
IRAQ 7
INDONESIA 7
USSR 3
OTHER
1965
1,242
IRAN 43
SAUDI ARABIA 15
NEUTRAL ZONE 10
KUWAIT 9
QATAR 5
OMAN 3
INDONESIA 13
OTHER 2
1970
Persian Gulf
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because of concern over foreign domination of much of the industry, the move was in keeping with Japanese economic philosophy regarding government participation and control of almost every important aspect of economic activity. MITI, whose authority continues to the present time, regulates refinery construction, sets domestic petroleum prices and import allocations, and even passes on new service station construction and sales quotas for retailers. Indirectly, MITI exercises considerable control over the growth of foreign investment, reviewing all foreign investment applications and applications for foreign loans. These also must be approved by the Ministry of Finance.

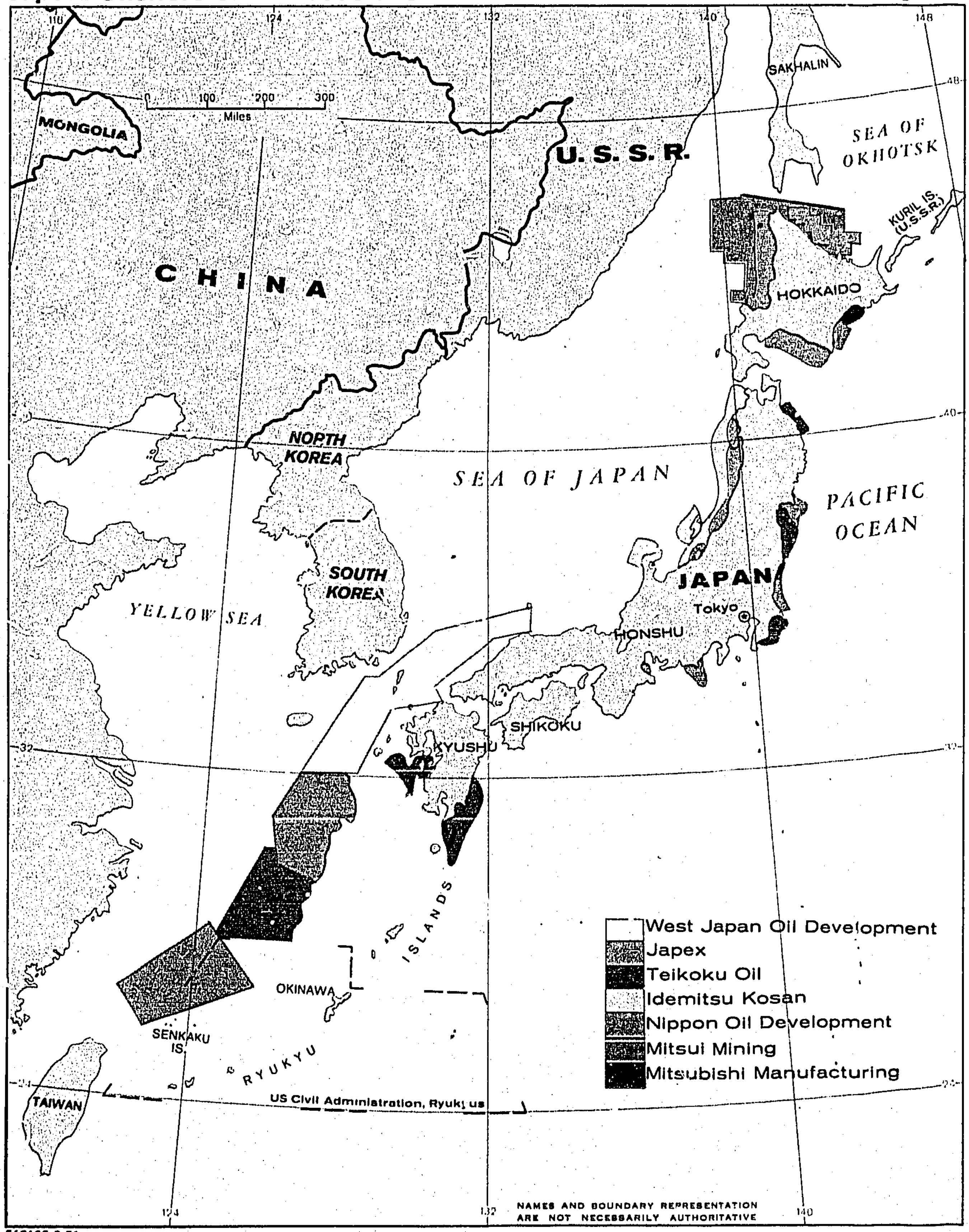
10. Although Japan continues to show concern over the participation of foreign firms which have an equity share in more than half of refining capacity and in nearly 55% of total product sales, the government has avoided taking strong measures to reduce foreign holdings. This may be due in part to the importance of the parent companies as crude oil suppliers. Also, Japan may realize that foreign participation in the oil industry does not constitute a threat. Foreign influence is negligible because of pervasive government control. Even profit remittances abroad are small since refinery earnings in Japan are quite low. The large return to foreign oil companies is from crude oil sales to refineries rather than from refinery profits, and these would not necessarily be affected by a reduction in foreign equity in the oil industry. Japan would like to have more control over crude oil sources, however, and this goal is being pursued by encouraging Japanese companies to increase their exploratory activities.

Search for Oil

11. Tokyo's concern with its dependence on foreign suppliers for crude oil is understandable considering that almost all of Japan's oil comes from abroad, and nearly 85% of it is supplied by foreign companies – US firms account for about 53%, British companies supply 12%, and about 19% is supplied by other foreign companies. Only 11% is supplied by Japanese-owned companies and 5% by companies owned jointly by US and Japanese firms.

12. While oil exploration and development in Japan have been under way since 1890, very little oil has been found. Indeed, production has stagnated during the past few years at around 5.5 million barrels, primarily because existing fields are small and funds for new exploration and development are inadequate (see Figure 2). By the end of 1969, Japan had about 1,500 operating wells producing an average of 10 b/d each. The selling price was relatively high – approximately $2.60 per barrel, compared with the $2.08 per barrel price for foreign oil – including customs duties. To compensate refineries that buy the more expensive domestic oil, a price differential is paid out of funds derived from the customs duties on oil

Japan: Offshore Oil Concessions **Figure 2**



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imports. The latest price hikes for foreign oil, however, will close the gap between the domestic and foreign prices.

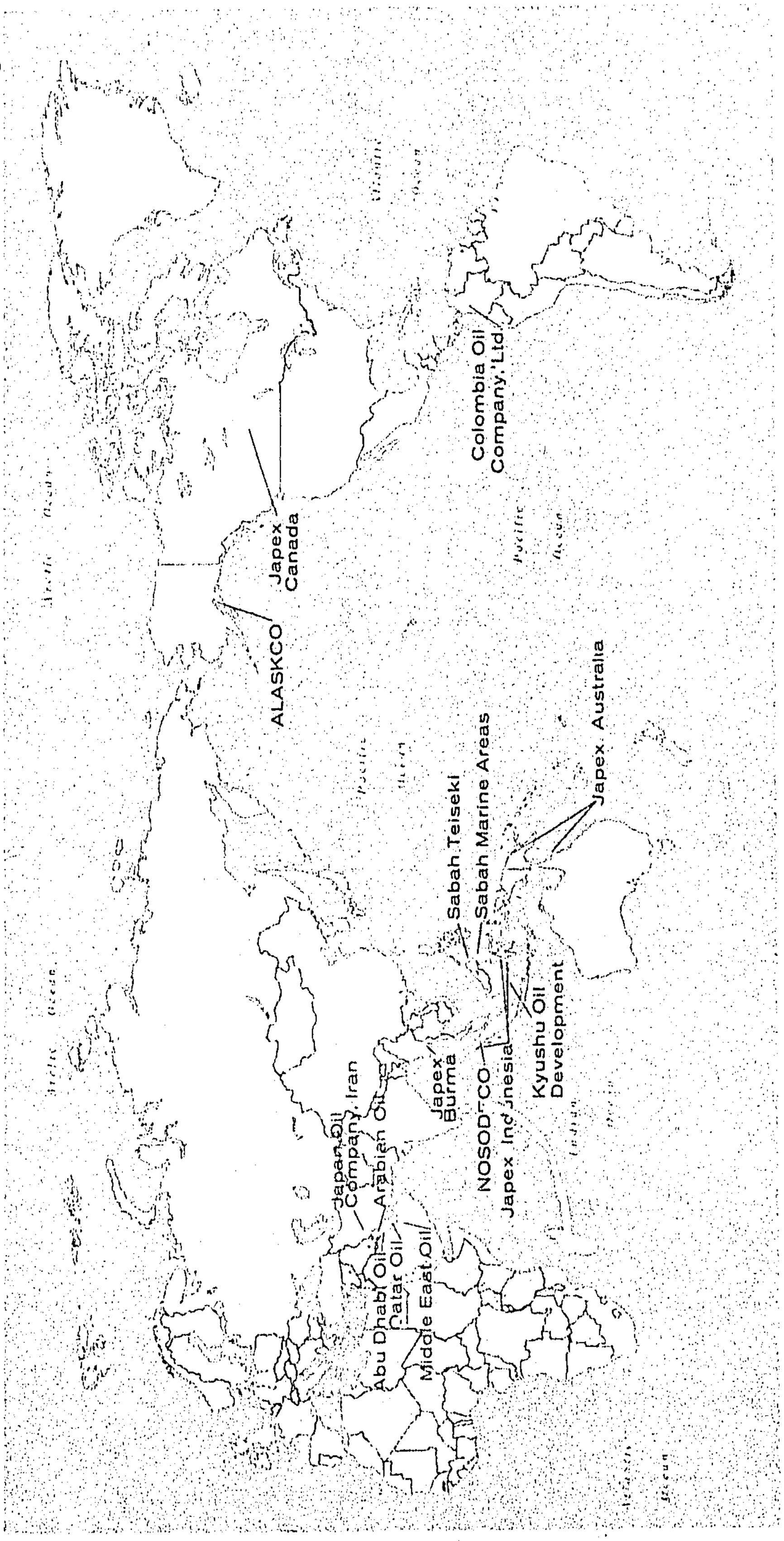
13. Japan's search for oil abroad also has been going on for some time, but only limited success has been achieved thus far (see Figure 3). Only two Japanese firms, the Arabian Oil Company (AOC) and the North Sumatra Oil Development Company (NOSODECO), are now producing significant quantities of oil abroad. AOC was established in 1958 in the Saudi Arabia - Kuwaiti Neutral Zone and by 1960 had struck its richest field, Khafji, which can produce up to 380,000 b/d. At the present time, some 70 producing wells are operating in the Khafji field. To meet the demand for low-sulfur oil, AOC developed the Hout oilfield in 1963, which now has a capacity of some 80,000 b/d. While AOC's sales have increased, its profits have fallen steadily during the past three years, mainly because of the reduction in the net selling price of its oil, resulting from increased desulfurization costs. Most of AOC's oil is the high-sulfur variety that pollution conscious Japan is becoming more unwilling to accept.

14. NOSODECO was established in 1960 and has been receiving part of the crude oil produced in North Sumatra in return for technical assistance and materials supplied to the Indonesian government oil enterprise, Pertamina. While the initial oil discoveries there were made by the Indonesians, Japanese assistance has been involved in drilling several new wells and in reworking many older ones. NOSODECO's share of oil produced in 1969 came to some 4 million barrels, all of which was shipped to Japan. Unlike AOC, NOSODECO's profits have been rising steadily over the past few years and in 1970 reached more than $1.5 million, mainly because of the saleability of the low-sulfur oil it produces.

15. AOC's early success in finding oil in the beginning of the 1960s encouraged other Japanese oil companies to seek oil overseas. Few other Japanese operations, however, have discovered commercially exploitable deposits. Nevertheless, prospecting has continued, and by 1970 Japanese firms were exploring concessions -- mostly joint ventures with other foreign companies -- in Alaska, Canada, Colombia, Australia, Malaysia, Indonesia, Thailand, Egypt, Congo (K), and the Persian Gulf. Recently, Japanese oil men reached an agreement with India to search for offshore oil near Bombay, and a loan has been extended to Burma to get oil exploration under way there. Other concessions also are being sought. Teikoku Oil Company, Mitsubishi Petroleum Exploration Company, and Teijen Limited reportedly are seeking concessions in Libya and Nigeria. In early March 1971 a group of Japanese oil firms sent a survey team to Peru, Colombia, and Equador to study the feasibility of joint prospecting with government prospecting teams exploring the upper Amazon Basin. The Mitsubishi group and Royal Dutch Shell are reportedly discussing joint exploratory operations in Indonesian offshore concessions, and JAPEX Canada may be reconsidering developing oil shale deposits in Canada, which was regarded

Figure 3

Japan: Major Overseas Oil Activities, 1971



as too costly a few years ago. Japan's most recent success was the acceptance of its bid for oil concessions by the Iranian government. Japanese companies will participate with Iran's National Oil Company in exploiting fields and in downstream operations, including refineries. Japan is also interested in Saudi Arabia and South Vietnam.

16. During the past few years there has been increasing interest in the continental shelf around Japan. Both Japan and the United Nations Economic Commission for Asia and the Far East (ECAFE) have made extensive surveys of the East China Sea where the geological composition is similar tc areas where 90% of the world's oil is produced. Surveyors agree that the area may contain potentially large reserves. Actually drilling did not begin until 1971, however, and it is still too early to expect encouraging results. Conflicting claims to certain areas have arisen between Japan, Taiwan, Korea, and, more recently, Communist China, but Japan has avoided any direct confrontations with the other claimants, and is confining exploratory work to uncontested areas.

17. Japanese firms involved on the continental shelf include the Japan Petroleum Exploration Company (JAPEX), a quasi-government firm that is active around the Senkaku Islands in the Ryukyu chain; Teikoku Oil which is prospecting in the East China Sea; and the Nippon Oil Development Company, a wholly-owned subsidiary of Japan's largest refinery-distributor, Nippon Oil, which is also prospecting in the East China Sea. Both Teikoku and Nippon Oil are making arrangements with Gulf Oil and the Caltex Group, respectively, for technical and financial tieups. In addition, Mitsui Petroleum Exploration Company is preparing for joint exploration with Continental Oil around Hokkaido, and three other firms are planning to start drilling in the Sea of Japan. Nishi Nihon Sekiyu Waihatsu K.K., a joint venture of the Mitsubishi group and the Royal Dutch Shell group, has completed a seismic survey of its 38,500-square-mile parcel between Japan and Korea. JAPEX and Idemitsu Kosan, the country's second largest refiner-distributor, were scheduled to start drilling in May 1971 in their 16,000-square-mile concession, with technical and possibly financial cooperation from Standard Oil of Indiana. In all these projects, profits will be shared on the basis of capital participation, with all oil going to Japan.

18. Almost all Japan's overseas undertakings thus far have failed to discover oil in commercially exploitable quantities. Both government and industry leaders agree that more funds are needed for oil exploration to succeed, but little actually has been done to make the funds available. Indeed, investment in exploration and development, excluding that spent on the AOC, has averaged about $10 million in each of the last 10 years, which is less than 0.5% of the country's import bill for crude oil.

Prospects and Conclusions

19. The remarkable growth of Japan's economy in the post-World War II period has placed great demands on the energy sector, which have been met largely by the dramatic expansion of the petroleum industry. Since the early 1950s the energy supplied by petroleum has risen by some 20 times. Petroleum's share of total energy supply increased from less than 20% of the total to about 70%.

20. Japan has enjoyed a stable supply of oil at relatively low prices throughout the 1960s. Imports from the Middle East, where most of Japan's oil originates, have never been disrupted despite almost constant instability in the area. Prices declined steadily during the 1960s as a result of both declining transportation costs, achieved largely by the use of supertankers, and because of the general glut of oil on the world market. Japan's success has been due to a large extent to good fortune, but its policy of diversification of suppliers has both increased the dependability of supply and encouraged limited competition, with some downward pressure on prices.

21. It was not until early 1971 that the price of Japanese crude oil imports was raised in conjunction with the worldwide price rises by producing countries. During the five-year term of the new price agreement, the total cost to Japan of the price increase will be about $4 billion, or some 22% more than Japan's bill would have been at the former price levels. Nonetheless, the $2.40 per barrel cost to Japan in 1975 will barely exceed the $2.38 per barrel price Japan paid for its crude oil in 1960 and will be considerably less than the price of Japanese domestically produced crude oil. Moreover, Japan's total oil bill of $19 billion during the period will be about one-third less than the United States pays for the same quantity of US domestically produced crude oil.

22. Wholly-owned foreign oil companies, which supplied a significant share of the capital and technology required for the industry's growth, continue to supply nearly 85% of Japan's crude oil requirements. The industry's continued reliance on foreign firms has been a source of concern. Although foreign participation in the domestic refining industry tightly controlled and presents few problems, foreign domination of Japan's crude oil supply is disquieting to many Japanese. Prospecting abroad by Japanese companies has been stressed, and a goal has been set for Japanese companies to supply 30% of crude oil requirements by 1985.

23. Additional funds will be made available for overseas oil exploration, and the role of direct government participation in exploration activities can be expected to expand. Already, several Japanese exploration companies have been consolidated at Tokyo's urging. The chances that

Japanese companies will discover large reserves, however, are poor, with the possible exception of the East China Sea. Most of the more promising concessions throughout the world have already been awarded to the major international oil companies, but Japan may obtain concessions that other companies have relinquished. It is also possible that some oil producing countries may prefer to award concessions to Japanese companies rather than to Western firms, which already control a large share of their oilfields. This may have been part of the rationale behind the recent choice of a Japanese consortium by Iran in preference to Western firms to exploit a promising concession. Japanese willingness to invest in pipe lines and refinery facilities in Iran, however, probably tipped the scales.

24. It appears unlikely that Japan will achieve its 1985 goal, although efforts to acquire petroleum resources are almost certain to increase. Considering that requirements are expected to quadruple by 1985 and that deliveries by Japanese companies will have to be increased by 600% in 15 years at a cost of some $5 billion, the target is indeed ambitious. Even if the target were achieved, Japan still would have to triple its purchases from foreign companies to meet domestic requirements.

25. Japan will continue to depend on Middle East oil for the foreseeable future despite its search for new sources. Alternatives to the Middle East are limited. The Soviet Union may be considered a source but the USSR is often hard pressed to meet it's commitments to Eastern Europe. Communist China may be supplying a small percentage of Japan's oil imports by 1975. A CIA estimate* places probable Chinese exports at 200,000 b/d by 1975. If all of these exports were sold to Japan, they would satisfy about 3% of total Japanese demand in that year. It is unlikely in the foreseeable future that Chinese crude oil will represent a significant source of supply to Japan. Japan has a relatively small concession in Alaska, but even if oil were discovered, production could not get under way before the mid-1970s, and output would be very small compared to Japan's needs. More Indonesian oil probably will be purchased, and by 1975 Djakarta could supply as much as 19% of Japan's needs, compared with a 13% share in 1970. Not only is the transport distance less than one-third the distance from the Middle East, but also Indonesian crude oil is the low-sulfur quality that Tokyo increasingly demands. African oil (south of the Sahara) is also a possibility. Japan has shown interest in Nigerian and Cabindan oil and is presently participating in a joint prospecting venture in the Congo (K). With the possible exception of Nigeria, however, African sources probably will not be able to supply a significant portion of the Japanese market for many years.

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