SOVIET OIL IN EAST-WEST TRADE

HEARING

BEFORE THE

COMMITTEE TO INVESTIGATE THE
AI TRATION OF THE INTERNAL SECURITY
A D OTHER INTERNAL SECURITY LAWS

OF THE

IMITTEE ON THE JUDICIARY
UNITED STATES SENATE

EIGHTY-SEVENTH CONGRESS

SECOND SESSION

TESTIMONY OF SAMUEL NAKASIAN

JULY 3, 1962

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SOVIET OIL IN EAST-WEST TRADE

TUESDAY, JULY 3, 1962

U.S. Senate,
Subcommittee To Investigate the
Administration of the Internal Security Act
and Other Internal Security Laws
of the Committee on the Judiciary,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10:40 a.m., in room 2228, New Senate Office Building, Senator Kenneth B. Keating presiding.

Present: Senator Keating.

Also present: J. G. Sourwine, chief counsel, Samuel J. Scott, assistant counsel; Benjamin Mandel, research director; and Frank W. Schroeder, chief investigator.

Senator Keating. The subcommittee will come to order.

We are fortunate in having with us today Mr. Samuel Nakasian, an outstanding expert on the subject of Soviet oil.

At my request he has done a great deal of work to bring testimony which he gave in 1954 before this committee up to date. I know we will benefit significantly from his presentation today.

Soviet oil exports are the latest and in some ways the most effective weapon the Soviets have found in their well-stocked arsenal of weapons against the free world.

Ever since the Soviets came to power in 1917, they have looked for methods to undermine the free world. Economic warfare is especially well adapted to their aims of worldwide conquest. Khrushchev has threatened to bury us on more than one occasion.

It is now becoming increasingly evident that he would also like to drown us in a sea of oil if we let him get away with it. The Soviets are dumping oil at bargain prices throughout the world. This is not dumping for economic reasons but for political and military reasons. They are using oil to buy valuable machinery and know-how from the West. They have even succeeded in exchanging oil for the pipelines, valves, and tankers which they must procure from free world sources in order to produce and distribute oil at a rapidly accelerating rate.

If these tactics continue to succeed, there is danger that Western countries will become increasingly dependent on Soviet oil supplies for vital defense as well as industrial activities. The danger such a situation would pose to the security of the free world cannot be overstated.

Another target of the Soviet oil offensive are the underdeveloped countries, where the Communists offer not only cheap oil, but also expert technology and know-how. The Russians offered to develop a national oil monopoly in new countries, teach the newly independent peoples how to run an oil operation, and incidentally how to throw out the private enterprise efforts of the West. Nationalists from Ceylon to Chile are tempted by Soviet promises. Once the Communists get a foot in the door, the political system and independence of the countries become easy prey to subversion.

The free world, while concentrating on Communist military threats, appears to be largely oblivious to these Soviet economic threats. As long as we maintain a military stalemate with the Reds, the economic aspects of the cold war actually may be a more decisive factor in determining whether freedom or tyranny will prevail than the military aspects. Cuba would fall in a month if Soviet oil supplies were cut off. This is just one example of the awesome consequences of this situation.

We must give more attention to these difficult problems of international economics if we are to combat Soviet tactics effectively and realistically. These hearings will serve as a valuable case history on Soviet economic warfare.

Mr. Nakasian will attempt to define the problem for us. We must proceed from that point to determine what the United States is doing and should be doing to meet the problem.

I have looked into this matter at some length, and would offer a number of suggestions for consideration.

In my judgment, the North Atlantic Treaty Organization community must develop uniform policies, not only with regard to Soviet oil imports, but also with regard to the supplying of oil transportation pipeline or other equipment to the Soviets. There must be more public disclosure of Soviet tactics to alert the underdeveloped nations to the extent to which Soviet tactics are injuring them. Finally, there must be a more determined effort to expand oil reserves in other parts of the free world to prevent any undue dependence on Soviet oil in a time of international crisis.

These are some measures we can take. I am sure there are others that will also be necessary if we are to meet the Soviet threat effectively.

The purpose of this hearing is to obtain information about Soviet oil strategy and to encourage an alert, realistic, and effective response to this situation. These hearings can be of tremendous significance. I am hopeful that the subcommittee will delve deeply into this important problem.

Mr. Nakasian, we are pleased to have you here this morning. You are free to proceed in whatever manner you see fit, by presentation to us, after which counsel may have some questions he would like to put to you.

Mr. SCOTT. Mr. Chairman, at this time will you swear the witness?

Senator KEATING. Yes.

Would you raise your right hand, please? Do you solemnly swear that the evidence which you give in this proceeding will be the truth, the whole truth, and nothing but the truth, so help you God?

TESTIMONY OF SAMUEL NAKASIAN, ATTORNEY, NEW YORK, N.Y.

Mr. NAKASIAN. I do.

Mr. SCOTT. Will you please state your full name?

Mr. NAKASIAN. My name is Samuel Nakasian.

Mr. SCOTT. Will you give the committee your address, your business address?

Mr. NAKASIAN. I live in Bronxville, N.Y. My office address is 30 Rockefeller Plaza, where I practice law.

Mr. SCOTT. You are here under subpena, is that correct?

Mr. NAKASIAN. Beg pardon?

Mr. SCOTT. You are here as a witness under subpena?

Mr. NAKASIAN. Yes, I am.

Mr. SCOTT. Mr. Chairman, at this time I would like to have placed in the record a copy of the subpena.

Senator KEATING. That will be received for the record, yes.

(The subpena referred to follows:)

UNITED STATES OF AMERICA

Congress of the United States

To Samuel Nakasian

30 Rockefeller Plaza

New York, N. Y. , **Greeting:**

Pursuant *to lawful authority, YOU ARE HEREBY COMMANDED to appear before the* Subcommittee on Internal Security of the/ *Committee on* the Judiciary *of the Senate of the United States, on* Tuesday, July 3, 1962, *at* 10:30 *o'clock* a. *m., at their committee room* 3232, New Senate Office Building, Washington, D. C. *, then and there to testify what you may know relative to the subject matters under consideration by said committee.*

Pursuant to S. Res. 366 approved by the 81st Congress-2d, as amended and extended, and S. Res. 264 agreed to February 7, 1962.

Hereof fail not, *as you will answer your default under the pains and penalties in such cases made and provided.*

To Samuel Scott

to serve and return.

Given *under my hand, by order of the committee, this* 22d *day of* June *, in the year of our Lord one thousand nine hundred and* sixty-two

James O Eastland

U.S.S.

Chairman, Committee on the Judiciary and the Subcommittee on Internal Security

July 2, 1962

I made service of the within subpena

by hand

the within-named

Samuel Nakasian, *at*

Washington, D.C.

at 11:45 *o'clock* a. *m., on*

the 2nd *day*

of July, 1962

Samuel J. Scott

U. S. GOVERNMENT PRINTING OFFICE 84344

Mr. SCOTT. You are the same Mr. Nakasian who testified before this subcommittee in June of 1954 on behalf of the Washington Board of Trade?

Mr. NAKASIAN. I am.

Mr. SCOTT. Mr. Chairman, I have a biographical statement of the witness, Mr. Samuel Nakasian, reflecting that he is an international lawyer, that he is a graduate of New York University, and he received his M.A. degree from Columbia University and completed his residence requirements there on his Ph.D. Emphasis in his education was placed upon economics, finance, and international trade.

Mr. Nakasian is an international lawyer of broad experience, extensive travel, and he has written several articles, two of which deal with the oil situation.

I would like to place in the record at this time this biographical summary.

Senator KEATING. Have you seen this summary, Mr. Nakasian?

Mr. NAKASIAN. Yes, I have.

Senator KEATING. Is it accurate?

Mr. NAKASIAN. Yes, it is.

Senator KEATING. It will be received for the record.

(The biographical sketch referred to follows:)

BIOGRAPHICAL STATEMENT OF SAMUEL NAKASIAN

Present position: International lawyer, office at 30 Rockefeller Plaza, New York. Member of the bars of New York and District of Columbia.

Birth and early life: Born Mersifon, Turkey, 1915. Came to the United States in 1920, spent most of early life on a New York dairy farm.

Education: Educated at New York University, A.B.; Columbia University, M.A., and completed residence requirement for a Ph. D. Education emphasized economics, finance, and international trade. Also Georgetown Law School, LL.B.

Employment: Nine years U.S. Government service: 1942–43, Office of Price Administration; 1943–46, Bureau of the Budget; 1948–51, Economic Cooperation Administration.

Private practice: Eleven years specializing in foreign investment and trade. Traveled extensively throughout the free world, frequently making several oversea trips a year. Many months of personal presence in Iran, Iraq, Pakistan, Greece, and Lebanon as well as all of the European countries. Practice has also required trips to Hong Kong and Japan as well as numerous trips to north Africa and South America.

Publications and public appearances: "Prices Via Costs," vol. 69, No. 6, Chemical Week, June 23, 1951. "The Anglo-Iranian Oil Case, A Problem in International Judicial Process," vol. 41, No. 4, Georgetown Law Journal, May 1953. "The Security of Foreign Petroleum Resources," vol. LXVIII, No. 2, June 1952, Political Science Quarterly. "Manufacturers' Problems Under Price Controls," Harvard Business Review, January-February 1952. Testified on strategy and tactics of world communism, Subcommittee To Investigate the Administration of the Internal Security Act and other Internal Security Laws of the Committee on the Judiciary, July 15, 1954.

Mr. SCOTT. Mr. Nakasian, when you testified at the June 1954 hearing before this committee, you made this statement:

I see the Soviet trade offensive increasing in magnitude.

Would you be good enough to summarize the conditions at that time, in 1954, preliminary to the testimony you are about to give today?

Mr. NAKASIAN. I will be glad to.

In 1954, we had climaxed a period in which the European and Japanese economies were reconstructed—a result substantially contributed to by the United States of America. From the war's end to

1954, the amount of exports from Europe into the Soviet and the amount of exports from the Soviet to Western Europe and to Japan was rather small. I would like to point that out to you on this chart. (See p. 18.)

In 1953, for example, the Soviet exports of oil amounted to 12 million barrels for the whole year. You cannot see this figure very well but it is down here in the corner of the chart: Soviet total exports were a billion and a half, of which the exports from the U.S.S.R. itself represented less than half a billion.

Senator KEATING. You mean a billion and a half from Communist countries?

Mr. NAKASIAN. The billion and a half was from the entire Soviet bloc, which would include Eastern Europe. But from the U.S.S.R. itself, a third of that amount—about half a billion. Before 1953, when the United States was the major country with an exportable surplus of manufactured and capital goods, the U.S. Export Trade Act was a pretty decisive measure in limiting exports to the Soviet Union. The same control system that we have now, Senator, was in existence at that time. Then, free world exports to the Soviet Union amounted to this small figure that I showed you.

Senator KEATING. That is exports of everything.

Mr. NAKASIAN. Total exports.

Now we look at 1960, and we see what has happened in this relatively short period: total free world exports to the Soviet had increased to $4.4 billion.

The subject of my testimony today is to point out, identify, and evaluate what has happened since 1954—a period of 8 years.

We were mindful—at least I was sensitive in 1954 to the fact that the Soviets were going to upgrade the importance of oil exports, and I thought it was a very useful weapon for them in the cold war. Then the amount of oil was not very great, but the method used in getting this oil into free markets showed signs that we ought to take heed and understand this weapon available to the Soviet.

In 1954, no one would get very excited about it.

I think the picture today, now, has reached the real danger stage. It is no longer a threat. It is here with us. If I succeed in my efforts today, I will have presented that picture to you.

Mr. SCOTT. Mr. Nakasian, you have been engaged recently in extensive research on current data and statistics reflecting the extent of Soviet penetration of free world oil markets and the threat to our national security posed by this economic offensive.

Now, in connection with your research and study, you have a prepared statement consisting of the narrative story and containing also reduced reproductions of this series of charts.

Mr. NAKASIAN. Yes, I do.

Mr. SCOTT. Would you submit that for the record at this time?

Mr. NAKASIAN. Yes; I would be happy to submit this statement. And with your permission, Senator, I would like to base my testimony on this statement. I will not try to read it, but follow its outline.

Senator KEATING. That would be perfectly satisfactory. It will be printed as if read. You do not need to stand as you testify, unless you prefer to.

Mr. NAKASIAN. Well, I would prefer to stand, because I will be pointing to these charts from time to time.

(Mr. Nakasian's statement follows in full:)

Mr. NAKASIAN. This statement aims to identify and evaluate the key elements in the Soviet [1] undertaking to make massive oil exports in its economic offensive against the free world. Of principal concern is the effect of this offensive on U.S. and free world security.

The term "economic offensive" is used to mean a purposive export-import program centrally directed by the Soviet pursuant to its overriding objectives of political and military aggression against non-Communist countries.

This offensive is waged by offering products at prices below those of regular suppliers. Products exported to industrialized countries are in payment for purchases by the Soviet of technology, capital goods, and supplies needed to strengthen the Communist industry and accelerate its expansion to support military and political programs. Products exported to underdeveloped countries are intended to disrupt the marketplace and to subvert the local government to Soviet influence and eventual domination, and thereby weaken the security of the free world. The Soviet vigorously exploits the opportunities in markets of the free world, which are unguarded by the lack of agreement among non-Communist nations to secure their economic and political survival.

Soviet imports are the result of capacity to export; the allocation of products for export rather than for internal consumption is largely influenced by the willingness of free world countries to supply what the Soviet needs. Of all Soviet products exported, petroleum is by far the most important, as measured by both volume and foreign purchasing power. This statement will deal primarily with Soviet oil capacity, how this capacity is being used, where oil exports are made, what is procured in return for oil, and the effect on the balance of strength between the Soviet and the free world.

In 1954, I testified before this committee on this same subject of Soviet oil exports. It was clear then that the Soviet would use oil exports for strategic purposes and for procurement that would serve the Kremlin's military and political aims. At that time only a small amount of Soviet oil was available for export, but the method of using these exports clearly indicated that the security of the United States would be affected. Today, the Soviet oil offensive is past the threat stage; it is now reality.

The Soviet is developing an enormous oil resource which, freely exported to world markets, can undermine the economic and political security of the West. Particularly dangerous is the growing prospect that the economies of the industrial countries of the Eastern Hemisphere will be realined to that of the Soviet Union. Moving in this direction, much faster than people would like to believe, the Soviet procures from the free world what it needs in machinery and technology to strengthen the industrial base which supports its political and military apparatus. In this process, the security of the United States, which cannot be isolated from that of the free world, is being jeopardized, with the result that our defense burden becomes greater.

[1] The term "Soviet" when used to denote a geographical area includes the countries of the U.S.S.R. and Albania, Bulgaria, Communist China, Czechoslovakia, East Germany, Hungary, North Korea, North Vietnam, Outer Mongolia, Poland, and Rumania. The term "Soviet" when used to denote administrative action means the authority of the U.S.S.R.

In recent years the Soviet achievement in space has tended to blur the facts and understanding of its achievements in other areas. It might be well to recall that the U.S.S.R. export position 15 years ago, sometimes described as "fish eggs and furs," was less than a half a billion annually. Today its exports are in the order of 2 billion. Taking the Soviet bloc as a whole, the exchange of shipments with the West has increased to almost $5 billion in and $5 billion out.

Regardless of volume, Soviet exports cannot be regarded as production which is surplus over internal needs. The fact is that practically every item produced in the Soviet Union, if consumed internally, would not approach the per capita consumption of the developed free world.

Products available for export from the Soviet are the result of a national system of controls directed by the Kremlin, which fixes the level of internal consumption and allocates production for export. The amount of exports in turn is predetermined by (*a*) opportunities to penetrate underdeveloped countries and disrupt existing economic relationships and (*b*) specified foreign procurement from industrialized countries to meet the needs of Soviet industries which cannot be supplied adequately by Soviet output. The bulk of Soviet exports are made to pay for machinery, equipment, critical materials and supplies not produced in sufficient quantity in the Soviet or inferior in quality and in performance to that of Western products. The capacity of the Soviet to import is thus limited by its exports and by restrictions imposed by the major powers. At present, only a very few industrial items are barred from the Soviet by common agreement among the industrial nations.

In the past 10 years the Soviet bloc has increased petroleum exports from a minor 5 million barrels to a colossal quarter of a billion barrels annually.

SOVIET OIL CAPACITY

In the Soviet land mass, the great sedimentary basins capable of producing oil are some three times greater in size than the total sedimentary basins of the United States. These Soviet sedimentary basins comprise a total area about equal in size to the 50 United States. May I turn your attention to the "U.S.S.R. Basin Areas" map which shows the approximate location of these sedimentary sections. Applying modern technology in production and transportation, these basins become great sources of oil which are economically accessible to the contiguous petroleum markets in Western Europe and to the growing markets of the Far East.

But, it takes more than sedimentary basins to produce oil. It takes equipment and technology. After Stalin's death, the Soviet lost no time in improving relations with suppliers in the West and in importing its equipment and technology.

In the postwar period, the highly developed American exploration and drilling technology was exported to the Eastern Hemisphere and from there made its way into the Soviet Union. Drilling machinery designed and perfected in the United States, reflecting the vast experience of drilling 50,000 wells annually over many years, was made available to the Soviet via Europe and contributed greatly to the progress made by Russian engineers. To minimize this contribution of Western technology, the Soviet conducted worldwide propaganda about its own turbodrill as evidence of its advanced technology.[2]

An American oil industry team visiting Russia in late 1960 was considerably impressed by the vigor and direction of the Soviet oil development program. A particularly effective part of the program is exploration. Geophysical crews have been more than quadrupled since 1950, today numbering more than a thousand. In terms of effort and scope of activity, this Soviet program equals, if not exceeds, the geophysical crew activity of the entire free world. The Soviet is drilling a great number of wells to map the substructure of its country, preparatory to further test drilling for oil or gas. This drilling activity, concentrating now on this preliminary stage, will make possible in the next decade a very high rate of oil discovery and development. The ambitious Soviet production goal of 14 million barrels per day by 1980 may indeed be greatly exceeded.

The Soviet is now employing on the order of a thousand drilling rigs, about one-third of the world total of drilling rigs in operation. Its plans call for a sizable increase in production of rigs. If its own production does not suffice, its requirements will undoubtedly be supplemented by importation from Western Europe. As the large sedimentary basins are defined into productive areas, the Soviet could well seek to double or triple its drilling machinery for the development of these areas, and thus skyrocket its production.

The transport of oil from field to market requires major outlays in capital goods, particularly steel pipe and related pipeline equipment. Although the Soviet has large steel production, it lacks the pipe mill capacity to meet its immediate needs for line pipe to transport oil. If the Soviet were to install sufficient pipe mill capacity to satisfy its oil expansion program, it would sacrifice not only time but divert resources which it prefers to use for other industrial and military support programs. Pipe mill self-sufficiency is not necessary when large quantities of big and small inch pipe may be procured more quickly and cheaply from Europe and Japan. Italy alone is supplying the Soviet about 1 million tons of line pipe.

Prior to 1953 the Soviet had few pipelines, and practically all of these were in the Black Sea area. Reference to the "U.S.S.R. Pipeline" map shows the extent to which crude and product pipelines have been built in the last 8 years. This accomplishment must be described as sensational. Given the freedom to procure the output of European pipe mills and those of Japan, the Soviet oil program would appear to be reasonably balanced, with the installation of pipelines equal to rising production.

Most of Soviet oil scheduled for export to Europe and Japan will reach these markets by pipelines. Some part to these and other markets beyond the reach of Soviet pipelines will depend on tankers. To increase its tanker fleet, the Soviet has made a substantial number

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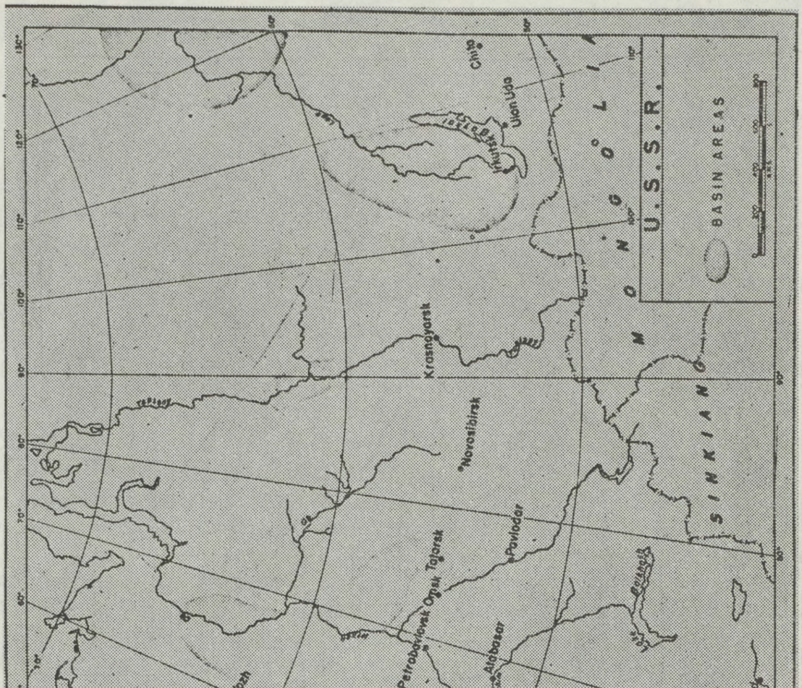
[2] The Soviet turbodrill, licensed to a U.S. manufacturer, has proved to be unsatisfactory to American drillers.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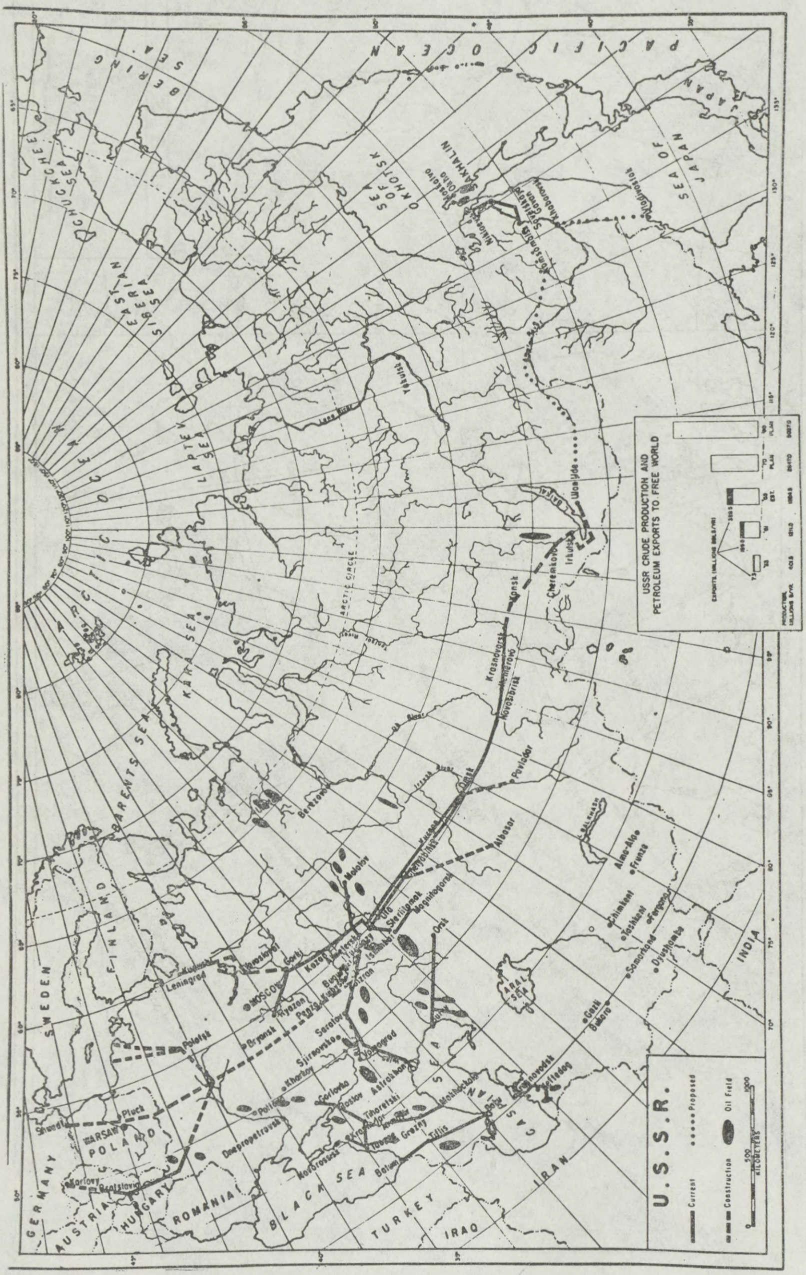
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Khabarovsk
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of charters of free world tankers and have ordered the construction of vessels in the shipyards of Finland, France, Denmark, United Kingdom, and Japan. It appears to be incurring no resistance in placing tanker orders, and it would appear that the number and size of new vessel construction is a matter of priority which the Soviet places on this procurement relative to other foreign purchases.

The conclusion is inescapable that the technology of the free world is making a critical contribution toward development of the Soviet bloc into one of the world's greatest petroleum-producing areas. In 1952 Soviet production was less than a million barrels daily. Today, 10 years later, it is almost 4 million barrels daily. The Soviet's schedule is to increase daily output to 5.3 million in 1965, 7.8 million in 1970, and 13.8 million in 1980. Compare this with current U.S. production which appears to have reached its peak at 7.5 million barrels daily. It is the opinion of the American oil team visiting Russia that the Soviet will achieve the 1965 goal and probably exceed it.

The Soviet now has the technology and the trained manpower. Shortages in its own production of equipment, materials, and supplies are met by imports from Europe. Thus, it is clear that the Soviet is in the happy position of being able to develop and expand its oil industry at an accelerated rate by exploiting at will the industrial countries of the free world.

SOVIET OIL FOR EXPORT

Soviet oil exports to the free world may be classified as to purpose under two headings—strategic procurement and political penetration. Each serves a special purpose in the grand design for world domination.

Penetration into underdeveloped countries by oil exports is a venture with possibly no immediate gains in hardware and essential raw materials but with potential benefits in building up a local Communist Party apparatus to undermine the ties of the importing countries to the West. The volume of Soviet oil exports to underdeveloped countries in 1961 was one-third of Soviet total oil exports. In return the Soviet took locally produced raw materials; for example, sugar from Cuba and cotton from Egypt.

Two-thirds of the Soviet oil exports are to the industrialized countries. Four of these in 1961 imported daily the following barrel amounts: Italy, 126,000; West Germany, 51,000; Japan, 53,500; and Sweden, 50,000. Although these imports are not as yet a large part of total imports—for Italy, 15 percent; West Germany, 10 percent; Japan, 7 percent; and Sweden, 19 percent—they have a major disruptive impact on the oil industry on which these countries depend for a secure fuel supply.

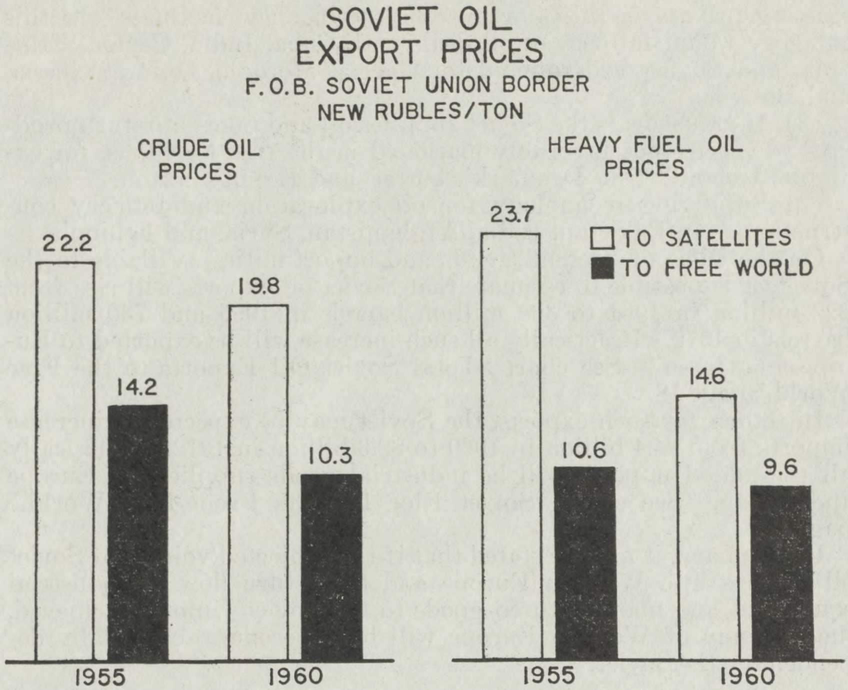
The Soviet got in return for this oil what you might expect—the latest electronic and related equipment, machine tools and other metalworking equipment, chemical and allied production facilities including complete plants, heavy industrial and powerplant equipment, transport equipment, steel and other metals, including great quantities of large diameter line pipe. A recent list of procurement by the Soviet, compiled and submitted to the Joint Economic Committee, shows that the Soviet bought high-technology equipment and machinery and steel products in an 18-month period ending in June 1961 amounting to more than $1 billion. There is no reason to believe that the volume of this procurement by the Soviet is declining; rather, one should expect that it is rapidly increasing. This procurement is made possible, in large part, by exports of oil.

The volume of capital goods procurement of about $2 billion annually is greater than the value of Soviet oil exports. The Soviet buying position, thanks to about $400 million annual oil exports to Europe and Japan, justifies extending credit to the Soviet. The amount of credit granted Soviets is not reported. It is known, however, that the Soviet is buying a great deal of industrial equipment on 5-year terms on payment of 20 percent down. The confidence of Western and Japanese creditors must in large part be influenced both by the capacity of the Soviet to expand its oil exports and by the continuing willingness to accept Soviet oil. Credit is important to the Soviet not only for deferring payments on current purchases, but for committing the Europeans to the Soviet oil source.

The Soviet has considerable, but not complete, freedom in entering the oil markets of the free world. If it exports crude it must find a company with a refinery which is willing to take the crude, refine it, and market it. Each of the large integrated oil companies has steadfastly refused to accept Soviet crude oil. The refineries which have accepted the Soviet crude are: some state-owned companies with refineries, such as the ENI of Italy, West German state-owned refineries, and some privately owned nonintegrated refineries in Japan, the largest being Idimitsu Co. Similarly, in the case of products, the Soviet must look to outlets in the Western countries and Japan other than those owned by the integrated oil companies. While these outlets represent a small part of total facilities, the presence of Soviet oil in the quantities mentioned have a major disruptive effect on the industry in these countries.

The Soviet attracts companies in the West by offering oil at submarket prices. The chart of "Soviet Oil Export Prices" shows the extent to which the Soviet will go in cutting prices to penetrate these markets. Crude oil exported to the West is priced at the border at about one-half the price charged the satellite countries. Such export price is, in some cases, equal to or less than the actual royalties received by the oil-producing countries in the free world. This is obviously a price which the major companies cannot meet. Similarly, in the case of petroleum products the Soviet dumps large quantities at submarket prices into Western Europe.

Some of the recent oil deals will illustrate the Soviet method. For the past 17 years, the regular source of crude for the Mediterranean markets has been the Persian Gulf. Italy, a large importer, has productive capacity in pipe mills, power equipment, machine tools, and chemical products which the Soviet needs in its industrialization and oil expansion program. To procure such items, the Soviet agreed to deliver, and an Italian firm agreed to accept, in excess of 100,000 barrels per day of Tuimaza crude f.o.b. Black Sea port at a price of $1.08 per barrel. This crude reaches Italy at a delivered price of about $1 per barrel lower than the delivered price of comparable Arabian crude, based on posted prices.



Oil companies normally supplying Italy were helpless in preventing Soviet crude from replacing the Persian Gulf source and in protecting their own market positions against the competition of the Italian importer subsidized in effect by Soviet crude supplied at submarket prices.

The expansion of Soviet exports must inevitably cut into the market of the established privately owned oil companies. Those companies which process and market Soviet oil will, in effect, be subsidized by the Soviets through submarket prices as they expand their part of the market. It should be expected that the Soviet will construct refineries in western Russia and the satellites with a view of exporting a part of the products into Western Europe. And there is every likelihood that the equipment and know-how for their construction will be supplied from Western Europe. As crude exports to Western Europe climb, the Soviet may participate in some form in the financing of refinery construction outside the Soviet bloc for the processing of that crude.

The Soviet oil offensive in free world markets may be summarized as follows:

(1) Supplying oil at submarket prices to attract established free world firms, both state and private owned. The submarket prices provide a subsidy to the importing firm in the expansion of its sales at the expense of firms supplied from regular free world sources. In this category would fall Soviet oil deals with Europe and Japan, Brazil, Argentina, Uruguay, Egypt, Israel, and Syria.

(2) Supplying oil at submarket prices to induce foreign governments to enter into the oil business by nationalizing or confiscating

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existing private facilities or by constructing new facilities. In this category would fall Soviet oil deals with Cuba, India, Ceylon, Ethiopia, and Soviet deals offered to Algeria, Morocco, Guinea, Ghana, and Bolivia.

(3) In other deals the Soviet supplies oil and takes in return products which are not favorably marketed in the free world, as, for example, Iceland's fish, Denmark's butter, and Egypt's cotton.

(4) Supplying technology for oil exploration and refinery construction as in Pakistan, India, Afghanistan, Syria, and Ethiopia.

On the basis of present trends and opportunities available to the Soviet, it is possible to estimate that Soviet oil exports will rise from 222 million in 1961 to 365 million barrels in 1965 and 730 million barrels in 1972. Practically all such increase will be exported to Europe and Japan. See chart "Total Soviet Oil Exports to the Free World," page 18.

In return for such exports, the Soviet may be expected to increase imports from $4.4 billion in 1960 to $8.6 billion in 1972. Practically all the added imports will be industrial goods supplied by Europe and Japan. See chart "Soviet Bloc Imports From Free World," page 17.

In summary, it may be stated that if the projected volume of Soviet oil exports into Western Europe and the return flow of industrial equipment and manufactured goods to the Soviet Union is achieved, the economy of Western Europe will have become substantially dependent on the Soviet.

SOVIET OIL EXPORTS SURPLUS OR ALLOCATED?

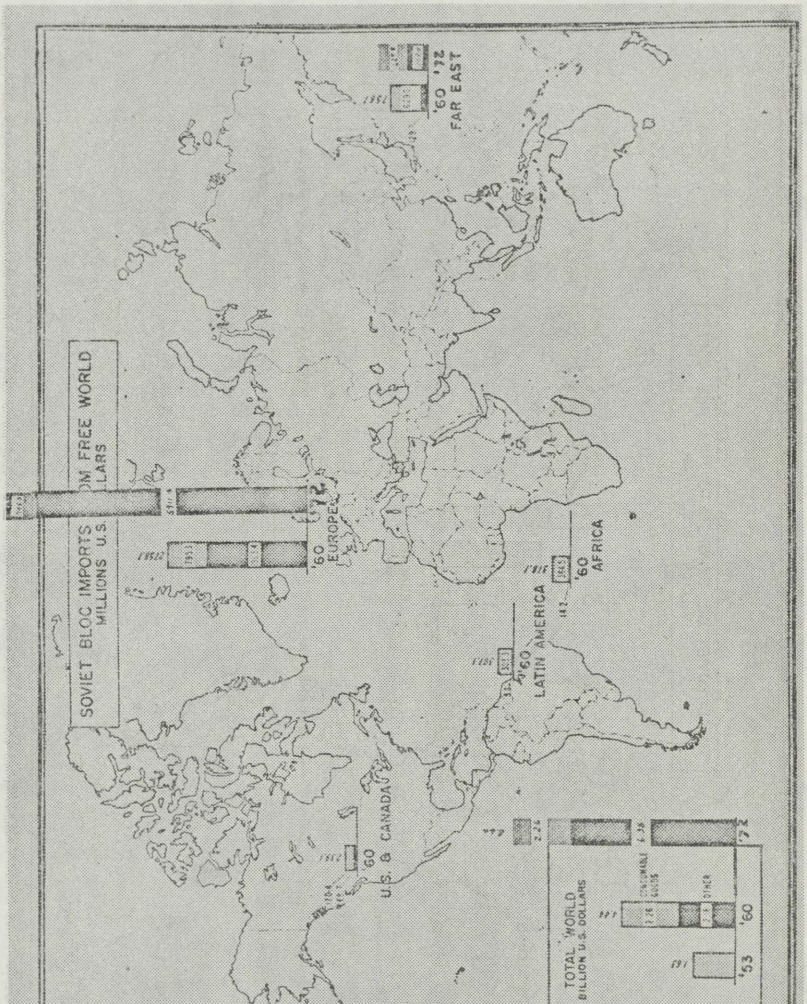
To further clarify the problem, the question should be raised: Are Soviet oil exports surplus or allocated?

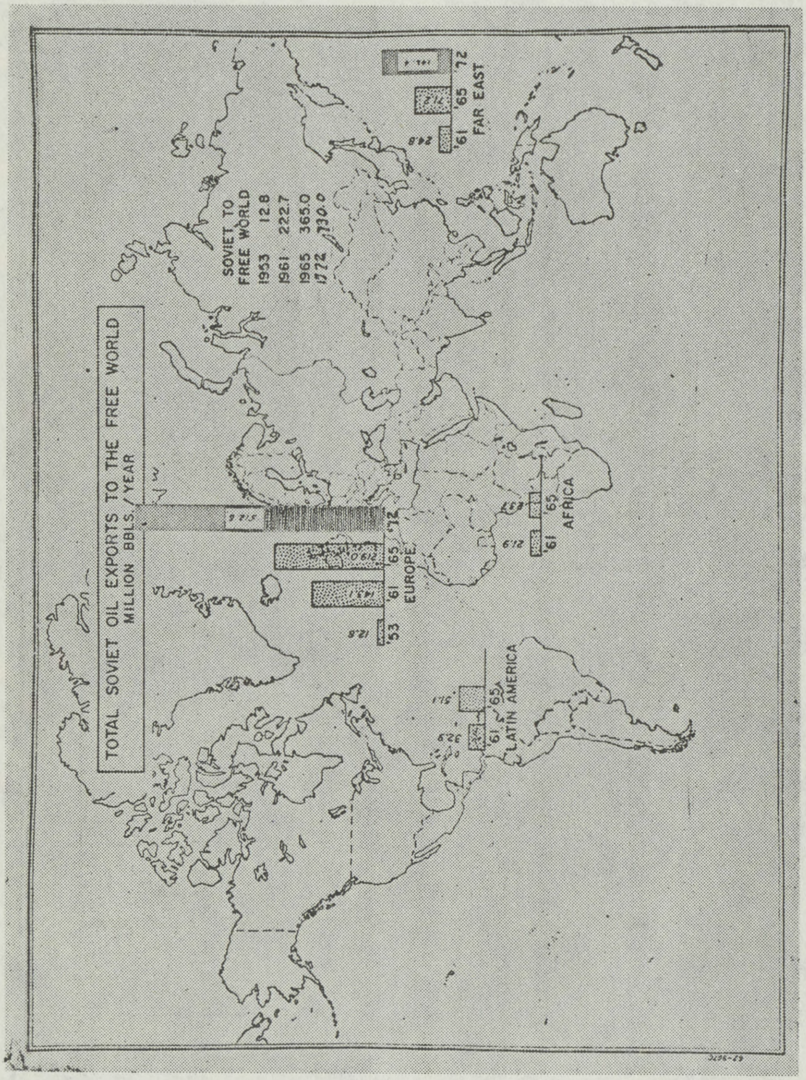
Previous testimony before congressional committees speaks of Soviet oil exports as surplus and also as trade. These terms when applied to describe the Soviet export-import position are misleading and confusing. If Soviet oil were committed to satisfying internal requirements, emphasizing human needs rather than international objectives, Soviet oil production would be inadequate for export for many years to come. If the Soviet Union itself were to achieve internally a level of per capita consumption equal to that of the United States, it alone would require 12 million barrels daily. Comparing such consumption with present Soviet output of only 4 million barrels, it is clear that the Soviet would not have an exportable surplus until 1980.

In this context of importance the cost of Soviet petroleum production, whatever that might be, has little or no bearing on the quantities exported. The value to the Soviet is measured in terms of what the Soviet purchases in return for oil. High-quality machinery and equipment is obviously of more value to the Soviet than barrels of crude oil.

SOVIET VERSUS FREE WORLD BENEFITS

In this statement I have consciously avoided the use of the term "trade." To use this term to describe the Soviet exchange of products is to suggest unrealistic considerations. From the days of Marco Polo,


SOVIET BLOC IMPORTS FROM FREE WORLD
MILLIONS U.S. DOLLARS
'60 '72 EUROPE
'60 '72 FAR EAST
'60 AFRICA
'60 LATIN AMERICA
'60 U.S. & CANADA
TOTAL WORLD
BILLION U.S. DOLLARS
OTHER
'53 '60 '72


TOTAL SOVIET OIL EXPORTS TO THE FREE WORLD
MILLION BBLS./YEAR
SOVIET TO FREE WORLD
1953 12.8
1961 222.7
1965 365.0
1972 730.0
61 65 72
FAR EAST
53 61 65 72
EUROPE
61 65
AFRICA
61 65
LATIN AMERICA

the term "trade" has generally meant international buying and selling for private gain. The government may benefit from such trade, but this benefit is derived through the trading of its people. When, where, what to trade, except in time of war, is largely the decision of the trader and not the state.

The 20th century totalitarian state, centralizing control of economic as well as political and military affairs, introduces an entirely new situation in the exchange of goods between nonbelligerent countries. When a totalitarian state controls the buying and selling of commodities internationally, such transactions become a primary means of achieving the political and military objectives of the government. Hence, the buying and selling of products internationally by the Soviet must be understood, not in the usual concept of trade, but in terms of the contribution which such transactions ultimately make to the Soviet political and military purpose.

The Soviet method of conducting its economic offensive clearly shows its essential character and purpose. Soviet agents shop the free world countries for high-technology production and capital equipment which they need. Firms in the free world are given no similar opportunity to shop in the Soviet bloc; rather, they are offered whatever products suits the Soviet purpose to export. Soviet agents have access to the economic organizations of the free world, but free world representatives are severely restricted in their movements in Soviet industry. Finally, the Soviet takes delivery of imports and makes delivery of exports at the border, thus preventing any contact by the free world firms with Soviet industry which is not officially approved.

Therefore, if the term "trade" is to be used to describe Soviet export-import, the "trade" policy must be understood as economic warfare in aid of Soviet political and military aggression.

This being the case, the Soviet, in conducting a program of foreign procurement, places greater weight on essential imports than the economic costs to it of the products which it exports. The product chosen for export is a matter of convenience and international acceptability. Oil is a convenient product for export because it is acceptable in Western markets and has high purchasing power.

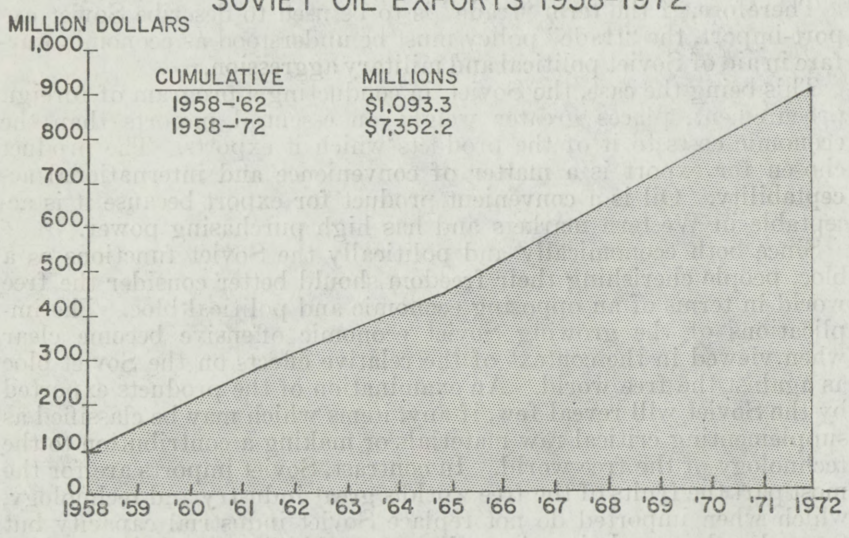
Since both economically and politically the Soviet functions as a bloc, people cherishing their freedom should better consider the free world in terms of an opposing economic and political bloc. The implications of the growing Soviet economic offensive become clear when viewed in the context of the relative effects on the Soviet bloc as against the free world. An examination of the products exported by the Soviet will reveal few, if any, items which may be classified as supplementing critical raw materials or making a contribution to the technology of the free world. In contrast, Soviet imports are for the most part the fruits of the free world's great industry and technology, which when imported do not replace Soviet industrial capacity but expand and upgrade it. A smaller part of its imports is in products which are taken in return for its exports, primarily designed to achieve political penetration. In this category fall Soviet exports to the underdeveloped countries.

Until the free world acts realistically in terms of bloc economics, the Soviet has the advantage of exploiting free world capacities and resources for its own use without giving adequate consideration to the free world.

The case of Soviet oil is clearly in point. If the free world production of oil were in short supply or if oil reserves were inadequate, the exchange of industrial equipment and machinery by the West for such Soviet oil would be justified on economic grounds and might well outweigh the political and military detriments of strengthening the antagonistic Soviet power. When, as is the case, the free world has an actual surplus of oil production capacity backed up by vast proven reserves adequate for foreseeable future needs, this exchange makes no economic sense.

The acceptance by the free world of large quantities of Soviet oil, in fact, results in a great economic loss. The free world loses the equivalent of $1.25 in current purchasing power on every barrel of oil imported from the Soviet. Oil-producing countries, which for the most part are economically underdeveloped, receive payments of royalties and taxes approximating 75 cents a barrel, plus 50 cents in foreign exchange representing local costs of production and of further exploration. The chart "Loss of Royalties and Exchange Earnings" shows the estimated loss of income and foreign exchange to oil-producing countries resulting from Soviet oil exports to the free world. From 1958 to 1962 the loss was $1 billion; by 1972 the loss will amount to $7.4 billion.

LOSS OF ROYALTIES AND EXCHANGE EARNINGS TO FREE WORLD OIL PRODUCING COUNTRIES RESULTING FROM SOVIET OIL EXPORTS 1958-1972



Remarkably great as European industrial capacity may be, it cannot simultaneously supply the billions of industrial output for the Soviet world and make a comparable contribution to the underdeveloped countries of the free world. The hard economics are that the supplemental Soviet demand can probably keep the free world industrial plants working at capacity, and it is highly unlikely that new capacity will be built to supply underdeveloped countries in the free world which do not have the ability to make current payment. Thus as the Soviet takes greater volumes of free world industrial production, and also supplants free world underdeveloped countries as suppliers of oil, the burden increases on the United States to support the development of dependent countries of the free world.

The implications of the rapidly growing exchange of goods between Western Europe and the Soviet Union are far reaching. On the basis of present trends, Western Europe in another decade will become heavily committed to the Soviet bloc as a source of petroleum supplies, and also become dependent on the Soviet bloc as a market for the output of its factories and laboratories. The chart on page 17 estimates that, if present trends continue, the Soviet will import 8.6 billion annually by 1972 of which 6.3 billion will be capital goods and high quality metals and chemicals. This orientation of Western Europe as well as that of Japan to the Soviet bloc should be of major concern to the countries involved as it is to the United States and the rest of the free world.

This development of interlinking European and Soviet economies is not explained by any declared policy; rather it is the result of a lack of any conscious Government policy. The manufacturing firm in Western Europe and Japan is largely free to sell to the Soviet, and the oil importer in these countries is in the position of being attracted by low Soviet oil prices. To help matters along, European banks extend credit to increase the amount of sales to the Soviet.

If the present trend of the Soviet economic offensive continues, a number of consequences are evident.

(1) A major source of purchasing power to underdeveloped countries will have been lost, and the foreign aid burden on the United States will be correspondingly increased.

(2) Industrialized Europe and Japan will be increasingly oriented to the industrial development of the great Soviet bloc, and therefore less able and willing to share with the United States the burden of developing the economically dependent areas of Africa, Asia, and South America.

(3) Industrialized Europe and Japan will become increasingly dependent economically on the Soviet both as a source of raw material and as a market for their industrial production. This economic dependence would make it possible for the Kremlin to exercise a dominant influence over European and Japanese political as well as defense policies.

(4) Accelerating its industrialization, the Soviet improves its position to expand its political penetration into the free world underdeveloped countries with economic aid and Soviet-type technical assistance.

(5) These consequences undermine the security of the free world; particularly the security of the United States which is critically dependent on raw materials from oversea sources.

In summary, this economic offensive, if unchecked, will make it possible for the Soviet to integrate the industrialized economies of Europe and Japan (exchanging raw materials for manufactured goods) and to penetrate the underdeveloped free world with its own products in order to subvert the nascent local political apparatus to

Soviet domination. As a consequence, supplies of foreign raw materials, on which the great industrial plant of the United States is dependent, would be threatened by Soviet control.

U.S. POSITION

In the immediate postwar period, the United States offered, and the war-devastated countries accepted, great quantities of U.S. aid for their reconstruction. This aid, despite Soviet opposition, made a critical contribution to the reconstruction of Western Europe and Japan. In defense of the free world against Soviet military aggression, the United States and other free world powers are joined in a mutual undertaking in which the principal objectives are defined and generally accepted. However, in the matter of defining the economic relationship between the free world and the Soviet bloc, there is a conspicuous lack of common policy and purpose. As a result of this indecision and drift, the Soviet is free to exploit European and Japanese markets, and in so doing is weakening the economic supports of the free world's defense structure.

Without consistent policies by industrialized Europe and Japan, the U.S. embargo on exports to and imports from the Soviet bloc no longer achieves the end result Congress intended. Up until a few years ago, the embargo was effective when the United States was the free world's major industrial producer with an exportable surplus. In the past 7 years, Western Europe and Japan have achieved surplus productive capacity which can supply all the machinery and technology the Soviet can pay for. In turn, the Soviet has developed productive capacity which it can release for export. Now unilateral U.S. action has little or no effect on the Soviet's ability to exploit the Western markets for its own ends. If the free world is to prevent the Soviet economic offensive from undermining its security, a common agreement must be reached by the great industrial powers.

The United States cannot avoid responsibility for spearheading such an agreement. Before any progress can be made in a common understanding with other countries, the problem must be given adequate recognition by the executive and legislative branches of our Government. This hearing is evidence of legislative concern, but, since the problem emerged 8 years ago, I am not aware of any statement from the White House that recognizes that this problem exists or that it threatens Western security.

In fact, agencies of the executive branch, I believe, without clear understanding, follow policies and make reports which would indicate that the Soviet economic offensive requires no change in the status quo. A few examples will illustrate this confusion and drift:

(*a*) The Justice Department takes the position that American firms abroad must conduct their foreign operations within the limits of the antitrust laws as they are interpreted to apply to the marketplace in the United States. Regardless of conditions in the foreign marketplace, such interpretation of U.S. laws restricts American firms in their efforts to protect their interests against the thrust of the Soviet raid in these markets. In effect, the Europeans and Japanese can only interpret this policy as evidence that current Soviet exports and imports are not regarded by the United States as adversely affecting free world security. It would seem that, were the U.S. Government concerned, it would not impose restrictions on American companies which impair their ability to protect themselves against the Soviet in these markets.

In the case of the oil industry, the major companies have a considerable strength if concerted action were possible to protect their common interest against Soviet oil dumping; but individually, as they are required to act under U.S. antitrust administration, they are helpless against the powerful thrust of the Soviet and the related practices of certain importers.

(*b*) There are only two published Federal reports on Soviet oil. One published U.S. Government report on the Soviet oil offensive comes out of the U.S. Air Force, prepared under contract with a private research company. This report regards Soviet oil exports as surplus to the Soviet economy and as competition with Western sources which benefits Western consumers by lowering prices. But the report acknowledges a possible danger if supplies are cut off. The author proposes that a free world tanker fleet be created and maintained as a standby reserve large enough to supply the Western world if, as, and when the Soviet decides to cut off exports. In the meantime, it is taken as quite normal and consistent with U.S. policy if Soviet oil should continue to supply Western markets in such quantities as the Soviet considers surplus to its own needs.

The other report, entitled "The Soviet Seven-Year Plan (1959–65) for Oil," published by the U.S. Department of the Interior (1961), describes the great Soviet oil development. It also supplies data on Soviet oil exports and the capital goods imported. The report concludes with a suggested favorable observation:

> This type of interdependence will tend toward political stability in that the Soviet Union would not create a world conflagration while it is struggling to acquire the means to achieve its mineral production goals.

These examples are cited not in criticism but as indicative of the confusion which must inevitably result from the absence of official policy direction. Lacking top-level official recognition of the problem and policy direction, the implicit assumption is that by this growing Soviet export-import activity, by "growing trade" as some would call it, the opportunities are improved for peaceful coexistence.

If this position is correct, then Congress should consider amending the Trade Act to permit a freer exchange of goods between the Soviet and the United States. On this premise, U.S. military and defense programs ought to be reappraised and curtailed consistent with this new-found security.

This thesis has never been offered as public policy nor is there any possibility that such an idea would be acceptable as realistic in the absence of a disarmament agreement between the United States and the Soviet which could be relied upon to preserve the peace and the security of the free world. But disarmament alone is not sufficient to secure the political freedom of non-Communist countries against Soviet imperialism.

If the present trend of Soviet exports and imports continues, the independence of Europe and Japan from Soviet influence will have been critically weakened by 1972. Any actions or policies regarded as hostile by the Soviet could be countered by a trade embargo of devastating impact. By then, immediate and large-scale unemployment would result in Europe and Japan by the loss of the Soviet market. These industrial nations then substantially dependent on Soviet oil could be immobilized for lack of fuel. Considering the volume of fuel thus cut off, the free world facilities could not possibly meet such requirement, estimated at a million and one-half barrels daily, so as to avoid the devastating economic and political effect of the embargo. Similarly, the markets in Africa, Asia, and South America which, over time, could have taken the output of European and Japanese plants, could not quickly absorb the output soon enough to prevent the wrecking of the social and political structures of these industrial countries.

The Soviet itself would face a problem of economic adjustment in the event of such embargo. But this adjustment for a totalitarian regime, organized and disciplined as for war, could be taken in stride without affecting seriously its position of international power.

CONCLUSION

This statement has attempted to show that the Soviet might be able to achieve its clearly stated objectives of world domination without the use of force, but in reliance on an expanding economic offensive. Oil is the principal weapon in the Soviet economic offensive because of the great potential capacity for export and the impact on free world economies.

I would summarize by stating that the Soviet economic offensive of the last 8 years has created a power monster. This monster is growing at an accelerating rate. In a matter of another decade or two, it will have produced for the Soviet Union an industrial capability that could make economic vassals of Europe and Japan that made it possible, and that could undermine the security of the United States which has ignored it.

RECOMMENDATION

This committee has sponsored much of the U.S. security legislation and supported its administration over the years. It should now take the lead in examining the security implications of the Soviet economic offensive which is being successfully waged, notwithstanding the U.S. policies on Soviet trade. There is now an urgent need to determine what new legislation or policies are necessary to meet this growing threat to our survival.

I respectfully recommend that this committee consider holding hearings to examine this complex problem of the Soviet economic offensive. In particular, the committee should receive testimony dealing with—

1. The efforts by the State Department and difficulties encountered in attempting to reach an agreement with other countries on a common policy of containing the Soviet exploitation of free world markets.
2. The appraisal of the Defense Department on the impact of the Soviet economic offensive on our security interests.
3. The administration of U.S. laws, particularly the antitrust policies, as they restrict and handicap American companies in their efforts to protect their investments and positions in foreign markets now being raided by the Soviet.

4. The experience of American companies with Soviet economic aggression in foreign markets and in maintaining facilities essential to U.S. and free world security.

5. The extent to which present laws, such as the Trade Act of 1949, are adequate or effective in carrying out the intent of Congress in view of the major world changes since such laws were enacted.

Now, the purpose of my statement is to identify and evaluate the key elements in this Soviet oil offensive as part of its general economic offensive, and to draw some references to the effect of that offensive on the security of the free world and of the United States.

Now, I use the words "economic offensive." Other people have used it. I would like to define what I mean.

By "economic offensive," I mean a purposive export-import program centrally directed by the Soviet pursuant to its overriding objectives of political and military aggression which they have clearly announced they intend to wage and are waging against non-Communist countries.

How this offensive is waged, its mechanics, its purpose, I think I can identify fairly clearly.

They export products, which they find convenient to allocate for export, at prices which are below those of the regular commercial suppliers in the free world market. Most of these products are exported to industrial countries for the purpose of paying for certain procurement that they want, and that they need in their own program of expansion of their capital industries, and military support programs.

They also export products to underdeveloped countries, products which will gain for them a political foothold, a penetration. Exports are a very useful aid to their political propaganda. Once they get in, of course, they look for an eventual domination of those countries. I will give you specific examples of these as we go along.

Now, Soviet imports are the result of their exports. They allocate production for export on the basis of the most convenient product to them, the most acceptable in the foreign market, and the one which has the highest purchasing power. That product is oil. It has a universal demand, satisfying a critical need, and a product about which the West is very price conscious.

So, when the Soviet exports oil, they have a real power in the marketplaces of the free world.

In 1954, as I have indicated, there were few exports of Soviet oil, but these were all strategic ones. They were not exporting oil to gain foreign exchange. For example, they were exporting oil to Iceland and taking fish in return. Well, it seems that the Soviets are not noted fisheaters. There was a strategic purpose there, which I pointed out in those hearings.

But today the Soviets are exporting massive quantities of oil and are developing capacity to increase the volume of these exports.

I would like to get into that now by discussing some of the charts before you.

May I call your attention to this chart of Soviet sedimentary basins. I do not know whether you can see that, Senator—but the shaded areas are the presently known sedimentary basins in the Soviet land mass which are capable of producing oil. Each of these basins has been tested. These basins have common characteristics, and the presence of oil has been established.

Recently a very promising discovery was made here on the Lena River, far to the east. As that basin is developed, you can see that it will provide a convenient source of supply for Japan. The political and military implications are indeed serious if Japan becomes dependent on that source of oil.

Senator KEATING. Does that have a producing well yet?

Mr. NAKASIAN. There is a producing well there—a very, very promising discovery.

Now, the Soviets have given a high priority to oil development. They have a thousand geophysical crews—these are fellows who go out and examine the areas and map the basins preparatory to drilling. This is the preliminary step in the search for oil.

These thousand geophysical crews in the field in the Soviet Union are equal to the total number of geophysical crews operating in all the rest of the world.

Following up the geophysical crew activity is a massive oil-drilling program.

The Soviets engage in their oil development somewhat more rationally than we can in the United States. They do not have to deal with individual landowners and farmers and worry about recording deeds and leases, and so on. They can conduct a rational program on a large area on the basis of getting the most oil for the minimum effort.

They have some 1,000 drilling rigs in operation—roughly a fifth of the total drilling rigs in operation in the world, including the Soviet. These rigs are very rationally engaged in a drilling program at this stage of mapping the substructure. Drilling to map the substructure may get less oil in the next month or 2 months or a year, but eventually it will make it possible to develop those fields a lot more quickly than they could otherwise.

So—as we get into the production projections I have made—it will reflect the fact that they are currently devoting a great number of those drilling rigs to mapping substructures and not drilling for oil per se.

The drilling machinery and the geophysical equipment which they have are for the most part of European origin but only one step removed from American design and development.

I should point out here that the United States has made the singular contribution to the technology of finding, drilling, and transporting oil. This technology is the product of experience in the location of borings and in drilling, over many years, an average of 50,000 wells in the United States alone. The American technology in the transport of oil is evident in the great network of pipelines in the United States and in the great fleet of supertankers. Technological development in the oil industry has flowered in the past 20 years in finding oil.

After the war, that technology was transported to the Eastern Hemisphere. I think we ought to be realistic in recognizing the fact that that technology has moved right on into the Soviet Union, and that is what they are using.

While we may not ship much equipment or any drilling equipment from the United States to the Soviet Union, it is going into the Soviet Union from Western Europe, and in all the quantities they need.

Senator KEATING. From U.S. sources, or both United States and Western European sources?

Mr. NAKASIAN. Well, Senator, European manufacturing firms and American firms based in the United States are not divorced in terms of technological exchange of information. I think the honest answer to that question is that European firms who supply this kind of equipment to the Soviet Union have American tieups, under licensing and patent agreements of one sort or another, if not some actual ownership by American companies in those firms.

Senator KEATING. Now, is such drilling equipment now on the prohibited list for direct export from the United States?

Mr. NAKASIAN. I think it is on the discretionary list. I do not think it is on the prohibited "RO" list—isn't that what it is called—end-use military items?

So the Soviets have vast sedimentary areas. Let me give you just a comparison.

These shaded areas constitute a total area equal in size to the 50 United States.

Senator KEATING. Fifty, did you say?

Mr. NAKASIAN. These areas are equal in size to the total area of the 50 United States. Stated differently, these sedimentary basins are 3½ times the size of the total sedimentary basins inside the United States. So you are looking at the world's greatest oil province.

Senator KEATING. Now, if you include the sedimentary basins of Canada—have they been charted?

Mr. NAKASIAN. Yes; they have been charted.

Senator KEATING. And considering those, how would the oil resources of all of North America compare with the Soviet Union?

Mr. NAKASIAN. It would still be—it would change the fraction somewhat. It might change it from a third to possibly two-fifths or something of the sort. It is not going to change it appreciably.

Senator KEATING. Do we know anything about sedimentary basins within Red China?

Mr. NAKASIAN. We know that they exist, Senator. We do not have as much information on Red China as we do on the Soviet Union. The Soviet Union, incidentally, has not been reluctant to disclose their oil resources. They make forecasts of what they are going to produce. Oddly enough, they achieve them. As a matter of fact, they have been exceeding their goals.

An American oil team visited Russia in 1960. That team was given a good look at their oil operations. The Soviets are quite proud of this achievement in the industrial sector. It may well be their most sensational achievement, next to nuclear development. They are very proud of it, and I think they have reason to be. Therefore, they issue more statistics, perhaps, than on other industries. Much of the information I refer to is taken from Soviet sources. To repeat: They regard this as a great achievement. I think it has to be identified or described as sensational.

Now, it is not enough to find oil and produce it; you have to get it to market. This is the next phase that I would like to discuss.

In 1953 there were practically no pipelines in the Soviet Union. The few that existed in the Soviet bloc were in the Black Sea area, where the early oilfields were. In this span of only 8 years, they have undertaken this massive construction of pipelines—these are distances of 5,000, 6,000, to 7,000 miles. (See chart, p. 12.) This huge network of pipelines has been built and is being built in a very short period.

Now, great technology goes into pipeline construction—the technology of making line pipe that can withstand pressures, pumping stations, compressors, and other equipment. The Soviets could not possibly have achieved anything of this magnitude without having had the freedom to draw upon the industrial plants and technology of Western Europe and Japan.

In the process of building these pipelines, one of the principal sources of pipe is Italy. Italy is supplying a million tons of line pipe to the Soviets, to make this gridwork of pipelines possible.

As you can see, the big fields from the Urals are being tapped to extend into the Baltic Sea, into Western Germany, and into the Black Sea for access to the Mediterranean. This gives them access to the world markets—northern Europe, central Europe, and the Mediterranean area, Africa, and the Western Hemisphere. A major pipeline is being built, extending out to the Far East, where it will supply the Japanese—a highly attractive market for the Soviets because of the industrial goods that they can get in return.

Senator KEATING. May I ask you this: To what extent does the Soviet Union supply oil to Red China?

Mr. NAKASIAN. I do not know what the quantities are, but they do supply Red China with oil.

Senator KEATING. What are the other suppliers of oil to Red China?

Mr. NAKASIAN. Well, some of the Western companies supply oil to Red China. I believe the British do. I do not think the American companies do. I am quite sure they do not—even through any of their foreign outlets. But the British companies do to some extent.

Senator KEATING. They ship it by tanker?

Mr. NAKASIAN. It is shipped by tanker.

Now, we might get to Soviet production and their goals.

In 1953 the Soviets produced 400 million barrels and exported in the order of 7 million barrels of oil. In 1961 their exports were very substantially increased to 222.7 million barrels out of total production of 1,211 million barrels. The figures on this chart at page 12 show production of 400 million barrels of oil in 1953—total production. In 1961, in 8 years, production had tripled to 1.2 billion barrels. In 1965, production will be in the order of 2 billion barrels.

The American oil team that visited the Soviet—I talked with members of that team—report they are confident that the Soviets will not only meet this goal but exceed it.

The Soviets plan to increase their production to these enormous figures of 2.8 billion barrels in 1970 and they should produce in the order of 5 billion barrels a year in 1980.

Now, based on those figures, I have attempted to make a projection of what they could export. I will get into that in a minute, and tie that up with imports which they will get in return.

This rapid achievement in transportation could not have been possible without aid from the West European and Japanese economies.

It is also significant that it came at a time after Western Europe and Japan had recovered from the war—had rehabilitated their production facilities. This progress by the Soviets—this development—had been forestalled, in effect, until Western Europe and Japan could contribute.

The Soviets have always known that the oil was there. Oilmen of the West knew that the basins were there. But it took a change in policy by Khrushchev to set the stage for the exchange of technicians and products—the idea of peaceful coexistence.

There was a marked difference in policy from that of Stalin, whose policies tended to isolate the Soviet Union from the West. Khrushchev is openly following a policy of trading with the West, which means to him getting what he wants from the West and shipping, in return, what he wants the West to have.

Mr. SCOTT. Mr. Nakasian, before you leave the chart on the pipelines, which reflects the lines in actual operation—then you have the lines proposed or, I suppose, under construction in Eastern Europe.

Would you tell the committee or do you have the information also about the Black Sea ports that ship out oil coming up to Marseilles into Western Europe, and flow through the pipelines of Western Europe, and may enter the market in a camouflaged form which would be difficult to identify as Soviet oil?

Mr. NAKASIAN. If I understand your question—to what extent would Soviet oil put into the pipeline by some company move through the facilities of the private or the integrated oil companies—American as well as British and Dutch—and go into the Western European markets.

Well, I think it is possible. It would be a terrible policing problem to prevent a company desiring to do so.

Oil is not easily identified. If anyone wanted to conceal sources and exchange shipments, it could be done.

We know, for example, that the Soviets are exporting oil to Egypt. Egypt is about self-sufficient in oil. The large quantities of oil that Egypt receives from the Soviet plus their own production is greater than the total consumed in Egypt. So Egypt in turn exports oil. It is exporting oil to Italy.

Senator KEATING. Let me get this straight. When you say Egypt exports oil, do you mean Egyptian companies or British and American companies and other companies operating in Egypt?

Mr. NAKASIAN. Well, Senator, Egypt has kicked out or discouraged all the American companies.

Senator KEATING. Have they kicked out the other free world companies?

Mr. NAKASIAN. Yes, largely. The only producing company that is there, other than Egyptian, now, is the Italian state-owned company, usually identified as ENI.

Senator KEATING. So that, when you say Egypt exports, you mean Egypt has a state monopoly.

Mr. NAKASIAN. Egypt has a state monopoly. And that state monopoly, together with ENI, controls the oil moving in and out of Egypt.

Senator KEATING. And ENI is a state monopoly of Italy.

Mr. NAKASIAN. And ENI is a state monopoly of Italy; right.

Now, to answer your question, Mr. Scott, about the intermingling or mixing or swapping of Soviet oil with non-Soviet oil, I think this is possible, if any company wants to profit from it. I do not know to my own knowledge that ENI is doing it, but they certainly have an opportunity to do it, if they choose, and I would suspect that they are doing it. I will tell you why.

Egypt is today self-sufficient in crude production. It imports crude from the Soviet Union. If you add the amount of its imports together with its own production, it has an exportable surplus—it does not consume that much oil. Egypt is exporting a substantial amount of oil to Italy. The oil which Egypt exports to Italy, I understand, is not the oil which is characteristic of the Egyptian crude but similar to the oil which flows out of the Black Sea area. You might conclude, therefore, that it is Soviet oil. Where that oil goes after it gets into Italian pipelines and refineries and so on would be a difficult investigative problem.

Mr. SCOTT. Then, Mr. Nakasian, you can say the statistics of production and export of Soviet oil are what you can actually identify as having come from the Soviet. Therefore they are conservative figures because probably, if you had the ability or means of identifying the camouflaged form of oil through the ENI and other sources, that figure would be larger, actually penetrating the free world market.

Mr. NAKASIAN. Let us say that these figures are conservative. I do not know to what extent they are understated. But I think they represent the picture fairly realistically. As for any one country—for example, Italy may be importing more Soviet oil than the figures show, because of the triangle shipment via Egypt.

Mr. SOURWINE. Mr. Nakasian, you said the achievement of the Soviets would have been impossible, the development of their oil resources and production of oil, without material from the West.

Can you tell us, are they now independent of material from the West, or do they still rely upon it?

Mr. NAKASIAN. They still rely very much upon the West. They cannot continue this rate of development which they have programed for themselves without the continuing supplies from the West.

Mr. SOURWINE. In other words, the Western World, the free world, has it in its power even yet to reduce and slow up the Soviet oil development program.

Mr. NAKASIAN. Very definitely—very definitely.

Now, I would like to state this conclusion, in the interest of time.

I would like to say that the pipelines are not the only means of transportation of importance to the Soviets. They also need tankers, of which the Soviets are rather short.

While the bulk of the Soviet oil will move to the industrial market, since it is the industrial market that has the capacity to use the oil, it is of usefulness to the Soviets also to get oil into the underdeveloped countries. To do that, they need tanker capacity.

In the last several years, the Soviets have placed tanker orders with the United Kingdom, Finland, France, Denmark, and Japan. That will increase their capacity over and above their own production of tankers to hit these far-off underdeveloped areas in greater quantities.

I might also say that the free world tanker owners have been chartering tankers to the Soviets. While some effort has been made by integrated companies to stop it, it appears that the Soviets are getting all the tankers they need at the present time to export the oil they want to export to Cuba and any other place that is important to them.

Senator KEATING. In other words, the Soviet may be using free world tankers to get oil to Cuba.

Mr. NAKASIAN. Let us say that those free world tankers chartered by the Soviets could easily be transporting oil to Cuba. Now, whether those tankers that are transporting Soviet oil to Cuba are free world owned tankers or not I do not know of my own knowledge. But it would make no end-result difference whether they were Soviet-owned tankers or free-world-owned tankers. The fact is that the free world has expanded the Soviet tanker capacity.

Senator KEATING. But they are operating free world tankers, flying the flags of free world nations, in this Soviet oil trade.

Mr. NAKASIAN. These would be tankers chartered under foreign flags. I doubt that the registries of those tankers would be changed when they are chartered to the Soviets. I think the answer to that statement is yes, they are.

With this expansion of the pipeline, with this development of oilfields, and with this tanker construction, the Soviet schedule of increased production and export is realistic, in my opinion.

Look what the trend has been.

In 1952 Soviet production was less than 1 million barrels daily. Today, 10 years later, it is almost 4 million barrels daily. Their schedule is to increase daily output to 5.3 million barrels daily in 1965, up to 7.8 million in 1970, and to 13.8 million in 1980.

Now, an idea of how large these figures are can be gained by comparing them with the U.S. production. We produce 7½ million barrels of oil in the United States daily, and we appear to have reached our peak in production at 7½ million barrels. So the Soviets are very rapidly catching up with the United States in the production of oil.

They have the technology; they have now the trained manpower. Most of the technology is not their own—it is largely Western in nature. Whatever shortages of materials and equipment they may encounter, they can make up by imports from Europe and Japan.

So the clear forecast is that, absent any change in policy, or if the situation remains as is, of really no policy, the Soviets will meet these production and export goals.

Now, I have been very much interested in reading the testimony that has heretofore been given on the Soviet oil available for export. Some of the material refers to it as surplus to the Soviets' own needs.

I find it more realistic to think of Soviet oil exports—that quantity which is exported—as being an allocation. The Soviets determine what amount they are going to allocate for export. Since the internal consumption of the country is subject to a rationing system, an allocation system, there is no reason to believe but what the Soviets ration or allocate how much petroleum is to be exported. A large part of this increased production, which we have referred to, is going to be made available for export, because it will produce for the Soviets machinery, equipment, technology, the fruit of all the productive genius and industrial plants of Western Europe and Japan, which

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the Soviets do not have, and need in their ambitious industrialization program.

Mr. SOURWINE. Mr. Nakasian, you hinted something there. I want to be sure I understand it.

It seems you are saying that the Soviets do not sell oil for money; they sell oil for the things they most need. It is almost a barter proposition. Is that correct?

Mr. NAKASIAN. That's correct. I would like to explain that point if I may.

Money means something different to a Communist totalitarian system than it means to a system of free enterprise, where the production and selling units are commercial and free enterprise in character. Each company has its own profit-and-loss statement, balance sheets, to be concerned with. Money is the medium of measuring transactions and for recording values.

So far as the Soviets are concerned, they do not use the money system in the sense the way we use it in this country, or it is used in Western Europe. Soviets are interested in physical things and political end results. They are interested in getting machinery or in pipelines or military support items. They look around and try to find something that they can export to markets that supply what they want—what these markets will accept in payment for those items the Soviet wants.

It is a barter. But this tag sometimes confuses more than it clarifies.

They do not use the money system the way we do. Their export-import program is essentially a program of procurement. Their emphasis is on procurement. Their emphasis is not on export for capital. Their export is for the purpose of getting in what they want in the way of physical equipment, technology, and essential supplies.

The Soviets are essentially, from an economic standpoint, an isolated economy. They do not want to be exposed to the rest of the world in a free exchange of goods. They only want to procure what they want, and they will ship out what they want the free world to have.

Mr. SCOTT. Mr. Nakasian, in connection with this question and your comment, I would like to invite your attention to page 11 of your statement where this is stated:

> Soviet oil exports to the free world may be classified as to purpose under two headings—strategic procurement and political penetration.

Would you care to expand on that for a moment?

Mr. NAKASIAN. All right. We have dealt mainly with the strategic procurement. They are also interested in political penetrations. A classic case of this is right in our backyard—Cuba.

The Soviets were very happy to supply the oil for those Cuban refineries because they knew full well that once Castro became dependent upon that oil that they had Castro in their grip.

If they were to shut this oil off—I think your statement is absolutely correct, Senator—if the Soviets were to shut that oil off for some reason convenient to them, Cuba would be on its knees begging for oil. There are relatively few places where they can get that quantity of oil outside the facilities of the integrated companies, whose refineries have been confiscated by Castro. The Soviets have a grip on Cuba as a result of this dependence of Cuba on Soviet oil.

Senator KEATING. I estimated they could not last more than a month.

Mr. NAKASIAN. I think that is a fair estimate. I do not know how much oil the Soviets are shipping into the storage tanks in Cuba. I would rather suspect they are keeping those storage tanks partly unoccupied, so that the dependence will be acute and immediate.

Senator KEATING. Are they shipping oil into other Latin American countries?

Mr. NAKASIAN. The Soviets have shipped into Uruguay and into Argentina. I understand that the Uruguayan contract has been canceled. I doubt that the Soviets are shipping crude into Argentina, but they may be shipping some products in there.

Senator KEATING. Are any other Latin American countries wholly dependent upon Soviet oil?

Mr. NAKASIAN. No. In fact, many Latin American countries have their own oil production. Argentina today is self-sufficient in petroleum. The west coast of Latin America has substantial production. The only country that represents a danger from our standpoint of importing Soviet oil in any great quantity is Brazil. This is a great deficit petroleum area, and the Brazilians have shown recent signs of greater friendliness toward the Soviets, and there may be some substantial quantities of Soviet oil put into Brazil. At the moment, I do not think there is any going into Brazil.

I have pointed out in that connection the amount of Soviet oil going into the underdeveloped countries for political penetration is about one-third in 1960, one-third of total Soviet oil exports. Two-thirds of their exports are going into industrial markets, where they are procuring this equipment and machinery and technology and capital goods that I referred to.

This is where we should expect the bulk of Soviet exports to go in the future.

For instance, in 1961, Italy imported 126,000 barrels a day, West Germany 51,000 barrels a day, Japan 53,500, Sweden 50,000. These amounts are increasing. If present conditions remain—unless there is some stop or some allocation system put in—I think we can look for something like the trend shown in this chart for the years ahead.

This is total Soviet oil exports. In 1953 we see it is less than 3 million barrels a year. In 1961 those exports went almost to a quarter of a billion barrels. In 1965 we estimate that there will be about 365 million barrels a year, or about a million barrels a day. In 1972 I estimate—and this is my estimate—that the export will amount to 730 million barrels a year, or 2 million barrels a day. I estimate that based on the production figures which I believe the Soviets will achieve; I deduct from those production figures estimated internal Soviet consumption which includes an increase in internal consumption at rates of the last 5 years, and the excess is what I would hold as being exportable.

The bulk of this increased export will be going into Europe. In return for that oil exported will be importation by the Soviets of machinery, high technology goods that were referred to in this chart.

If we accept the premise the Soviets are not going to export oil unless they get something in return for it—what they want in return comes from Europe and from Japan—this industrial equipment, and the products of research and development which the Europeans have put into the making of these products and which in turn reflect what the Americans have put into these products in the way of research and development, and which has been exported to Europe. By 1972 I would say that the Europeans will be exporting $6 billion worth of industrial equipment and high technology goods per year.

Mr. SOURWINE. To the Soviets?

Mr. NAKASIAN. To the Soviets.

Mr. SOURWINE. Mr. Nakasian, it is true, is it not, that while price is very much a part of the Soviet oil penetration into the free world, it is never a detriment or a hindrance to that penetration, because the Soviet price never need bear any particular relationship to the actual cost of the production? In other words, they fix the price to achieve their objective.

Mr. NAKASIAN. That is right. May I comment further on that?

We have the continuous problem in this country of trying to understand the Soviet's practice and the end results of what they do, in terms of our sense of values. We emphasize costs in relation to prices. In our free society, we believe costs should reflect sacrifices and prices should reflect costs and thus prices reflect value. I do not believe the Soviets think in those terms at all. What they think in terms of is: "We can export X quantity of crude oil, and for that crude oil we can get machinery and equipment that we do not have." I think it is clearly and simply a matter of their exchanging barrels of oil for a new lathe or a new tanker or thousands of feet of line pipe, which they would have difficulty producing themselves in the time period that they have set up for themselves. So that the cost of—the cost factors of the oil, I think, in their rational way of thinking—is not considered important. They would put great emphasis on the time factor, because they do have a timetable of political objectives.

Mr. SCOTT. Then, Mr. Nakasian, your statement about the thinking in values is reflected here in the statement of Mr. Khrushchev in 1955: "We value trade least for economic reasons and most for political reasons." So, if that is true—which is apparent, on the basis of their thinking of price and value—oil is the very vehicle which will lend itself best to enable them to bring this economic impact upon the free world.

Mr. NAKASIAN. I would definitely think so.

The Soviets could not find a more convenient commodity to export. As a matter of fact, I doubt that if they had as much reserve and production in gold they would find gold as acceptable in world markets and such quantity as they would find oil. There is a point beyond which gold would depreciate in value if produced in excessive quantity. Oil is essential to modern life; gold has very limited utility—its value is largely a function of scarcity.

Senator KEATING. Could you give us an idea of the cost of Soviet oil compared to oil from free world sources?

Mr. NAKASIAN. I think I might get at that question in this way:

The Soviets produce oil under entirely different circumstances than oil is produced in the free world. They do not have to deal with a sovereign country that has jurisdiction over the oil and they do not pay anybody any royalties.

So far as the actual finding, producing, and transporting costs are concerned, there is no reason to believe that the Soviet costs are any less than they are in the United States or in oversea free world countries. But the Soviets do not bear the other costs imposed on American and other free world companies.

I would like, at this point, to maybe leapfrog into a subject I am going to talk about a little later in more detail.

The free world countries in the Middle East, for example, and Venezuela, pay a royalty plus taxes of about 75 cents a barrel. You know, this is a cost to them. It is not a cost to the Soviets, but it is a real cost to the oil companies. That is a fixed burden that the oil companies must bear, must meet on any oil produced from a foreign country. In addition to that, they have production costs of around 25 cents a barrel, and they have to replace those reserves with additional exploration which roughs out about another 25 cents a barrel. So, to keep themselves going, they have to lay out about $1.25 a barrel—not to speak of the return on their investment and other factors.

The Soviets do not have that 75-cent royalty to pay.

Now, this is about as close as we can get to the comparison on costs.

A great effort has been made to get cost figures from the Soviets, and they just won't release them. It is questionable that they really have them in the way that we would set up cost accounts. Whether Soviet production costs are high or low is not very significant, as long as they can get something in return. I think they are looking at end results rather than immediate burden.

Senator KEATING. Now, money means something in Italy.

Mr. NAKASIAN. Yes, sir.

Senator KEATING. How much less does Italy pay for Soviet oil than it does for oil from free world sources?

Mr. NAKASIAN. Well, we can give you a pretty concrete answer to that. ENI, the state-owned monopoly, is buying oil at the Black Sea, f.o.b. Black Sea, which delivers in Italy at about $1 a barrel less than Persian Gulf crude oil would deliver in Italy at the posted price.

Senator KEATING. And in rough figures, what does $1 a barrel less mean?

Mr. NAKASIAN. Well, it would mean——

Senator KEATING. I know the price of oil changes from time to time.

Mr. NAKASIAN. Well, that would mean that the oil companies, to meet that Soviet price, would have had to sell oil f.o.b. Persian Gulf at about 80 cents a barrel. Of that 80 cents, they would have to give 75 cents to the oil-producing country, Kuwait or Saudi Arabia. So it is not practical—they are helpless in meeting that competition.

Is my answer clear?

Senator KEATING. Yes. What are they in fact selling oil for now?

Mr. NAKASIAN. I beg your pardon?

Senator KEATING. What are they in fact selling oil for, from the Persian Gulf?

Mr. NAKASIAN. Well, depending on the quality of the crude, posted prices range from $1.60 to $2 a barrel.

Senator KEATING. So that, to compete with Soviet sources, they would have to more than cut in half their own prices.

Mr. NAKASIAN. Yes, sir.

Senator KEATING. And cut it up to a third—between a third and a half. That is, they would have to cut them to between a third and a half of what they are now charging.

Mr. NAKASIAN. That is right. And, of that which they receive, they would have to pay almost the entire amount to the producing country, because producing countries are insisting on at least 75 cents a barrel royalty and taxes. They are not concerned about what the company receives for the oil. They have geared themselves to expect that much income per barrel exported. So it is almost a hopeless situation for these companies to prevent Soviet oil from taking over their markets.

Mr. SOURWINE. You have a chart there showing Soviet oil export prices. Could you explain those discrepancies?

Mr. NAKASIAN. All right. Incidentally, these are new rubles per ton. One new ruble is equal to $1.11.

In 1955 crude oil was delivered at the Soviet border to the satellite countries at a price of 22 rubles per ton. At the same time crude oil was being exported, delivered at the border for export at 14 rubles per ton.

Mr. SOURWINE. That is to the free world.

Mr. NAKASIAN. To the free world.

Senator KEATING. In other words, they were soaking the satellites 22 rubles and selling to free world sources or underdeveloped countries at 14 rubles.

Mr. NAKASIAN. Or they are undercutting the price for the world market by this amount. Actually, the price to satellite countries is comparable to the free world market price—the 22 ruble price.

Senator KEATING. That has consistently been their policy—to sell to other countries in the bloc, their so-called friends, at prices way above the amount they sell to the free world areas.

Mr. NAKASIAN. It is very interesting, for example, to see the prices the Soviets charge Yugoslavia for petroleum—the 22 ruble price.

Senator KEATING. And Poland, too.

Mr. NAKASIAN. And Poland, too. And that pattern has not changed since 1955.

It is not the Soviet's generosity in reducing those prices that accounts for this difference.

Senator KEATING. Well, that seems to me one of the strongest arguments: that they are selling oil not for income, but for the purposes that you have expressed.

Mr. NAKASIAN. For procurement.

Senator KEATING. For procurement and political penetration.

Mr. NAKASIAN. Right. And their capacity to continue doing this is infinite. The Soviets presently have no limitations. The only limitations that might change the picture would be safeguards imposed by the Western countries.

Mr. SCOTT. Mr. Nakasian, would you further explain the chart on Soviet oil export prices, as to what years it covers?

Mr. NAKASIAN. Yes. For the record—crude oil was exported by the Soviets in 1955 to the satellite countries at 22.2 rubles a ton. In the same year the Soviets exported crude oil to free world countries at a price of 14.2 rubles per ton.

In 1960, the corresponding figures were 19.8 and 10.3 rubles per ton.

I have taken, in this chart, one of the petroleum products, heavy fuel oil, and we find that for fuel oil the differential in 1955 was even greater. The Soviets then received 23.7 rubles per ton when they exported heavy fuel oil to the satellites and 10.6 rubles per ton when exported to free world countries.

In 1960, the corresponding figures are 14.6 rubles and 9.6 rubles.

Senator KEATING. Now, is there any significance in that change from 1955 to 1960—the disparity is not so great in 1960. Do you have any information whether that is because the satellites griped about it, or how did it come about?

Mr. NAKASIAN. Well, on crude the disparity is about the same, I think.

Senator KEATING. On crude it is.

Mr. NAKASIAN. As for this heavy fuel product, prices would fluctuate depending on whether they have more fuel oil around than other products. Fuel oil prices will gyrate, depending upon the need for storage space and getting other products in. But this is remarkably consistent. I think this pattern—you see, this 10.3 rubles per ton will amount to around $1 a barrel when you put it in terms of dollars per barrel, which is the 1.08 that we spoke of earlier.

Now, those figures are taken from the official Soviet publication. Some people are surprised that they would publish this, because it should upset the satellites. It would indicate that the Kremlin is not too much concerned about what the satellites think. This is published and it is available to us here, so it ought to be available to the satellites.

Mr. SCOTT. Mr. Nakasian, in your chart reflecting this disparity, would probably one of the reasons why they would be able to deal with the satellite countries a little differently from the free world be the use that they make of this Soviet oil trust? Would you tell us how it operates, how it is utilized there—as compared to our free world countries, particularly the United States, where each oil company is a private enterprise and has to deal individually against this combine?

Mr. NAKASIAN. Well, the basic difference is that the Soviets deal through a centralized agency. They do not have, in comparison with an American company dealing in oil, a cost and price relationship to be concerned about.

So far as this exporting agency is concerned, I think it is a partner of the procurement agencies. The central control authority tells procurement agencies what they want, and tells the oil trust to make so much oil available for export. It would be their job to get the oil together and get it delivered at a particular time and particular place.

I am sure that this export trust is not interested in machine tools or electronic equipment or anything else. It is just a service organization to get that oil delivered. The trading decisions are made at a more elevated level, and it is centrally directed. They would decide what kinds of machine tools they want and so on.

Previous testimony before congressional committees speaks of Soviet oil exports as surplus and also as trade. These terms when applied to describe the Soviet export-import position are misleading and confusing. If Soviet oil were committed to satisfying internal requirements, emphasizing human needs rather than international objectives, Soviet oil production would be inadequate for export for many years to come. If the Soviet Union itself were to achieve internally a level of per capita consumption equal to that of the United States, it alone would require 12 million barrels daily. Comparing such consumption with present Soviet output of only 4 million barrels, it is clear that the Soviet would not have an exportable surplus until 1980.

Senator KEATING. In other words, their own people do not have available to them petroleum products, anything remotely comparable to those of the free world.

Mr. NAKASIAN. Right. And Mr. Khrushchev makes that perfectly clear in his statement. He says that there will be no mass ownership of automobiles in the Soviet Union; that the Russians will ride in buses and trains.

Now, perhaps it is a preferable way for the Russian people to travel. But I doubt that they find that more convenient than private cars. In any event, it makes it possible—restricting internal consumption of petroleum—it makes it possible for the Soviets to export more. That is clearly what they are doing.

Mr. SCOTT. Mr. Nakasian, you would say that some of the people discussing this problem of Soviet oil have looked at it as a surplus and tried to meet it in that manner, whereas in fact if it is viewed as an allocation, and if proper steps were taken, we would be in a better position to meet the offensive.

Mr. NAKASIAN. It represents the problem before all of us in trying to understand the Soviet method. We have this problem of transferring our own ideas, our own concepts, our own vocabulary to describe their operations. Theirs is a different world. And so we have to be careful when we try to describe what the Soviets are doing.

Mr. SOURWINE. Mr. Nakasian, you have forecast a huge increase in Soviet oil exports, which, of course, means necessarily an increase in Soviet oil production through 1975.

Can you give us a projection of what the United States might be able to increase its own production or its own exports percentagewise to in that time?

Mr. NAKASIAN. Well, first let me say this: The forecast of the U.S. production of petroleum for the next 10 years does not show any substantial increase. There is no expectation that the domestic production of petroleum in the United States will be much, if any, higher than it is currently.

Mr. SOURWINE. In other words, this is an item on which we cannot outproduce the Russians.

Mr. NAKASIAN. No. In the United States, at the rate of 13.8 million barrels daily, we have pretty well explored this country so far as petroleum potential is concerned, and it seems we have topped off our crude production at about 7.5 million barrels daily.

We do not export petroleum from the United States any more. As a matter of fact, we are a major deficit country—we import on the order of 2 million barrels a day. Our total consumption requirement of liquid petroleum is about 10.3 million barrels a day; we produce

7.3 million crude, about 1 million barrels of liquid natural gas, and we import roughly 2 million barrels of crude oil products.

We are dependent on foreign sources of petroleum and will become increasing dependent on them as the years go by.

Now, to the extent that the Soviets can undermine our security in these foreign producing areas, we have a major problem here. I will get into that.

Mr. SCOTT. In other words, it is almost inevitable that, as the Soviet oil trade expands, that of the free world, particularly the United States, in the world market will recede.

Mr. NAKASIAN. Well, that is one way of putting it. The Soviet's oil now is replacing Middle East, and to some extent Venezuelan, production. If it continues in the trend that we see now, it is going to be a major replacement.

Mr. SCOTT. Mr. Nakasian, at this point, concerning the U.S. position, would you, in the interest of time, summarize your observation of either a position, lack of position, or an indefinite position, of what you, as an international lawyer viewing the world situation—what your interpretation of it would be.

Mr. NAKASIAN. All right.

The U.S. position on trade with the Soviet has been made clear by the legislation and administration of export controls. As I indicated, we have a new situation now because unilateral legislation and control by the United States is not preventing Soviet procurement.

The United States has the duty to deal with this problem for the reason that, in the final analysis, the United States is relied upon by the free world as its bulwark of security.

Ultimately the United States must forge some kind of an agreement with the other industrial powers of the free world to deal with this problem of Soviet exploitation of free world markets.

I cannot be too critical of Europe and Japan in participating in this business with the Soviets because I find—and I have searched—that there has been no official recognition of this problem by the top levels of our executive department.

Senator, I have made a conscious effort to find some statement from the White House, not only of this administration but of the prior administration, that this problem exists. Until this problem is officially recognized in the other branch of our Government, as it is here, I do not think that we can address ourselves very seriously to the remedies or the courses of action that we might take or suggest that might deal with it.

For example, the Justice Department takes the position that American firms abroad must conduct their operations in the foreign marketplace subject to the limits of the antitrust laws as they are interpreted to apply to the marketplace in the United States.

The political economists and legal theorists who thought up that interpretation of this U.S. antitrust application, some 30 or more years after the passage of the Sherman and Clayton Acts, should take another look at what it means today. Today it means that American firms are easy prey for Soviet raids on American oversea markets and facilities. If American firms could act together, they have substantial strength that might be employed to buck this thrust of the Soviets. But they are told by the Justice Department interpretation that any action they take must be taken individually and, if they cannot stand up against the Soviet export thrust individually, it is just too bad, because they cannot join forces in self defense. This is an area that I think ought to be explored and recommendations ought to be received as to how that policy might be made more realistic.

I do not think the antitrust statutes prescribe the present interpretation now being applied blindly to American firms in the foreign marketplace.

Mr. SCOTT. I note, Mr. Nakasian, you say: "There are only two published Federal reports on Soviet oil," and you identify them. Do you have available copies of those?

Mr. NAKASIAN. Yes, I can make them available.

Now, those reports I refer to in my statement as significant because they indicate the confusion which is inevitable if you do not have a policy position or a statement of this problem from the White House or from a top source. As long as that voice is silent, we should expect some naive suggestions of how to deal with this problem from persons in agencies who are subordinate and not the final authority of the country.

One of these reports suggests that, since there may be a danger that the Soviets might cut off this oil, that we ought to build up a tanker fleet large enough and kept in reserve to be thrown in and transport this oil to Europe whenever the Soviets decide to cut it off.

Another report suggests that there are some favorable aspects of this Soviet oil offensive because it would not be rational for the Soviets to consider a war until they have achieved their oil development.

Now, I do not make these remarks in criticism of these authors. But I just say that, until there is a high-level policy established on this problem, we are going to get some rather ridiculous statements on the problem.

Mr. SCOTT. In order to meet this situation, you have certain recommendations.

Would you care to comment on or read those?

Mr. NAKASIAN. All right.

I have attempted, Senator, to define this problem, and I have reviewed in the last month just about all the evidence that is available on this subject. I have come to this conclusion—that we know too little about it. I would hope that the committee does not receive my statement as representing any more than an effort to define the problem and to lay the basis for further inquiry.

There are big gaps here that ought to be further explored and an understanding reached. Therefore, I would recommend that this committee—which has sponsored the security legislation of the United States and has taken an active role in supporting its administration—that this committee consider setting up a special hearing to go into this problem. I would suggest the following matters for inquiry:

1. The efforts by the State Department and difficulties encountered in attempting to reach an agreement with other countries on a common policy of containing the Soviet exploitation of free world markets.

2. The appraisal of the Defense Department on the impact of the Soviet economic offensive on our security interests.

3. The administration of U.S. laws, particularly the antitrust policies, as they restrict and handicap American companies in their efforts to protect their investments and positions in foreign markets now being raided by the Soviet.

4. The experience of American companies with Soviet economic aggression in foreign markets and in maintaining facilities essential to U.S. and free world security.

5. The extent to which present laws, such as the Trade Act of 1949, are adequate or effective in carrying out the intent of Congress in view of the major world changes since such laws were enacted.

I believe, Senator, that there is a fruitful source of inquiry here, and, until we get a few more answers, I think that any suggested solutions are somewhat premature.

I have restrained myself from making any suggestions.

Senator KEATING. Your point is well taken. It was evident in the recent debate on extension of the Export Control Act that there was a concerted effort on the part of all Government departments, undoubtedly headed by the State Department, to prevent any realistic language of any kind being written into that legislation, either in the House or in the Senate, and to try to get simply an extension of that act without meeting any of these problems.

Fortunately, they were thwarted in that, by the almost unanimous action in both bodies. There was some improvement made in the Export Control Act, and it was extended for 3 years.

But we simply have not come to grips with this tremendous problem of procurement by the Communist bloc, and there is an unrealistic attitude toward it in Government departments. I say this in no political sense whatever—it has existed over a period of years. They have not come to grips with the problem. They are not coming to grips now with this awesome problem of the Soviet oil offensive.

In my judgment, you have performed a great service by coming here today and giving us this very careful analysis which is the result of the deep study which you have given to this problem.

Speaking as one member of the committee, I feel sure that the others would share my view that we would not want to stop here and do want to pursue this matter further.

Counsel, do you have any questions at this time?

Mr. SCOTT. Well, on this—you certainly have a very thorough prepared statement here which reflects a great amount of work, as indicated by the charts.

Mr. Chairman, in the statement submitted to the committee for our record, this statement contains therein reproductions, reduced reproductions, of the charts. Therefore, we will not submit them as separate exhibits, as they are contained in the statement itself.

Mr. Nakasian, do you have any additional information which might have occurred to you or any comments or further suggestions which you would like to bring to the attention of the subcommittee at this time?

Mr. NAKASIAN. I think that what I have attempted to do, which is basically to define this problem—the information I have submitted is probably sufficient for that purpose.

There is a great deal more information available on this, and it is available through people who have more direct contact with its sources than I do.

I would think that at an appropriate time, Senator Keating, you ought to bring in those people and get the specific kind of information that you want to fill out this record, and which will provide the basis for some recommendations.

Senator KEATING. You can suggest to us the names of people?

Mr. NAKASIAN. Yes, sir, I can. I can perhaps be helpful to you in that.

Mr. SCOTT. In this study, this survey of yours, Mr. Nakasian, that was done in the light of what is best for the national security. It is not a question of whether or not this oil offensive—the Soviet oil offensive may work a hardship on any particular oil company—but your purpose is to bring it to our attention as a matter of national security.

Mr. NAKASIAN. This problem is more important than any hardship that may be resulting to particular industries. It directly involves the security of the United States. Its immediate effect may not be measurable. But when it is realized that the Soviets are building up a mass industrial complex with the aid of machine tools and industrial plants that they are importing from Europe, and that they are thereby increasing their own production of goods, which they will be able to export to the uncommitted areas of the free world including the oil-producing countries. In the next stage, I predict, within 5 to 10 years, they will be waging a massive export of consumer goods as aids to underdeveloped countries. When that happens, they can cause us no end of grief in these uncommitted areas. We will look like Shylocks in our foreign aid program, compared with the end products that the Soviets will ship without "strings attached."

We say we will not ship end products to these underdeveloped countries, because we want them to help themselves. The Soviets will ship them shoes, clothing, anything that they can put on their backs, in order to win their political favor and get established in the country.

Do I make myself clear, Senator?

Their aid program is not in the interest of developing these countries. Their aid program is in the interest of getting a political foothold. They can do that very easily by shipping consumer goods, which this expanded industrial plant is going to make possible. When they use their method, our method of building up these countries by building up their resources and their capacity to produce is going to look pretty hard and strenuous, and we are not going to look very generous in comparison.

In the final result, Soviet success will have the effect of weakening our position of access to sources of raw materials.

This country, the United States, is dependent—it is no longer self-sufficient—it is dependent on foreign sources of raw material, of which oil is one of the principal raw materials imported.

Senator KEATING. Hasn't the Interior Department made a study of the international oil situation?

Mr. NAKASIAN. The Interior Department asked the National Petroleum Council, which is a quasi-Government advisory group, made up of heads of several of the large oil companies, to make a report on the Soviet oil offensive. This request was made last year, sometime after the American oil team returned and reported on its visit to the Soviet. I think Mr. Collado, when he testified before the Joint Economic Committee, made reference to that report last December, and said that he would make it available. This report is available and valuable.

In addition, I would have liked to have had for use here a copy of the draft report of the National Petroleum Council in the preparation of this testimony. While this report had been prepared by oil company executives, and not employees of the Government, I understood that that report had been classified by the Interior Department and it was not therefore available. So I have not seen what is in that report, Senator.

Senator KEATING. Is it still in that condition, so far as you know?

Mr. NAKASIAN. So far as I know it is still a classified report, and it is a report which was not prepared by Government employees, but was prepared by the industry. I was a little surprised that this would be the case.

Senator KEATING. Was any reason given to you why it should be a classified document?

Mr. NAKASIAN. Well, I did not speak to the Government about it. I spoke to some of the oil company officials who were working on the report. I might add some of the oil company officials have been very helpful to me in supplying information.

Incidentally, I would like to make this clear for the record. In my appearance today, I do not represent any oil company or any organization. I appear in response to the suggestion that I make the statement, and the views that I have expressed are my own, for better or for worse.

Senator KEATING. We are certainly grateful to you.

Mr. SCOTT. I have no further questions, Mr. Chairman.

Senator KEATING. I do not think I need to pursue these questions further than I have.

We are grateful to you, Mr. Nakasian.

The subcommittee will now stand adjourned.

(Whereupon, at 12:45 p.m., the subcommittee adjourned subject to the call of the Chair.)

APPENDIXES

THE SOVIET SEVEN-YEAR PLAN (1959-65) FOR OIL 1/

by

Donald J. Frendzel 2/

SUMMARY

The post-World War II expansion of the Soviet petroleum industry has established the U.S.S.R. as a major oil-producing nation and has led to Russian reentry into the international petroleum trade. The rapid growth of Soviet petroleum production will allow the U.S.S.R. to displace Venezuela as the world's second largest oil-producer in 1960 and to narrow further the gap between Soviet and U.S. crude-oil production. U.S.S.R. crude oil output was only a tenth of U.S. production in 1946, but it will be more than a third at the end of 1960 and more than half in 1965.

The Soviet Seven-Year Plan (1959-65) for oil provides for substantial increases in petroleum production, refining, storage, and distribution facilities. Crude oil production and primary distillation capacity are to double, considerable storage capacity is planned, and pipelines for crude oil and petroleum products are to increase threefold. According to the Soviets, the initial phases of this plan (1959 and 1960) have been completed successfully. However, this progress has been achieved with difficulty.

The foremost impediment to realization of the Seven-Year Plan's oil goals is inadequate material supply. Deficiencies in material supply have long hindered rational development of the Soviet petroleum industry. Prior to 1959, Soviet oil-pipeline construction plans failed repeatedly. The U.S.S.R. is seeking large-diameter oil and gas pipe, pumps, compressors, and auxiliary equipment in the free world. The Soviet Union imported 162.5 thousand metric tons of oil pipe in 1959, compared to 73.3 thousand in 1958 and 21.2 thousand in 1957. The Russians are importing pumps and compressors from satellite and free world countries and undoubtedly intend to intensify this activity in the near future, as domestic production facilities continue to fail to produce the necessary equipment. Despite the problem of material supply, the Soviets and many Western observers of the U.S.S.R. petroleum industry have expressed optimism that the Russian oil-output goal for 1965 will be attained and even exceeded. There should be no undue optimism at this time.

1/ Work on manuscript completed October 1960.

2/ Commodity-industry analyst, Division of Foreign Activities, Bureau of Mines, Washington, D.C.

Soviet crude oil and petroleum products exported to the free world reached a new peak in 1959, and another substantial increase can be expected in 1960. Exports to Communist nations also grew. The U.S.S.R. is busily preparing to increase its oil-export capability by 1965; a pipeline is under construction to the East European satellites, and another is planned to the Baltic; a number of oil tankers are being built in Russian, satellite, and free world yards; and, production, refining, and storage facilities are being expanded. Attainment of Seven-Year Plan goals could result in an exportable Soviet oil surplus of 359 million barrels; more than half might be consigned to free world destinations. The relative volume of U.S.S.R. oil moving in international trade is small, and it will still not be large in 1965, but the importance of the Soviet oil trade is that it will encompass more than economic considerations in world affairs.

INTRODUCTION

Since its inception nearly 100 years ago, the Russian petroleum industry has led the world in crude oil production only from 1898 to 1901. Thereafter, Russia became a distant second in production behind the United States, and during World War II it relinquished this position to Venezuela. In 1959, the United States continued to command a wide lead in crude oil production over the Soviet Union--Soviet crude oil output was only one-third of United States production. Furthermore, the United States consumes over five times more petroleum products per capita than the U.S.S.R. However, the U.S.S.R. has made rapid strides in crude oil production since 1946 and is now in a position to dislodge Venezuela from second place among the leading crude oil producing nations.

The projected expansion of the Soviet petroleum industry is based on proved oil reserves, believed to be about 25 billion barrels, and on ultimate reserves which are, according to the Russians, larger than those of the United States. Confident of its oil wealth, the U.S.S.R. is expanding its petroleum industry from exploration to the ultimate step of exportation of crude oil and petroleum products. In 1959 the Soviet Union began a program designed to double crude oil production by 1965. According to the Russians, the 1959 output goal was exceeded by approximately 7 million barrels, and Soviet petroleum publications express optimism that the original goal for 1960 will be exceeded.

Achievement of petroleum production, refining, and transport goals will allow the U.S.S.R. to expand considerably its oil-export potential, for the Soviets have published data which indicate that domestic oil supply is to exceed domestic demand throughout the 1959-65 period. Herein lies the implication of the Soviet Seven-Year Plan for oil to the free world. When and where the U.S.S.R. chooses to place its oil on the world market will concern the United States in the years immediately ahead.

This report, based almost entirely on Soviet petroleum literature, describes the planned expansion of the U.S.S.R. petroleum industry and attempts to provide some idea of the magnitude of future Soviet oil exports. The statistics in this paper are primarily from published U.S.S.R. reports which describe the projected goals of the Soviet Seven-Year Plan for oil.

In certain instances, particularly where computations are made for petroleum demand and exports for 1965, percentage increases, as stated by the Soviets, have been translated into absolute increases by the use of a base year (in this case 1958). The accuracy of the data in this paper depends, of course, on the reliability of the Soviet statistics.

PETROLEUM PRODUCTION

In 1959 the Soviets embarked upon a program to increase crude-oil production from 826 million barrels in 1958 to between 1,680 and 1,750 million barrels in 1965. Attainment of this goal will allow the Soviets to boost the share of oil in the primary fuel production balance of the country from 25 percent in 1959 to 30 percent in 1965. Table 1 shows that oil will account for about 40 percent of the total increase in primary energy production during the 1959-65 period, whereas coal will account for only 20 percent. This reflects the new Soviet energy policy of giving increased emphasis to production of liquid and gaseous fuels rather than coal. The Soviets state that oil-production costs are one-third and natural gas costs one-twelfth those of coal and that labor productivity in the oil and gas industries is 6 and 20 times greater, respectively, than in the coal industry.

TABLE 1. - Seven-year plan for U.S.S.R. primary energy production,1/ 1959 and 1965, (millions of metric tons of standard coal equivalent2/)

	1959		1965	
	Production	Percent of total	Production	Percent of total
Coal (all grades)	369.1	52.4	446.0	40.8
Crude petroleum	178.3	25.3	330.3	30.2
Natural gas	41.2	5.8	172.2	15.7
Fuelwood3/	54.0	7.7	54.0	4.9
Peat	21.2	3.0	27.3	2.5
Industrial waste3/	19.2	2.7	19.2	1.8
Hydroelectric power	17.5	2.5	28.4	2.6
Combustible shale	4.5	.6	7.1	.7
Nuclear electric power	-	-	9.0	.8
Total	705.0	100.0	1,093.5	100.0

1/ Mine production.
2/ One metric ton of standard coal equivalent equals 28,878,400 B.t.u.
3/ Estimated.

The following goals have been put forth under the Seven-Year Plan to sustain the projected increases in crude-oil production:

1. To invest 170 to 173 billion rubles3/ (US$42.5 to US$43.3 billion) in the oil and gas industries compared to 72.2 billion rubles (US$18.1 billion) during the 1952-58 period. This includes 64 billion rubles (US$16 billion) for oil and gas prospecting, twice the amount spent during the 1952-58 period.

3/ At a nominal exchange rate of 4 rubles to US $1.

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2. To drill 2.5 times more exploratory footage than during the 1952-58 period. Exploratory footage is to increase from 49 percent of all drilling in 1958 to 62 percent in 1965. (While the Soviets publicize a large exploratory drilling program, this activity is deflated since much of their "exploratory" drilling is performed in step-out wells on known structures).

3. To increase production well footage from 11 million feet in 1958 to 19.5 million feet in 1965.

4. To increase the average monthly commercial speed per rig in development drilling from 3,557 feet in 1958 to 5,798 feet in 1965 and in exploratory drilling from 1,368 to 2,559 feet during the same period.

5. To complete 42,000 hydraulic fracturing jobs.

6. To increase daily water injection into reservoir pressure maintenance projects from 14,120,000 feet^3 in 1959 to 30,005,000 feet^3 in 1965. This will permit the national crude oil output from pressure maintenance projects to increase from 68 percent of the total crude production in 1959 to 81 percent in 1965.

LIQUEFIED PETROLEUM GAS

During the Seven-Year Plan the U.S.S.R. plans to put about 20 natural gasoline plants on stream in order to increase production of liquefied petroleum gas (LPG) from 1.2 million barrels in 1958 to 44.1 million barrels in 1965. It is not known if the goal of 2.3 million barrels for 1959 was achieved. Soviet plans call for production of 6.7 million barrels in 1960.

The Russians say that the construction program for LPG pipelines and natural gasoline plants will improve markedly the utilization of casing-head gas. In recent years about 149 billion feet of casing-head gas was flared annually. As late as 1957, only 58 percent of the available casing-head gas was collected and utilized. The Soviets hope for 70- and 85-percent utilization in 1960 and 1965, respectively.

The following tabulation is a partial list of U.S.S.R. natural gasoline plants in existence, under construction, or planned; it was compiled from published Soviet petroleum literature:

Name and location of plant	Status of construction	Annual throughput capacity
1. Ali-Bayramly, Azerbaydzhan S.S.R.	For completion in 1963.	3/
2. Archeda, Stalingrad Oblast'	For completion in 1964.	8.2 billion ft.^{3}
3. Dolina, Ukrainian S.S.R.	Under construction.	3/
4. Duvannyy,1/ Azerbaydzhan S.S.R.	Under construction.	3/
5. Karadag,2/ Azerbaydzhan S.S.R.	For completion in 1960.	3/

1/ To refine condensate from the Kyanizadag deposit.

2/ To refine condensate from the Karadag deposit.

3/ Information not available.

Name and location of plant	Status of construction	Annual throughput capacity
6. Korobki, Stalingrad Oblast'	For completion in 1962.	16.3 billion ft.
7. Minnebayevo, Tataria	In operation. Being expanded.	3/
8. Mukhanovo, Kubyshev Oblast'	Under construction.	3/
9. Otradnyy, Kuybyshev Oblast'	Believed to be under construction.	3/
10. Siazan', Azerbaydzhan S.S.R.	For completion in 1960.	3/
11. Skapovo, Bashkiria	In operation.	3/
12. Stalingrad, Stalingrad Oblast'	Scheduled for operation in 1959.	3/
13. Tuymazy, Bashkiria	In operation.	3/
14. Zhirnoye, Stalingrad Oblast'	Scheduled for operation in 1959.	3/
15. Zol'noye, Kuybyshev Oblast'	Completed prior to 1959.	3/

3/ Information not available.

In 1959 the Soviet petroleum press reported that a new organization, SOYUZGAZ (All-Union Gas Trust), had been established within GLAVGAZ (Main Administration for the Gas Industry) to supervise and coordinate production and distribution of LPG. Initial plans call for SOYUZGAZ to manage the Moscow liquefaction plant and the Leningrad LPG vaporization unit. Later, SOYUZGAZ is to administer the Moscow LPG vaporization unit and all interconnecting LPG bases and distribution stations within the country.

SOYUZGAZ will be responsible for providing 44.1 million barrels of LPG to the Soviet economy in 1965. Natural gasoline plants in the Russian Federated Republic (principally in the Volga-Urals oil-producing region) are to produce 90 percent of the National LPG output in 1965; the Azerbaydzhan plants, 7 percent; and the Ukrainian plants, 3 percent.

The bulk (29 million barrels) of the LPG output is to be consumed as chemical charging stock; 11.6 million barrels is destined for municipal services, and 3.5 million barrels is marked for consumption as transport fuel (chiefly for motor vehicles). During the 1959-65 period the Soviets plan to convert 28,000 trucks and 5,000 buses to LPG and place an additional 1.5 million apartments on LPG.

The Seven-Year Plan provides for expansion of LPG distribution facilities: 20 LPG interconnecting bases and 136 distribution points are to be constructed; several LPG pipelines are planned; 3,000 LPG railroad tank cars are to be delivered to GLAVGAZ; and, an unspecified number of oceangoing LPG tankers are reported to be under construction. In the summer of 1959 the Soviet petroleum press complained that the following LPG pipelines were not being built according schedule:

Minnebayevo to Kazan;

Tuymazy to Ufa;

Shkapovo to Sterlitamak.

DOMESTIC DEMAND FOR PETROLEUM PRODUCTS

Table 2 indicates that the U.S.S.R. domestic petroleum product demand was 666.6 million barrels in 1958.

TABLE 2. - Domestic demand for petroleum products in the U.S.S.R.,1/ 1958 and 1965, millions of barrels

	1958		1965	
	Demand	Percent of total	Demand	Percent of total
Gasoline	182.3	27.3	333.4	26.3
Kerosene	114.4	17.2	181.7	14.3
Diesel fuel	137.3	20.6	288.0	22.7
Fuel oil	185.3	27.8	374.5	29.6
Lubricants	26.1	3.9	48.0	3.8
Bitumen	20.1	3.0	39.0	3.1
Coke	1.1	.2	2.8	.2
Total	666.6	100.0	1,267.4	100.0

1/ Method: A. Net trade in crude oil and field losses were subtracted from crude oil production to obtain the crude-oil charge to the refinery (amount of storage not known).
B. Refinery output was obtained by subtracting refinery losses from the crude charge.
C. Net trade in products was subtracted from refinery output to obtain the total amount of products available for internal consumption (amount of storage not known).

The Seven-Year Plan indicates the demand for domestic products, by percentages, for 1958 and 1965 and declares that domestic demand is to increase 91 percent during the 1958-65 period. Hence, it is calculated that 1,267.4 million barrels of petroelum products will be consumed in 1965.

The following tabulation, computed from Soviet data, shows 1958 petroleum products consumption by major consumer sector in the U.S.S.R. and the projected consumption pattern for 1975, in percentages of the total:

	1958	1975
Industry	44.5	47.4
Agriculture	20.4	16.2
Transport	16.2	22.2
Military	12.5	8.8
Public and Household	6.4	5.4
	100.0	100.0

PETROLEUM REFINING

Commensurate with the large projected increases in crude-oil production during the 1959-65 period, the Soviets plan to more than double primary distillation capacity from an estimated 2.4 million barrels per day in 1958 to 5 million barrels per day in 1965.

The 1959 absolute capacity of individual secondary refining processes is not presently known. However, under the Seven-Year Plan, catalytic-cracking capacity is to more than quadruple, catalytic reforming is to increase 16 to 18 times, and lubricating oil processing is to double.

According to the refinery-construction program, 37 percent of the increase in primary-distillation capacity is to come from plants now under construction, 20 percent from refineries now being reconstructed or expanded, 23 percent from more efficient use and partial reconstruction of present refinery units, and 20 percent from refineries under construction since 1959.

Under the Seven-Year Plan, eight to nine refineries are to be completed in the Russian Federated Republic, three in the Ukraine, one in Belorussia, one in the Uzbek S.S.R., and one in the Kazakh S.S.R. See figure 1.

The Soviets have proposed a standard refinery design which would run as follows:

	Barrels per day
Primary distillation	120,000
Catalytic cracking	34,000
Catalytic reforming	20,000
Light cracking to lower viscosity of boiler fuel	34,000

Refineries with primary-distillation capacities of 240,000 and 360,000 barrels per day are also planned.

Refinery output for 1958 in table 3 was derived from product demand in table 2 and reported product exports. Refinery output in 1965, based on calculated domestic demand, should show a smaller yield of gasoline and kerosene and an increased yield of diesel fuel and fuel oil.

The U.S.S.R. petroleum-refining industry faces several problems in the current Seven-Year Plan. One of its foremost tasks is the processing of the sulfurous crude oils of the Volga-Urals region. The Soviets report that the sour oils of Tataria, Bashkiria, and Kuybyshev Oblast' may comprise 62 percent of the refinery runs in 1960. By 1965, the sour crudes are to comprise 88 percent of all runs to stills.

TABLE 3. - Computed petroleum refinery output in the U.S.S.R., 1958, thousands of barrels

	Output	Percent of total
Gasoline	198,274	27.0
Kerosene	120,971	16.5
Diesel fuel	163,291	22.3
Fuel oil	200,967	27.4
Lubricants	28,291	3.8
Bitumen	20,235	2.8
Coke	1,168	.2
Total	733,197	100.0

The mounting sulfur problem is illustrated in the following tabulation which indicates that from 1959 to 1965 the relative share of high sulfur crude in total sour crude runs to stills is to increase threefold:

1959 Percent of total sour crude runs to stills	Percent S content	1965 Percent of total sour crude runs to stills
32.2	Less than 0.5	18.0
62.6	0.5 to 1.9	66.5
5.2	More than 1.9	15.5

Soviet refiners must also cope with crude oil which has not been desalted in the field. (This year, Petrobras, the official Brazilian oil company, complained about salty Russian crude oil).

The first electric desalting units were installed belatedly in Soviet oil fields in 1959. It was reported that 44 million barrels of crude oil were dewatered and desalted in the field in 1959, and the Soviets are aiming for 88 million barrels in 1960 and 730 million barrels (including stabilized crude oil) in 1965.

The Soviets also plan to improve the quality of their petroleum products. In 1958, nearly 27 percent of motor-gasoline production had an octane number of 56 to 60. However, the Russians planned to reduce the volume of this low-grade gasoline to 20 percent of total output in 1959 and to 5 percent in 1960. The Seven-Year Plan calls for production of higher quality gasoline; that is, 72 octane and higher (motor method, no ethyl fluid added). In 1965, output of 72 octane is to represent more than 40 percent of motor gasoline production, 66 octane will comprise the balance (about 59 percent). Since the Soviets anticipate a need for higher octane motor gasoline, they are studying the problem of producing 96 to 99 octane gasoline (with 1.4 to 2.0 milliliters of tetraethyl lead added per U.S. gallon of gasoline). To solve this problem the Soviets recognize that a considerable expansion of polymerization, alkylation, catalytic reforming, and isomerization capacities must be accomplished.

The Seven-Year Plan provides for improvement of diesel fuel quality. The Soviets are attempting to develop new additives for sulfurous diesel fuel and to improve the quality of sour diesel fuels by reducing the sulfur content and improving the fractional composition and pour point. The following tabulation shows that the relative share of high sulfur diesel fuel is to decrease from 1959 to 1965:

1959 percent of total	Percent sulfur content	1965 percent of total
11.1	Arctic grade	15.6
23.2	.2 and .6	50.0
65.7	.6 to 1.0	34.4

PETROLEUM STORAGE

Complaints in the Soviet petroleum press indicate that installation of new storage capacity is not keeping pace with the huge increase in crude oil production and output of petroleum products. In recent years the average annual growth in storage capacity was reported to be 6 to 8 percent. In 1960, the Soviets plan to complete 500,000 barrels of new storage capacity.

In the R.S.F.S.R., the largest of the Soviet Republics, storage capacity is to increase 72 percent during the 1959-65 period, and 81 oil distribution bases and 8 huge transshipment bases are to be built.

The trend in storage construction will be toward greater use of the reinforced concrete tank. This type of storage will increase from 21 percent of the new storage capacity planned for 1960 to 30 percent in 1961. In 1961, construction of metal tanks for crude oil and black products is to be curtailed except where installation of concrete tanks would not be advisable due to engineering or economic reasons. Tanks with floating and breathing roofs are desired by the Soviets, and they hope to cut 1958 storage losses in half by 1965.

PETROLEUM DISTRIBUTION

Under the Seven-Year Plan the U.S.S.R. has allocated 12 billion rubles (US$3 billion) to expand the country's petroleum trunk-pipeline system from 9,000 miles in 1958 to 28,000 miles by the end of 1965. Crude-oil lines will comprise about 11,000 miles and petroleum-product lines 8,000 miles of the projected increase. The pipeline program calls for installation of more than 100 pumping stations with an aggregate capacity exceeding 1.2 million kilowatts.

Completion of the pipeline program will boost the pipeline's share of oil transport (in terms of freight turnover) from 13 percent in 1958 to 34 percent in 1965 and allow the railroad's burden to decrease from 61 to 46 percent during the same period. The three major pipeline projects planned or now underway are:

1. 2,300-mile crude oil line from Tuymazy in the Volga-Urals oil region to Irkutsk near Lake Baykal in South Central Siberia. This line is scheduled for completion in 1962 and has a planned capacity of 360,000 to 400,000 barrels per day and more than 20 pumping stations. A Soviet source declares that construction in 1960 may progress to Uyar, east of Krasnoyarsk; this would be nearly three-quarters of the way to Irkutsk. Another Soviet source says that the line will be extended from Irkutsk to Ulan-Ude on the other side of Lake Baykal and ultimately to the Soviet Far East.

2. The 2,500-mile crude oil line from the vicinity of Kuybyshev in the Volga-Urals to the East European satellites of Czechoslovakia, East Germany, Hungary, and Poland. Upon completion in 1963, it is estimated that this line will have a daily capacity of at least 400,000 barrels and more than 20 pumping stations. Construction is believed to be underway in Czechoslovakia, Hungary, and Poland.

3. The line which is to carry Volga-Urals oil to the Lithuanian port of Klaypeda and possibly to Ventspils on the Latvian coast. Whereas other pipeline projects have been well publicized by the Soviet press, information is lacking on this line. It might originate at some point on the East Europe line and extend to Polotsk in the Belorussian Republic, where the first section of a refinery is to go on stream in 1961 (a year earlier than planned). From Polotsk the line could be extended to the Klaypeda, where tanker-loading facilities are known to be under construction.

The pipelines to the Baltic and East Europe hold special significance for free world petroleum marketers in West Europe: the Baltic line will strengthen the competitive position of the U.S.S.R. in Scandinavia and other parts of Europe, and the East European line could be extended ultimately into West Germany.

In addition to the expansion of pipeline-distribution facilities, the U.S.S.R. is planning to enlarge its oil-tanker fleet. Although the Russians are taking advantage of the current world-tanker surplus, they want more Russian ships for protection against future charter embargoes or another Suez-type crisis which would limit their ability to obtain charters.

In June 1960 the U.S.S.R. had 120 tankers totaling 1,067,000 deadweight tons (small as world tanker fleets go) and another 13 ships aggregating 141,000 deadweight tons under construction in Soviet, satellite, and free world yards. The ships are being constructed as follows: six in Bulgaria, two each in the U.S.S.R., Finland, and Sweden, and 1 in Poland. In October 1959 Finland signed an agreement to deliver 25 tankers of 4,000 to 4,500 tons each to the Soviet Union during the 1961-65 period. In addition, the Soviets are buying a 39,000-ton tanker from Japan for delivery in November 1960.

The Russians also talk of their "super" tankers; the "Peking," the first of a series, carried about 26,000 tons of crude oil on its July 1960 run to Cuba. However, the "Peking" is much smaller than the huge tankers of more than 100,000 tons thus far built in U.S. and Japanese yards. Of the other so-called "super" tankers, the "Warsaw" is believed to be undergoing sea trials, and the "Budapest" is still on the ways.

PETROLEUM TRADE

Soviet crude oil and petroleum product exports to the free world reached a new peak of 104 million barrels in 1959, a 63-percent rise over 1958, and another substantial increase was expected for 1960. Russian exports to Communist nations attained a new high of 81.9 million barrels in 1959, a 31-percent increase over 1958. In 1959, 56 percent of Soviet oil exports went to free world countries and 44 percent to Communist nations. Of the free world exports: 74 percent went to Western Europe, 17 percent to Africa and the Near East, 8 percent to South America, and 1 percent to Asia. Of the exports to Communist nations: 28 percent went to China, 18 percent to Czechoslovakia, 17 percent to Poland, 16 percent to East Germany, 12 percent to Hungary, and the remaining 9 percent to six other Communist countries.

From 1955 to 1959 the Soviet crude oil and/or product recipients in the free world increased from 20 to 30. In 1960, Cuba and India were added to this growing list, and the U.S.S.R. is actively seeking more free world markets including Canada, Ceylon, Ethiopia, and Australia. Brazil, Ghana, Lebanon, the Republic of Guinea, and Tunisia all received their first Soviet oil in 1959. Portugal discontinued Russian oil imports in 1959.

The relative volume of Soviet oil now moving in international trade is small (less than 5 percent of all oil in international trade), but the impact of U.S.S.R. petroleum on world oil markets has been great. Growing Russian oil exports have contributed to the world oversupply of petroleum, have forced prices down, and have taken sales from Western oil producers. By 1965 the volume of U.S.S.R. oil in the world petroleum trade will still be less than 10 percent of all oil moving in international trade, but the Soviets will become increasingly stronger competitors.

A number of indications point to a greater Soviet oil-export capability in 1965: Crude oil production is scheduled to run well ahead of domestic demand; natural gas output is to increase sharply, thereby freeing some demand on oil; pipelines are planned to the East European satellites and the Baltic; and several oil tankers are on order or are being built in satellite and free world yards.

Since the Soviets have published no export plans, it is not possible to declare precisely how much oil the U.S.S.R. will have available for export in 1956. However, the computations in table 4 show that 359 million barrels of crude oil equivalent could be available for export to the free world and Communist countries in 1965. The pipeline to East Europe could take between 131 and 146 million barrels to the exportable surplus, leaving roughly 213 to 228 million barrels for free world destination. This would be double the amount the free world received in 1959.

TABLE 4. - Computed supply and demand for crude oil and petroleum products in the U.S.S.R., 1958 and 1965, million of barrels1/

	Supply	
	1958	1965
Crude oil production	826.4	1,752.0
Crude oil imports	8.0	negligible
Petroleum products imports	2/25.7	negligible
Total supply	860.1	1,752.0
	Demand	
	1958	1965
Indigenous demand for petroleum products	666.6	1,267.4
Crude oil exports	66.4	2/359.2
Petroleum products exports	2/66.6	
Field and refinery losses	60.5	125.4
Total demand	860.1	1,752.0

1/ No allowance made for stock changes or output of natural gas liquids.

2/ Crude oil equivalent.

Table 5 summarizes U.S.S.R. crude oil and petroleum products exports to free world and Communist nations during the 1955-59 period. Table 6 summarizes Soviet importations of crude oil and petroleum products during the 1955-59 period.

During the 1955-59 period the ruble value of U.S.S.R. petroleum exports increased 2.5 times, from 915 million rubles in 1955 to 2,268 million rubles in 1959, and the value of petroleum exports, expressed as the percent of the total value of mineral exports, increased from 6.6 percent in 1955 to 10.4 percent in 1959. The value of Soviet importations of petroleum fluctuated from year to year during the same period, but the relative share of petroleum imports in the total value of U.S.S.R. mineral imports decreased from 4 percent in 1955 to 2.9 percent in 1959. These trends are seen in table 7.

The value of U.S.S.R. mineral exports in 1959 was 14.3 percent above that of 1958 and accounted for 33.4 percent of the total Soviet export trade, compared to 37.0 percent in 1958. The largest gain in 1959 over 1958 was in the shipment of petroleum, as petroleum exports became a more important factor in U.S.S.R. mineral export trade.

The implications of increasing Russian oil production and exports to the free world are manifold:

1. The U.S.S.R. represents a new source of oil for the world which may be used as a means of exerting political pressure.

2. The Soviet oil surplus will come when there will be an oversupply of oil in the world; it will require painful adjustments of the world oil market, with a continuing period of price uncertainty.

3. Soviet oil exports will continue to be used to establish stronger trade and political ties with free world nations. As in the past, the political and economic motives behind Russian oil trade will be manipulated and intertwined to suit the opportunity.

4. The U.S.S.R. will continue to offer material and technical aid to the underdeveloped petroleum industries of the free world. Thus, it is not unlikely that a Russian-built refinery in a foreign land will subsequently process Soviet crude oil. This is the case in Ethiopia where an agreement was made in June 1960 for the Soviets to build a refinery and supply the crude oil charge.

5. An increasing proportion of Soviet crude oil production will be high in sulfur content, and the projected fivefold increase in natural gas output will include production of a considerable amount of sour gas. The Russians say that recovery of sulfur from crude oil and gas for commercial purposes in only in the experimental stage in the U.S.S.R., but nevertheless the potential is there. Requirements at home must be met, but there might be a surplus of recovered Soviet sulfur for marketing in Europe at some later date.

TABLE 5. - U.S.S.R. crude oil and petroleum product exports, 1955-59, in 1,000 barrels

	Crude oil and petroleum products				1959										
						Petroleum products									Total crude oil and products1/
	1955	1956	1957	1958	Crude oil	Gasoline	Kerosine	Diesel fuel	Fuel oil	Lubricants and greases	Bitumen	Paraffin	Petroleum coke	Total1/ products	
Free world nations:															
Afghanistan........	154.0	200.0	250.4	305.1	-	307.7	27.9	34.3	-	9.8	10.9	-	-	390.6	390.6
Algeria............	-	-	1,214.0	277.4	-	-	-	191.0	-	-	-	-	-	191.0	191.0
Argentina..........	-	-	-	4,912.2	1,429.6	-	268.2	1,797.1	62.6	-	-	-	-	2,127.9	3,557.8
Austria............	51.1	7.3	8.0	440.9	3,552.3	-	-	-	-	-	-	2.8	-	2.8	3,555.1
Belgium............	221.2	222.7	5.1	532.2	-	-	-	166.4	1,144.9	-	-	-	-	1,311.3	1,311.3
Brazil.............	-	-	-	-	436.6	-	-	-	-	-	-	-	-	-	436.6
Denmark............	15.3	4.4	165.7	282.5	-	-	-	142.5	512.7	-	-	3.6	-	658.3	658.3
Egypt..............	2,405.4	6,721.1	7,828.5	14,175.9	7,135.4	42.5	2,102.6	1,251.8	3,246.1	-	-	-	-	6,643.0	13,778.4
Finland............	4,471.3	7,386.1	7,595.7	5,504.2	6,613.5	318.8	167.4	3,788.2	2,540.1	46.2	3.6	7.9	-	6,872.2	13,485.7
France.............	1,965.9	2,985.0	4,023.8	5,188.1	901.8	964.8	-	2,627.4	1,459.9	-	-	-	-	5,052.1	5,953.9
Germany, West......	38.7	1,041.7	5,445.1	4,100.4	1,921.3	-	-	4,585.7	1,114.9	-	-	-	-	5,700.6	7,621.9
Ghana..............	-	-	-	-	-	.4	.4	-	-	-	-	-	-	.8	.8
Greece.............	689.9	1,635.9	2,208.3	2,642.6	1,954.4	49.3	17.1	784.8	299.0	-	-	-	-	1,150.2	3,104.6
Iceland............	2,068.1	1,890.0	2,188.5	2,425.1	-	361.3	-	1,405.5	895.8	-	-	-	-	2,662.6	2,662.6
Iran...............	3.7	1.5	2.2	2.2	-	-	-	-	-	1.4	-	-	-	1.4	1.4
Israel.............	3,323.0	2,656.5		-	-	-	-	-	-	-	-	-	-	-	-
Italy..............	1,338.1	3,652.9	3,666.8	7,898.6	17,348.2	-	-	27.6	4,464.9	-	-	11.8	-	4,504.3	21,852.5
Japan..............	-	-	-	81.0	825.4	-	8.5	74.6	11.3	-	-	-	-	94.4	919.8
Lebanon............	-	-	-	-	-	-	-	3.0	436.9	-	-	-	-	439.9	439.9
Morocco............	-	-	243.1	219.0	474.8	-	-	-	-	-	-	-	-	-	474.8
Netherlands........	75.2	110.2	1.5	751.2	-	-	-	264.1	80.6	-	-	3.3	-	348.0	348.0
Norway.............	259.2	190.5	1,071.6	1,153.4	-	-	-	195.5	1,575.8	-	-	3.9	-	1,775.2	1,775.2
Portugal...........	-	-	-	360.6	-	-	-	-	-	-	-	-	-	-	-
Republic of Guinea.	-	-	-	-	-	-	.2	.2	-	-	-	-	-	.4	.4
Sweden.............	5,296.9	5,067.7	3,915.7	6,353.2	-	-	85.3	3,146.6	6,779.2	-	-	5.5	-	10,016.6	10,016.6
Switzerland........	-	8.8	938.8	-	-	121.6	-	65.6	108.6	-	-	-	-	295.8	295.8
Syria..............	-	189.8	220.5	1,976.8	-	-	282.9	2,237.3	745.9	-	-	-	-	3,266.1	3,266.1
Tunisia............	-	-	-	-	-	-	-	35.1	60.0	-	-	-	-	95.1	95.1
Turkey.............	4.4	41.6	34.3	1.5	-	-	-	-	4.7	-	-	-	-	4.7	4.7
United Kingdom.....	273.0	190.5	419.0	275.9	-	-	-	14.9	390.3	269.5	-	21.2	-	695.9	695.9
Uruguay............	-	-	-	810.3	2,389.5	85.0	72.1	361.8	717.9	-	-	.1	-	1,236.9	3,626.4
Yugoslavia.........	1,522.8	2,421.4	2,962.3	2,779.1	3,038.5	106.3	-	19.4	64.6	-	-	-	-	190.3	3,228.8
Total free world.	24,177.2	36,625.6	44,408.9	63,449.4	48,021.3	2,357.7	3,032.6	23,220.4	26,716.2	326.9	14.5	60.1	-	55,728.4	103,750.0
Communist nations:															
Albania............	62.8	86.9	34.3	36.5	-	-	-	15.7	-	48.3	-	-	-	64.0	64.0
Bulgaria...........	862.1	1,204.5	2,777.7	3,089.4	-	1,661.8	215.5	1,800.1	384.9	151.2	77.6	13.4	-	4,304.5	4,304.5
China..............	6,923.3	7,958.5	7,903.0	18,303.3	4,673.9	10,676.0	2,945.8	4,152.2	-	1,512.7	-	25.2	-	19,311.9	23,985.8
Czechslovakia......	3,948.6	5,886.7	9,765.9	10,964.6	13,372.6	867.0	-	-	-	-	-	4.7	-	871.7	14,244.3
Germany, East......	4,769.8	5,473.5	7,727.8	8,198.6	11,627.7	-	-	1,246.6	-	36.4	-		71.0	1,354.0	12,981.7
Hungary............	1,479.0	2,519.2	7,158.4	8,330.0	8,851.6	-	-	-	363.0	22.4	-	-	-	385.4	9,237.0
Korea, North.......	352.6	366.5	1,311.8	1,652.0	-	1,053.2	78.3	578.9	47.3	175.0	-	1.8	-	1,934.5	1,934.5
Mongolia...........	441.7	572.3	545.3	463.6	199.9	354.2	0.8	324.5	-	46.2	1.8	-	-	727.5	927.4
Poland.............	4,843.6	6,298.4	9,692.2	11,083.6	5,020.1	4,522.9	386.0	2,914.6	723.9	55.3	-	66.9	-	8,669.6	13,689.7
Rumania............	8.8	31.4	11.0	15.3	-	-	-	-	-	1.4	-	-	-	1.4	1.4
Vietminh...........	-	22.6	341.6	221.9	-	241.4	167.4	154.4	-	16.8	-	-	-	580.0	580.0
Total communist nations........	23,692.3	30,420.5	47,269.0	62,358.8	43,745.8	19,376.8	3,793.8	11,187.0	1,519.1	2,065.7	79.4	112.0	71.0	38,204.5	81,950.3
Unaccounted......	10,399.7	6,305.8	891.2	6,599.2	-	569.5	299.7	232.4	236.2	40.6	98.2	2.6	-	1,479.5	1,479.5
Grant total......	2/58,294.2	2/73,351.9	2/92,569.1	2/132,407.4	91,767.1	22,304.0	7,126.1	34,639.8	28,471.5	2,433.2	192.1	174.7	71.0	95,412.4	187,179.8

1/ The individual traceable components do not always add to the reported total.
2/ Crude oil equivalent.

TABLE 6. - U.S.S.R. imports of crude oil and petroleum products, 1955-59, in 1,000 barrels

	Crude and petroleum products				1959									
						Petroleum products								Total crude oil and products
	1955	1956	1957	1958	Crude oil	Gasoline	Kerosine	Diesel fuel	Fuel oil	Lubricants and greases	Bitumen	Paraffin	Total products	
Free world nations:														
Austria..........	3,219.3	9,477.9	7,747.3	6,925.8	6,976.1	-	-	-	-	-	-	-	-	6,976.1
Greece...........	-	-	-	-	-	40.8	-	-	-	-	-	-	40.8	40.8
Total free world...	3,219.3	9,477.9	7,747.3	6,925.8	6,976.1	40.8	-	-	-	-	-	-	40.8	7,016.9
Communist nations:														
Albania..........	1,025.5	1,326.4	2,131.7	1,140.9	473.0	-	1.6	-	-	-	770.2	-	771.8	1,244.8
China............	-	-	-	-	-	-	-	-	-	-	23.6	-	23.6	23.6
Germany, East....	1,652.0	1,664.4	1,540.3	1,690.0	-	-	-	-	-	-	-	-	-	-
Hungary..........	472.3	337.2	197.6	492.9	-	113.9		14.2	-	91.7	-	-	219.8	219.8
Mongolia.........	-	72.3	34.3	-	-	-	-	-	-	-	-	-	-	-
Poland...........	21.5	111.3	3.7	-	-	-	-	-	-	-	-	-	-	-
Rumania..........	25,578.0	25,614.5	19,245.9	21,049.5	-	17,313.7	2,762.9	2,533.4	340.3	798.7	286.6	65.3	23,100.9	23,100.9
Total communist nations.	28,749.3	29,126.1	23,153.5	24,373.3	473.0	17,427.6	2,764.5	2,547.6	340.3	890.4	1,080.4	65.3	25,116.1	25,589.1
Unaccounted...	340.9	3.7	-	-	-	1,503.7	7.8	127.6	-	9.1	-	166.1	1,814.3	1,814.3
Grand total...	32,309.5	38,607.7	30,900.8	31,299.1	7,449.1	18,972.1	2,772.3	2,675.2	340.3	899.5	1,080.4	231.4	26,971.2	34,420.3

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APPENDIX II

THE SOVIET OIL OFFENSIVE AND IN TER - BLOC ECONOMIC COMPETITION

By Harold Lubell for U.S. Air Force project RAND

I. INTRODUCTION

Recent moves by the USSR to expand petroleum exports have led to much concern in Western countries about "the Soviet oil offensive." This study attempts to set out the available data on the USSR's oil and energy production and consumption and its international trade in petroleum, and to relate these data to the more general problem of economic competition between the Soviet bloc and the West.

The Soviet oil drive illustrates three general aspects of inter-bloc economic competition. Which aspect is most relevant in a particular instance varies according to the area to which the drive is directed. The first aspect, dealt with in Section II, is the comparison between the accomplishments of the Soviet bloc and the West. This is of importance if one considers either the ability of Soviet production to meet domestic consumption demands, or the ability of the USSR to compete with the oil producers of the West in exporting oil to third areas (as well as to compete in exporting the techniques and equipment for exploring for, producing, and refining oil). With respect to energy consumption, both Western Europe and the USSR are approaching U.S. patterns; but Western Europe must do so on the basis of imported oil, while the USSR is doing so on the basis of increases in domestic oil production large enough to raise domestic consumption and at the same time to make available significant surpluses for export.

The second aspect is competition for influence, which is of particular importance in dealings with the uncommitted underdeveloped countries. The third aspect is what is here termed competition for markets and relates to Soviet oil exports to the industrialized countries and to those underdeveloped countries that are important sources of raw materials. Section III gives a number of examples to illustrate the techniques used by the USSR in the competition for influence and for markets. The West's concern with the Soviet oil drive stems from the USSR's apparent success in all three aspects.

For the non-Soviet world, the implications of the Soviet oil export drive are discussed in Section IV. As an oil consumer, the West gains from lower oil prices, although, as an oil producer, it may be troubled by Soviet competition. A problem for the West as consumer arises from the insecurity of a supply that has the USSR as its source. However, if it is Middle East oil that Soviet oil displaces in Western markets, the reduction in the security of supply would be small, for two reasons. In the first place, the political instabilities to which the Middle East suppliers are themselves subject render them only slightly more dependable than the USSR as a source of supply. In the second place, the ease of maintaining unutilized ("shut-in") capacity in the Middle East makes it possible to retain there, at low cost, the means of replacing Soviet oil -- provided, of course, that the Middle East suppliers are willing to sell the additional quantities of oil needed during an emergency caused by the cutting off of Soviet supplies. If, on the other hand, it is Venezuelan or other Western Hemisphere oil that Soviet oil displaces, the effect on the security of supply would be more serious.

There are several ways the West can react to the Soviet oil export drive. Oil producers can cut prices; major oil consuming regions, such as Western Europe, can protect their markets against Soviet oil just as the United States now protects its market against all foreign oil; an international oil cartel might be set up with Russian participation. But each of these steps would be rendered difficult by conflicts of interest within the non-Soviet world. If the West chooses to accept the benefits of cheaper oil and lower-cost energy, whatever the geographical source, it would be wise to provide for continuity of supply by making sure that alternative and more reliable sources are readily available. Surplus capacity should be maintained outside the Soviet bloc, and a reserve tanker fleet kept afloat large enough to transport the oil to market.

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LIST OF ABBREVIATIONS AND PHYSICAL UNITS

Organizations Frequently Referred to:

API	American Petroleum Institute
ECE	Economic Commission for Europe
OEEC	Organization for European Economic Cooperation
OPEC	Organization of Petroleum Exporting Countries

Physical Units Employed:

bbls	barrels
bbls/day or b/d	barrels per day (of oil) = 0.02 T/year (of oil)
Btu	British thermal unit
cu ft	cubic feet
cu ft/day or cf/day	cubic feet per day = 0.096 m^3/day
HCE	hard coal equivalent
kWh	kilowatt-hour
m^3	cubic meters
m^3/day	cubic meters per day = 10.23 cu ft/day
T	metric ton = 1,000 kilograms = 2,204.6 pounds
T oil	metric ton of oil = 1.4 T HCE
T/year	metric ton per year (of oil) = 50 bbls/day (of oil)
T HCE	metric ton hard coal equivalent (i.e., the equivalent of a metric ton of hard coal) = 0.714 T (of oil) = 1,300 m^3 (of natural gas) = 400 KWh (of electricity) = 0.35 x 10^{12} Btu

II. ACCOMPLISHMENTS AND POTENTIAL OF THE SOVIET OIL INDUSTRY

The ability of the USSR to achieve high levels of crude oil output is significant in a number of ways. It is of direct military significance in the old-fashioned sense of assuring to Soviet military forces and to the Soviet economy an adequate supply of the liquid fuels that the USSR almost lost during World War II at the time of the German army's advance toward the Caspian oil fields in 1942. In the economic contest between the Soviet bloc and the West, it is of significance not only in demonstrating the ability of the USSR to achieve Western technological standards and catch up with the West in satisfying the demands of its citizens and its retainers, but also in determining (at least in part) the ability of the USSR to extend by exports its economic and political penetration of the non-Soviet world.

THE PAST PATTERNS OF SOVIET OIL PRODUCTION AND TRADE

Before speculating on the future of the Soviet oil industry, it will be helpful to examine briefly the past patterns of Soviet oil production and oil exports and imports. The aggregate figures are shown in Table 1, which points up the rapid rise in both total output and the proportion of exports to domestic production during the decade following 1950. Despite the rapid rate of increase, however, the total volume of exports was still small in 1959, and its ratio to total production was well below the 28 per cent reached in 1932, the peak year for Soviet oil exports in the inter-war period. The Soviet export drive became alarming in 1960 not so much because of the current magnitude of shipments, but because it became evident that the Russians

Table 1

OIL PRODUCTION AND TRADE OF THE USSR, SELECTED YEARS, 1913-1960
(in millions of metric tons (T) and per cent)

Year	(1) Crude oil Production	(2) Crude oil and refined products combined: Imports	(3) Crude oil and refined products combined: Exports	(4) Apparent consumption [(1)+(2)-(3)]	(5) Net exports [(3) - (2)]
	[millions of metric tons (T)]				
1913	9.2	0.0	1.0	8.2	1.0
1932	21.4	0.4	6.1	15.7	5.7
1940	31.1	0.1	0.9	30.3	0.8
1950	37.9	2.6	1.1	36.4	1.5
1955	70.7	4.4	8.0	67.1	3.6
1956	83.8	5.3	10.1	79.0	4.8
1957	98.3	4.2	13.7	88.8	9.5
1958	113.2	4.3	18.1	99.4	13.8
1959	129.5	4.4	25.4	108.5	21.0
1960	148.0	..	(35.0)	..	..
	(per cent)				
1913	100.0	0.0	10.9	89.1	10.9
1932	100.0	1.9	28.5	73.4	26.6
1940	100.0	0.3	2.9	97.4	2.6
1950	100.0	6.9	2.9	96.0	4.0
1955	100.0	6.2	11.3	94.9	5.1
1956	100.0	6.3	12.0	94.3	5.7
1957	100.0	4.3	13.9	90.3	9.6
1958	100.0	3.8	16.0	87.8	12.2
1959	100.0	3.4	19.6	83.8	16.2
1960	100.0	..	(23.6)	..	..

Sources:

Production:

1913-1959: National Economy of the USSR in 1959: Statistical Annual (in Russian), Moscow, 1960, pp. 184, 186.
1960: Pravda, 26 January 1961.

Imports, exports:

1913-1940: Foreign Trade of the USSR 1918-1940 (in Russian), Moscow, 1960, pp. 45, 129, 192, 211, 341, 406.
1950: National Economy of the USSR in 1958: Statistical Annual (in Russian), Moscow, 1959, pp. 802, 804.

Table 1 (continued)

Imports, exports (cont.):

1955: Foreign Trade of the USSR in 1956 (in Russian), Moscow, 1958.
1956-1957: Foreign Trade of the USSR in 1957 (in Russian), Moscow, 1958.
1958-1959: Foreign Trade of the USSR in 1959 (in Russian), Moscow, 1960.

Notes:

.. Not available.
() Rough estimate.
(T) Metric tons. For convenience, abbreviations are employed for the commonly used measures. See list of abbreviations given on page xi.

would be able to continue to increase exports at a high rate. Not only did it begin to look as if the USSR would be able to make increasing volumes of oil available for export, but experience indicated that the Russians could find customers for sizeable amounts of their oil.

One of the factors affecting the structure of Soviet oil exports is the geographical distribution of oil production within the USSR. Table 2, which presents figures on production of crude oil by geographical region within the USSR for selected years 1913-1959 and planned for 1965, emphasizes the major shift in location of oil production during and since World War II.[1] Where before World War II some three-quarters of Soviet oil was produced in the Baku region of Azerbaijan, in 1959 almost this proportion of the greatly increased total came from the Ural-Volga area of the RSFSR; and it is expected that the RSFSR's share will continue to rise, at least through 1965. For internal consumption, this has meant a shift in the pattern of oil movements within the USSR. When the Baku oil fields were predominant, petroleum moved west and northwest by rail and barge to the consuming centers of the Ukraine and Russia; in the last decade, oil has been moving west and southwest to these centers by rail, barge, and (more

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[1]During World War II, part of the major producing region of the USSR was wrecked during the German invasion of the Northern Caucacus. The German army's advance south of Stalingrad in the summer of 1942 reached Mozdok, 100 miles west of the Caspian, with the Russians withdrawing to Grozny. The Russians wrecked and abandoned the Maikop oil fields, and the Germans occupied Krasnodar. The Germans were astride the northernmost Caspian-Black Sea pipeline, and in occupation of one of the area's major producing and refining zones. See: J.F.C. Fuller, The Second World War, New York, Duell Sloane and Pearce, 1949, p. 184.

Table 2

PRODUCTION OF CRUDE OIL IN THE USSR BY REPUBLIC, SELECTED YEARS, 1913-1965

(in millions of (T) and per cent)

	Millions of T									Per cent		
	1913[a]	1940	1950	1955	1956	1957	1958	1959	Plan 1965	1940	1959	Plan 1965
RSFSR	1.3	7.1	18.2	49.3	61.3	74.6	88.0	102.8	198.0	22.8	79.4	82.5
Volga-Urals	(..)	(1.9)	(..)	(41.2)	(52.6	(64.9)	(78.5)	(91.3)[b]	(180.0)	(6.1)	(70.5)	(75.0)
N. Caucasus	(..)	(4.7)	(..)	(..)	(..)	(..)	(..)	(10.3)	(..)	(15.1)	(..)	(..)
Sakhalin	(..)	(0.5)	(..)	(..)	(..)	(..)	(..)	(1.2)	(..)	(1.6)	(..)	(..)
Ukraine	1.1	0.4	0.3	0.5	0.8	1.0	1.2	1.6	6.0	1.3	1.2	2.5
Uzbekistan	0.0	0.1	1.3	1.0	1.0	1.1	1.3	1.5	2.0	0.3	1.2	0.8
Kazakstan	0.1	0.7	1.1	1.4	1.4	1.4	1.5	1.5	3.0	2.3	1.2	1.3
Georgia	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Azerbaijan	7.7	22.2	14.8	15.3	15.6	16.0	16.5	17.1	21.5	71.4	13.2	9.0
Kirghizia	-	0.0	0.1	0.1	0.2	0.4	0.5	0.4	2.0	0.0	0.3	0.8
Tadzhikstan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turkmenistan	0.1	0.6	2.0	3.1	3.4	3.8	4.2	4.6	7.5	1.9	3.5	3.1
TOTAL: USSR	10.3	31.1	37.9	70.7	83.8	98.3	113.2	129.5	240.0	100.0	100.0	100.0

Sources: Totals and breakdown by Republic:
1913-1956: National Economy of the USSR in 1956: Statistical Annual (in Russian), Moscow, 1957, p. 75.
1957-1959: National Economy of the USSR in 1959: Statistical Annual (in Russian), Moscow, 1960, p. 186.
1965: [W. L. Newton], The Oil and Natural Gas Industries of the USSR, Petroleum Economics Ltd., London, Jan. 1958, mimeo., p. 8.

Breakdown within RSFSR: Ibid.; Shell Petroleum, Planning Division, The Oil Industry of the USSR, Nov. 1960, mimeo., p. 4; and M. Brenner, "Some Economic Problems of the Development of the Petroleum Industry of the USSR" (in Russian), Voprosy ekonomiki, 1959, No. 1, p. 68.

Notes:
a. Present borders of the USSR.
b. Figure according to Shell plus 0.5 (the amount by which RSFSR total in Statistical Annual exceeds that in Shell paper).
.. Not available.
\- Zero.
0.0 Less than 0.05.
( ) Figures in parentheses add up to unbracketed numbers immediately above.

recently) pipeline. With respect to exports, however, the Black Sea has remained the main point of exit, and the Baku fields have remained the main source of exported oil. This pattern will change in the near future, with the construction of pipelines from the Ural-Volga region to the Baltic and into the heart of Eastern Europe.

The destination of USSR oil exports and the origin of USSR oil imports (crude oil and refined products combined) are shown in Table 3 for the period 1955-1959 and Plan 1965. In 1955, exports to the Soviet bloc and to the non-Soviet world were equal in volume, each about 3.3 million metric tons (T).[1] Since then, except for 1957 which saw a marked increase in exports to Eastern Europe (and particularly to Hungary), exports to the non-Soviet world have exceeded exports to the Soviet bloc by growing amounts; the excess was 3.7 million T in 1959 compared with 0.2 million T in 1956. Within the Soviet bloc, as shown in Appendix Table A-1, the largest importers of USSR oil have been China, Czechoslovakia, and Poland. By 1965, Russian exports to Eastern Europe are scheduled to rise to 17.5 million T. Outside the Soviet bloc, Western Europe has taken the largest share of Russian oil, although the USSR's oil exports to Western Europe accounted for only 6.3 per cent of the latter's total oil consumption of 169 million T in 1959.[2] In 1959 Italy displaced the United Arab Republic as the largest single importer of Russian oil outside the Soviet bloc, while in 1960 the

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[1] For convenience, abbreviations are employed for the commonly used measures of volume and energy. See the List of Abbreviations given above on page xi.

[2] Organization for European Economic Cooperation, Oil: Recent Developments in the OEEC Area, Paris, 1961, p. 50.

Table 3

USSR OIL[a] EXPORTS AND IMPORTS, 1955-1959, 1965, BY AREA OF DESTINATION AND ORIGIN
(in millions of T/year and thousands of bbls/day)

	Millions of T						Thousands of bbls/day[b]					
Destination or origin	1955	1956	1957	1958	1959	Plan 1965	1955	1956	1957	1958	1959	Plan 1965
Exports from USSR, to:												
All areas	8.0	10.1	13.7	18.1	25.4	..	160	202	274	362	508	..
Soviet bloc	3.3	4.9	7.2	8.5	10.8	..	66	98	144	172	216	..
Eastern Europe	2.2	2.9	5.0	5.7	7.3	17.5	44	58	100	116	146	350
Far East	1.1	2.0	2.1	2.8	3.5	..	22	40	42	56	70	..
Non-Soviet world	3.3	5.1	6.1	9.6	14.5	..	66	102	122	190	290	..
Western Hemisphere	0.0	0.0	-	1.1	1.1	..	0	0	-	22	22	..
Western Europe	2.5	3.7	4.7	6.1	10.7	..	50	74	94	122	214	..
Other Eastern Hemisphere	0.8	1.4	1.4	2.4	2.7	..	16	28	28	48	54	..
Unaccounted	1.4	0.1	0.4	0.0	0.1	..	28	2	8	0	2	..
Imports into USSR, from:												
All areas	4.4	5.3	4.2	4.3	4.4	..	88	106	84	86	88	..
Soviet bloc	3.9	3.9	3.1	3.3	3.4	..	78	78	62	66	68	..
Eastern Europe	3.9	3.9	3.1	3.3	3.4	5.0	78	78	62	66	68	100
Far East	-	-	-	-	-	..	-	-	-	-	-	..
Non-Soviet world	0.5	1.4	1.1	1.0	1.0	..	10	28	22	20	20	..
Western Hemisphere	-	-	-	-	-	..	-	-	-	-	-	..
Western Europe	0.5	1.4	1.1	1.0	1.0	..	10	28	22	20	20	..
Other Eastern Hemisphere	-	-	-	-	-	..	-	-	-	-	-	..

Sources: Tables 5, A-1, and A-2.

Notes:
a. Crude oil and refined products combined.
b. Conversion ratio: T/year x 0.02 = bbls/day.
\- Zero.
.. Not available.

biggest oil export deal made by the USSR (for an additional 3 million T per year for four years) was again with Italy.[1]

Although mainly an exporter of oil, the USSR does import over 4 million T per year: a million T from Western Europe and over 3 million T from Eastern Europe. As shown in Appendix Table A-2, Austria has been the source in Western Europe. Until 1959, Austria shipped a million T of crude oil a year to the USSR as reparations; since 1959, the equivalent of half of this has been turned back to Austria.[2] The bulk of imports from Eastern Europe consists of refined products from Rumania.

As shown in Table 4, Russian oil exports were, in 1958 and 1959, almost equally divided between crude oil and refined products. Exports to the Soviet bloc were more heavily weighted with crude, while exports to the non-Soviet world were more heavily weighted with refined products. Imports, on the other hand, were heavily weighted with refined products so that a little more than half of <u>net</u> exports consisted of crude oil and a little less than half consisted of refined products.

Eastern Europe's oil imports and exports are shown in Table 5 for 1957-1959. On balance, Eastern Europe is a heavy net importer of oil so that its exports are indirectly made possible by imports from the USSR. In the future, Eastern Europe is likely to become more heavily a net importer as its oil requirements grow more rapidly than its production, and its exports are likely to become more directly dependent

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[1] <u>Petroleum Press Service</u>, November 1960, p. 418.

[2] According to a Soviet-Austrian agreement of July 1960, the cross-haul of 500,000 T was to end in July 1961, and reparations will end in July 1964, one year ahead of schedule (<u>Vneshniaia torgovlia</u>, Moscow, 1960, No. 8, p. 3).

Table 4

USSR EXPORTS AND IMPORTS OF CRUDE OIL AND REFINED PRODUCTS, 1958, 1959
(in millions of T)

Destination or origin	Exports: Crude oil	Exports: Refined Products	Exports: Total	Imports: Crude oil	Imports: Refined Products	Imports: Total	Net exports: Crude oil	Net exports: Refined Products	Net exports: Total
1958:									
TOTAL	9.1	9.0	18.1	1.1	3.2	4.3	8.0	5.8	13.8
Soviet bloc	4.8	3.7	8.5	0.1	3.2	3.3	4.7	0.5	5.2
Eastern Europe	4.1	1.6	5.7	0.1	3.2[a]	3.3	4.0	-1.6	2.4
Far East	0.7	2.1	2.8	-	-	-	0.7	2.1	2.8
Non-Soviet world	4.3	5.3	9.6	1.0	-	1.0	3.3	5.3	8.6
Western Hemisphere	0.8	0.3	1.1	-	-	-	0.8	0.3	1.1
Western Europe	2.1	4.0	6.1	1.0	-	1.0	1.1	4.0	5.1
Other Eastern Hemisphere	1.4	1.0	2.4	-	-	-	1.4	1.0	2.4
Unaccounted	-	0.0	0.0	-	-[a]	-	-	0.0	0.0
1959:									
TOTAL	12.5	12.9	25.4	1.1	3.3	4.4	11.4	9.6	21.0
Soviet bloc	6.0	4.8	10.8	0.1	3.3	3.4	5.9	1.5	7.4
Eastern Europe	5.3	2.0	7.3	0.1	3.3[a]	3.4	5.2	-1.3	3.9
Far East	0.7	2.8	3.5	-	-	-	0.7	2.8	3.5
Non-Soviet world	6.5	8.0	14.5	1.0	-	1.0	5.5	8.0	13.5
Western Hemisphere	0.6	0.5	1.1	-	-	-	0.6	0.5	1.1
Western Europe	4.8	5.9	10.7	1.0	-	1.0	3.8	5.9	9.7
Other Eastern Hemisphere	1.1	1.6	2.7	-	-	-	1.1	1.6	2.7
Unaccounted	-	0.1	0.1	-	-[a]	-	-	0.1	0.1

Source: See Table 1.

Note: a. Assuming 0.2 million T (unaccounted for in original source) imported from East Germany, as in each of the previous years, 1955-1957.

\- Zero.

Table 5

EASTERN EUROPE'S OIL IMPORTS AND EXPORTS, 1957-1959, 1965
(millions of T)

Origin or destination	Imports	Exports	Net exports[a]
1957			
USSR	5.0	3.1	-1.9
Non-Soviet world	-	1.6	1.6
Total	5.0	4.7	-0.3
1958			
USSR	5.7	3.3	-2.4
Non-Soviet world	-	1.8	1.8
Total	5.7	5.1	-0.6
1959			
USSR	7.3	3.4	-3.9
Non-Soviet world	-	2.3	2.3
Total	7.3	5.7	-1.6
1965			
USSR	17.5	5.0	-12.5
Non-Soviet world	..	..	..
Total	..	..	..

Sources:

1957-1959: Tables 3 and 6.

1965:

Imports: Petroleum Week, April 10, 1959, p. 31.

Exports: Extrapolated from 1958, assuming some increase in shipments from Rumania to the Ukraine.

Notes: **a. Figures preceded by a minus sign are net imports.**
- Zero.
.. Not available.

on imports from the USSR. This will be true particularly if construction of a crude oil pipeline system into Eastern Europe implies a role for Eastern Europe as a processor of Russian crude both for local consumption and for export to the West. The tie between imports from the East and exports to the West would then be quite direct, with Eastern European refineries acting as an entrepôt for USSR crude on its way to Western Europe.

Table 6 shows oil exports by the Soviet bloc as a whole to the non-Soviet world. Here the USSR plays a preponderant and increasing role. With Eastern Europe's oil exports to the West rising by 44 per cent from 1957 to 1959 and those of the USSR rising by 138 per cent, Eastern Europe's share in total Soviet bloc oil exports fell in two years from 21 per cent to 14 per cent; and the trend continues.

CATCHING UP WITH THE WEST: PATTERNS OF ENERGY PRODUCTION AND CONSUMPTION

One of the major technological changes occurring in the contemporary world is a shift in the commodity composition of energy production and consumption, a shift in which the USSR is in advance of Western Europe although still behind the United States. An indication of the 1958 patterns of commercial energy[1] production and consumption in the non-Soviet world and in the Soviet bloc is given by the United Nations Statistical Office figures in Table 7, in which all primary energy forms are converted to metric tons of hard coal equivalent (T HCE) as a common

[1]Commercial energy excludes noncommercial sources such as peat and firewood.

Table 6

SOVIET BLOC OIL EXPORTS TO NON-SOVIET WORLD 1957-1960
(in millions of T and per cent)

Year and Origin \ Destination	(1) Western Hemi-sphere	(2) Western Europe	(3) Sub-total ([4]+(5)]	(4) United Arab Republic	(5) Other	(6) TOTAL Non-Soviet world [(1)+(2)+(3)]	(7) TOTAL Non-Soviet world
	Millions of T		Other Eastern Hemisphere				Per cent
1957:							
USSR	-	4.7	1.4	1.1	0.3	6.1	79.2
Eastern Europe	-	1.2[a]	0.4	0.1[c]	0.3[b]	1.6	20.8
Total: Soviet bloc	-	5.9	1.8	1.2	0.6	7.7	100.0
1958:							
USSR	1.1	6.1	2.3	2.1	0.2	9.6	84.2
Eastern Europe	-	1.5	0.4	0.0[c]	0.4[b]	1.8	15.6
Total: Soviet bloc	1.1	7.6	2.7	2.1	0.6	11.4	100.0
1959:							
USSR	1.1	10.7	2.7	2.4	0.3	14.5	86.3
Eastern Europe	-	1.9	0.4	0.1[c]	0.3	2.3	13.7
Total: Soviet bloc	1.0	12.7	3.1	2.5	0.6	16.8	100.0
1960:							
USSR	..	..	..	..	..	..	..
Eastern Europe	..	..	..	..	..	..	..
Total: Soviet bloc	2.2	16.8	3.7	1.9	1.8	22.7	100.0

Sources: Soviet bloc total: Petroleum Press Service, April 1961, p. 125.
USSR: Table 3 above.
Eastern Europe: Residual in table.

Notes:
a. Excluding United Kingdom (included in miscellaneous).
b. Including United Kingdom (in miscellaneous).
c. Probably residual resulting from rounding.
.. Not available.
\- Zero.

unit.[1] The table clearly shows the importance of the United States, Western Europe, and the USSR in producing and consuming the world's energy, as befits the industrialized regions of the world. One major difference shows up immediately, however; the preponderance of coal in the production pattern for Western Europe, compared with the much greater weight of crude oil in the pattern for the USSR, and of crude oil and natural gas in the pattern for the United States. With regard to consumption, however, the pattern for Western Europe, as a consequence of imports of oil, is close to that of the USSR, the United States differing from both in natural gas consumption. The importance of crude oil production in the underdeveloped areas of the non-Soviet world shows up in the weight of crude oil in the patterns for Other Western Hemisphere and Other Eastern Hemisphere. Eastern Europe is similar to Western Europe in its reliance on coal in the production pattern, although Eastern Europe produces comparatively more oil and gas and less hydro-electricity than Western Europe. Eastern Europe's consumption pattern is, however, similar to its production pattern (unlike Western Europe with its consumption of imported oil). Energy production and consumption in the Far Eastern countries of the Soviet bloc (China, Outer Mongolia, North Korea, and North Viet Nam) are both low, consisting mainly of coal.

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[1] In the U.N. figures, there is a discrepancy between consumption and total production minus net exports. This discrepancy consists partly of losses and partly of statistical errors and omissions. The third section of Table 1, which indicates net exports of each primary energy material for each area, therefore also includes the residual errors in the published figures.

Table 7

WORLD PRODUCTION, CONSUMPTION, AND TRADE OF COMMERCIAL[a] PRIMARY ENERGY MATERIALS, BY PRODUCT AND BY AREA, 1958

(in millions of T HCE and per cent)

	Non-Soviet world					Soviet bloc				
	United States	Other Western Hemisphere	Western Europe	Other Eastern Hemisphere	Sub-total	USSR	Eastern Europe	Far East	Sub-total	TOTAL
	(millions of T HCE)									
1. Production:										
TOTAL	1,314	354	633	525	2,826	627	284	223	1,134	3,960
Coal and lignite	390	18	530	177	1,115	424	252	217	893	2,008
Crude oil	450	260	16	312	1,038	147	17	3	167	1,205
Natural gas	416	28	10	4	458	37	12	-	49	507
Hydro-power[b]	58	48	77	32	215	19	3	3	25	240
2. Consumption:										
INLAND CONSUMPTION	1,372	244	819	319	2,754	612	272	225	1,109	3,863
Coal and lignite	349	33	547	180	1,109	417	241	216	874	1,983
Petroleum products	548	139	185	103	975	139	16	6	161	1,136
Natural gas	417	24	10	4	455	37	12	-	49	504
Hydro-power[b]	58	48	77	32	215	19	3	3	25	240
3. Net exports including bunkers or imports (-):										
TOTAL	-58	110	-186	206	72	15	12	-2	25	97[c]
Coal and lignite	41	-15	-17	-3	6	7	11	1	19	25
Crude oil and products	-98	121	-169	209	63	8	1	-3	6	69
Natural gas	-1	4	-	-	3	-	-	-	-	3
Hydro-power	-	-	-	-	-	-	-	-	-	-

Table 7 (continued)

	Non-Soviet world					Soviet bloc				
	United States	Other Western Hemisphere	Western Europe	Other Eastern Hemisphere	Sub-total	USSR	Eastern Europe	Far East	Sub-total	TOTAL
	(per cent)									
4. Production:										
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Coal and lignite	29.7	5.1	83.7	33.7	39.5	67.6	88.7	97.3	78.8	50.7
Crude oil	34.2	73.4	2.5	59.4	36.7	23.5	6.0	1.3	14.7	30.4
Natural gas	31.7	7.9	1.6	0.8	16.2	5.9	4.2	-	4.3	12.8
Hydro-power	4.4	13.6	12.2	6.1	7.6	3.0	1.1	1.4	2.2	6.1
5. Consumption:										
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Coal and lignite	25.4	13.5	66.8	56.4	40.3	68.1	88.6	96.0	78.8	51.3
Petroleum products	40.0	57.0	22.6	32.3	35.4	22.7	5.9	2.7	14.5	29.4
Natural gas	30.4	9.8	1.2	1.3	16.5	6.1	4.4	-	4.4	13.1
Hydro-power	4.2	19.7	9.4	10.0	7.8	3.1	1.1	1.3	2.3	6.2

Source: United Nations, World Energy Supplies 1955-1958, New York, 1960, Tables 1 and 2.

Notes:
a. Excluding firewood and peat.
b. UN figures multiplied by 3.2 (for conversion of theoretical equivalent of 0.125 T per thousand kWh to the 0.4 T HCE consumed to produce a thousand kWh in thermal electricity plants).
c. Equal to:

Bunkers	106
less Discrepancy	-9
	97

86868 O - 62 - 6

Although the net export figures in part 3 of Table 7 are less accurate than the rest of the table, since they include the residual errors in the published figures, they do indicate the broad directions of the international movement of energy materials. The United States is an exporter of coal and an importer of oil but an energy importer on balance; Other Western Hemisphere is an importer of coal and a heavy exporter of oil, hence an energy exporter on balance. Western Europe is an importer both of coal and of oil, from both the rest of the non-Soviet world and from the Soviet bloc. Within the Soviet bloc, both the USSR and Eastern Europe are net exporters of coal and oil; in Eastern Europe, Poland providing the coal and Rumania the oil. The Soviet bloc's Far East is an importer of oil.

Some idea of the changes in production and consumption patterns to be expected in the coming years may be gained from Table 8, which compares projections for four major world areas in terms of T HCE,[1] but on the basis of somewhat different data from those used in Table 7. The projection of energy consumption to 1975 for the United States was made by Joseph Lerner as part of the Resources for the Future study of Energy in the American Economy 1850-1975[2] on the basis of 1955 figures that differ considerably from those of the U.N. Statistical Office shown

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[1] In the current literature on energy, and particularly oil, magnitudes are expressed in a variety of units: original units such as barrels (bbls), tons, metric tons (T), cubic feet (cu ft), cubic meters (m^3), kilowatt hours (kWh), per year or per day; as well as in standardized units such as the T HCE used above, British thermal units (Btu's) and kilocalories. In order (hopefully) to reduce confusion, some of the magnitudes of Table 8 are set out in Table A-3 in the original units.

[2] Sam Schurr et al., Energy in the American Economy 1850-1975: Its History and Prospects, Baltimore, Johns Hopkins for Resources for the Future, 1960.

Table 8

PRIMARY ENERGY PRODUCTION AND CONSUMPTION, UNITED STATES, OEEC COUNTRIES COMBINED, USSR, AND EASTERN EUROPE, 1955, 1958, 1965, 1975

(in millions of T HCE[a] and per cent)

	United States (Resources for the Future estimates)			
			Projected	
	1955	1958	1965	1975
	(millions of T HCE)[a]			
Production:				
TOTAL	1,420	..	..	..
Coal and lignite	450	..	..	..
Crude oil and NGL	551	..	..	..
Natural gas	369	..	..	..
Hydro-power	50	..	..	..
Nuclear energy	-	..	..	..
Other	-	..	..	..
Consumption:				
TOTAL	1,390	..	1,902	2,608
Coal and lignite	400	..	517	667
Crude oil and NGL	606	..	841	1,168
Natural gas	334	..	480	690
Hydro-power	50	..	64	83
Nuclear energy	-	..	..	..
Other	-	..	-	-
	(per cent)			
Production:				
TOTAL	100.0	..	..	..
Coal and lignite	31.7	..	..	..
Crude oil and NGL	38.8	..	..	..
Natural gas	26.0	..	..	..
Hydro-power	3.5	..	..	..
Nuclear energy	-	..	..	..
Other	-	..	..	..
Consumption:				
TOTAL	100.0	..	100.0	100.0
Coal and lignite	28.8	..	27.2	25.6
Crude oil and NGL	43.6	..	44.2	44.8
Natural gas	24.0	..	25.2	26.4
Hydro-power	3.6	..	3.4	3.2
Nuclear energy	-	..	..	..
Other	-	..	-	-

Sources and Notes: [end of table]

Table 8 (continued)

	OEEC countries			
			Projected	
	1955	1958	1965	1975
	(millions of T HCE)[a]			
Production:				
TOTAL	603	621	675	790
Coal and lignite	507	504	490	490
Crude oil and NGL	13	18	30	50
Natural gas	7	10	25	60
Hydro-power	56	69	95	140
Nuclear energy	-	-	15	30
Other	20	20	20	20
Consumption:				
TOTAL	777	811	1,050	1,425
Coal and lignite	535	511	550	550
Crude oil and NGL	159	201	340	550
Natural gas	7	10	30	135
Hydro-power	56	69	95	140
Nuclear energy	-	-	15	30
Other	20	20	20	20
	(per cent)			
Production:				
TOTAL	100.0	100.0	100.0	100.0
Coal and lignite	84.1	81.2	72.6	62.0
Crude oil and NGL	2.1	2.9	4.4	6.3
Natural gas	1.2	1.6	3.7	7.6
Hydro-power	9.3	11.1	14.1	17.7
Nuclear energy	-	-	2.2	3.8
Other	3.3	3.2	3.0	2.6
Consumption:				
TOTAL	100.0	100.0	100.0	100.0
Coal and lignite	68.8	63.0	52.4	38.6
Crude oil and NGL	20.5	24.8	32.4	38.6
Natural gas	0.9	1.2	2.9	9.5
Hydro-power	7.2	8.5	9.0	9.8
Nuclear energy	-	-	1.4	2.1
Other	2.6	2.5	1.9	1.4

Sources and Notes: [end of table]

Table 8 (continued)

	USSR			
	1955	1958	Plan 1965	Projected 1972
	(millions of T HCE)[a]			
Production:				
TOTAL	458	628	1,050	1,510
Coal and lignite	303	365[b]	439[b]	515[b]
Crude oil and NGL	95	166[b]	350[b]	539[b]
Natural gas	11	34	178	321
Hydro-power	9	18	30	75[d]
Nuclear energy	-	-	-	-
Other	40[c]	45[c]	53[c]	60[c]
Consumption:				
TOTAL	456	602	961[e]	1,388
Coal and lignite	303	359	433	505
Crude oil and NGL	93	146[b]	[267][b]	[427][b]
Natural gas	11	34	178	321
Hydro-power	9	18	30	75
Nuclear energy	-	-	..	..
Other	40	45	53	60
	(per cent)			
Production:				
TOTAL	100.0	100.0	100.0	100.0
Coal and lignite	66.2	58.1	41.8	34.1
Crude oil and NGL	20.7	26.4	33.3	35.7
Natural gas	2.4	5.4	17.0	21.2
Hydro-power	2.0	2.9	2.9	5.0
Nuclear energy	-	-	-	-
Other	8.7	7.2	5.0	4.0
Consumption:				
TOTAL	100.0	100.0	100.0	100.0
Coal and lignite	66.4	59.6	45.1	36.4
Crude oil and NGL	20.4	24.3	27.8	30.8
Natural gas	2.4	5.6	18.5	23.1
Hydro-power	2.0	3.0	3.1	5.4
Nuclear energy	-	-	..	..
Other	8.8	7.5	5.5	4.3

Sources and Notes: [end of table]

Table 8 (continued)

	Eastern Europe			
	1955	1958	Plan 1965	1975
	(millions of T HCE)[a]			
Production:				
TOTAL	249	278	381	..
Coal and lignite	217	237	316	..
Crude oil and NGL	16	19	27	..
Natural gas	9	12	25	..
Hydro-power	2	3	6	..
Nuclear energy	-	-	-	..
Other	5	7	7	..
Consumption:				
TOTAL	229	..	..	..
Coal and lignite	201	..	..	..
Crude oil and NGL	12	..	..	..
Natural gas	9	..	..	..
Hydro-power	2	..	..	..
Nuclear energy	-	..	..	..
Other	5	..	..	..
	(per cent)			
Production:				
TOTAL	100.0	100.0	100.0	..
Coal and lignite	87.2	85.3	82.9	..
Crude oil and NGL	6.4	6.8	7.1	..
Natural gas	3.6	4.3	6.6	..
Hydro-power	0.8	1.1	1.6	..
Nuclear energy	-	-	-	..
Other	2.0	2.5	1.8	..
Consumption:				
TOTAL	100.0	..	..	..
Coal and lignite	87.8	..	..	..
Crude oil and NGL	5.2	..	..	..
Natural gas	3.9	..	..	..
Hydro-power	0.9	..	..	..
Nuclear energy	-	..	..	..
Other	2.2	..	..	..

Sources and Notes: [end of table]

Table 8 (continued)

Sources: United States:

1955, 1975: Sam Schurr et al., Energy in the American Economy 1850-1975: Its History and Prospects, Baltimore, Johns Hopkins for Resources for the Future, 1960, pp. 63, 86, 130, 141, 238-239, 736.

1965: Interpolated assuming constant rate of increase from 1955 to 1975 for each broad category.

OEEC countries: OEEC, Towards a New Energy Pattern in Europe, Paris, 1960, pp. 17, 19, 114.

USSR: Production:

1955: Economic Commission for Europe, Energy Situation in Europe, Geneva, January 1958, mimeo., pp. I-9/10, I-29. Noncommercial energy estimate adjusted downward for consistency with later years.

1958, 1965: A. Grusho and Y. Shteingauz, "Calculation of an Overall Energy Account" (in Russian), Planovoe khoziaistvo, Moscow, 1959, No. 7, p. 35; see also Petroleum Press Service, London, July 1960, p. 258.

1972: Shell Petroleum, Planning Division, The Oil Industry of the USSR, November 1960, mimeo., p. 13.

Consumption:

1955: ECE, Energy Situation in Europe, loc. cit. Noncommercial energy estimate adjusted downward for consistency with later years.

1958: ECE, Economic Survey of Europe in 1959, Geneva, 1960, p. III-31.

1965, 1972: Coal: assuming little change in net exports; oil: see Table 9.

Eastern Europe:

1955: ECE, Energy Situation in Europe, loc. cit.

1958, 1965: ECE, Economic Survey of Europe in 1959, op. cit., pp. III-30, 31.

Notes:
a. For data in original units, see Table A-3.
b. Including shale.
c. Peat and firewood.
d. Adjusted to thermal plant equivalent.
e. Excluding 10 mill T HCE of nuclear power.
.. Not available.
- Zero.
[ ] Figures in brackets derived in Table 9, assuming 9 per cent annual increase from 1958 to 1965, and 7 per cent annual increase from 1965 to 1972.

in Table 1. The projection of production and consumption for the OEEC countries (which form the bulk but not the whole of the Western European grouping in Table 1) was published by an OEEC Energy Advisory Commission (the Robinson Commission) in 1960. The projections for the USSR and Eastern Europe are Plan figures that are already out-dated but nevertheless serve to indicate the directions in which energy patterns are expected to move.

The expected trends for all four areas show a common characteristic: in each, the share of coal declines continuously and the shares of oil and natural gas rise. (With respect to hydro-power, the United States and Europe differ: hydro-power's share in the total energy pattern is projected to decline in the United States, but to rise in the OEEC countries, the USSR, and Eastern Europe.) However, the change in the pattern is smallest for the United States, which is in effect approaching "maturity" in the evolution of its energy consumption. The three European areas, on the other hand, are moving toward the U.S. pattern, both by design and by force of technological circumstance. In Western Europe, the switch in the pattern of consumption takes the form of a decline in indigenous coal production and a large increase in oil imports. For the USSR, however, the rapid switch from coal to oil in the projected pattern of energy consumption is coming about as a result of a rapid increase in the domestic production of crude oil and natural gas, accompanied by only a moderate increase in production of coal and lignite.[1]

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[1]In 1960, coal production in the USSR increased by only 1.4 per cent over 1959 (Pravda, January 26, 1961).

In Eastern Europe, as in the United States, the change in the production pattern results from rates of growth for coal, on the one hand, and oil and gas, on the other, that differ from each other by much less than in the OEEC countries and the USSR, so that any rapid changes in the consumption pattern will result from increases in oil imports from the USSR.

The increases in crude oil and natural gas production in the USSR are thus the basis for a major change in the Soviet economy that will hasten its approach to North American technological patterns, and the approach of Eastern Europe's to those of Western Europe. In the process, the USSR will shortly displace Venezuela as the world's largest producer of crude oil after the United States -- the kind of comparison the Russians dearly love to make. However, achievement of North American consumption levels for energy and oil by the USSR is still a long time off, either in the aggregate or per capita. By the early 1970's total energy consumption per capita in the USSR will reach only a little over one-half the U.S. level, while per capita consumption of oil products will reach only about one-third the U.S. level.[1] Despite differences between Russian and American patterns of consumer preferences,[2] this disparity between consumption levels still indicates a substantial lag by the USSR behind the United States in satisfying consumer demands.

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[1] Petroleum Press Service, October 1960, p. 364.

[2] In a speech at Vladivostok on his return from the United States in October 1959, Khrushchev announced the eventual establishment of a system of public taxi pools in the USSR as an alternative to private ownership of vast numbers of automobiles (Pravda, October 8, 1959). Such a system would economize in the use of automobiles and might hold down gasoline consumption, although at the cost of consumer convenience.

COMPETING WITH THE WEST: SOVIET OIL PRODUCTION AND EXPORTABLE SURPLUSES

On the supply side, the ability of the USSR to increase oil exports to the non-Soviet world will depend on the volume of oil it can produce and the calls on this by consumption in the USSR itself and in the other countries of the Soviet bloc in Eastern Europe and the Far East. On the demand side, as will be discussed in a later section of this paper, it will depend on the extent to which the USSR can break into markets that have been the preserve of the international oil companies for decades.

Production

From all the reports on the present situation of the Soviet oil industry, it appears that the USSR is in a position to obtain a considerable increase in production. The USSR has sufficient proved resources to increase production by stepping up drilling rates without having to devote a greatly increased amount of investment resources to the task, although other investment costs, such as those for the construction of pipelines and refineries, are likely to be substantial. Limitations on oil production are likely to be imposed from the demand side rather than from the supply side. Internally, demand for oil products will be limited by the availability of oil-consuming equipment of all kinds, creation of which would compete for scarce resources with other investment demands; it is the cost of oil-consuming equipment rather than the cost of oil that will restrict internal demand. Externally, the limitation will be the volume of oil the USSR will be able to dispose of profitably on the international market. In the Plan targets, as indicated in Table 8 and Table A-3, crude oil production (including shale) in the USSR is expected to increase from 118 million T (2.4 million bbls/day) in 1958 to 250 million T (5.0 million bbls/day) in 1965 and to 385 million T (7.7 million bbls/day) in 1972. These quantities -- and probable upward revisions -- provide the opportunity both to raise domestic consumption and to increase exports to the Soviet satellites and to the non-Soviet world.

Soviet Bloc Consumption

It is in estimating the priority consumers' claims on this production that difficulties begin. In dividing the production increases between domestic consumption and export availabilities, the Soviet planners have some flexibility in determining (or permitting) future levels of consumption; and without considerably more knowledge of Soviet plans for domestic consumption than is available from published sources, it is of little avail to guess at the volume of oil that the USSR will dispose of on the world market in the coming years. Nevertheless, it seems useful to examine the elements of the Soviet oil balance to see what effect differing assumptions about USSR domestic use will have on the future capacity of the USSR to export oil. For production, a target of some 250 million T (5.0 million bbls/day) was published in the Seven-Year Plan for 1965. For planned consumption, however, there are no figures available except percentage breakdowns of an unspecified total. Assuming no over-fulfillment of the production target, one can, however, project apparent consumption levels[1] at different rates of increase from the base year (1958) to see what net export availabilities result. Thus, as set out in Table 9, if it is assumed that consumption rises

[1]Apparent consumption equals consumption plus stock changes; hence it also equals production less net exports.

Table 9

ALTERNATIVE PROJECTIONS OF USSR OIL PRODUCTION, CONSUMPTION, AND EXPORTS, 1958, 1965, 1972

Item and assumption as to rate of increase	Per cent: Annual rate of increase 1965/1958	Per cent: Annual rate of increase 1972/1965	Per cent: Index 1965/1958	Per cent: Index 1972/1965
A. Moderate production increase:				
1. Production (incl. shale)	11.2	6.4	211	154
2. Apparent consumption:[a]				
2.1 @ Production rate	11.2	6.4	211	154
2.2 @ 9% per year	9	9	183	183
2.3 @ 7% per year	7	7	160	160
2.4 @ 9% and then 7%	9	7	183	160
3. Net export availability:				
3.1 (1) less (2a)	xx	xx	xx	xx
3.2 (1) less (2b)	xx	xx	xx	xx
3.3 (1) less (2c)	xx	xx	xx	xx
3.4 (1) less (2d)	xx	xx	xx	xx
B. Rapid production increase:				
4. Production (incl. shale)	13.1	5.6	237	146
5. Apparent consumption:[a]				
5.1 @ Production rate	13.1	5.6	237	146
5.2 @ 9% per year	9	9	183	183
5.3 @ 7% per year	7	7	160	160
5.4 @ 9% and then 7%	7	7	183	160
6. Net export availability:				
6.1 (4) less (5a)	xx	xx	xx	xx
6.2 (4) less (5b)	xx	xx	xx	xx
6.3 (4) less (5c)	xx	xx	xx	xx
6.4 (4) less (5d)	xx	xx	xx	xx

Sources and Notes: [end of table]

Table 9 (continued)

Item and assumption as to rate of increase	Million T HCE[b]			Million T[b]			Million bbls/day[b]		
	1958	1965	1972	1958	1965	1972	1958	1965	1972
A. Moderate production increase:									
1. Production (incl. shale)	166	350	539	118	250	385	2.4	5.0	7.7
2. Apparent consumption:[a]									
2.1 @ Production rate	146	308	474	104	220	338	2.1	4.4	6.8
2.2 @ 9% per year	146	267	489	104	191	349	2.1	3.8	7.0
2.3 @ 7% per year	146	234	374	104	167	267	2.1	3.3	5.3
2.4 @ 9% and then 7%	146	267	427	104	191	305	2.1	3.8	6.1
3. Net export availability:									
3.1 (1) less (2a)	20	42	65	14	30	47	0.3	0.6	0.9
3.2 (1) less (2b)	20	83	50	14	59	36	0.3	1.2	0.7
3.3 (1) less (2c)	20	116	165	14	83	118	0.3	1.7	2.4
3.4 (1) less (2d)	20	83	112	14	59	80	0.3	1.2	1.6
B. Rapid production increase:									
4. Production (incl. shale)	166	392	574	118	280	410	2.4	5.6	8.2
5. Apparent consumption:[a]									
5.1 @ Production rate	146	344	503	104	246	359	2.1	4.9	7.2
5.2 @ 9% per year	146	267	489	104	191	349	2.1	3.8	7.0
5.3 @ 7% per year	146	234	374	104	167	267	2.1	3.3	5.3
5.4 @ 9% and then 7%	146	267	427	104	191	305	2.1	3.8	6.1
6. Net export availability:									
6.1 (4) less (5a)	20	48	71	14	34	51	0.3	0.7	1.0
6.2 (4) less (5b)	20	125	85	14	89	61	0.3	1.8	1.2
6.3 (4) less (5c)	20	158	200	14	113	143	0.3	2.3	2.9
6.4 (4) less (5d)	20	125	147	14	89	105	0.3	1.8	2.1

Sources: Production:

Moderate production increase: Table 8. Assumes no overfulfillment of 1965 plan target, and takes middle of range of Khrushchev's projection to 1972.

Rapid production increase: see text. Assumes overfulfillment of 1965 plan target, and takes upper end of range of Khrushchev's projection to 1972.

Apparent consumption:

1958: Table 8.

1965, 1972: Projected at annual rates of increase indicated in body of table.

Net export availability: Residual

Notes: a. Apparent consumption = consumption plus net changes in stocks = production less net exports.

b. Conversion factors:

1 T HCE x 0.714 = 1 T oil (or 1 T oil x 1.4 = 1 T HCE)

1 T oil x 0.02 = 1 bbl/day (or 1 bbl/day = 50 T oil)

xx Not relevant.

at the same rate as planned production from 1958 to 1965 (11.2 per cent per year), net availabilities for export would amount to 30 million T (0.6 million bbls/day) in 1965. With net exports to the Eastern European satellites amounting to about 12 million T for 1965, this would leave only 18 million T for export to the non-Soviet world and the Soviet bloc's Far East, a rather low figure when compared with the 14.5 million T of exports outside the Soviet bloc already reached in 1959. However the USSR is likely to export more than 18 million T to the non-Soviet world. Unless the 1965 oil production target is exceeded, domestic oil consumption will have to increase at a lower rate than production. A rate of increase in oil consumption of 9 per cent per year (a figure that would be reasonable for Western Europe for the same period) would result in the availability of almost twice this volume of exportable oil, or 59 million T/year (1.2 million bbls/day). At lower rates of increase in consumption, net export availabilities would be correspondingly raised. By taking some 385 million T (7.7 million bbls/day) as the tentative production target for 1972[1] and going through the same sort of exercise as for 1965, a range of export availabilities for 1972 was also calculated as set out in Table 9. Using 9 per cent per year for the period 1958-1965 and 7 per cent per year for the period 1965-1972 as plausible rates of increase for consumption, the USSR's export availability would amount to some 80 million T/year (1.6 million bbls/day)

[1]This figure is derived as the sum of 375 million T of crude petroleum (the midpoint of the range 350-400 million T adopted as a tentative target in a November 1957 speech by Khrushchev on the 40th anniversary of the Revolution) plus 10 million T for shale oil.

by 1972, which would put the USSR in the same class as Iraq as a potential exporter of oil.

Increasing production beyond the Plan targets would, of course, make it possible both to reach these or higher volumes of potential exports and to raise domestic consumption at faster rates than the ones just mentioned. There is some expectation that production will reach a level as high as 295 million T/year (5.9 million bbls/day) by 1965, exceeding the Plan target by as much as 45 million T/year (0.9 million bbls/day).[1] In the second part of Table 9, we project production to 280 million T (5.6 million bbls/day) in 1965, a figure that exceeds the Plan target by 30 million T, and to 410 million T (8.2 million bbls/day) in 1972,[2] the upper end of the target range cited by Khrushchev in his November 1957 speech. These production levels would provide the USSR with additional leeway to increase exports or domestic consumption without strain.

In planning for oil exports to the non-Soviet world, the USSR has to take into account another claim on its oil production in addition to domestic consumption, namely the oil requirements of the satellite

[1] Oil and Gas Journal, November 21, 1960, p. 156.

[2] An estimate by Leon Herman of the Library of Congress places Soviet crude oil production (including shale) at 245 million T (4.9 million bbls/day) in 1965 and 410 million T (8.2 million bbls/day) in 1970. Herman obtained the latter figure by using the upper end rather than the mid-point of the 350-400 million T range, adding to it 10 million T (0.2 million bbls/day) for natural gas liquids, and attributing the result to 1970 rather than 1972. See [Halford L. Hoskins and Leon Herman], Soviet Oil in the Cold War, a study prepared by the Library of Congress at the request of the Subcommittee to Investigate the Administration of The Internal Security Act and Other Internal Security Laws of the Committee on the Judiciary, U.S. Senate, 87th Congress, 1st Session, Washington, 1961, p. 20.

countries, particularly the Eastern European satellites. Although planned exports of oil from the USSR to Eastern Europe are known, the proportion intended for re-export to the non-Soviet world is not. The magnitude of this re-exportable Soviet oil is, however, not likely to be large, given the rising oil requirements of Eastern Europe itself.

Some idea of the range within which such exports might fall in 1965 is given in Table 10, which applies to the figures for Eastern Europe a procedure similar to that just described for the USSR (Table 9). The volume of oil available to Eastern Europe is estimated as the sum of the published Plan production targets for Eastern Europe and the planned level of oil exports from the USSR to Eastern Europe,[1] net of oil shipments in the reverse direction which we assume to rise only slightly over the 1959 level. Of Eastern Europe's oil imports from the USSR, up to 15 million T/year (0.3 million bbls/day) may pass through the Economic Mutual Assistance Council (COMECON) pipeline.[2] If consumption increases by 9 per cent per year, the potential for re-export from Eastern Europe to the West would amount to 5 million T/year (0.1 million bbls/day); if consumption increases by 7 per cent per year, potential re-exports would amount to 9 million T/year (0.2 million bbls/day).

Refining capacity in Eastern Europe is expected to reach some 30 million T/year (0.6 million bbls/day) by 1965.[3] Since this annual throughput exceeds apparent domestic consumption, exports to the West

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[1]The figures for planned exports from the USSR to Eastern Europe in Table 10 have probably been revised upward by 2 or 3 million T since originally announced.

[2]Petroleum Press Service, May 1959, p. 171.

[3]Petroleum Week, April 10, 1959, p. 31.

Table 10

ALTERNATIVE PROJECTIONS OF OIL CONSUMPTION AND EXPORTS: EASTERN EUROPE, 1958, 1965

	Per cent: Annual rate of increase 1965/1958	Per cent: Index 1965/1958	Million T HCE[a] 1958	Million T HCE[a] 1965	Million T[a] 1958	Million T[a] 1965	Million bbls/day[a] 1958	Million bbls/day[a] 1965
1. Production (incl. shale)	5.1	142	19	27	14	19	0.3	0.4
2. Imports from USSR			7	24	5	17	0.1	0.3
3. Gross availabilities [(1) + (2)]			27	50	19	36	0.4	0.7
4. less Exports to USSR			4	7	3	5	0.1	0.1
5. Net availabilities [(3) less (4)]	9.9	194	23	43	16	31	0.3	0.6
6. Apparent consumption:[b]								
a. @ 9% per year	9	183	20	36	14	26	0.3	0.5
b. @ 7% per year	7	160	20	31	14	22	0.3	0.4
7. Potential exports to non-Soviet world:								
a. (5) less (6a)			3	7	2	5	0.0	0.1
b. (5) less (6b)			3	13	2	9	0.0	0.2

Sources: Production: Table 8.

Imports from USSR: Table 5.

Exports to USSR: Table 5. (1965 extrapolated from 1958, assuming some increase in shipments from Rumania to the Ukraine.)

Apparent consumption:
1958: Table 8.
1965: Projected at annual rates of increase indicated in body of table.

Note: a. Conversion factors:
1 T HCE x 0.714 = 1 T oil (or 1 T oil x 1.4 = 1 T HCE)
1 T/year oil x 0.02 = 1 bbl/day (or 1 bbl/day = 50 T/year oil)

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will consist partly of refined products and partly of crude oil, so that Eastern Europe will be able to play the role of middleman in refining, as well as trans-shipping, USSR oil.

An even larger unknown in future calls on the USSR's oil production is the volume of oil that will be supplied to China. There is reason to suspect considerable reluctance on the part of the USSR to supply China's requirements directly. Aside from any possible intra-bloc political difficulties, resource costs for delivering the oil are high, whether the oil moves by rail through Siberia or by tanker from the Black Sea, and the economic returns to the USSR can only be small, given China's balance of payments problems. The USSR might try to reduce its obligation to supply oil to China by setting up a triangular trade arrangement, for example, one with Indonesia in which Indonesia pays for imports from the USSR by shipping oil to China.

Ancillary Activities

One of the strengths of the USSR in its oil export drive is that it is in a position to export the men and equipment needed for the oil industry (such as petroleum geologists, technicians, drilling rigs, and refinery equipment). The USSR apparently has a surplus of geologists[1] and is able to provide their services to underdeveloped countries, probably at lower cost to these countries than for comparable Americans or Western Europeans. It also has enough spare drilling rigs and drilling crews to undertake oil exploration activities in underdeveloped countries

[1] V. E. Komarov, The Economic Framework of the Training of Specialists for the National Economy (in Russian), Moscow, Academy of Sciences of the USSR, Institute of Economics, 1959, pp. 84 ff.

that may be dissatisfied with the success of, or the offers made by, Western oil companies. Furthermore, although investment requirements in the USSR and in Eastern Europe are already extremely high for activities related to oil (particularly in oil refining), both the USSR and Rumania are able and willing to export the equipment and technicians for setting up refineries in countries where the pay-off looks good enough.

Other Physical Factors Limiting Soviet Oil Exports

Apart from the limitation on oil exports imposed by the available supply, several other obstacles reduce, for the time being, Soviet ability to compete with the Western oil companies. In transportation the USSR has first to overcome the physical problem of getting oil to market from the producing regions in the interior. It must build pipelines into central Europe and to the Baltic, and build or acquire tankers to carry oil overseas. Pipelines require steel pipe, which is in short supply. Tankers require steel and shipbuilding facilities which the Soviet planners prefer to allocate to other uses. However, in a world tanker market characterized by surplus capacity, the USSR enjoys considerable room for maneuver, and it is acquiring tankers by chartering them, buying them second hand, and ordering them new from underutilized foreign shipyards. Nevertheless, the USSR has still to build up a fleet of tankers to ensure its ability to deliver oil, and this will require a considerable investment.

In marketing oil in the non-Soviet world, the USSR has to overcome the fact that oil distribution facilities are owned by the Western oil companies, the bulk being in the hands of the major international companies and the remainder in the hands of the big independents. In order to market its oil, the USSR, therefore, has either to set up its own distribution facilities, or to acquire existing facilities (presumably from independent or national oil companies), or to persuade the governments of importing countries to force the international oil companies to handle Soviet oil. In the present Soviet oil export drive, only the latter two methods have been used.

III. COMPETITION FOR INFLUENCE AND COMPETITION FOR MARKETS

The expansion of Soviet oil exports has come as a shock to Western sensibilities because the Russians have used these exports to score both political and economic gains. In 1960 the Russians achieved both effects. In Cuba, and to some extent India, they extended their influence, in Cuba with devastating results for the American political position. In Western Europe and Japan, they succeeded in snatching a share of the market from the international oil companies and in obtaining, in exchange, commodities from which they clearly benefited. To some extent these effects may reinforce each other, and may be achieved by some of the same techniques, but they should be kept distinct in analyzing the Soviet export drive.

Within limits, the Soviet purpose in a particular oil transaction can be inferred from the economic status of the trading partner. In transactions with the economically underdeveloped parts of the world, particularly with those countries from which the USSR can get little or nothing of economic value in direct return, the USSR's motive is probably the extension of Soviet influence. In transactions with developed and industrialized countries which can provide goods more cheaply than the USSR (cheaper absolutely or relatively to oil), and in transactions with underdeveloped countries which are able to pay in hard currency or in goods the USSR really needs, the Soviet motive is likely to be acquisition of a market.

COMPETITION FOR INFLUENCE

One of the effects of Soviet oil exports has clearly been to gain influence in the uncommitted parts of the world or to displace U.S. or Western influence in those parts committed to the West. The fact that the West loses influence is automatically (though perhaps not validly) regarded by both the Soviets and the West as a gain for the USSR and a loss for the United States.

A curious thing about "influence" is that all empire builders seem to consider it desirable for itself as well as for what it can obtain. The broad aim behind the Soviet thrust for influence in the underdeveloped countries is to hasten the breakup of the non-Soviet world order in Latin America, Asia, and Africa inherited from the former Western European imperialisms. Any one of a large range of events, from local revolution to the acceptance of Russian technical aid, is cited by the Soviets and accepted by the West as serving this purpose. The specific ends this extension of Soviet influence may serve are varied. In the political sphere, it may lead directly to a strengthening of the local Communist Parties or to a strengthening of the "national bourgeoisie" which the Russians (although not the Chinese) consider a major step toward eventual Communist takeover. In countries that are part of the American alliance system around the periphery of the USSR, the extension of Soviet influence may lead to the neutralization or removal of Western military bases, or the defection of members of the alliances; or it may render the alliances less workable than formerly. In the economic sphere, it may lead to internal changes that the Soviets, but not the West, would find desirable, ranging from expropriation of Western economic interests to prevention of their continued or expanded operation.

In the case of oil, the quest for influence is characterized by an effort to displace the Western oil companies in their control of the marketing system, and as the only source of oil and technical knowledge. Acquisition of influence may then be an aid to further market penetration, which in turn may be desired for itself as well as for the political and economic benefits the USSR may derive from it. Where the market in question offers little or no immediate economic return, it may hold future promise.

The USSR has been using a variety of techniques to displace the Western oil companies, among them the offer of more favorable terms. Most important so far has been the offer of lower prices. In addition to cutting prices, however, the USSR has arranged bilateral barter agreements that have relieved potential trading partners of embarrassing surpluses. And the USSR has offered oil on credit terms the Western oil companies have been unwilling or unable to match. One such credit arrangement has been the sale of Soviet oil against local currencies to be used by the USSR for purchases of locally produced goods or held as blocked funds.

In making their offers, the Russians have been able to time them to take advantage of bargaining difficulties in the West, whether or not these difficulties have arisen directly in oil transactions. Among the disputes that did not initially involve oil sales by the international oil companies may be mentioned Soviet trade arrangements with Nasser when Egypt was suffering the extreme foreign exchange difficulties caused by the Suez crisis of 1956. Another was the fisheries dispute between Iceland and the United Kingdom with which negotiation of a fish-for-oil trade agreement between Iceland and the USSR coincided.[1] Two bargaining impasses directly involving oil will be discussed shortly.

In addition to the direct sales of oil, Soviet ability to provide the equipment and technicians for oil exploration and oil refining has enabled the USSR to open up new areas of influence. The availability of oil contractor services from a non-Western source, particularly if offered on favorable credit terms, provides underdeveloped countries with a partial alternative to dependence on the Western oil companies for the creation or expansion of a domestic oil industry. Although indigenous oil production might ultimately eliminate Soviet as well as non-Soviet oil from local markets, Soviet participation in the preliminary (exploratory) and final (refining) stages of the oil industry may, in the short run at least, expand the market for Soviet crude oil by displacing Western suppliers. This could come about, for example, as the result of Russian construction of a refinery for processing the local oil which is still being prospected for. If the oil is not found, the refinery would be available for processing imported Soviet crude.

In an effort to overcome its disadvantage in local distribution and marketing, the USSR has tried to organize local independent distributors into a marketing network (so far with little success), as well as to enlist the support of government-sponsored national oil companies.

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[1] See: Richard J. Ward, "Soviet Competition in Western Markets: A Commodity Case and its Implications," The Journal of Industrial Economics, Oxford, March 1960, p. 144.

The list of underdeveloped countries with which the USSR is engaged in transactions involving oil grows longer and longer. The discussion here, however, will be limited to Egypt, Cuba, India, Ceylon, and Pakistan.

Prior to 1960, the most important "political" oil sales were those made to Egypt in connection with Soviet courtship of Nasser with military and economic aid. The role of oil in the resulting flow of Soviet-Egyptian trade was, however, overshadowed by Soviet deliveries of military equipment to Egypt and Syria, financed by a Soviet credit being paid off by commodity exports (primarily cotton) from the United Arab Republic to the USSR.[1]

In 1960, the two main examples of political oil sales by the USSR concerned Cuba and India. The Soviet purpose was clearest in the case of Cuba, and the payoff in terms of political difficulties for the United States must have exceeded Mikoyan's fondest hopes. Cuba was clearly in no position to pay hard currency for the 1.5 million T (30,000 bbls/day)[2] of Russian oil that it received in 1960 and it is doubtful that the USSR was really in great need of the Cuban sugar it took in exchange. But as an opportunity for disturbing the U.S. position in the Western Hemisphere, it was too good to let slip. With the Cuban government anxious to show its hostility to the United States, the USSR had nothing to lose. By offering oil to Cuba, the Soviets could raise, in an environment favorable to them, the issue of whether the Western oil companies would refine and distribute Soviet oil. If the oil

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[1] Klaus Billerbeck, Soviet Bloc Foreign Aid to Underdeveloped Countries: An Analysis and a Prognosis, Hamburg, Archives of World Economy, 1960, p. 153.

[2] Petroleum Week, March 10, 1961, p. 68.

companies accepted an outsider's crude thus "imposed" on them, they would have set a bad precedent for themselves in other countries. If they refused, they ran the serious risk of having their properties confiscated. Either way the USSR would be ahead, unless U.S. government intervention forced the Cubans to back down. The oil companies, evidently willing to write off their Cuban properties as a dead loss (and perhaps counting on the eventual collapse of the Castro regime under serious economic pressure), refused to process the Soviet oil. The subsequent chain of expropriation, retaliation, and counter-retaliation led to an acceleration of the Castro revolution, an increase in its violence, the abortive anti-Castro invasion, and the present unhappy state of Cuban-U.S. relations.

In their offer to India, the Soviets proposed to accept payment in rupees, hence, in effect, to provide a loan to India, as well as to deliver Black Sea crude oil at prices below the international oil companies' posted prices (for Middle East crude plus transport from the Persian Gulf). This would appear to be a "political" sale from the Russian point of view, possibly an element of the Soviet budget for economic aid to India. The Cuban pattern was followed at the start, when the Indian government proposed to the international oil companies that they refine the Russian crude. Unlike the Cubans, however, the Indians accepted the oil companies' refusal to do so, partly because the oil companies made a counter-offer of a price discount on Middle East crude, and partly (one would presume) because the Indians are aware of the usefulness of private foreign investment in Indian oil exploration and refining. And the Indian government was not intent on alienating the West, as Castro seems to have been.

India's position as a heavy importer of both crude oil and refined products put her in a favorable bargaining situation in the buyer's market of 1960. In 1959 domestic oil production (0.4 million T) met only 6 per cent of India's total consumption (7.4 million T), while domestic refining capacity (5.5 million T) could at best cover only 75 per cent of total consumption[1] and in fact was probably not fully utilized. India's major "traditional" foreign source of supply has been the Persian Gulf (Iran, Kuwait, and Saudi Arabia) because of the production and marketing relations of the Western international oil companies. India's interest is, however, to obtain crude oil and refined products at the lowest delivered price. Tied neither by sentiment nor by finance to the Middle Eastern producers, India could be indifferent as to the geographical origin of its crude oil and refined products. In the 1960 oil dealings, the Indian government was first offered crude oil by the Russians at 10 to 20 per cent below world prices, or about $0.25/bbl ($1.66/T) below the delivered price in India.[2] As this was in the framework of a bilateral Soviet-Indian trade agreement, the offer had the additional virtue of permitting payment in rupees rather than hard currency. The only refining capacity available for processing this crude would have been the refineries owned by the international oil companies. When the Indian government proposed to the international oil companies that they refine the Russian crude, the oil companies accompanied their refusal with an offer to lower the

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[1] World Petroleum Report 1960, New York, February 15, 1961, p. 20.

[2] Ibid., p. 54.

delivered price of Middle East crude by about \$0.27/bbl (\$1.80/T) by granting discounts of about 12.5 per cent from the f.o.b. posted price for the Persian Gulf.[1] The Indian government accepted this arrangement and, in renegotiating the Russian offer, obtained for rupees refined products from the Black Sea instead of crude oil, apparently at about a 20 per cent discount from f.o.b. posted prices.[2] The volume of refined products involved in the renegotiated trade agreement was about 0.4 million T/year (for 4 years), or about one-third the level of India's refined product imports in 1958.[3] More recently the total volume of agreed product imports was raised from 1.5 million T over 4 years to 2.5 million T, with the annual rate of deliveries rising from 0.3 million T in 1961 to 1.0 million T in 1964.[4] The reduction in the cost of oil that India achieved by this chain of bargaining may be estimated for 1961 at something close to \$14 million,[5] or a saving of some 10 per

[1] Information obtained from Paul Frankel of Petroleum Economics Ltd., London.

[2] World Petroleum, September 1960, p. 52.

[3] United Nations, World Energy Supplies 1955-1958, New York, 1960, p. 78.

[4] Petroleum Press Service, London, December 1960, p. 460.

[5] Derived as follows:

Type of Import	(1) Volume (million T)	(2) Discount (\$/T)	(3) Saving (\$ millions) [(1) x (2)]
Crude oil	6.0	1.80	10.8
Refined products:			
Soviet	0.3	6.00	1.8
Other	0.2	5.00	1.0
Total affected by discounts	6.5	xx	13.6

xx Not used in calculation.

cent on a total c.i.f. import bill for oil of something like $140 million. Tanker freight to Indian ports is not directly affected by changes in posted prices.

The Indian negotiations with the Russians and the agreement by the oil companies to supply oil to India at discounts of some 12.5 per cent were followed by a 6 to 7 per cent reduction in posted prices in the Persian Gulf (in August 1960). This action raised a new crop of discontent with the international oil companies, primarily on the part of the Middle East producers, but also on the part of India and several other consumers (including Pakistan and Ceylon) who claimed that they were being cheated of their discounts now that posted prices were lowered.

The Russian effort to sell Black Sea crude to the Indians had two clear political aims: to build up good will for the USSR in India; and to disrupt the established arrangements of the oil companies. However, the Indian episode was affected by political undercurrents outside India, relating to oil pricing. In their operations east of Suez, the oil companies have to deal not only with the governments of consuming countries but also with the governments of producing countries. The Indian negotiations took place at a time of oil surplus when the oil companies were already extending considerable discounts from posted prices in order to push oil sales. With royalties to the governments of the producer countries based on the posted prices, the oil companies were already seriously tempted to reduce these prices, but were reluctant to do so for fear of unfavorable political reactions in the producer countries. The threat of Russian competition in India and the pressure by the Indian government for lower oil prices were used as the overt excuse by the oil companies to lower the posted prices for crude in the Persian Gulf. Thus three games were being played: that of the Russians in attempting to disrupt existing oil arrangements; that of the Indians in pressing for lower prices; and that of the oil companies in cutting their losses in the Indian situation by passing on to the governments of the producer countries the reduction in receipts resulting from de facto discounts from prices as posted. In the short run, it was the Persian Gulf producers who lost the most. However, the producer countries set up the OPEC (Organization of Petroleum Exporting Countries) as a reaction to the reduction in posted prices, so that it is not yet clear who the long-run loser is going to be.

The USSR has added force to its oil export drive in India by offering to build refineries for the Indians. The present and expected future volume of refined product imports provides India with an incentive to establish refineries at home, both to increase domestic value added (incidentally reducing the current foreign exchange cost of imported oil) and to process domestically-produced crude oil when it is found in quantities large enough to displace imports. The Soviet bloc has therefore been able to combine its attempts to sell oil with offers to the Indians to build oil refineries as part of Soviet-Indian bilateral trade agreements financed by Soviet credits. Two refineries financed by the Soviet bloc are under construction in India: one of 2.0 million T/year (40,000 bbls/day) being built by the USSR, and one of 0.75 million T/year (15,000 bbls/day) being built with Rumanian technical and financial assistance.[1] In the future, the existence of such refineries will facilitate the import of Soviet crude oil into India by making it unnecessary to rely on the cooperation of the Western oil companies in processing it for use.

India's neighbors, Ceylon and Pakistan, have also entered into dealings with the USSR that involve oil. A trade agreement was signed by Ceylon and the USSR in 1960 under which the USSR would purchase agricultural commodities and Ceylon would import and distribute 130 thousand T/year of Soviet oil (a figure to be compared with the total inland consumption of 600 thousand T/year and a bunkering trade at Colombo of 450 thousand T/year).[2] Initially, a private company to handle and distribute the Soviet oil was formed by a group of local businessmen, but their inability to acquire storage and distribution facilities -- and a political climate unfriendly to the Western oil companies[3] -- led the Ceylon parliament to pass a bill, in May 1961, setting up a national company for the distribution of oil products and giving the government the power to take over from the international oil companies (with compensation) facilities sufficient to handle 25 per cent of Ceylon's oil consumption.[4]

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[1] World Petroleum, September 1960, p. 134.

[2] Petroleum Press Service, December 1960, p. 463.

[3] A Soviet article on the oil deal with Ceylon sees the transaction as an effort by the new government (elected in June 1960) to break the grip of the Western oil companies on the distribution of petroleum products in Ceylon and to force them to lower their "monopolistic prices." See: U. Domrachev, "Ceylon Does Not Wish to be Dependent on the Oil Monopolies" (in Russian), Vneshniaia torgovlia, Moscow, 1961, No. 3.

[4] Oil and Gas Journal, May 15, 1961, p. 118.

At the present time there is no refinery in Ceylon, and negotiations between the government and a four-company marketing group (Shell, British Petroleum, Caltex, and Stanvac) to build one have been stalled for several years. One reason for the failure to agree is the insistence of the marketing group on a 25-year guarantee against nationalization.[1] Recently the Russians offered to build a refinery for the Ceylon government, to be financed by a Soviet credit at 2-1/2 per cent interest. The government of Ceylon has an interesting choice to make. Does it accept foreign private investment for financing the refinery, permit the private investors to amortize their investment during the course of profitable operation of the facilities, and have the economy take on a long-term balance of payments burden in the form of repatriated earnings over the life of the refinery? Or does it accept the Russian offer and acquire a more immediate balance of payments burden by undertaking repayment of the Soviet credit by direct commitment of exportable agricultural products which Ceylon would have no difficulty in marketing in the West? A possible economic gain to Ceylon from accepting the USSR's offer would be an improvement in its bargaining position with respect to the price of future imports of crude oil. A cost would be the greater imminence of the foreign exchange burden involved in paying for the refinery.

In Pakistan, the USSR is to undertake exploration for oil under an agreement signed in March 1961. The agreement calls for a Soviet credit repayable in commodities over a 12-year period at 2-1/2 per cent interest, to be used to pay for the services of Russian experts and equipment to be acquired by a new state-owned oil exploration body.[2] In this kind of

[1] World Petroleum Report 1960, op. cit., p. 46.

[2] Petroleum Press Service, April 1961, p. 143.

transaction, the Soviets take much less of a risk than the Western oil companies who supply their own capital and lose it if they do not find oil. On the other hand, the direct economic gain for the Soviets, if they do find oil for the Pakistanis, will be much smaller than for a private oil company finding oil for its own account, unless the USSR can extend the arrangement in more profitable ways later on. For example, the USSR might expand exports of equipment and technical services if the Soviet teams are more successful with their exploratory wells than the Western oil companies have been. One may expect the exploration agreement with Pakistan to be followed by a Soviet offer to build a refinery, whose ostensible purpose will be to process domestic crude oil when it is found but which would also be available to refine Soviet crude imported under future trade agreements.

COMPETITION FOR MARKETS

The other aspect of the Soviet oil export drive, the aspect particularly painful to the Western oil companies, is that the Soviets are succeeding in taking profitable markets away from their Western competitors.

In expanding exports to the economically advanced countries of the world, the USSR has been able to obtain the gains from trade that result from exchanging a commodity that is relatively cheap to produce at home for other commodities that are relatively dear to produce at home. In trading with Western Europe and Japan, the USSR seeks industrial goods that it cannot produce in sufficient quantity at home or as cheaply as it can buy them abroad. Recently, the USSR has been particularly

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anxious to obtain goods -- such as tankers and steel pipe for pipelines -- that can be used to get more oil to foreign markets in the future. In paying for these goods, the USSR is hard put to find goods acceptable to the industrialized countries. Marketing oil abroad is one of the more efficient ways for the Soviets to obtain industrial goods from the non-Soviet world, for oil is relatively inexpensive for the USSR to produce, can be handled in bulk, and enjoys a steadily rising demand.

In other cases, the aim of the competition for markets may be to gain access to new sources of supply, or perhaps to pre-empt existing sources of supply, particularly of raw materials. Soviet trade and credit agreements that tie up a considerable portion of the future commodity output of the underdeveloped trading partner appear to have this feature.

A weaker, but still significant, motive might be the desire to open up broadened trade relations in the future, either because the trading partner might be part of a wider trading and producing area, or because it produces a commodity that the USSR will need as its standard of living rises.

Some of the techniques used in the trade war are the same as in the competition for influence. Price cutting and the use of barter agreements to relieve the trading partner of an otherwise unsaleable commodity fall into this category. (Where both techniques are involved in the same transaction, but accounting prices are not announced, it is difficult or impossible to determine the actual extent of price cutting.) Differences in the economic status of the various trading partners lead to some differences in approach. With the industrialized countries, most of whom today enjoy convertible or nearly convertible currencies, the Soviet technique of accepting a soft local currency as a means of extending credit is not applicable. On the other hand, the existence of a large number of eager and capable traders in the developed economies who are willing and able to compete with the major oil companies, and of governments in a position to apply effective pressure on the oil companies, easily makes it possible for the USSR to get Soviet oil marketed locally.

The gains from trade and the marketing aspects of Soviet oil transactions with the economically advanced countries may be illustrated by USSR sales to Denmark, France, West Germany, Italy, Sweden, and Japan.

Western Europe has been the major non-Soviet market for Russian oil, as was indicated in Table 3; and, as the world's heaviest oil-deficit region, it will continue to be the main target for all the oil exporters except, perhaps, Indonesia. Through 1959, oil shipments from the Black Sea to France, West Germany, and Italy were part of the broader bilateral trade agreements within which trade between Western Europe and the Soviet bloc has been carried on. In this trade, the goods shipped from the West included a large variety of manufactures, weighted rather heavily with engineering goods.[1]

The Soviet-Italian agreement of 1960 to exchange Soviet oil for Italian steel pipe, pipeline equipment, and synthetic rubber was the first clearly labeled as a more or less direct barter agreement. The quantities involved were on the one side 12 million T of oil to be

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[1] Economic Commission for Europe, Economic Bulletin for Europe, Vol. 12, No. 2, Geneva, 1960, p. 34.

supplied by the USSR over the 4-year period 1961-1964, and on the other side, 240,000 metric tons of steel tubing, an unstated amount of pipeline equipment, and 50,000 metric tons of synthetic rubber to be supplied by Italy.[1] In May 1951, the USSR and Italy signed a new agreement under which the USSR would supply an additional 0.8 million T of crude oil and would obtain two chemical plants.[2]

Japan's first imports of small quantities of Black Sea oil were made in 1958. In that year and in the trade negotiations of 1960 and 1961, the agreements have given the appearance of bilateral barter arrangements, with the USSR purchasing tankers and paying for them with crude oil.[3] The placing of Soviet orders for tankers has had something of the character of relieving the Japanese of a surplus: not only do the Japanese shipyards have considerable excess capacity as a result of the present tanker surplus in the non-Soviet world market, they have suffered cancellation of orders placed during the post-Suez tanker boom. As a result the USSR has, in addition to placing new orders, been able

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[1] It is not possible to determine the terms of trade implied in the 1960 Soviet-Italian Agreement, owing to the lack of specification of the pipe and synthetic rubber components and the undefined nature and quantity of the pipeline equipment. The magnitude of the transaction quoted in the press is $200 million, or $100 million in each direction (Oil and Gas Journal, November 28, 1960, p. 37; Petroleum Press Service, November 1960, p. 418). For the Russian oil, this total implies a delivered price of $8.33/T or $1.19/bbl. On the Italian side, if we price steel at $165/T and synthetic rubber at $700/T ($0.32/lb), the breakdown would look like this:

	(million dollars)
240,000 T steel pipe at $165	39.6
50,000 T synthetic rubber at $700	35.0
Residual (pipeline equipment)	25.4
Total	100.0

[2] Ekonomicheskaia gazeta, Moscow, May 27, 1961.

[3] Oil and Gas Journal, February 13, 1961, p. 68.

to pick up orders cancelled by Western (Greek) tanker operators,[1] and has also been negotiating with the Japanese for large diameter pipe for construction of a pipeline from Irkutsk to the Pacific. In both the Italian and the Japanese agreements, the USSR has been following a pattern of acquiring the components of an export-oriented oil transport system. Another example of this is a contract signed with a Swedish firm in February 1961 for the supply of large diameter steel pipe against shipments of Soviet crude oil, refined products, coal, and other goods.[2]

Western Europe shows a variety of ways in which Soviet oil has been able to penetrate markets that were formerly under the tight control of the international oil companies. As pointed out earlier, one of the obstacles to Soviet penetration is that the USSR does not have a distributive apparatus for marketing oil in the West. The USSR has, therefore, to build up such an apparatus or else find an existing distribution system to deal with. By making government to government bulk agreements, the Russians have so far left it to the purchasing governments to introduce Soviet oil into the marketing system. In Denmark, where for some years the government refused to accept Russian oil unless the Russians established their own distribution system, the international oil companies have been obliged to handle Soviet oil since 1958.[3] France has been able to handle Soviet oil without

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[1] Petroleum Press Service, January 1961, p. 21.

[2] Petroleum Week, February 24, 1961.

[3] Petroleum Press Service, February 1959, p. 68.

disturbing existing marketing arrangements because the oil companies operate under tight government regulation in any event, and there is a nationalized oil company (C.F.P., the Compagnie Française des Pétroles) with a distribution system of its own that can dispose of Russian or Saharan or Iraqi crude as it sees fit. In Italy also, the national oil company (E.N.I., the Ente Nazionale Idrocarburi), operating in competition with the international oil companies, has introduced Soviet oil into the Italian (and thence the European) market. In West Germany, which prides itself on a free market in energy products (although it makes some exceptions, such as placing restrictions on the import of U.S. coal), Soviet oil has been handled by independent oil brokers. Many of the latter originally operated in the marketing of coal and have also been marketing surplus fuel oil from non-Soviet sources by cutting prices below those of the major international oil companies. In West Germany's highly developed economic environment, with its independent refineries and numerous storage and distribution facilities controlled by large consumers, the independent brokers have been able to subject the international oil companies to stiff competition.

IV. IMPLICATIONS FOR THE NON-SOVIET WORLD

THE WEST AS CONSUMER VERSUS THE WEST AS PRODUCER

Despite the peripheral activities of the Soviets as suppliers of oil equipment, technical services, and a political counter-weight to the international oil companies, the main reason for their success in promoting exports of their oil is that they are willing to sell it at prices competitive with those set by the international oil companies.

From the point of view of the oil consumers of the non-Soviet world, particularly of those countries that are not self-sufficient in oil, Russian crude is as beneficial as any other cheap oil (e.g., from Libya) that serves to lower the cost of the aggregate volume imported. For India and Ceylon, for example, improvement in their terms of trade as a result of active price competition among oil suppliers would result in considerable savings of both foreign exchange and of real resources. Western Europe, though a net importer of oil, is divided into oil "haves" and oil "have-nots." Until the opening of the Sahara fields, control of the supply of oil was held largely by the British (and Dutch) and the Americans. For the United Kingdom and the Netherlands, therefore, the domestic gains from lower oil prices for imported oil would in part be offset (in the aggregate although not for particular groups) by a decline in profits abroad. For the Italians, Germans, Scandinavians, and until recently the French, any reduction in the cost of oil would improve their position as consumers. In the case of West Germany, whose coal industry suffers from the competition of oil, the benefits of cheap oil would be partly offset by the effects of a decline in the coal industry. Italy and Scandinavia, being heavy importers of fossil fuels, could only gain.

The oil producers -- both the oil companies and the producing countries -- obviously have much to lose from Soviet competition: some of their profits, some of their markets, and their controlling position in world oil. Unless the price elasticity of demand for oil is greater than unity,[1] any price declines instituted to meet Soviet competition mean a reduction in aggregate profits. And if oil prices are not reduced in the face of competitive Soviet offers, consumers are likely to take increasing volumes of Soviet oil.

SOVIET OIL EXPORTS AND THE WEST'S SECURITY OF SUPPLY

Soviet oil shipments to the non-Soviet world, like those of other new suppliers, will of necessity displace part of the expected increases in production and sales by the already established oil producers of the West. From the point of view of non-Soviet consumers, this implies both a benefit and a danger. On the one hand, as we have pointed out above, Soviet oil can be a benefit as it is not likely to break into non-Soviet markets unless it brings with it a clear short-term gain to the purchasers of oil -- either because Soviet oil is made available at lower

[1] I would venture to assert that the oil industry has not tested the price elasticity of its products to any degree. When it was a competitive industry, severe price wars taught it to deal with prices as gingerly as possible. In the heyday of the international oil cartel's control of oil marketing outside the United States, incentives to cut prices to test market expansibility were reduced by several factors, among them the rapid secular increase in demand for oil at current prices and the tendency of governments in the consuming countries to place heavy taxes on oil products for revenue purposes and (particularly in Europe) to protect domestic coal producers.

prices than those offered by the Western oil companies, or because it is provided in exchange for goods the purchaser would otherwise find it difficult to dispose of, or because it is made available on favorable credit terms, or for any of a variety of other reasons. On the other hand, growing reliance on the Soviet bloc for such a strategic commodity as oil exposes non-Soviet consumers to the danger that the incoming flow of oil can be cut off at the whim of the Soviets, as illustrated by the interruption of shipments from the USSR to Israel at the time of the Sinai invasion in 1956. However, the extent of this danger can easily be exaggerated.

One of the things to be borne in mind is that, even without the re-entry of Russian oil into the world market, much of the non-Soviet world's oil has become strategically undependable owing to the weakening or destruction of the British, French, and American positions in the Middle East since the end of World War II. A case can be made for the proposition that reliance on the Middle East, which produced 29 per cent of the non-Soviet world's oil[1] and supplied 80 per cent[2] of Western Europe's oil consumption in 1959, is itself dangerous and ought to be reduced. One factor that reduces the West's dependence on the Middle East oil producers is the existence of alternative (and preferably cheap) sources of oil supply. The emergence of the USSR as a major oil exporter establishes an additional source of low-cost oil for Western consumers, although it is likely to be an even more unreliable source than the Middle East.

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[1]U.S. Bureau of Mines, World Petroleum Statistics 1959, Washington, July 25, 1960, Table 1.

[2]Petroleum Press Service, March 1961, p. 88; April 1961, p. 134.

Despite the strategic unreliability of Soviet oil, one of the immediate consequences of its current availability as a competitor to Middle East oil is that it somewhat weakens the bargaining position of the Middle East oil producers vis-a-vis the international oil companies and the consuming countries of the West. In the normal course of trade, the availability of Soviet oil to Western Europe will serve as a damper on Middle East oil prices, though not necessarily on producer governments' demands to increase their share of oil revenues. In the event of future bargaining difficulties, the availability of Soviet oil to Western Europe may also reduce the probability that the producer governments would break entirely with the international oil companies. In a political crisis between Western Europe and the Middle East in which the USSR supported the Middle East oil producers by cutting off Soviet oil shipments, Western Europe would at least be no worse off than if there had been no Soviet shipments to begin with -- provided that it was Middle East oil that had been displaced by Soviet shipments in the first place.

The preferred position of the established international oil companies in Middle East production stems to a large extent from their control of the marketing facilities of the non-Soviet world. A competing world-wide distribution system set up by the USSR on a scale sufficient to handle its own exports and large volumes of oil in addition to its own exports, would go a long way toward forcing the international companies out of their preferred position. If, in the event of serious disagreement between the oil companies and the governments of the Middle East producers, the USSR undertook to handle Middle East oil, and in addition were willing to handle Middle East oil instead of its own, it could seriously damage the position of the oil companies.

Over a long period, loss of markets to the USSR and additional losses of earnings as a result of the general downward pressure on oil prices exerted by Soviet competition, could, of course, reduce future rates of expansion in the non-Soviet oil industry. This is particularly true because of the international oil companies' practice of financing expansion largely or entirely out of profits on the sale of crude, particularly Middle East crude. Unless investment funds for expansion could be raised in sufficient volume in the capital markets of the West, the past rates of expansion might not be maintained. And the availability of sufficient funds is by no means sure, given the probable reluctance of private investors to commit their capital to the politically (and economically) risky areas where oil is produced without the possible prize of high rates of profit. As a result of reduced rates of expansion over a period of years, the availability of non-Soviet capacity (and of shut-in capacity) would be lower than it might otherwise be.

For the most part, however, the problem of vulnerability can be reduced to a single question: Whose shipments will be displaced by increased Soviet oil exports? If it is Middle East oil that is displaced, the net loss in reliability of supply may not be great, since the flow of Middle East oil to Western Europe is subject to the hazards of both political antipathy and accidental disturbances. The loss in physical availability of production may be negligible. If our concern is with a shutdown of the flow of Soviet oil, the relevant consideration is that shut-in capacity in the Middle East itself is likely to remain (or can easily be kept) at a level high enough to replace Soviet shipments even if much of current Middle East production is displaced by Soviet oil. On the other hand, if we are concerned with a shutdown of the flow of Middle East oil, there is at least a possibility that the USSR might choose to profit from a shutdown of Middle East oil by raising its own prices or increasing its own sales.

The only reduction in availability that might result from the expansion of Soviet oil exports, under these circumstances, would arise as a consequence of a reduction in the number of tankers in the hands of the West. This might occur if the Soviet bloc acquired its own tanker fleet to carry Soviet oil exports (thereby indirectly reducing the number of Western-owned tankers in current operation), or if Soviet oil entered Europe by pipeline from the Ural-Volga fields (thereby reducing the overall current use of tankers and the eventual size of the Western-owned, and in fact the world, tanker fleet). In this case, strategic vulnerability could be reduced by maintaining a reserve tanker fleet, the cost of which it might be wise for the consumer-beneficiaries of lower cost Soviet oil (such as Italy and West Germany) to bear.

Displacement of Venezuelan or other Western Hemisphere oil production by Soviet oil exports would create a more serious threat to the long-term security of Western supply, for two reasons. The Western Hemisphere producers are politically more stable and from the Western point of view more dependable than the Middle East producers. The second reason is that, although shut-in capacity in the Middle East is likely to stay at extremely high levels (because of the great productivity of the Persian Gulf wells) even if markets are lost to the USSR, Western Hemisphere shut-in capacity is much more closely linked to the volume of current production. If the latter declines (or fails to rise), a concomitant loss of shut-in capacity will result. To reduce the strategic vulnerability of Western Europe to a shutdown of oil from the Middle East or the USSR, it is necessary to maintain capacity in more "reliable" areas, particularly in the Western Hemisphere.

LIMITATIONS ON THE SOVIET OIL EXPORT DRIVE

Although politically the Soviet oil export drive has so far produced only gains for the USSR, these gains have been registered in the oil consuming countries. As Soviet oil sales mount, negative reactions are likely in the oil producing countries of the underdeveloped world. Cuba's purchases from the USSR supplant sales by Venezuela. India's purchases from the USSR displace sales by the Middle East -- particularly by Iran but by the Arab producers as well. Egypt's imports of Soviet oil displace Arab oil. Indeed, the lack of audible reactions from the Arabs to the loss of Egypt as a market for Arab oil in the recent past may be attributed to the fact that Cairo makes most of the noise for the Arab world. As the competition becomes keener, so will resentment against Soviet aggressiveness. This may not bother the USSR at the present time because the governments of oil producing countries (such as Iran, Venezuela, Saudi Arabia, Kuwait, and even Iraq) are wholeheartedly or halfheartedly anti-Soviet anyhow. But the Soviet role as a competing producer of oil should make future Russian blandishments less acceptable than they might otherwise be. For example, at least some of the members of the second Arab Petroleum Congress held in

Beirut in October 1960, reacted unfavorably to a statement by Y. Gurot, the head of the Soviet delegation to the Congress (and president of the Soviet oil export trust), that the USSR intended to regain its pre-World War II share (some 14 per cent) of the European oil trade.[1]

There is a limitation on the USSR's oil export opportunities that will make itself felt only after a time, as the maneuverability of the Soviets in making new oil deals tends to diminish with increases in their sales to the non-Soviet world. As a larger volume of their total oil supply is committed under contract for agreed lengths of time, the USSR may have less oil to play with in making new deals. Furthermore, Soviet ability to cut prices in specific deals is, at present, due in part to the fact that they do not yet stand to lose by resulting revisions in already existing arrangements. Soviet freedom of action in pricing may diminish as the USSR accumulates a stock of existing contracts with customers who would complain unless their own contracts were revised to accord with new ones being made. With their own previous contracts as the reference point for new bargaining, possible loss of profits on existing contracts may well impose on the Soviet export agency the same kind of restraint that it forces on the Western oil companies.

WHAT CAN THE WEST DO ABOUT SOVIET OIL?

The non-Soviet world can react to the threat of Russian oil, if it feels it to be a threat, either in its role as producer or in its role

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[1] [Halford L. Hoskins and Leon Herman], Soviet Oil in the Cold War, op. cit., p. 8.

as consumer. The obstacle to consistent and effective action is that there are numerous conflicts within the West: among producers, between producers and consumers, and among consumers.

The effectiveness of an outsider in cutting oil prices in the world market arises from the fact that prices scheduled by the insiders are high enough to keep the high cost producers in the Caribbean (and the U.S. Gulf States) operating profitably. This level of prices leaves a wide spread between costs and prices in the low cost producing areas such as the Middle East or the particularly prolific producing areas such as Maracaibo and the newer USSR fields. The spread between costs and prices is wide enough to tempt outsiders with efficient producing sources to cut prices; but it also means that any price reduction offered by an outsider (e.g., the Soviets) can be met by the insiders if they are willing to cut into their unit profit on Middle East oil.

Meeting the price competition of outsiders raises a number of difficulties for the established oil producers of the non-Soviet world. The first is that in oil, where marginal costs of producing from existing wells under free flow can be almost zero, vigorous price competition can easily lead to disastrous price wars -- as it did in the market struggle between Shell and Standard Oil in the early days of the oil industry. This might lead to the dismantling of the already shaky structure of the world's oil market, an occurrence the producers of the West (and probably the USSR as well) have a great incentive to avoid.

A second difficulty is that it is not so much the producing areas of the Middle East that stand to lose their markets to Soviet competition as it is the high cost areas such as the Caribbean, which is already in trouble because of the opening up of new sources of oil in North Africa and the increasing shut-in capacity in the Persian Gulf. To the extent that the oil companies are concerned with their corporate interests in the Caribbean as well as in the Middle East, and to the extent the West has strategic interests in the stability and growth of the Caribbean producing countries, a chain of price-cutting that ended by knocking out Venezuelan production would be highly undesirable.

A third difficulty is that the oil producers now include two sets of powerful and articulate, vested interests: the oil companies themselves and the royalty-receiving governments of the countries where oil is produced. So long as profits on oil production are shared by the oil companies and the producer governments according to fixed proportions, any price cuts instituted by the oil companies in meeting outside competition will be reflected in a decline in government receipts per unit of oil sold. With government budgets predicated on increasing sales of oil at fixed (or even increasing) unit prices, price cuts appear as a national disaster to producer governments and raise havoc with relations between them and the oil companies. There remains the possibility that the oil companies could absorb more than a proportionate share of price cuts. This is painful enough when it occurs as now, as a result of sales of oil at discounts from the posted prices that are the basis for calculation of royalty payments. To formalize it by changing the contractual proportions for dividing profits (still 50-50 in most dealings of the international oil companies)[1] would be

[1] Except in Venezuela where a unilateral change in the tax law by the government at the end of 1958 increased the government's share -- and led to a drastic decline in oil company activity in the country.

fought tooth and nail by the oil companies.

As the major consumer in the non-Soviet world, Western Europe could, if it wanted to, keep out Soviet oil. But Western Europe is not a unified and protected market like the USSR or (for oil) the United States. In Western Europe, a relatively free market does exist, with competing suppliers, competing consumers, and old conflicts of political and economic interest. Since France has become a producer of overseas oil in its own right, it has lost some of its old resentment of British and American control of Middle East and Western Hemisphere oil supplies. Germany and Italy are, however, still on the outside; and Italy especially is not inclined to sympathize with the international oil companies who, among many other sins, have discovered and are producing oil in Italy's former colony, Libya. Italy now has concessions in the Persian Gulf (in Iran), but until E.N.I. becomes a major overseas producer there is every likelihood that its director, Mattei, will continue to flirt with the Russians. Italy, still on the outside as a supplier, is happy to use its position as a consumer to disrupt the control exercised by the insiders.

The threat posed by the entry of Soviet oil into Western Europe is thus an effective one because Western Europe's oil market is hampered by its own institutional framework. On the one hand, the international oil companies have to guard their established interests as producers in many places around the world, but no longer have sufficient control of the market to manipulate prices at will. On the other hand, there is a sharp conflict of interests in Western Europe, preventing the establishment of a common policy to freeze out the Russians.

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Japan is in a position similar to Italy's, with its own concession in the Persian Gulf (offshore from the Neutral Zone between Kuwait and Saudi Arabia) but still a heavy importer of oil through the marketing channels of the international oil companies. The Japanese do not go out of their way to antagonize the latter,[1] but are willing to buy their oil where they can get it cheapest.

An effective attempt to keep Soviet oil out of the established markets in the industrialized regions of the West would have to combine some form of joint protection with compensation to the oil have-nots. This compensation might take the form of special price reductions or of a greater sharing of control of (and profits from) overseas oil operations -- none of which would be very palatable to the international oil companies. If such an attempt were successful, it might lead the USSR to use the oil kept out of the protected markets to intensify competition in the underdeveloped countries and attempt to increase Soviet political gains there as compensation for the economic gains that protection of the industrialized markets forced them to forego.

Clearly one course of action is to cut the Russians into the market without a fight by reconstituting an international oil cartel with Russian participation and thus assure them of an "adequate" share of the market. Re-establishment of an effective cartel would be no easy matter, as the producer governments of the Caribbean and the Persian Gulf have recently come to realize during the discussions accompanying

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[1]The Japanese government has so far refused to give the Japanese company operating in the Persian Gulf preferential treatment in the Japanese market (Petroleum Press Service, May 1961, p. 184).

the establishment of OPEC. Too many diverging producer interests (both competing oil companies and competing producing regions with different expected rates of growth) have to be satisfied to make the prospect of an effective cartel a likely one. One would suspect, moreover, that the Russians might like to enter a cartel which would allocate sales in a well-controlled area like Western Europe, but would retain their freedom of action in the underdeveloped areas of the world where they have a better chance of gaining influence than in Europe.

The prospects of organized resistance to Soviet penetration of the oil markets of the non-Soviet world would therefore seem to be slim. If the West chooses to relax and enjoy the benefits of cheaper oil and lower-cost energy whatever its geographical source, it would be wise for it to take measures to ensure continuity of supply. Two things are needed: maintenance of adequate surplus capacity in the more "reliable" producing areas; and retention of a reserve tanker fleet large enough to carry Western needs from the alternative sources of supply. Such measures are already called for by the unreliability of the Middle East as a source for the West, and increasing dependence on Soviet oil would make them even more desirable.

APPENDIX TABLES

Table A-1

USSR OIL EXPORTS (CRUDE OIL AND REFINED PRODUCTS COMBINED), 1955-1959, BY COUNTRY OF DESTINATION
(in millions of T/year and thousands of bbls/day)

Destination	Millions of T/year					
	1955	1956	1957	1958	1959	Plan 1965
TOTAL	8.0	10.1	13.7	18.1	25.4	..
Soviet bloc	3.3	4.9	7.2	8.5	10.8	..
Eastern Europe	2.2	2.9	5.0	5.7	7.3	17.5
Czechoslovakia	(0.5)	(0.8)	(1.3)	(1.5)	(1.9)	(5.5)
East Germany	(0.7)	(0.7)	(1.0)	(1.1)	(1.8)	(4.8)
Hungary	(0.2)	(0.3)	(1.0)	(1.1)	(1.3)	(2.2)
Poland	(0.7)	(0.9)	(1.3)	(1.5)	(1.9)	(4.0)
Other	(0.1)	(0.2)	(0.4)	(0.5)	(0.5)	(1.0)
Far East	1.1	2.0	2.1	2.8	3.5	..
China	(1.0)	(1.7)	(1.8)	(2.5)	(3.1)	
Other	(0.1)	(0.3)	(0.3)	(0.3)	(0.4)	
Non-Soviet world	3.3	5.1	6.1	9.6	14.5	..
Western Hemisphere	0.0	0.0	-	1.1	1.1	..
Argentina	(-)	(-)	(-)	(0.9)	(0.5)	
Cuba	(-)	(-)	(-)	(-)	(-)	
Uruguay	(0.0)	(0.0)	(-)	(0.2)	(0.5)	
Other	(-)	(-)	(-)	(-)	(0.1)	
Western Europe	2.5	3.7	4.7	6.1	10.7	..
Austria	(0.0)	(0.0)	(0.0)	(0.1)	(0.5)	
France	(0.3)	(0.4)	(0.6)	(0.7)	(0.8)	
Greece	(0.1)	(0.2)	(0.3)	(0.4)	(0.4)	
West Germany	(0.0)	(0.1)	(0.7)	(0.6)	(1.1)	
Iceland	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	
Italy	(0.2)	(0.5)	(0.5)	(1.1)	(3.0)	
Sweden	(0.7)	(0.7)	(0.5)	(0.9)	(1.4)	
Finland	(0.6)	(1.0)	(1.0)	(1.2)	(1.9)	
Yugoslavia	(0.2)	(0.3)	(0.4)	(0.4)	(0.4)	
Other	(0.1)	(0.2)	(0.4)	(0.4)	(0.8)	
Other E. Hemisphere	0.8	1.4	1.4	2.4	2.7	..
United Arab Republic	(0.3)	(0.9)	(1.1)	(2.1)	(2.4)	
India	(-)	(-)	(-)	(-)	(-)	
Israel	(0.5)	(0.4)	(-)	(-)	(-)	
Other	(0.0)	(0.1)	(0.3)	(0.3)	(0.3)	
Unaccounted	1.4	0.1	0.4	0.0	0.1	..

Sources and Notes: [end of table]

Table A-1 (continued)

	Thousands of bbls/day					
Destination	1955	1956	1957	1958	1959	Plan 1965
TOTAL	160	202	274	362	508	..
Soviet bloc	66	98	144	172	216	..
Eastern Europe	44	58	100	116	146	350
Czechoslovakia	(10)	(16)	(26)	(30)	(38)	(110)
East Germany	(14)	(14)	(20)	(22)	(36)	(96)
Hungary	(4)	(6)	(20)	(22)	(26)	(44)
Poland	(14)	(18)	(26)	(30)	(38)	(80)
Other	(2)	(4)	(8)	(12)	(10)	(20)
Far East	22	40	42	56	70	..
China	(20)	(34)	(36)	(50)	(62)	
Other	(2)	(6)	(6)	(6)	(8)	
Non-Soviet world	66	102	122	190	290	..
Western Hemisphere	0	0	-	22	22	..
Argentina	(-)	(-)	(-)	(18)	(10)	
Cuba	(-)	(-)	(-)	(-)	(-)	
Uruguay	(0)	(0)	(-)	(4)	(10)	
Other	(-)	(-)	(-)	(-)	(2)	
Western Europe	50	74	94	122	214	..
Austria	(0)	(0)	(0)	(2)	(10)	
France	(6)	(8)	(12)	(14)	(16)	
Greece	(2)	(4)	(6)	(8)	(8)	
West Germany	(0)	(2)	(14)	(12)	(22)	
Iceland	(6)	(6)	(6)	(6)	(8)	
Italy	(4)	(10)	(10)	(22)	(60)	
Sweden	(14)	(14)	(10)	(18)	(28)	
Finland	(12)	(20)	(20)	(24)	(38)	
Yugoslavia	(4)	(6)	(8)	(8)	(8)	
Other	(2)	(4)	(8)	(8)	(16)	
Other E. Hemisphere	16	28	28	48	54	..
United Arab Republic	(6)	(18)	(22)	(44)	(48)	
India	(-)	(-)	(-)	(-)	(-)	
Israel	(10)	(8)	(-)	(-)	(-)	
Other	(0)	(2)	(6)	(4)	(6)	
Unaccounted	28	2	8	0	2	..

Sources and Notes: [end of table]

Table A-1 (continued)

Sources: 1955: Foreign Trade of the USSR in 1956 (in Russian), Moscow, 1958.

1956, 1957: Foreign Trade of the USSR in 1957 (in Russian), Moscow, 1958.

1958, 1959: Foreign Trade of the USSR in 1959 (in Russian), Moscow, 1960; see also: Petroleum Press Service, September 1960, p. 329; and Theodore Shabad, Russia's Potential in Future World Markets, paper presented to American Petroleum Institute, Chicago, November 10, 1959, mimeo., p. A-9.

1965: Petroleum Week, April 10, 1959, p. 31.

Notes: Conversion ratio: T/year x 0.02 = bbls/day.

0.0 Less than 0.05.
\- Zero.
.. Not available.
( ) Figures in parentheses add to give unbracketed figure immediately above.

Table A-2

USSR OIL IMPORTS (CRUDE OIL AND REFINED PRODUCTS COMBINED), 1955-1959, BY COUNTRY OF ORIGIN
(in millions of T/year and thousands of bbls/day)

	Millions of T/year					Thousands of bbls/day				
Origin	1955	1956	1957	1958	1959	1955	1956	1957	1958	1959
TOTAL	4.4	5.3	4.2	4.3	4.4	88	106	84	86	88
Soviet bloc	3.9	3.9	3.1	3.3	3.4	78	78	62	66	68
Eastern Europe	3.9	3.9	3.1	3.3	3.4	78	78	62	66	68
Rumania	(3.4)	(3.4)	(2.6)	(2.8)	(2.9)	(68)	(68)	(52)	(56)	(58)
Other	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(10)	(10)	(10)	(10)	(10)
Far East	-	-	-	-	-	-	-	-	-	-
Non-Soviet world	0.5	1.4	1.1	1.0	1.0	10	28	22	20	20
Western Hemisphere	-	-	-	-	-	-	-	-		
Western Europe	0.5	1.4	1.1	1.0	1.0	10	28	22	20	20
Austria	(0.5)	(1.4)	(1.1)	(1.0)	(1.0)	(10)	(28)	(22)	(20)	(20)
Other Eastern Hemisphere	-	-	-	-	-	-	-	-	-	-

Sources and Notes: See Table A-1.

Table A-3

ENERGY PRODUCTION AND CONSUMPTION IN UNITED STATES, OEEC COUNTRIES COMBINED, AND USSR, 1955, 1958, 1965, 1975

(in various units)

	Unit[a]	United States (RFF estimates)[b] 1955	1958	1965	1975
Production:					
Coal & lignite	mill T HCE	450[c]	..	..	..
Crude oil	mill bbls	2,484	..	..	..
	mill b/d	6.8	..	..	..
	mill T	340	..	..	..
	mill T HCE	494	..	..	..
Natural gas	bill cu ft	10,179	..	..	..
	bill cf/d	27.9	..	..	..
	bill m^3	285	..	..	..
	mill T HCE	369	..	..	..
Natural gas liquids	mill bbls	281	..	..	..
	mill b/d	0.8	..	..	..
	mill T	40	..	..	..
	mill T HCE	57	..	..	..
Hydro-power	bill kWh	120	..	..	..
	mill T HCE	50	..	..	..
Consumption:					
Coal & lignite	mill T HCE	400[c]	..	..	667[c]
Crude oil	mill bbls	2,774	..	..	5,154
	mill b/d	7.6	..	..	14.1
	mill T	380	..	..	705
	mill T HCE	555	..	..	1,016
Natural gas	bill cu ft	9,614	..	..	19,881
	bill cf/d	26.3	..	..	54.4
	bill m^3	269	..	..	556
	mill T HCE	334	..	..	690
Natural gas liquids	mill bbls	260	..	..	769
	mill b/d	0.7	..	..	2.1
	mill T	35	..	..	105
	mill T HCE	51	..	..	152
Hydro-power	bill kWh	120	..	..	265
	mill T HCE	50	..	..	83

Sources and Notes: [end of table]

Table A-3 (continued)

	Unit[a]	OEEC Countries 1955	1958	1965	1975
Production:					
Coal & lignite	mill T HCE	507	504	490	490
Crude oil	mill bbls	66	88	146	256
	mill b/d	0.18	0.24	0.4	0.7
	mill T	9	12	20	35
	mill T HCE	13	18	30	50
Natural gas	bill cu ft	175	255	694	1,570
	bill cf/d	0.48	0.7	1.9	4.3
	bill m^3	5.3	7.7	20	45
	mill T HCE	7	10	25	60
Natural gas liquids	mill bbls	-	-	-	-
	mill b/d	-	-	-	-
	mill T	-	-	-	-
	mill T HCE	-	-	-	-
Hydro-power	bill kWh	140	173	240	350
	mill T HCE	56	69	95	140
Consumption:					
Coal & lignite	mill T HCE	535	511	550	550
Crude oil	mill bbls	766	1,022	1,752	2,884
	mill b/d	2.1	2.8	4.8	7.9
	mill T	107	142	243	393
	mill T HCE	159	201	340	550
Natural gas	bill cu ft	182	255	803	3,650
	bill cf/d	0.5	0.7	2.2	10.0
	bill m^3	5.3	7.7	23.2	105
	mill T HCE	7	10	30	135
Natural gas liquids	mill bbls	-	-	-	-
	mill b/d	-	-	-	-
	mill T	-	-	-	-
	mill T HCE	-	-	-	-
Hydro-power	bill kWh	139	173	240	350
	mill T HCE	56	69	95	140

Sources and Notes: [end of table]

Table A-3 (continued)

	Unit[a]	USSR 1955	1958	1965	1972	1975
Production:						
Coal & lignite	mill T HCE	303	365	439	515	..
Crude oil	mill bbls	511	840	1,752	2,738	..
	mill b/d	1.4	2.3	4.8	7.5	..
	mill T	71	113	240	375	..
	mill T HCE	99[d]	158[d]	336[d]	539[d]	..
Natural gas	bill cu ft	292	986	5,292	10,402	..
	bill cf/d	0.8	2.7	14.5	28.5	..
	bill m^3	8.4	28	150	273	..
	mill T HCE	11	34	178	321	..
Natural gas liquids	mill bbls	-	-	-	-	..
	mill b/d	-	-	-	-	..
	mill T	-	-	-	-	..
	mill T HCE	-	-	-	-	..
Hydro-power	bill kWh	21	45	75	188	..
	mill T HCE	9	18	30	75	..
Consumption:						
Coal & lignite	mill T HCE	303	359	..	..	..
Crude oil	mill bbls	470	730	..	..	..
	mill b/d	1.3	2.0	..	..	..
	mill T	67	98	..	..	..
	mill T HCE	93[d]	138[d]	..	..	..
Natural gas	bill cu ft	292	986	..	..	..
	bill cf/d	0.8	2.7	..	..	..
	bill m^3	8.4	28	..	..	..
	mill T HCE	11	34	..	..	..
Natural gas liquids	mill bbls	-	-	..	..	..
	mill b/d	-	-	..	..	..
	mill T	-	-	..	..	..
	mill T HCE	-	-	..	..	..
Hydro-power	bill kWh	23	46	..	..	..
	mill T HCE	9	18	..	..	..

Sources and Notes: [end of table]

Table A-3 (continued)

Sources: United States: Sam Schurr et al., Energy in the American Economy 1850-1975: Its History and Prospects, Baltimore, Johns Hopkins for Resources for the Future, 1960, pp. 63, 86, 130, 141, 238-239, 736.

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USSR: 1955: ECE, Energy Situation in Europe, op. cit., pp. I.25-27, 29.

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Production: ECE, Economic Survey of Europe in 1959, op. cit., p. A-13.

Consumption: Petroleum Press Service, London, October 1960, p. 364.

1972: Ibid.

Notes: a. Conversion factors:

Crude oil and natural gas liquids:

T x 0.02 = bbls/day; bbls/day x 50 = T;

T x 1.4 = T HCE.

Natural gas:

m^3 x 0.096 = cu ft/day; cu ft/day x 10.23 = m^3;

1,000 m^3 x 1.3 = T HCE

Hydro-power: 1,000 kWh x 0.40 = T HCE.

b. Converted from Btu's using following conversion factor:

T HCE = 10^{12} Btu's x 0.35.

c. Given by Schurr et al. in tons and Btu's rather than metric tons (T).

d. Excluding shale.

.. Not available.

\- Zero.

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