

January 22, 1979

CHINESE OIL: PROBLEMS AND PROSPECTS

INTRODUCTION

The establishment of formal diplomatic relations between the United States and the People's Republic of China on January 1, 1979 has focused much attention on the future prospects for Sino-American trade. Recently, Peking has manifested a growing determination to import western technology to modernize the Chinese economy. The Chinese oil industry is not only expected to become one of the principal beneficiaries of the prospective western technological transfusion, but will also bear a major share of the burden for acquiring the foreign exchange necessary to finance such imports. This paper examines the nature of Chinese oil trends and assesses potential problems which might be generated by the development of China's oil reserves.

CHINA'S ENERGY SITUATION

The People's Republic of China is currently the world's fourth largest energy producer (after the United States, Soviet Union and Saudi Arabia) and the fourth largest energy consumer (after the U.S., USSR, and Japan). China's major source of energy has traditionally been coal, but oil has rapidly expanded its share of the energy picture in recent years. As late as 1965 well over 80 percent of PRC's energy requirements were satisfied by coal, with oil and natural gas supplying only about 13 percent of China's needs. Today coal accounts for a little more than 60 percent of PRC energy production while oil and natural gas have increased their share to 36 percent. Although natural gas is produced in fairly substantial quantities (64,800,000 cubic meters in 1976), it has not

received as much attention as the oil industry since it is used almost entirely for domestic purposes, while oil is perceived to be a major export commodity with which to earn sorely needed foreign exchange.

While the PRC did not attain energy self-sufficiency until 1963 and did not export significant quantities of oil until skyrocketing oil prices and Japan's urgent need to diversify its sources of oil imports in the wake of the Arab oil embargo triggered a fairly abrupt Chinese entry into the world oil market in 1974, the PRC is generally expected to become one of the most important sources of new oil production in the 1980's. Although it is highly unlikely that the PRC will become a major oil exporter in the short run due to the long lead times inherent in oil exploration/development, serious deficiencies in the infrastructure of the Chinese oil industry, the low quality of Chinese crude oil and the growing energy needs of the PRC itself, the imminent development of promising Chinese offshore oil deposits has already become a factor in shaping the geopolitical future of the Far East and will become an increasingly important barometer of Sino-Japanese relations as well as a high profile symbol of growing Sino-American cooperation in the economic and technological spheres.

OIL RESERVES AND OIL PRODUCTION

At present no one, including the Chinese, knows how much oil there is in China. In 1977, Premier Teng Hsiao-ping over-optimistically claimed China was sitting on 400 billion barrels of oil. Westerners have had no access to the post-1949 geological surveys, but the general consensus among academic and industry experts is that China's onshore reserves are comparable with the estimated 39 billion barrels remaining in the United States, and are matched by a roughly equal amount of offshore oil reserves. In November 1978, Secretary of Energy James Schlesinger made a slightly higher estimate of 100 billion barrels, half onshore and half offshore. Until the Chinese continental shelf is more fully explored and technical capabilities such as the efficiency of Chinese reservoir management are determined, oil reserve estimates will remain subject to constant re-evaluation.

PRC oil production has climbed steadily over the last decade, but the rate of growth is slowing down considerably. By force-feeding the Chinese oil industry with funds and technical manpower, Peking prodded oil production along at an annual growth rate of 20-25 percent between 1970 and 1975, and by 1976 was producing 1.7 million barrels of oil a day (MBD), roughly equal to Indonesia's output. However, the bubble burst in 1975 as production growth dropped to 14 percent, and by 1977 the annual growth rate of oil

production had slackened to 9 percent as the oil industry became increasingly hampered by bottlenecks in the supply of critical capital goods, shortages of skilled manpower, and serious deficiencies in the economic infrastructure, especially pipeline, storage and port facilities necessary to the efficient operation of a modern oil industry. According to a CIA expert, the Chinese can hope for no more than a 13 percent annual growth rate in oil production through 1985 due to increasingly tight technological and financial constraints. The most accessible reserves are already being exploited and investment in other industries, especially coal and steel, can no longer be held back in order to give the oil industry a shot in the arm.

In 1977, PRC oil production was estimated by the U.S. Department of Energy to be approximately 1.8 MBD. More than half of total output was contributed by the Taching oil fields in northeastern China, with an additional 20-25 percent coming from the North China Basin (Shengli and Takang fields). Taching production has leveled off in the last two years; by draining the fields at a slower pace the Chinese hope to raise the percentage of ultimately-recoverable reserves and forestall an actual production decline until after 1985. Given the considerable time lags involved in the development of offshore oil, the PRC is expected to rely heavily on onshore oil in general and North China Basin oil in particular for its short-term oil production growth. In 1978, survey and exploratory drilling increased 77 percent over 1977, much of it concentrated in the Shengli, Takang and Pohai fields. As some of the older oil fields begin to yield lower rates of crude and rely increasingly on the expensive injection of water (which is not always available in sufficient quantities) the People's Republic of China's energy position will become progressively more dependent on offshore petroleum production.

The wide Chinese continental shelf is believed to contain up to 40 billion barrels of oil. Limited production has already begun in the Gulf of Po Hai and in the shallow water in the South China Sea off the island of Hainan, but promising geological formations in the Yellow Sea and East China Sea have yet to be explored. The Chinese currently lack both the quality and quantity of offshore drilling equipment which they will need in order to rapidly develop offshore deposits to meet their production goal of 3-4 MBD by 1985. Currently, they are believed to possess only 11 jack-up rigs, 3 drillships and 1 modern semi-submersible rig. Because their own rig-building program is hamstrung by a shortage of suitable steel alloys and a lack of experience in offshore oil production, they are likely to look to foreign suppliers, especially the United States, to provide them with the highly advanced technological equipment and expertise required for offshore oil development.

PRC TECHNOLOGICAL IMPORTS

While Peking's policy of self-reliance has succeeded to the point where the Chinese are believed to produce 70 percent of their own oil production equipment, there is at least a ten year technological gap between China and the world at large, and Peking has increasingly sought to narrow this gap by importing sophisticated western oil technology. More than \$360 million worth of equipment was imported between 1972-1977 and the pace of purchases seems to be quickening. In April 1978 the Chinese bought their first item from an American-affiliated firm, a mat-type jack-up offshore rig estimated to cost \$20-30 million depending on the equipment provided. Given the fact that the PRC seems particularly interested in obtaining ferro-concrete platforms, specialized pipeline equipment, sophisticated drilling and production testing equipment and a variety of safety products for drilling platforms which American companies would be well-situated to provide, the "normalization" of Sino-American relations is likely to trigger a boom in U.S. exports of oil-related technology to China. Not only are the Chinese aware of America's traditional leadership in oil production technology, but Peking would have its own political reasons for playing up Sino-American cooperation in the field of energy, not the least of which would be to demonstrate to the Soviets the growing intimacy of Sino-American relations.

Offshore oil production technology is likely to become the fastest growing category of PRC imports since it is one of the most deficient of Chinese technologies. It requires extremely costly equipment which is severely difficult to build and Peking could hope to limit western contact with the Chinese people by confining western participation to offshore areas. The Chinese will probably tend to import expendable oil equipment such as pipeline and tubing from Japan and Europe while concentrating the purchases of high-technology equipment among American suppliers. While it is not possible to project the scale of such a technological transfusion until offshore development begins in earnest, the National Council for U.S.-China Trade estimates that Peking will purchase \$40 billion in foreign technology between now and 1985, and the petroleum industry will probably account for a sizeable portion of these imports, given its relatively high priority in Chinese economic and strategic plans.

American firms will also be in line for joint offshore oil development ventures with the Chinese government as well. Six U.S. companies are currently interested in China's offshore oil: Exxon, Pennzoil, Phillips, Union, Mobil and Atlantic Richfield. Pennzoil, which made the first trip to Peking in June 1978, has already submitted a formal application for acquiring offshore drilling rights, and other applications are expected in the near future. According to the State Department, a total of fifty billion dollars of construction and production business could be generated by offshore

oil development in the East China Sea, South China Sea and the Yellow Sea, but it is unlikely that a very large proportion of this business will find its way into foreign hands. The Chinese are apparently adamant about retaining as much control over projects as possible, bringing in outsiders only as contractors. Although the Chinese are short of cash, there are signs that they want to put up most if not all of the risk capital themselves, thereby greatly reducing the role and ultimate share of oil revenues of the foreign companies.

The oil companies are wary of such an arrangement since there is little reliable information on the size and quality of offshore oil deposits and they would prefer to put up all the risk capital in return for a sizable, permanent share of revenues or output. Moreover, American companies are unhappy with the Chinese tax structure because it does not mesh with U.S. Tax Codes; unless Peking rewrites its tax laws concerning foreign firms, the companies will have nothing to write off against U.S. taxes, and relatively less incentive to invest in costly offshore exploratory drilling. As it stands now, there are preliminary indications that Japanese oil companies will be chosen to develop the oil deposits in the shallow Gulf of Po Hai, while American companies will get the nod in the South China Sea, where they can put their experience in similar offshore work in the Gulf of Mexico and Persian Gulf to good use.

OIL EXPORTS

The rate at which the PRC can bring its offshore oil production on line will be a major factor determining the size of PRC oil exports in the 1980's. The PRC exported 10.6 million metric tons (mmt) in 1977 and 1978 exports are estimated to have risen to 12 mmt, out of an estimated production total of about 100 mmt (there are 7.3 barrels of Chinese oil per metric ton). In 1977, 6.5 mmt of Chinese oil was exported to Japan, .9 mmt to the Philippines, .6 mmt to Romania and .4 mmt to North Korea; China also exported refined production to Hong Kong (1 mmt), Thailand (.6 mmt) and Cambodia (.6 mmt).

In recent years the PRC has exported approximately 10 percent of its total oil production. However, according to the CIA this proportion will steadily decline in the future as Chinese industry grows and becomes more energy-intensive and rural communes demand higher rations of fuel for their accumulating inventories of farm machinery. A 1977 study* projected China's 1980 oil production to

* CIA China: Oil Production Prospects June 1977; ER 77-10030U.

be 2.4-2.8 million BD of which only 200,000-600,000 BD would be available for export due to expanding domestic demand for crude oil and refined products. The Department of Energy expects PRC oil exports to rise from the 1977 level of 200,000 BD to up to 500,000 BD by 1985.

Although China's oil export market in Asia seems secure in the coming decade, Peking will face severe technological and financial constraints in expanding its oil exports. The weak technical infrastructure will have to be vastly improved by modernizing unsophisticated and obsolete pipeline, port facilities, lighters, rigs, tankers, support vessels, storage equipment and general technology. Even if the Chinese can renovate production, transport and storage facilities they will face a critical shortage in refining capacity unless the growth in refining capacity dramatically accelerates. In late 1977 there was a 10 million ton gap between production and refining capacity; this lack of refining capacity may become more of a bottleneck in the future, forcing the Chinese to consume large quantities of crude as raw fuel or find a market for their unrefined crude.

One of the most serious problems constraining Chinese oil exports is the extremely poor quality of Chinese oil. Taching oil, which makes up 85-90 percent of Chinese oil exports is an extremely high viscosity crude burdened with a high paraffin content and a large percentage of residium. Although it is low in sulphur, the high wax content (35 percent by weight compared to Saudi Arabian crude which is 2.8 percent by weight) makes storage and transport costly, difficult and often dangerous, as the crude has to be heated in order to flow freely.

The PRC has experienced several problems with the quality of its exported oil in the past and is likely to experience more in the future. Hong Kong rejected its first shipment of crude in July 1974 because of high viscosity, the Thais rejected highly waxy Takang oil on the grounds that they did not have the specialized refining capabilities necessary to process it, and the Philippines actually suspended imports of Chinese oil for several months in 1975, complaining of high viscosity and unacceptable levels of salinity which significantly corroded their pipelines (they eventually resorted to mixing light Arabian crude with the Chinese oil in order to make it more refinable). The transport, storage and refining problems which plague the Chinese oil exports will continue to serve as a deterrent to potential customers for the indefinite future.

JAPAN AND PRC OIL

Since 1973 Japan has imported more Chinese oil than all other importers combined. Anxious to reduce its dependence on relatively

insecure Middle Eastern oil and build closer economic, energy and diplomatic relations with Peking, Tokyo has committed itself in effect to become the buyer of last resort for Chinese oil, despite the footdragging of Japanese oil refiners who are not particularly pleased with the quality of Chinese crude. In 1975 the Chinese optimistically predicted that they could supply Japan with 1 MBD by 1980 and put pressure on the Japanese government which in turn pressured Japanese oil refining companies to accept a five year contract for importing progressively more oil each year until imports leveled off at 1 MBD in 1980. The refineries, caught in a recession, refused, citing current losses, uncertainty of future demand for their products and technical problems involving the refining of waxy Chinese crude.

However, the present Japanese government has developed a vested political interest in the importing of higher levels of Chinese crude. In February 1978 it concluded a \$20 billion trade deal with the PRC and in August of the same year it signed a Friendship Treaty formally aligning both states against any outside power (i.e. the Soviet Union) which might seek to establish hegemony over the region. It appears that the Japanese government will insist that Japanese refiners install expensive catalytic hydrocracking units necessary for breaking down heavy, waxy Chinese crude, even if it requires government subsidies. The Far Eastern Economic Review* estimates that Japan will have to spend \$10.5 billion for such equipment in order to refine the 40 million metric tons of oil which Japan expects to import by 1985. Without such a massive investment, Japan would be forced to burn Chinese crude as raw fuel in its boilers, or refuse to import non-refined Chinese crude, a move fraught with political overtones.

THE UNITED STATES AND PRC OIL

It is highly unlikely that Chinese oil will be exported to the United States in the foreseeable future. Currently there is a significant surplus of crude oil on the west coast of the United States and there is no indication that this glut will be absorbed in the immediate future. In recent months up to 500,000 barrels a day of the 1.2 million barrels of oil which daily emerges from the Alaskan pipeline at Valdez has had to be shipped elsewhere, significantly increasing the transport costs which the oil companies must meet in order to market their oil. The U.S. oil industry has proposed three separate pipelines -- the Pactex, Northern Tier and Alaska Highway projects -- each of which would soak up the west coast oil surplus by conveying Alaskan oil to the interior of the continental United States. However, all three proposals are likely to be hampered by political, environmental and financial difficulties and are not

* Far Eastern Economic Review, November 6, 1978, pg. 77.

likely to bring relief for years to come, given the long leadtimes involved in pipeline construction.

The state of Alaska has also made overtures to Pemex, Mexico's national oil company, about rerouting Pacific oil traffic by swapping 100,000 BD so that Mexican oil could be shipped to nearby Texas refineries while Alaskan oil was redirected to Japan. Such an arrangement would be logical according to criteria of economic efficiency since it would shorten the distances that oil would have to be shipped on the world market. But good economics is often subordinated to political considerations; any oil barter arrangement with Mexico would face stiff opposition from the U.S. Congress, which has already enacted restrictions on any overseas sale of North Slope oil unless the President formally declares such sales to be in the national interest. The Carter Administration ruled out any diversion of Alaskan oil to Japan in 1977 and at this point it would be extremely reluctant to reverse its stand. At a time when it is warning a skeptical public of an impending energy shortage, it could not convincingly call for further belt-tightening in the energy sphere if it conceded that there was more oil coming out of Alaska than the nation needed.

Chinese oil exports would be difficult to market in the United States not only because the west coast is awash with Alaskan crude, but also because the expensive refining procedures which would be necessary to adapt waxy Chinese crude to American consumer requirements would put Chinese crude at a disadvantage relative to higher quality Alaskan or Mexican crude. Furthermore, Japan's ravenous thirst for oil would soak up Chinese export capacity in any case, obviating any need for long distance trans-Pacific shipments of oil to the United States. For these reasons PRC oil would have a negligible impact on the U.S. energy position aside from a beneficial alleviation of the demand pressures which are likely to build up for OPEC oil in general and Persian Gulf oil in particular.

However, Chinese oil will constitute an important factor in the Far Eastern balance of power. In China, more than elsewhere, "politics is in command." Chinese oil exports are as much a tool of Chinese foreign policy as they are an instrument of economic development. Chinese oil exports give the PRC leverage over client states (North Korea and Cambodia) and have precluded Soviet oil exports from gaining a foothold in the Philippines. More importantly they have helped to divert the oil-hungry Japanese away from the potentially rich Siberian energy deposits, thus depriving the Soviets of a valuable economic ally. Peking even tailored its oil policy to encourage Tokyo to accept the anti-hegemony clause in the Sino-Japanese Friendship treaty of 1978 by lowering its prices, raising exports to Japan, and promising to exclude discussions at the treaty negotiations on the controversial issue of the oil-rich Tiao Yu Tai (Senkaku Islands) which both Japan and China claim.

PRC claims to other islands off its coast could also lead to open conflict with South Korea in the Yellow Sea, Taiwan in the East China Sea, and the Philippines in the South China Sea. The PRC displayed a willingness to use force in pursuit of its territorial ambitions when it seized the Paracel Islands from Vietnam in 1974, so it would not be surprising if it resorted to force once again. There is a danger that the United States would become involved in such an eventuality not only because it underwrites the security of all three states but also because American oil companies will be prominently involved in the efforts of all three states to explore and exploit potential oil deposits in disputed waters.

In the long run, the most troubling potential outgrowth of Chinese oil diplomacy from Washington's perspective would be the foreign policy/national security implications of growing Japanese dependence on Chinese oil. It must be remembered that it was a critical deficiency in oil production which led Japan into World War II and contributed to its defeat. Should Japan replace its current dependence on Middle Eastern oil with a heavy reliance on PRC oil, its foreign policy would to some degree fall hostage to Chinese oil diplomacy. In this event, Japanese-American relations could be harmed and the present balance of power in the Far East might be altered over time, possibly in directions prejudicial to the national interests of the United States.

SUMMARY

The PRC will become an important new source of world oil production but is unlikely to become a major oil exporter because its growing domestic energy requirements will probably absorb a sizable portion of future oil production. While PRC oil production grew at a rapid pace during the early seventies, its growth has recently been retarded by financial, technological, manpower and infrastructure related constraints which are likely to become more serious in the future as Peking moves to exploit increasingly inaccessible petroleum deposits. Although China's offshore oil reserves are promising, Peking will have to move fast to develop them before on-shore oil production peaks and then gradually declines as older fields become exhausted. In order to rapidly develop offshore oil the PRC will be forced to rely on a significant transfusion of western technology, much of it likely to come from the United States.

Aside from marginally relieving the upward pressure on world oil prices by satisfying demand for oil which might otherwise be funneled into the Middle East, Chinese oil will not improve the U.S. energy position. The west coast of the United States will remain glutted with Alaskan crude for the immediate future and in

any case low quality PRC oil would be unsuitable for the American market. While development of Chinese oil reserves will provide an export market for American oil technology, new oil leases for a small number of oil companies and a limited financial role for U.S. banks in the development of the PRC oil industry, there will be no resultant dramatic improvement in the U.S. balance of payments position vis-a-vis the world as a whole.

Peking has used its growing oil power to lure Tokyo away from Siberian energy investments, enhance its leverage over client states and cement closer relations with oil-hungry Japan. The PRC has resorted to force to gain control over promising oil-bearing off-shore islands in the past and could do so again in the future, possibly threatening U.S. interests in several insular Pacific states. However, in the long run the greatest challenge which Chinese oil diplomacy will pose to U.S. foreign policy will be the possibility that Japan's foreign relations will become reoriented by a growing dependence on Chinese oil.

James A. Phillips
Congressional Fellow