IMPACT OF
OIL EXPORTS
FROM THE
SOVIET BLOC

Volume I

A Report of the

NATIONAL PETROLEUM COUNCIL

—1962—

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SOVIET BLOC

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VOLUME I

A Report of the

NATIONAL PETROLEUM COUNCIL'S
COMMITTEE and WORKING SUBCOMMITTEE

on the

IMPACT OF OIL EXPORTS FROM THE SOVIET BLOC

Adopted by the National Petroleum Council
October 4, 1962

NATIONAL PETROLEUM COUNCIL
Washington, D. C.

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NATIONAL PETROLEUM COUNCIL

(Established by the Secretary of the Interior)

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October 3, 1962

Mr. J. Ed Warren
Chairman, NPC Committee on
Impact of Oil Exports from
the Soviet Bloc
c/o Cities Service Company
60 Wall Tower
New York 5, New York

Dear Mr. Warren:

Your Working Subcommittee on the Impact of Oil Exports from the Soviet Bloc has completed its assignment, and I am pleased to transmit herewith the final report. The comprehensive study is presented in two volumes. Volume I includes our comments and conclusions, together with a Summary of Volume II. Volume II contains the detailed data compiled by the Subcommittee.

In the compilation of this report, the Subcommittee has reviewed a vast amount of facts and data to arrive at an analysis of the current oil export policy of the Soviet Bloc and its impact on the Free World Nations. It is believed that it is vital to keep informed on future developments in this area. Accordingly, your Subcommittee recommends that the National Petroleum Council suggest to the Department of the Interior that it consider the advisability of requesting the Council to prepare periodic reports and evaluations of Soviet oil developments.

Sincerely yours,

George D. Piercy, Chairman
Working Subcommittee
NPC Committee on Impact of
Oil Exports from the Soviet Bloc

F O R E W O R D

This is Volume I of a two-volume report of the National Petroleum Council prepared pursuant to a request of the Department of the Interior that the Council make a factual study of the effects on the Free World of the exports of petroleum from the Soviet Bloc, together with such comments and conclusions as deemed appropriate.

To make the requested study, the National Petroleum Council established the Committee on the Impact of Oil Exports from the Soviet Bloc, and the Working Subcommittee thereof. The Subcommittee gathered and studied a vast number of facts and data related to oil exports from the Soviet Bloc. In this Volume I, the Subcommittee presents its comments and conclusions, based upon an analysis of the detailed data contained in Volume II, as well as a concise summary of Volume II. The comprehensive detail obtained and examined by the Subcommittee comprises Volume II.

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G E N E R A L

T A B L E O F C O N T E N T S

VOLUME I

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PART ONE

REPORT OF
WORKING SUBCOMMITTEE
NPC COMMITTEE ON
IMPACT OF OIL EXPORTS
FROM THE SOVIET BLOC

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REPORT OF WORKING SUBCOMMITTEE
NPC COMMITTEE ON IMPACT OF OIL
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P R E F A C E

In considering the problem of Soviet oil, it should be emphasized at the outset that, as a result of an absolute state monopoly over its foreign trade, the Soviet Bloc is in a unique position to use trade for political purposes. Politics and trade cannot be considered apart when dealing with the communists.

The ultimate goal of the Soviet Bloc is to extend its political control, destroy freedom, and communize the world, and it uses its monopoly of foreign trade to further these objectives. This, in short, is the problem the Free World faces when trading with the Soviet Bloc.

PART ONE

COMMENTS AND CONCLUSIONS

OF THE

REPORT OF THE WORKING SUBCOMMITTEE NATIONAL PETROLEUM COUNCIL'S COMMITTEE ON THE IMPACT OF OIL EXPORTS FROM THE SOVIET BLOC

INTRODUCTION

On November 28, 1961, the Assistant Secretary of the Interior, the Honorable John M. Kelly wrote to Walter S. Hallanan, then Chairman of the National Petroleum Council, as follows:

> The Department of the Interior views with concern the growing shipments of petroleum from the Soviet Bloc to the Free World. Because of the varied but widespread impact of these shipments upon Free World nations and upon international relationships between the United States and other nations, it is greatly in the interest of national security for this situation to be better understood.
>
> Accordingly, the National Petroleum Council is requested to make a factual study of the effects on the Free World of the exports of petroleum from the Soviet Bloc, together with such comments and conclusions as are deemed appropriate.

In response to this request, the National Petroleum Council formed the Committee on the Impact of Oil Exports from the Soviet Bloc, as well as a Working Subcommittee.

The parent Committee provided the Working Subcommittee with a detailed outline for its study which asked for a complete and comprehensive review of the Soviet Bloc's energy resources, its petroleum industry, its trade with the Free World and, in particular, the impact of the petroleum trade on the Free World. The Subcommittee has followed this comprehensive approach to the extent practicable. The many detailed items of information gathered and examined in the course of the Subcommittee's study

are presented separately in Volume II. A summary of that detail is given in Part Two of this Volume. The plan of this study can be briefly outlined as follows:

a. The petroleum industry in the USSR was studied in considerable depth. This involved an evaluation of:

(1) Quality and scope of its prospective sedimentary areas
(2) Exploratory effort
(3) Development drilling
(4) Reserves
(5) Production and methods of production
(6) Refining
(7) Transportation facilities
(8) Costs
(9) Investments
(10) Consumption
(11) Trade
(12) Projections for the future

b. To the extent possible, the petroleum industry within each of the other countries of the Bloc was also examined in detail. For many of the Satellites, the data were more limited; however, this deficiency is not of particular significance since the USSR produces about 90 percent of the Bloc petroleum, and this percentage is expected to increase. Hence, the USSR is the critical component of the Bloc petroleum industry.

c. From the supply/demand relationship for each country and for the overall Bloc, a future exportable surplus of petroleum was ascertained. However, petroleum being only one form of energy, it was necessary to study all other forms of energy in order to be certain that the estimates for petroleum were consistent with the overall energy supply and demand.

d. The Committee also studied past Bloc petroleum exports to the Free World, how this petroleum was absorbed, its effect on producing and importing countries, and its contribution as a foreign exchange earner for the Bloc.

But since petroleum exports are only a part of the Soviet Bloc foreign trade they could not be properly evaluated in isolation. This led to a study in some depth of the entire Bloc trade, its motivations and its effects.

In making this study it was necessary for the Committee to rely on USSR published statistics and comments. Generally, the historical data on the USSR's oil industry, except for the tanker fleet, are from Soviet statistics. The sources of the data are documented in Volume II, but are omitted in this Volume for the sake of brevity. Throughout the report the word "plan" has been used to denote an official plan of the USSR or Satellite and the word "estimate" to refer to estimates made by the Committee.

C O N C L U S I O N S

The study conducted by the Subcommittee resulted in the following conclusions:

1. SOVIET BLOC ENERGY IS COAL DOMINATED

The present importance of coal as a source of energy to the Bloc as a whole is shown in Table I.

TABLE I

ENERGY PRODUCTION IN THE SOVIET BLOC - 1960
(Million Metric Tons of Standard Fuel
of 27,780,000 BTU Per Ton)

	USSR	EAST EUROPE	COMMUNIST CHINA *	TOTAL	PERCENT OF TOTAL
Coal	373	239	298	910	71
Petroleum	212	21	8	241	19
Natural Gas	54	17	NA	71	6
Hydroelectric	24	3	30	57	4
TOTAL	663	280	336	1,279	100
PERCENT OF BLOC	52	22	26		100

* In this Table, China is the only Far East country included because of incomplete data on the other Far East Satellites.

Since liquid petroleum today supplies only 19 percent of the energy of the Bloc, the leverage the other forms have on petroleum is great. Slight percentage-wise shifts in the production of coal would be multiplied several-fold on the amount of petroleum needed to satisfy internal demand and the volume available for export. Such shifts could be executed in planned economies.

Of the total production of energy in 1960, the Bloc as a whole exported to the Free World the equivalent of 51.6 million metric tons of standard fuel, or 4 percent of its energy production. Two-thirds of this exported energy was petroleum. The total Bloc energy production of 1.3 billion metric tons of standard fuel in 1960 compares to the U. S. production in that year of 1.5 billion metric tons of standard fuel.

Of the total Bloc energy produced in 1960, 52 percent was supplied by the USSR, with the remainder produced in nearly equal amounts by China and the European Satellites.

2. THE USSR IS THE DOMINANT PETROLEUM PRODUCER IN THE BLOC

It will be noted from Table I that the USSR produces about three-fourths of the natural gas produced in the Bloc. With regard to liquid petroleum, the USSR's position is even more dominant. Table II summarizes the estimated petroleum supply and demand picture for the entire Bloc for 1961 and 1965.

TABLE II

SOVIET BLOC PETROLEUM BALANCE
(Thousand Barrels Per Day)

	1961		1965 ESTIMATE	
	PRODUCTION	CONSUMPTION	PRODUCTION	CONSUMPTION
USSR	3,320	2,600	5,400	4,000
East Europe	336	390	371	615
Communist China and Far East	106	176	140	276
TOTAL BLOC	3,762	3,166	5,911	4,891
NET EXPORTS FROM BLOC		596*		1,020 (Available)

* Represents total exports of 610,000 barrels per day less Bloc imports from the Free World. Throughout this report Cuba and Yugoslavia data are included in Free World data.

Total Bloc petroleum production has increased from 2,010,000 barrels per day in 1956 to 3,762,000 barrels per day in 1961, for an average increase of 12 percent per year, and the Committee predicts that this total will reach about 5,900,000 barrels per day by 1965 (including natural gas liquids and synthetics). The great bulk of the petroleum production increase has in the past and will in the future come from the USSR. She provided 85 percent of Bloc petroleum production in 1956, 88 percent in 1961, and is expected to provide 91 percent in 1965. There will be an increasing deficiency of indigenous supplies in the Satellite countries relative to their consumption. The Soviet production will be sufficient to meet this deficiency and still permit ever-increasing exports to the Free World.

Clearly, from the standpoint of Bloc petroleum production, the USSR is the force to be reckoned with. For this reason the Committee has analyzed the energy base of the USSR in considerable detail.

3. TOTAL ENERGY PRODUCTION IN THE USSR IN 1965 WILL APPROXIMATE PLAN

The USSR has been successful in developing its energy at the rapid rate of 8-9 percent per year for the last decade. The Committee's estimate of energy production in the USSR in 1965 is as follows:

TABLE III

TOTAL ENERGY PRODUCTION IN THE USSR

SOURCE OF ENERGY	UNIT OF NATURAL MEASURE*	1961 NATURAL UNITS	1961 MMTSF **	1961 PERCENT OF TOTAL	1965 ESTIMATE NATURAL UNITS	1965 ESTIMATE MMTSF **	1965 ESTIMATE PERCENT OF TOTAL
Coal	MMT	510.	372	48.8	565.	424	39.6
Crude Oil	M/B/D	3.32	237	31.0	5.30	379	35.5
Natural Gas	TCF	2.08	71	9.3	4.77	162	15.2
Hydro-electric	BKWH	57.	27	3.5	90.	41	3.8
Nuclear	BKWH	-	-	0	6.6	3	0.3
Sub-Total			707	92.6		1,009	94.4
Peat		-	22	2.9	-	27	2.5
Shale		-	5	.7	-	7	0.7
Fuelwood		-	29	3.8	-	26	2.4
TOTAL			763	100.0		1,069	100.0

*MMT = Million Metric Tons
M/B/D = Million Barrels Per Day
TCF = Trillion Cubic Feet
BKWH = Billion Kilowatt Hours.

**MMTSF = Million Metric Tons of Standard Fuel (One metric ton of standard fuel is equivalent to 27,780,000 BTU's.)

The Committee estimates given in Table III have been arrived at after studying the USSR's plans, past production performance, and problems besetting each industry.

The Committee concludes that coal will continue to fall behind plan as it has for several years and will reach only 565 million tons in 1965, or 92 percent of goal.

With regard to natural gas, the Committee's estimate for 1965 is 4.77 trillion cubic feet, which is 91 percent of the planned goal.

On the other hand, the Committee believes crude oil production will exceed plan by 10 percent. Excess production of crude oil will almost offset anticipated shortfalls in the production of coal and natural gas. Therefore, the Committee's estimate of total energy is only 1.5 percent short of the USSR's goals. This small deficiency should have a negligible effect on their plans for industrial growth and export of energy.

Inasmuch as petroleum is the energy the USSR finds most useful to export to enable them to reach their overall objectives, the following summarizes the Committee's conclusions with regard to petroleum.

4. PETROLEUM PRODUCTION LEVELS IN THE USSR WILL NOT BE LIMITED BY GEOLOGICAL FACTORS FOR MANY YEARS

The magnitude of the sedimentary area of the Soviet Union is indeed impressive. Areas which are suitable for the occurrence of petroleum in the USSR extend from the Soviet-Iranian border in the south to the Arctic Ocean in the north and from the Western Ukraine to the Pacific.

Latest Soviet estimates place the known oil-gas bearing and prospective sedimentary areas of the USSR at 11.3 million square kilometers or 4.36 million square miles. The Committee's analysis indicates an area of 3.98 million square miles, or only some 9 percent less than the Soviet estimates. This is shown on Table IV.

TABLE IV

CLASSIFICATION OF SEDIMENTARY AREAS - USSR

DESCRIPTION OF AREA	MILLION SQUARE MILES
Total Favorable Area	2.84
Basin Areas of Unknown or Poor Prospects	1.14
TOTAL PROSPECTIVE AREA	3.98
Basin Areas Considered Non-Prospective	1.51
TOTAL	5.49

The areas considered favorable for the deposits of petroleum in the USSR total 2.84 million square miles. It is believed that this can be compared to the estimated favorable area for the U.S. (including Alaska and the Continental Shelf up to 600 feet in depth) of 2.12 million square miles. Considering that the favorable area for the USSR is considerably greater than that of the U.S., and recognizing the present level of U.S. producibility, the Committee concludes that the petroleum production levels in the USSR will not be limited by geological factors for many years.

5. THE USSR IS LAUNCHING A MAJOR GEOPHYSICAL AND CORE DRILLING EFFORT

Geophysical techniques of prospecting have become more important as the search for oil has progressed into deeper fields and into regions where surface indications are not prominent. Table V gives the Committee's estimate of the number of operating crews.

TABLE V

GEOPHYSICAL CREWS - USSR

	1961	1965
Seismic	850	1,200
Electric	200	250
Gravimetric	100	200
Magnetic	6	12
Airborne Magnetometer	12	20
	1,168	1,682

It is particularly significant that the USSR now has more geophysical crews in operation than the entire Free World.

The USSR also makes extensive use of core drilling. In 1952-58 they carried out 0.9 feet of core drilling for each foot of exploratory drilling. In 1959-65 the USSR plans to let the ratio decline to 0.68; however, a total core drilling footage of 20 million feet has been scheduled for 1965, compared to 12 million feet in 1961 and 10 million feet in 1958.

6. THE USSR IS SHARPLY INCREASING DRILLING, BUT DIFFICULTIES MAY FORCE IT TO SEEK ADDITIONAL EQUIPMENT FROM THE WEST

Exploratory and development drilling have failed to meet the Soviet annual goals during the period 1957-61 by about 11 percent for exploratory and 4 percent for development. Nevertheless, the total amount of drilling has increased rapidly, and future targets are high.

TABLE VI

EXPLORATORY AND DEVELOPMENT DRILLING
FOR OIL AND GAS IN THE USSR

YEAR	MILLION FEET		
	EXPLORATORY	DEVELOPMENT	TOTAL
1950	7.0	7.1	14.1
1955	7.4	9.1	16.5
1960	13.4	12.2	25.6
1961	15.4	13.3	28.7
1965 Plan	33.4	19.5	52.9
1961-80 Plan (Total for Period)	495-594	1,072	1,567-1,666

In 1960, 85 to 90 percent of all drilling was done by the turbodrill. This drill, developed after World War II, has been of great significance in the development of the USSR petroleum industry. It has provided a fairly efficient and economical method for drilling to moderate depths, and enabled the Soviets to use their own inferior drill pipe. Had the USSR continued with the rotary rig, they would have been forced to import from the West drill pipe and tool joints of higher quality than the USSR manufactured.

The Soviet Union is entering a new phase in its search for additional crude oil and natural gas. In this phase, which calls for penetration to average depths of 9,800 to 13,200 feet and even greater, the performance of the turbodrill so far has been unsatisfactory. As evidence of turbodrill difficulties persisted, Soviet engineers began to recommend limiting the turbodrill technique to 6,000 feet in depth and to suggest the electrodrill technique for deeper drilling. But the electrodrill has its own disadvantages, and as a consequence, drillers in the field have called for the almost exclusive use of rotary drilling in the deep drilling program. Until movement can be made in turbodrilling techniques, a combination of turbo and rotary drilling will be used. Use of this combination will necessitate the development of rotary drilling know-how, the training of drilling crews in rotary practice, and the development of better drill pipe, tool joints and bits required for rotary drilling. The Committee believes there will be increasing need on the part of the Soviet oil industry to seek technology and equipment in Free World markets.

The drilling rates reported in the USSR are very low in terms of U.S. practice, and planned increases in efficiency are not being obtained. Nevertheless, the current Seven Year Plan calls for an approximate doubling of rates between 1961 and 1965. The Committee does not believe that this improvement in efficiency will take place.

Drilling efficiency has, of course, a direct effect on the number of drilling rigs. The Committee estimates that in 1961 the Soviet Union had 1,279 drilling rigs in operation and plans to have only 1,360 in operation in 1965. If drilling efficiencies continue at present levels (which seems likely), the USSR will require twice as many rigs as planned. It is likely the Soviet planners have anticipated this, but if they have not, the USSR may look to the West for rotary drilling rigs. As pointed out elsewhere in this report, the failure to meet drilling targets has not, however, impaired reaching and even exceeding the crude oil production goals.

7. CRUDE OIL PRODUCTION IN THE USSR IS INCREASING RAPIDLY AND EXCEEDING OFFICIAL PLANS

Of all the major forms of primary energy in the Soviet Union, only the production of crude oil has been in excess of the annual goals for each of the first three years of the Seven Year Plan. In 1961 the goal was exceeded by about 3 percent or 120,000 barrels per day. The major portion of the growth in production of crude oil during the postwar period can be attributed to the continued development of new capacity in the Urals-Volga, which in 1960 accounted for 73 percent of total national output.

The reported actual and planned production of crude oil is as follows:

TABLE VII

PRODUCTION OF CRUDE OIL IN THE USSR

YEAR	MILLION BARRELS PER DAY
1950	0.76
1955	1.42
1960	2.96
1961	3.32
1962 Plan	3.70
1965 Plan	4.80
1965 Estimate	5.30
1970 Plan	7.80
1975 Plan	10.90
1980 Plan	13.8-14.2

Growth in production has been at a rate of 14 percent per year for the 1950-61 period, and is estimated to be 12 percent per year for the 1961-65 period.

8. THE USSR EXPLORATORY DRILLING PROGRAM APPEARS ADEQUATE TO ATTAIN THE PRODUCTION LEVEL OF 5,300,000 BARRELS PER DAY ESTIMATED FOR 1965

Calculations indicate that for each foot of exploratory oil well drilled there was discovered 200 barrels of oil during 1951-55, and 370 barrels of oil during 1956-61. The planned drilling program and production targets for crude in 1965 would allow a drop in effectiveness to 200 barrels per foot, or the same as the 1951-55 success level. Admittedly any allocation of exploratory drilling as between oil and gas must be arbitrary, but the announced program for gas exploratory drilling also looks consistent with planned production increases and past success. On this basis, drilling plans seem adequate to support the Committee's estimate of 5.3 million barrels per day crude production by 1965.

The probability of achieving the latter level of production depends to a considerable extent on the continued supply of critical materials and equipment from the Free World, and upon the degree of importance the Soviet authorities place upon petroleum exports as a political and economic weapon.

9. THE USSR PRODUCTION PLANS (1970-80) APPEAR REALISTIC BUT EQUIPMENT FROM THE FREE WORLD WILL PROBABLY BE NEEDED

Table VII above also gives the USSR announced targets for crude production for 1970, 1975 and 1980. The Committee estimates that in order to reach production levels in 1980 of 13.8-14.2 million barrels per day, the USSR will have to find between 1961 and 1980 about 115 billion barrels of oil. This compares with reserves of about 100 billion barrels found and developed in the U.S. to date. This indeed is an impressive task. The Committee notes, however, that the Soviet planners are allowing for the discovery and development of only three-fourths as much crude per foot of total drilling planned in the 1960-80 period as they obtained in the 1946-60 period.

While it is not feasible to forecast whether the USSR will succeed or fail in achieving these long range production goals, such goals appear consistent with the announced plans for prospecting and drilling and are not unreasonable in view of the probable oil reserves of the USSR. Probably the greatest problems in reaching the 1961-80 plans will be overcoming the deficiencies present in Soviet drilling and producing equipment, and the shortage of oil field tubular goods and other related material. The Committee believes that these shortages may be more acute after 1965 and, in an attempt to overcome these problems, the Soviet Union will look increasingly to the Free World for equipment.

10. USSR REFINING CAPACITY IN 1965 WILL BE IN EXCESS OF THAT NEEDED TO SUPPLY DOMESTIC NEEDS

The Committee estimates that during the current Seven Year Plan the USSR is attempting to increase its capacity for crude distillation by 2.6 million barrels per day to a total of 5.0 million barrels per day by 1965. Operated according to current Soviet practice (i.e., about 85 percent of stated capacity), 5.0 million barrels per day of design capacity will be sufficient to process 4.3 million barrels per day. This will be sufficient to meet estimated domestic consumption of 3.6 million barrels per day of non-gaseous products and leave a balance of 340,000 barrels per day for export. Natural gas liquids and synthetics will add to the total surplus, and on this basis the Committee estimates that total export of products from the USSR (with the bulk to the Free World) will be 440,000 barrels per day in 1965.

11. THE USSR IS EXPERIENCING A NAPHTHA SURPLUS THAT THEY MAY EXPORT

The USSR has a problem of disposing of naphtha* and getting adequate yields of diesel oil and fuel. (The desired 1965 naphtha yield has been estimated at 16.5 weight percent.) To some extent this problem is being solved by maximizing naphtha in diesel oil blends. The Western gasoline markets have not yet been penetrated to any appreciable extent, and probably will not be in the near future. This can be attributed to the poor octane quality of Soviet gasolines due to a lack of catalytic reforming capacity and to mild operations on the catalytic cracking units to minimize gasoline yield. The Committee believes the USSR may push virgin naphtha on the Free World markets.

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* Naphtha refers to the product in the gasoline boiling range which has not been up-graded by processing to make it suitable for gasoline.

12. THE USSR IS INCREASING ITS ABILITY TO EXPORT PETROLEUM BY BUILDING A MAJOR PIPELINE SYSTEM

At the end of 1958, the Soviet Union had in operation only 8,900 miles of crude oil and petroleum product pipelines and 8,200 miles of gas pipelines. The Seven Year Plan (revised) calls for construction of 19,700 miles of oil pipelines and 18,300 miles of gas pipelines. Thus in seven years, the USSR plans to install about twice as much trunk line as existed at the end of 1958.

Of the major petroleum pipeline systems planned for 1959-65, most are designed to increase the export capability of the Soviet Union.

These systems are:

a. The much publicized Comecon (CEMA) pipeline, or the so-called "Pipeline of Friendship", is scheduled for completion in 1964. The Comecon line is a 3,595 mile system, including all branches, designed to transport Urals-Volga crude oil to Poland, East Germany, Czechoslovakia and Hungary, to supply refineries planned or under construction in the USSR and to carry crude to the Baltic export terminals of Ventspils and Klaipeda. The Committee has calculated that the Comecon line will have a carrying capacity of 740,000 barrels per day over the 40-inch sector leading out of the Urals-Volga, based on 85-90 percent load factor. The section from Brody (USSR) to Bratislava (Czechoslovakia) already is in operation and being supplied by rail. That section from Sahy (Czechoslovakia) to Szazhalambatta (Hungary) will be in operation shortly.

b. Another important system is the Al'met'yevsk (Urals-Volga) to Leningrad crude oil line. This 32/28-inch system will have a capacity of 340/320,000 barrels per day and will be completed in early 1963.

c. To facilitate petroleum exports from the Black Sea, construction is under way on a system which will link the oil fields in the Stalingrad (Volgograd) area with the Black Sea ports of Tuapse and Novorossiysk. It will be able to deliver 210,000 barrels per day to each of the two Black Sea ports, when completed in early 1965.

d. Construction is also proceeding on an extension of both crude oil and products lines running east from the Ufa region to the Far East. The crude oil line will terminate at Irkutsk and probably will be completed in early 1963. The products line, to terminate at Chita, is to be finished by 1965. The crude oil line will have a capacity of 320,000 barrels per day. Negotiations are still underway between the USSR and Japan concerning the barter of Soviet crude for Japanese steel pipe for use in a 2,730 mile extension of the crude oil line as a 28-inch (or possibly a 32-inch) line from Irkutsk to the Pacific Ocean port of Nakhodka. This line is not considered part of the Seven Year Plan.

13. THE NEW PIPELINE SYSTEMS OF THE USSR WILL HAVE GREAT ECONOMIC AND STRATEGIC SIGNIFICANCE

It should be noted that these new pipeline systems will supply crude oil to terminals where there are heavy concentrations of Soviet and Satellite military forces. Thus the lines make possible a more reliable, uninterrupted delivery of fuels to these forces. Moreover, pipelines to the Baltic will facilitate the fueling of naval vessels.

The economic significance of these lines arises from several factors:

First, the Communist export capabilities to the Free World will increase and put the Soviet Bloc in a better position to exert more economic and political pressures on nations of the West that rely on Soviet oil supplies. Further, additional exports will permit the Soviet Bloc to increase purchases of critical equipment and technology in the Free World.

Second, the Comecon system will increase the dependence of the European Satellites on the USSR for crude oil and further diminish the chances of their turning to Western sources of supply.

Third, the pipeline systems will result in a substantial reduction in transportation costs. The savings can be illustrated by comparing rail transport costs from Kuybyshev to Klaipeda on the Baltic Sea with estimated pipeline costs over the same route. The Committee estimates that rail costs to move crude oil from Kuybyshev to Klaipeda are about $1.05 per barrel. But pipeline costs, following completion of the line to Klaipeda, will be only 29 cents per barrel, by Committee estimates.

On the other hand, the estimated pipeline cost of delivering crude oil from Tuymazy-Ufa to Nakhodka would be about $1.18 per barrel which slightly exceeds a comparable cost of $1.15 per barrel by pipeline to the Black Sea and then by tanker through the Suez Canal. Thus, it is probable that the greater benefit from the construction of the Irkutsk-Nakhodka pipeline will accrue to internal economic and military interests of the USSR.

14. THE USSR WOULD NOT HAVE BEEN ABLE TO COMPLETE ITS PIPELINE SYSTEMS AS PRESENTLY SCHEDULED WITHOUT OBTAINING MATERIALS FROM THE FREE WORLD

For the years 1951-61, the USSR failed to achieve its petroleum pipeline construction goals each year, and for the entire decade actual construction fell below the goals by 20 percent. Most of the lag encountered in the construction of oil pipelines, particularly after 1955, can be traced to an inadequate supply of steel pipe, and a desire to expand at a rapid rate the natural gas transmission system. The production of steel pipe from domestic sources has only been 75 to 80 percent of requirements.

The performance would have cast some doubts at one time on the capability of the USSR to complete the plan on schedule. There now seems little doubt, however, that the essential parts

of this program will be completed on schedule. This has been accomplished by resorting to purchases of pipe and other facilities from Western suppliers. In the period 1959-Mid-62, the Soviet Union either has purchased or arranged to purchase at least the following amounts of 40-inch steel pipe for delivery through 1964:

SUPPLIER	METRIC TONS
West Germany	680,000
Italy	240,000
Sweden	135,000
TOTAL	1,055,000

These purchases will supply 40 percent of the entire requirements of the Seven Year Plan for 40-inch pipe.

By the end of 1961, the USSR had installed 900 miles of 40-inch pipe, although only token amounts had been produced in Soviet mills.

Clearly, the imports of pipe breathed new life into the pipeline construction program and averted a delay of far-reaching proportions.

15. INTERNAL TRANSPORTATION DOES NOT APPEAR TO BE A BOTTLENECK TO EITHER USSR DOMESTIC PETROLEUM INDUSTRY OR TO USSR EXPORTS

Railroads not only have been the backbone of the transportation system of the USSR, but also have provided the major means of transport of petroleum as shown on Table VIII.

TABLE VIII

TRANSPORT OF PETROLEUM FREIGHT IN THE USSR, BY TYPE OF CARRIER

CARRIER	1958 BILLION TON-MILES	1958 PERCENT OF TOTAL	1965 PLAN BILLION TON-MILES	1965 PLAN PERCENT OF TOTAL
Rail	95.5	62.7	156*	46.1
Maritime	26.1	17.1	53	15.6
Inland Waterway	9.8	6.4	15	4.4
Pipeline	21.0	13.8	115	33.9
TOTAL	152.4	100.0	339	100.0

* Soviet estimates of transport of petroleum by rail in 1965 have been recently revised upward to 168 billion ton-miles.

Although successful implementation of the pipeline construction program will significantly increase the role of pipeline transport in the movement of petroleum freight, railroads will continue to account for the largest share--more than 46 percent in 1965--of petroleum traffic.

It is significant that, according to Soviet plans, petroleum freight carried by pipelines in 1965 will be equivalent to only 10 percent of the total rail freight in the USSR, and the petroleum freight carried by ship and inland waterways will be equivalent to only 6 percent of total rail freight. Hence any failure to achieve completely plans for modes of petroleum transportation, other than rail, would not throw a relatively large extra burden on the railroads. Western specialists have concluded that the USSR is allocating enough resources to its rail program and that fulfillment of their Seven Year Plan goals is feasible.

Therefore, the Committee concludes that the new pipeline capacity being imposed on an expanded and possibly more efficient rail system implies that the Soviet program for future petroleum exports will probably not be limited by internal transportation difficulties. In making this appraisal, the Committee has

recognized that the existing transportation system of the USSR was adequate to move more than 800,000 barrels per day in 1961 to the Soviet border for export.

According to the Committee's estimates, the deliverability of the new pipelines definitely planned or under construction will aggregate approximately 1,500,000 barrels per day at their terminals in the Baltic, Central Europe, and the Black Sea.

Finally, it should be recognized that the Trans-Siberian line now under consideration for extension to Nakhodka will provide an outlet for petroleum to foreign markets in addition to those mentioned above, if it is actually constructed.

16. TO RAPIDLY BUILD A SOVIET DEEP SEA TANKER FLEET, THE USSR HAS HAD TO UTILIZE FREE WORLD SHIPYARDS AND OTHER FACILITIES

In 1950 the USSR deep sea tanker fleet totaled only 174,000 dwt with the largest vessel 10,900 dwt. Also, the Satellite fleet was extremely small. In 1958, when the Soviet oil offensive was beginning to get into its stride, the first of their super tankers, the Pekin of 29,000 dwt, was laid down. Three other ships of this size followed in 1960 and 1961, and in 1960 the USSR started acquiring tonnage in Free World yards.

As of September 1, 1962, the Soviet Bloc fleet totaled almost 2,000,000 tons as shown on Table IX.

TABLE IX

SOVIET BLOC TANKER FLEET
(AS OF SEPTEMBER 1, 1962)

	T-2 EQUIVALENT	DWT
Bloc Flag Tankers in Petroleum Service	90.7	1,556,061
Bloc Flag Tankers Not Reported in Ocean Petroleum Trade	14.7	302,349
Yugoslavian Flag Tankers in Petroleum Service*	4.3	82,106
TOTAL OPERATING	109.7	1,940,516

* The Yugoslavian fleet has been included in the Soviet Bloc availability inasmuch as a study of trade statements indicates that a major portion of their trade is into the Black Sea. Combination USSR flag ore/oil carriers have been excluded from availability since the portion of their time during which they are engaged in petroleum trade is unknown.

Of this total fleet, shown in Table IX, 786,000 dwt or 40 percent was built in Free World countries.

17. THE SOVIET BLOC TANKER FLEET WILL BE PRACTICALLY SELF-SUFFICIENT BY 1965 WITH TWO-THIRDS OF THE NEW TONNAGE SUPPLIED BY THE FREE WORLD

The Bloc tanker fleet is continuing to grow through buildings in both the Bloc and Free World yards.

As of September 1, 1962, orders for new construction in the Soviet Bloc yards totaled 23 ships equivalent to 42.3 T-2's. But far more important than the buildings in the Bloc yards are the acquisitions in the Free World. As of September 1, 1962, orders for new construction in the Free World yards for the USSR totaled 51 ships equivalent to 82.4 T-2's as shown below:

TABLE X

SOVIET BLOC NEW TANKER CONSTRUCTION ON ORDER-
FREE WORLD YARDS
(AS OF SEPTEMBER 1, 1962)

	NUMBER OF SHIPS OF EACH DWT CLASS					TOTAL	
LOCATION	5,000	25,000	35,000	48,000	TOTAL	DWT	T-2 EQUIVALENT
Japan			14		14	490,000	32.6
Italy				6	6	288,000	19.7
Finland	15				15	75,000	4.4
Yugoslavia		16			16	400,000	25.7
TOTAL	15	16	14	6	51	1,253,000	82.4

The tonnage the Bloc is receiving from the Free World is twice its buildings in its own yards. Clearly it is indebted to the Free World for the success of its program.

When the Seven Year Plan (1959 through 1965) was announced in 1958, the stated intention was to increase the size of the tanker fleet by 80 percent during the Plan. Thus the Soviet fleet would have to increase from 819,000 dwt at the end of 1958 to 1,474,000 dwt at the end of 1965. As contrasted to this, the Committee estimates that the USSR fleet will total approximately 3,500,000 dwt at the end of 1965. Thus, instead of only an 80 percent increase as planned, the USSR fleet will quadruple with just the buildings known to date.

Balances made by the Committee on the basis of 1,020,000 barrels per day of export volume to the Free World show that the Bloc will have enough tankers of its own to move about 85 percent of this volume. Those customers who prefer to use their own tonnage would supply the bulk of the remaining requirements. Thus the Bloc will be practically self-sufficient and independent of Free World ships by 1965.

18. INSECURITY OF SUPPLY OF BLOC OIL AND TANKERS COULD CAUSE SERIOUS TRANSPORTATION DIFFICULTIES FOR THE FREE WORLD

With the Bloc self-sufficient in tankers and moving most of its exports in its own bottoms, it is in a position at any time to deny the Free World not only this export volume of oil, but also the ships being used to transport the oil. The Committee estimates that if the Bloc is exporting 1,020,000 barrels of oil per day to the Free World in 1965, and if it should interrupt this supply and deny the use of the Bloc's own tankers, then the Free World would need an additional 231 T-2 equivalents to replace this supply of oil from the Free World's alternative sources. This surge in requirements could be in excess of the then existing spare tonnage, causing severe transportation and oil crises. The transportation and oil crises might not be limited to marine movements, as difficulties could be experienced in inland movements of both crude and products to areas heavily dependent on Bloc supplies.

19. SOVIET BLOC PETROLEUM EXPORTS TO THE FREE WORLD HAVE GROWN AND WILL CONTINUE TO GROW UNLESS ACTION IS TAKEN BY THE WEST

From 1955 to 1961 Bloc oil exports to the Free World increased from 116,300 to 610,000 barrels per day as shown on the following table:

TABLE XI

VOLUME OF SOVIET BLOC OIL EXPORTS
TO THE FREE WORLD - CRUDE AND PRODUCTS

YEAR	THOUSAND BARRELS PER DAY (APPROXIMATELY)
1955	116
1956	139
1957	166
1958	235
1959	353
1960	486
1961	610
1965 Estimate	1,020

During the six-year period 1955-61 these exports grew at a compound rate of 32 percent per annum. During the same period, Free World oil consumption grew at a compound rate of less than 6 percent per annum.

Fifty-three percent of the total Bloc exports in 1961 was crude oil, with the remainder products. Of the 1961 total, eighty-five percent came from the USSR. However, the importance of the USSR is greater than shown by this percentage since in 1961 the USSR exported to the Bloc and the Free World an estimated 800,000 barrels per day. This came from a country that in 1950 was a net importer of 30,000 barrels per day.

It will be noted that the Committee estimates a surplus of 1.02 million barrels per day available for export to the Free World from the Bloc in 1965. Slightly less than one-half of this volume is expected to be products. The supply-demand balance which forms the basis for this estimate is given in Table II above.

A country-by-country analysis of predicted demand patterns, types of Soviet oil purchasers, and refining and marketing facilities, indicates that there would be markets that could be induced to absorb this oil. Whether and where this much Bloc oil will actually enter the Free World in 1965 depends upon the actions taken by the West between now and then.

The Committee considered it impractical to attempt any prediction of exportable volumes beyond 1965. However, taking the published statements of the USSR on percentage growth in production and demand would indicate that the USSR plans to have an exportable surplus to the Satellites and the Free World of 1.8 to 3.7 million barrels per day in the 1972-75 period. Some of this would, undoubtedly, be needed to make up the deficiencies in the Satellites. Nevertheless, there seems to be every reason to expect that the export potential will continue to increase after 1965.

20. THE BULK OF THE SOVIET BLOC OIL EXPORTED TO THE FREE WORLD GOES TO EUROPE

Historically, the bulk of the Bloc exports has gone to Europe. In 1961, Europe absorbed two-thirds of Bloc oil exports, as shown on the following table:

TABLE XII

ESTIMATED TOTAL SOVIET BLOC PETROLEUM EXPORTS
TO FREE WORLD BY COUNTRY OF DESTINATION - 1961

	THOUSAND BARRELS PER DAY	PERCENT OF LOCAL DEMAND
Western Hemisphere		
Brazil	10.2	4
Cuba	78.0	100
Uruguay	1.0	4
Sub-Total	89.2	
Free Europe		
Austria	13.4	21
Belgium	6.8	3
Denmark	4.4	3
Finland	47.7	78
France	23.0	3
West Germany	82.5	10
Greece	18.0	35
Iceland	6.0	88
Italy	126.6	22
Netherlands	1.0	-
Norway	5.0	7
Spain	2.0	2
Sweden	51.3	19
Switzerland	2.0	-
United Kingdom	2.3	-
Yugoslavia	2.0	10
Sub-Total	394.0	8
Other Eastern Hemisphere		
Japan	54.8	7
Egypt	47.0	48
Others	25.0	-
Sub-Total	126.8	
TOTAL FREE WORLD	610.0	6

Eighty percent of the volume of Bloc oil is absorbed by a handful of customers--Italy, West Germany, Cuba, Japan, Sweden, Egypt and Finland. NATO countries absorb 275,000 barrels per day or about half the volume. While the total amount of 1961 imports of Soviet Bloc oil was 6 percent of the Free World demand (outside the U.S.), certain countries import much more than this percentage of their local requirements as noted in Table XII.

21. GOVERNMENT-OWNED OIL COMPANIES ARE THE LARGEST CUSTOMERS FOR SOVIET CRUDE OIL

An analysis of the types of Free World companies which buy Communist oil shows that in 1961, 62 percent of the crude was purchased by government oil companies and 34 percent was purchased by non-integrated oil companies. Government oil companies bought 20 percent of the Bloc petroleum products, while non-integrated marketers accounted for 51 percent. This is shown on the following table:

TABLE XIII

1961 SOVIET BLOC SALES TO FREE WORLD
BY TYPE OF PURCHASER

	THOUSAND BARRELS PER DAY			
	GOVERNMENT OWNED COMPANIES	NON-INTEGRATED COMPANIES	OTHERS	TOTAL
Crude				
Western Hemisphere	68.1	0.7	-	68.8
Europe	99.8	66.9	12.0	178.7
Other Eastern Hemisphere	30.0	41.3	1.0	72.3
Sub-Total	197.9	108.9	13.0	319.8
PERCENT OF TOTAL	62.0	34.0	4.0	100.0
Products				
Western Hemisphere	20.4	-	-	20.4
Europe	18.6	134.4	62.3	215.3
Other Eastern Hemisphere	19.9	12.2	22.4	54.5
Sub-Total	58.9	146.6	84.7	290.2
PERCENT OF TOTAL	20.0	51.0	29.0	100.0

Clearly the governments could, through their own companies, do much to restrict the penetration of Soviet oil.

22. SOVIET OIL EXPORTS HAVE REDUCED THE REVENUE OF THE FREE WORLD'S OIL PRODUCING COUNTRIES AND OIL INDUSTRY

The rapid increase in Soviet Bloc petroleum exports in recent years has been at the expense of the Free World's oil industry. For the purpose of assessing the effects of Soviet oil on the revenues of producing countries, 1953 was selected as a base year. It was the year of the death of Stalin and also saw a change in emphasis in Soviet economic policy, from maximum autarky to a growing reliance upon foreign trade to accelerate the development of the Bloc's resources. In 1953, Soviet Bloc oil exports were confined to Western Europe, and equaled 1.9 percent of demand in that area. In 1961, Bloc oil supplied about 8 percent of Western Europe's greatly increased demand and has made inroads into Free Asia, Africa and the Western Hemisphere.

In 1961, Soviet Bloc oil exports to the Free World approximated 610,000 barrels per day. If Soviet Bloc exports to Western Europe since 1953 had remained in line with their percentage share in that year, and there had been no penetration of other markets, the 1961 total Bloc exports would have been only 86,000 barrels per day, or 524,000 barrels per day less than the actual total. Insofar as Soviet Bloc oil exports reduced the volume of exports from Free World producing countries, Venezuela and the Middle East were the principal sufferers. To assess the effect on revenue, this volume of 524,000 barrels per day was apportioned between the Middle East and Venezuela on the basis of their exports of oil to the regions of the Free World in that year. The government revenues that would have been derived from such displaced oil have been estimated on the basis of the average direct income per barrel received by the Middle East and Venezuela.

An estimate of the cumulative loss of direct income by Middle Eastern and Venezuelan governments over the period 1954-61, based on the above method, is shown below to have reached $US 490 million. This estimate is given without considering the depressing effect on prices of the dumping of Soviet oil in the Free World.

TABLE XIV

CALCULATED LOSS OF DIRECT INCOME TO THE MIDDLE EAST AND VENEZUELA DUE TO FREE WORLD IMPORTS OF SOVIET BLOC OIL 1954-61

	1953	1954	1955	1956	1957	1958	1959	1960	1961	1954-61
Millions of U.S. Dollars	-	15	19	25	34	52	83	117	145	490
Percent Increase Per Year	-	-	27	31	36	53	59	41	24	38

In addition to payments of tax and royalties, and other payments stipulated in basic contracts--which form the basis of the preceding loss calculations--the production and export of oil gives rise to a number of other local receipts, e.g., wages and salaries, revenues of local contractors, and payments for local purchases of goods. The level of such local receipts generated by oil companies are linked to the level of oil production; hence the Soviet oil exports have a retarding or depressing effect on such transactions.

The size of direct payments to the governments of Free World oil exporting countries not only depends upon the volume of exports, but also is related to f.o.b. selling prices. If Soviet price cutting contributes to a reduction in those prices, the levels of direct payments per barrel, as well as total direct payments, are reduced. There is ample evidence that the USSR has substantially reduced prices, below economic levels, as its main means of obtaining or increasing its oil export business. This practice has inevitably increased existing pressure upon the f.o.b. selling prices. For example, though the degree of responsibility is not demonstrable, there can be no doubt that cut-price Soviet Bloc exports contributed to the reduction in Middle East posted prices, which took place in February 1959 and August 1960.

The Committee did not consider it practical to make an attempt at quantifying the damage done to the Free World's oil industry, but it is significant.

23. BLOC FOREIGN TRADE IS AN IMPORTANT FACTOR IN REACHING SOVIET ECONOMIC AND POLITICAL GOALS

Among the first things to be nationalized when the Communists came to power in Russia was foreign trade. A government decree of April 23, 1918, prohibited all import and export transactions except through the intermediary of special state agencies. While there have been some changes in form through the years, the principle of maintaining a state monopoly over exports and imports has never been infringed.

The USSR considered it essential that foreign trade be monopolized in order to make it entirely subordinate to the aims of the country's national economic plans. Aside from this, however, it was recognized that complete control over foreign trade had other purposes. Such control provides:

Complete protection of the domestic economy against foreign competition.

Isolation of the internal currency from the influence of foreign exchange markets.

A strong bargaining position in trading with private enterprises in the Free World.

Ability to discriminate among purchasers and suppliers and to sell in foreign markets without regard for normal commercial considerations or internal costs.

Flexibility to adjust trade to serve political objectives.

Premier Khrushchev underscored the importance of the last purpose when he stated that, "We value trade least for economic reasons and most for political purposes". Clearly, Soviet Bloc trade, which is backed by the monolithic power of the State, cannot be considered on the same terms as the trade of individual private companies motivated by commercial objectives. The foreign trade of the Soviet Bloc is but one element in the Soviet Union's plan to consolidate its own power and to extend communistic influence over countries that deal with it.

Specifically, the foreign trade and aid program of the Soviet Bloc is aimed at:

a. Obtaining vital materials and technical know-how from the Free World to strengthen the Communist economic-military base.

b. Spreading communism through extension of state control in countries with whom they trade, thus expanding their area of immediate ideological influence and eventual control.

c. Destroying operations of private companies. The USSR recognizes that large commercial firms, particularly the international oil companies, are a source of strength to the Free World, and pose a threat to extension of their own ideology of state control.

d. Creating unrest and political instability in areas of vital importance to the defenses of the Free World.

In the initial years following World War II, the trade of the Soviet Bloc followed a deliberate policy of aiming toward economic self-sufficiency. The Bloc was slow in developing surpluses for export to the Free World. Following the death of Stalin in 1953, the commercial policy of the Bloc was reversed with the aim of increasing trade between the East and the West. The result was a spectacular increase in Free World trade with the Soviet Bloc.

TABLE XV

FREE WORLD TRADE WITH SOVIET BLOC
($U.S. Millions)

FREE WORLD IMPORTS FROM:

YEAR	USSR	SATELLITES	FAR EAST	TOTAL BLOC	BLOC AS PERCENT OF WORLD TRADE
1947	273.9	732.9	417.9	1,424.7	2.5
1953	374.1	803.2	442.7	1,620.0	2.1
1956	806.1	1,473.1	657.5	2,936.9	3.0
1960	1,504.3	2,117.7	784.0	4,406.0	3.7

FREE WORLD EXPORTS TO:

1947	477.0	856.5	672.3	2,005.8	3.9
1953	423.5	677.8	287.6	1,388.9	1.8
1956	784.1	1,318.5	434.2	2,536.8	2.7
1960	1,565.0	2,175.4	702.4	4,442.8	3.9

By 1960, Free World trade with the Bloc had increased three-fold over 1953 levels to $4.4 billion, in each direction. The Bloc's share of international trade rose from about 2 percent to almost 4 percent during this period. Two-thirds of the East-West trade in 1960 was with Western Europe.

24. THE ACQUISITION OF STRATEGIC GOODS AND TECHNOLOGY IS AN IMPORTANT OBJECTIVE OF THE SOVIET BLOC COUNTRIES IN THEIR TRADE WITH INDUSTRIALIZED NATIONS

In the following table, the exports to the Bloc of metals, metal shapes, transportation equipment, machinery, complete plants and other manufactured goods are shown to demonstrate the importance of this segment of trade to the USSR and its Satellites.

TABLE XVI

VALUE OF EXPORTS TO SOVIET BLOC OF METALS, METAL SHAPES, TRANSPORT EQUIPMENT, MACHINERY, PLANTS, OTHER MANUFACTURED GOODS IN 1960

EXPORTING COUNTRY	VALUE IN MILLIONS OF U.S. DOLLARS	PERCENT OF TOTAL EXPORTS TO SOVIET BLOC
West Germany	613.5	80
France	240.4	87
United Kingdom	234.7	65
Austria	141.0	84
Italy	130.3	61
Belgium-Luxembourg	102.8	73
Sweden	76.1	61
Japan	61.8	85
United States	47.5	25

The items of major interest to the Soviet Bloc are the products of advanced technology. Particularly desirable from the Communist point of view are complete plants which represent an import of technology that can be duplicated directly and thus multiply many-fold the yield from a relatively small purchase. The following items are of especial significance: Complete petrochemical and synthetic plants, electronic equipment for communications and control, precision and highly automatic machine tools, construction machinery, industrial handling

equipment, carbon steel and alloy sheet and strip, modern cold-rolling mills for sheet and strip steel, electric power generation and transmission equipment, precision bearings, rail and ocean transport equipment, complete tire plants, and large diameter pipe and other equipment needed for the production and transportation of oil. As previously mentioned, in the period 1959-Mid-62, the USSR purchased or arranged to purchase at least 1,055,000 tons of 40-inch diameter pipe from West Germany, Italy and Sweden. Also, during the last two years, the USSR purchased a number of tankers.

In return, the industrialized nations buy from the Bloc large amounts of food, crude materials and fuels. Of the ten countries listed in Table XVI above, six--West Germany, France, Austria, Italy, Sweden and Japan--are among the ten largest offtakers of Soviet Bloc oil.

Many of the items which the industrialized nations export to the Soviet Bloc--for example, equipment used for an expanding oil transportation network, have obvious potential military value. The effect is that the industrialized nations who engage in this kind of trade are strengthening the avowed enemy of the Free World.

Though the Bloc is now buying huge amounts of industrial equipment and products of high technology, there is no intent of the Bloc to continue to remain dependent on these suppliers for such items. They have not abandoned their goal of self-sufficiency. A current example of the Soviet desire for self-sufficiency is the case of tankers. Currently the Bloc is dependent on tonnage chartered in the Free World, but by 1965 it will be practically self-sufficient.

It would make more sense for the Western World to limit its trade with the Bloc largely to consumer goods which are in short supply in those countries. Consumer goods, if traded, would emphasize to the Soviet citizen the deficiency in the Communist system for providing these items.

25. ANOTHER IMPORTANT AIM OF THE SOVIET BLOC'S ECONOMIC OFFENSIVE IS TO EXERT POLITICAL PRESSURE AND EXTEND COMMUNIST INFLUENCE

In the developing countries of the world, the USSR combines the extending of economic assistance with an aggressive expansion of trade often under conditions which are ostensibly favorable to the less developed participants. Many of these nations have political and economic structures that make them prime targets for communist subversion.

From the less developed countries, the Soviet Bloc generally receives agricultural commodities and raw materials. In turn, the Bloc sells them machinery, petroleum, food and ferrous metals. The benefit to the less developed countries lies largely in their ability to dispose of commodities in chronic surplus. In some cases, however, the Bloc has moved in with much fanfare to buy up a whole crop or substantial quantities of surplus products, only later to resell them on Free World markets in competition with countries from which they were originally purchased. Examples are cotton from Egypt and sugar from Cuba.

Nevertheless, barter deals involving surplus products are effective vehicles of Soviet influence since they make commodity producing countries highly dependent on the Soviet Bloc for markets.

However, the specter of Soviet pressure and interference in the domestic affairs of the Free World also hangs over the industrialized countries. Development of industries that depend on the Soviet markets can be under mined by abrupt and arbitrary political decisions of the Bloc. If these markets are closed, it is natural that the enterprises involved should seek a reopening of trade outlets. Since the markets would have been closed for political reasons, regaining access to them might well involve concessions that would be more advantageous to the Soviets.

The significance to the exporting nations of outlets in the Soviet Bloc, acquired or increased as a result of the acceptance of Soviet Bloc oil or other products, varies widely from country to country. It can hardly be doubted, however, that any substantial reliance by a Free World country upon trade with the Soviet Bloc, the government of which exercises complete control over foreign trade, creates a threat to the security, political independence and economic health of that country.

Soviet Bloc markets can be--and have been--closed and Soviet Bloc supplies can be--and have been--interrupted more for political reasons than for commercial considerations. This happened to Israel in 1956 when its supply of Soviet oil was cut off in the Suez crisis. Israel's claims for damages were rejected by the Soviet Foreign Trade Arbitration Commission. Also in 1958, the USSR cancelled orders in Finland, delayed trade negotiations, and cut off crude oil supplies until certain Conservative members of the Cabinet resigned.

26. PETROLEUM EXPORTS ARE MOST ESSENTIAL TO THE SOVIET UNION IN REACHING ITS TRADE OBJECTIVES

The Soviet Bloc has seized on petroleum as a highly merchantable commodity that they can barter for much needed Western equipment and technology as well as for political influence. This is not surprising when one surveys what little else the Bloc has available for trade.

In 1960 the value of Free World petroleum imports from the Soviet Bloc amounted to $460 million as shown on the following table:

TABLE XVII

PETROLEUM COMPONENT OF FREE WORLD
IMPORTS FROM THE BLOC
($U.S. MILLIONS AND PERCENT)

	FROM TOTAL BLOC			FROM USSR		
YEAR	TOTAL TRADE	PETROLEUM	PERCENT OF TOTAL	TOTAL TRADE	PETROLEUM	PERCENT OF TOTAL
1952	1,634	26	1.6	468	10	2.1
1955	2,421	143	5.9	640	71	11.0
1960	4,276	460	10.8	1,395	344	24.6

The growth of oil has been spectacular. It now accounts for 10.8 percent of the Free World imports from the Bloc and 24.6 percent of those from the USSR.

27. THE FREE WORLD OIL INDUSTRY IS A MAJOR TARGET OF THE SOVIET ECONOMIC OFFENSIVE

The growth in Bloc oil trade has a significance more widespread than the volume indicates.

From Lenin down to the present day, the Communists have looked upon the private oil industry as a major symbol of the free enterprise system and of the economic strength of the Free World. As such, the continuing existence and prosperity of the private oil industry poses an obstacle to the spread of their own ideology and influence.

An article in an authoritative Soviet publication went further in clarifying the aims of the Communists toward the Free World oil industry. It stated:

> It should be borne in mind that oil concessions represent, as it were, the foundation of the entire edifice of Western political influence in the (less developed) world, of all military bases and aggressive Blocs. If this foundation cracks, the entire edifice may begin to totter and then come tumbling down.

Thus, the Soviet Union is not out simply to sell oil, but to disrupt, undermine and, if possible, destroy the position of the private oil industry.

The USSR is using every means to encourage state control over oil in Free World countries, and to incite the leaders of developing nations against the private oil industry. Facilities have already been expropriated in Ceylon and Cuba, and the industry is under heavy pressure in many other countries as a result of Soviet offers of oil aid. The Soviet Bloc is sending out petroleum technicians and making loans to any country willing to promote state development and distribution of oil. Countries which have accepted such aid range from Afghanistan in the Far East to Argentina in the Western hemisphere. As previously shown, government oil companies, in turn, become large customers of Soviet oil.

The trading methods of the Communists--state trading on the basis of government-to-government barter agreements--weaken seriously the basis for continued private trading in oil. State trading is by its nature discriminatory and destructive of free enterprise, and when conducted on a massive scale and by countries opposed to private ownership, it becomes an even more powerful means of weakening private oil company operations.

The USSR openly charges its Satellites considerably higher prices than it charges for the same oil in Free World markets without the least fear of competition.

TABLE XVIII

AVERAGE EXPORT PRICES FOR USSR CRUDE OIL
($U.S. Per Barrel*)

YEAR	TO FREE WORLD	TO SATELLITES
1955	2.16	3.37
1956	2.17	3.30
1957	2.55	3.29
1958	2.08	2.96
1959	1.87	3.01
1960	1.56	3.01

* Converted at $1.11 per ruble.

Further evidence is obtained by comparing crude prices charged specific countries. In 1960, for instance, East Germany paid $2.69 per barrel vs. $1.38 per barrel for West Germany. Hungary paid $3.06 per barrel vs. $1.41 per barrel for Italy. Communist China paid $2.92 per barrel vs. $1.34 per barrel for Japan.

Product prices also show the same discrimination. This discriminatory pricing suggests that the Satellite economies are being used to subsidize the USSR's oil exports to the Free World. In countries where currencies are soft or inconvertible, the exchange of commodities through barter agreements gives Soviet oil a big advantage over Free World oil.

28. FREE WORLD TRADE CONTROLS ARE INEFFECTIVE IN RETARDING THE FLOW OF BLOC OIL OR THE CRITICAL EQUIPMENT THAT THE BLOC PROCURES WITH OIL

Although the Committee may not be aware of all the efforts to restrict Bloc oil, it believes that relatively little has been done to date. However, it is known that restrictive measures have been discussed in NATO and active consideration is now being given this problem by the European Common Market.

Equally as serious is the lack of an effective program of controlling the critical equipment the Bloc is purchasing in the West--purchases for which Soviet oil is making a large contribution. The present COCOM agreement seems limited to a narrow list of arms, atomic energy material and strategic materials. The agreement is not aimed at the export of goods and technology which contribute to the industrial potential of the Bloc. To illustrate, the Committee believes the USSR may seek certain petroleum equipment in the West to ensure meeting its oil production goals. None of these items is embargoed by COCOM.

The U. S. maintains a much tighter control than the COCOM agreement prescribes, but even in the U. S. there are no restrictions on the export of drill pipe, drill collars, tool joints and diamond bits--items the Committee believes the Soviet oil industry will need to meet its production targets. The U. S. does require export licenses for rotary drilling rigs that the USSR will in all probability need.

It would appear evident that the Western industrialized countries, which know themselves to be threatened militarily and subversively by the Soviet Bloc are defeating their own ends by contributing to the industrial strength of the Communists.

C O N C L U D I N G R E M A R K S

In view of the above factors, the Committee feels that continued expansion of communist oil exports is a serious problem to the Free World. The impact of Soviet oil on Free World countries is far greater than the volume figures would indicate and goes beyond its immediate implication for the oil companies involved.

Without a doubt, Soviet oil is the most important element in the Soviet politico-economic offensive in the Free World. The communists are using it to procure vital equipment and technology, to create political unrest and spread communism. It is a weapon with which they hope to destroy the private oil industry.

The seriousness of the Soviet economic offensive requires a concerted effort by the leading countries of the Free World to restrict further imports of communist oil and the export of strategic materials to the Soviets. Individual action is insufficient. For example, the "Black Sea" chartering policy of a single company (the refusal to charter ships from owners supplying tonnage to the Bloc) did not stem the flow of Soviet oil to Cuba.

The political alliances which Free World countries have formed to combat Soviet aggressions must now be extended fully to the equally important economic field. It is unrealistic to leave the Free World's economic flanks unprotected, particularly as the Soviets have clearly indicated that their trade is conducted "most for political purposes".

PART TWO

SUMMARY OF VOLUME II

TABLE OF CONTENTS

for

PART TWO

of

VOLUME I

SUMMARY OF VOLUME II

INTRODUCTION

For this report it was necessary for the Committee to rely heavily on USSR published statistics and comments. This involved sifting of a large amount of data in an attempt to find that which was most authoritative, accurate, and reasonable. The data that your Committee chose to use and evaluate are included in Volume II, and the most important are summarized here.

The Committee believes it should be apparent which facts are from reports of the USSR and other Bloc nations, and which are calculations and conclusions of the Committee. Nevertheless it might be well to point out that the Committee has tried to consistently use the word "planned" to denote an official plan of the USSR (or other Bloc nations), and the word "estimate" to refer to a calculation made by the Committee.

One final word of caution: Some of the statistics (particularly cost data) may appear questionable in the light of difficulties in arriving at comparable data for the U.S. However, it must be recognized that in some cases certain data may be more readily fixed in a planned and arbitrary economy. Obviously the Committee had no way of checking Soviet statistics except to judge them on the basis of consistency within Soviet publications.

Where there are known significant omissions in the USSR cost allocations these have been pointed out.

The Committee wishes to emphasize that even though it recognizes inaccuracies in some of the cost data reported by the USSR, a very important aspect is that these data are apparently used by official planners and operators in decision making. In many ways it is the data they use, rather than what is actually true, which is more significant. Furthermore, it should be noted that the actual cost of production or the Soviet estimates thereof, is not the true factor in the selling price of petroleum to the Free World. The Soviet economic system permits the establishment of selling prices at any level believed desirable to meet economic and political requirements.

The cut-off date for most of the data included in this volume was June 1, 1962, except for Section 50--Soviet Bloc Marine Activities--where the data have been brought up to September 1, 1962 because such data were readily available and reflected significant changes. Since June 1, 1962, the USSR has published various statistics, particularly its official trade statistics for 1961, which have not been included in this report. The Committee has reviewed the newly acquired data and believes that they do not alter its conclusions.

S U M M A R Y O F V O L U M E II

The following is a summarization of the detailed data and findings contained in Volume II (containing Parts Three through Seven). This summary is arranged in the same order as the information appearing in Volume II.

SUMMARY OF PART THREE

THE SOVIET UNION

CHAPTER I

ENERGY IN THE SOVIET UNION

SECTION 1. PRODUCTION OF ENERGY

The production of the major primary sources of energy in the Soviet Union is steadily moving in the direction of an increasing share of crude oil and natural gas in the energy balance at the expense of the share attributed to coal. This shift to the more economical liquid and gaseous fuels, which was programmed in the Seven Year Plan (1959-65), will result in substantial lessening of costs and give the USSR a more diversified energy base.

During the first three years of the Seven Year Plan, the production of both coal and natural gas has lagged behind goals, while that of crude oil has been consistently in excess of goals. The Committee estimates that the production of both coal and gas will be only slightly more than 90 percent of the plan for 1965. On the other hand, crude oil production in that year may be as much as 10 percent in excess of plan. Thus the estimated output of total energy may fall short of the plan in 1965 by only 1.5 percent, and it is probable that this shortfall will be of no consequence to the economy.

The following table compares reported energy production for 1960 with the Committee's estimate for 1965.

TOTAL ENERGY PRODUCTION IN THE USSR

SOURCE OF ENERGY	UNIT OF NATURAL MEASURE [a]	1960 NATURAL UNITS	1960 MMTSF [b]	1960 PERCENT OF TOTAL	COMMITTEE ESTIMATE 1965 NATURAL UNITS	COMMITTEE ESTIMATE 1965 MMTSF [b]	COMMITTEE ESTIMATE 1965 PERCENT OF TOTAL
Coal	MMT	513	373	52.1	565	424	39.6
Crude Oil	Million B/D	2.96	212	29.5	5.30	379	35.5
Natural Gas	BCM	45	54	7.6	135	162	15.2
Hydroelectric	BKWH	51	24	3.3	90	41	3.8
Nuclear	BKWH	-	-	-	6.6	3	0.3
SUB-TOTAL			663	92.5		1,009	94.4
Peat	MMT	54	20	2.8	-	27	2.5
Shale	MMT	14	5	0.7	-	7	0.7
Fuelwood	BCM	-	29	4.0	-	26	2.4
TOTAL			717	100.0		1,069	100.0

a/ MMT = Million Metric Tons.
B/D = Barrels Per Day.
BCM = Billion Cubic Meters.
BKWH = Billion Kilowatt Hours.

b/ MMTSF = Million Metric Tons of Standard Fuel. (One metric ton of Standard fuel is equivalent to 7,000,000 kilocalories or 27,780,000 BTU's.)

SECTION 2. CONSUMPTION OF ENERGY AND SECTION 3. NET TRADE

Little information is available in the current Soviet literature with respect to the consumption of primary energy. Those figures which are published consistently exclude light petroleum products, and, therefore, overemphasize the importance of coal and underestimate the role of petroleum products.

The Committee has, however, calculated the apparent energy consumption for a number of recent years. The following tabulation summarizes the estimate for 1958 and the prediction for 1965.

COMMITTEE ESTIMATES OF APPARENT
TOTAL ENERGY CONSUMPTION IN USSR

	1958		1965	
	MILLION METRIC TONS OF STANDARD FUEL	PERCENT OF TOTAL	MILLION METRIC TONS OF STANDARD FUEL	PERCENT OF TOTAL
Coal	356	58.2	412	42.8
Crude Oil	142	23.1	286	29.7
Natural Gas	34	5.5	162	16.8
Peat	21	3.4	27	2.8
Shale	5	0.7	8	0.8
Fuelwood	33	5.4	26	2.7
Hydroelectric	22	3.7	41	4.3
Nuclear	-	-	3	0.3
TOTAL	612	100.0	964	100.0

In the above table, and elsewhere in this Summary, "apparent consumption" is defined as production minus net exports. Figures given for apparent consumption, therefore, consistently include fuel losses, fuel used in processing, and stock changes.

The Committee estimates that the apparent consumption of primary energy will increase from 612 million metric tons* of standard fuel in 1958 to about 964 million tons in 1965. Of this growth, two-thirds is to be provided by crude oil and natural gas, despite net exports of these fuels equivalent to more than 93 million tons of standard fuel in 1965. The South economic region, which includes the Ukraine, is the largest single consuming area (23.7 percent of the total in 1958 and 21.7 percent planned in 1965) while the Center region, having the Moscow industrial complex as its focal point, is the second leading consumer of energy.

Per capita energy consumption in the U.S. in 1961 was almost 3 times that in the USSR (250 vs. 89 million BTU's/capita) and despite the scheduled high rates of expansion of energy production in the USSR during 1959-65, the absolute gap in per capita consumption between the U.S. and the USSR probably will remain about constant.

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* All tons in this Summary are metric tons.

In 1958 the USSR showed a net export of energy equivalent to 4 percent of production, but by 1961 net exports reached almost 8 percent of production. The Committee believes that exports are to increase further to 105 million tons of standard fuel in 1965, or 10 percent of estimated energy output in that year. Clearly energy is and will continue to be a prime export commodity.

CHAPTER II

USSR NON-PETROLEUM ENERGY

SECTION 4. COAL IN THE SOVIET UNION

Increases in coal production have, so far, fared poorly in the Seven Year Plan, largely because of the slow rate in the construction of new mines in the Donets Basin, a continued shortage of mining equipment, failure to achieve the desired results in the hydraulic mining of coal, and a shift in emphasis to the production of high-grade coal. All of these factors have contributed to continued failure to meet the annual plan goals for mining, and as the production program unfolded, it became necessary to revise downward the annual output goals. Production of coal during the first years of the Seven Year Plan is compared with goals in Figure 2.* Additional information is tabulated below.

Because of the foregoing, the Committee believes that actual production of coal in 1965 will be no more than 565 million tons, considerably less than the 612 million tons which originally had been planned for that year.

PRODUCTION OF COAL IN USSR

YEAR	MILLION METRIC TONS
1950	261
1955	391
1960	513
1961	510
1965 Committee Estimate	565
1970 Plan	686-700
1975 Plan	900
1980 Plan	1,180-1,200

The USSR has laid out a 20-year program for the development of the coal industry. As shown in the tabulation, this

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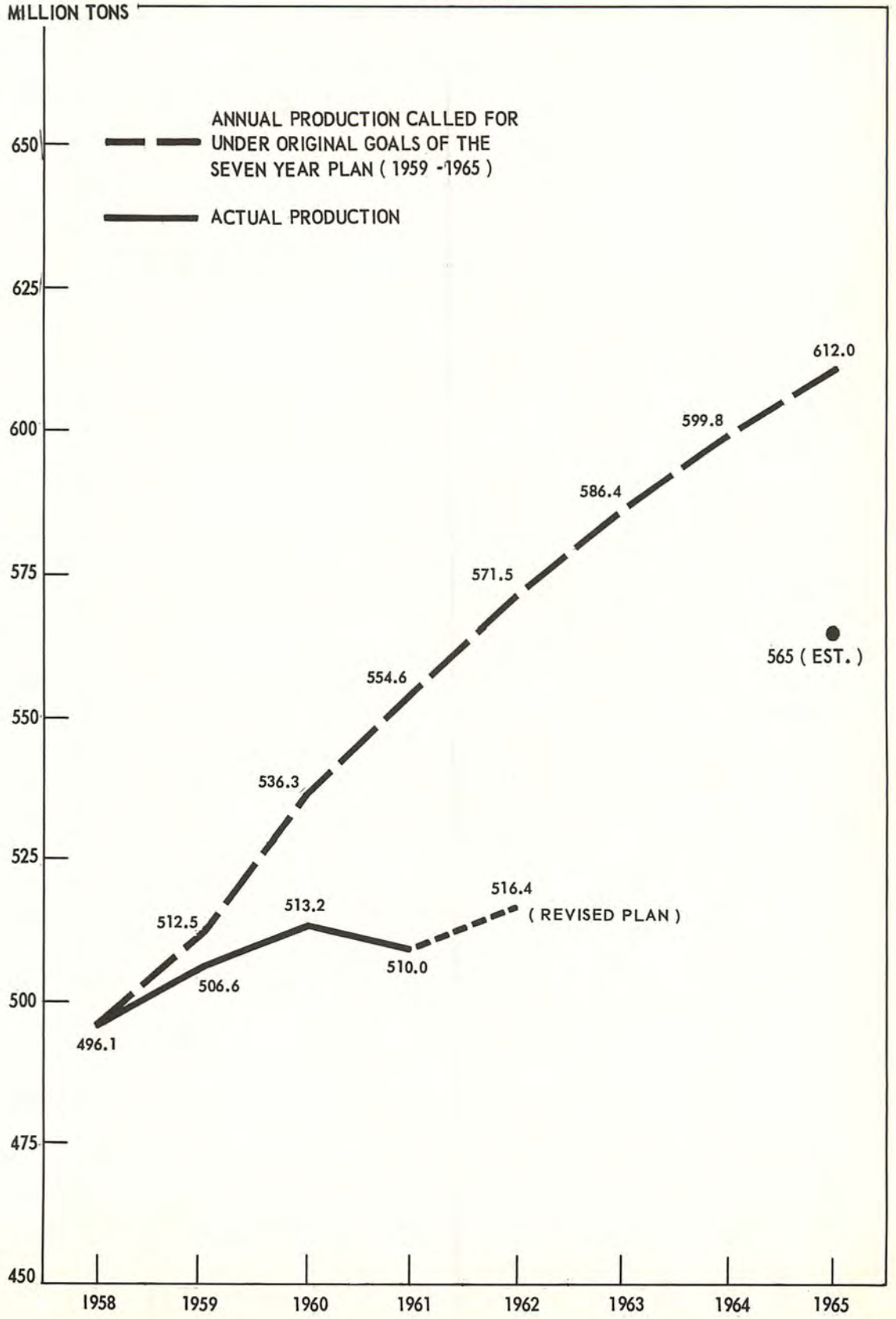
* Figure and Map Numbers in this Summary correspond with those appearing in Volume II of the report.

Figure No. 2

PRODUCTION OF COAL IN THE USSR
IN THE FIRST THREE YEARS OF THE SEVEN YEAR PLAN
1959 - 1961



program calls for production of coal to reach between 1,180-1,200 million tons by 1980. On the basis of current problems plaguing the industry and the likelihood that these problems will not be easily solved, the Committee believes that it is unlikely that these long-range production goals will be attained. Nevertheless, the program as announced is to emphasize the development of production of coal in the eastern regions, to the point that in 1980, 66 percent of total national output is to be provided by this area, compared to 36 percent in 1960. Production from strip mines is to provide the major portion of the output--51.5 percent in 1980, compared to 21 percent in 1961--again through development of strip mines in the eastern regions. It seems likely that the production goals, in particular, and probably the general long-range plans for development of the coal industry, will ultimately be revised downward to levels more in keeping with Soviet capability.

Costs of production of coal were greatly affected by the introduction of the reduced work-week in 1958. As a result of this change, the cost was raised back to the 1949-50 level, and according to Soviet reports averaged 8.17 rubles ($9.08) per ton in 1961, compared with 6.58 rubles ($7.31) per ton in 1955. A major effort during the Seven Year Plan will be concerned with bringing costs back in line with those which prevailed before the reduced work week.

The greater portion of the annual production of coal is used as a fuel by thermal power stations, which in 1958 accounted for 32.8 percent of total coal consumption, and by 1965 is to account for 41.1 percent of the total, according to plan. Three of the twelve economic regions--the South, Urals and Central (Moscow industrial area)--accounted for 62.5 percent of the total coal consumption in 1958.

The Soviet Union has been a net exporter of coal and coke since 1956. In 1960, of the total exports of coal and coke, 56.5 percent, or 5.5 million tons, was exported to the West. Yugoslavia is the major Western importer, having accounted for 18.7 percent of Soviet sales of coal and coke in 1960.

The European Satellites pay the highest prices of anyone for Soviet coal--16.39 rubles ($18.20) per ton f.o.b. border in 1960--compared to 12.91 rubles ($14.36) per ton f.o.b. for sales to the West. On the other hand, Communist China and Mongolia have been paying only 9.92 rubles ($11.01) per ton f.o.b.--the lowest prices for Soviet coal.

SECTION 5. HYDROELECTRIC AND ELECTRIC POWER

In terms of hydroelectric power technical potential, the USSR ranks second in the world, after Communist China. For the past several years the output of electric power by hydroelectric power plants has represented about 17 to 18 percent of the total electric power generated in the USSR:

GENERATION OF ELECTRIC POWER AND OF HYDROELECTRIC POWER IN THE USSR

YEAR	TOTAL (BILLION KILOWATT-HOURS)	OF WHICH, FROM HYDROPOWER STATIONS: AMOUNT (BILLION KILOWATT-HOURS)	OF WHICH, FROM HYDROPOWER STATIONS: PERCENT OF TOTAL
1950	91.2	12.7	13.9
1955	170.2	23.2	13.6
1960	292.3	50.9	17.4
1961	327.0	57.0	17.4
1965 Plan	520.0	90.0	17.3
1970 Plan	900-1,000	190.0	19-21
1980 Plan	2,700-3,000	570.0	19-21

In 1958 only 38 percent of total electric output and 24.4 percent of hydroelectric output was provided by the eastern regions of the country, but implementation of the Seven Year Plan directives is to bring about a marked change in this distribution. According to plan, in 1965 the eastern regions are to account for 46 percent of total electric power output and 40.5 percent of hydroelectric output.

Industry consumes about two-thirds of the electric power, and approximately 12 percent is used for illumination and for the everyday needs of the population.

Information available on the planned development of the hydroelectric power industry through 1980 indicates that there is to be no revision of significance in the ratio of hydropower to total electric power output. More electric power is to be made available to the population of the country--22 percent of total output in 1980--but per capita consumption planned for that year will only slightly exceed U.S. per capita consumption of electric power in 1960.

CHAPTER III

USSR PETROLEUM (CRUDE OIL AND NATURAL GAS)

SECTION 6. PROSPECTIVE SEDIMENTARY AREAS

The Committee estimates the prospective sedimentary areas of the USSR at 10.3 million square kilometers or 3.98 million square miles. The Committee has classified the prospective area of the USSR into four categories, as shown on Map No. 2.

Of the total prospective area, it is estimated that 2.84 million square miles can be classed as favorable for the occurrence of oil and gas, which roughly compares with 2.12 million square miles of favorable area for the U.S. (including Alaska and the Continental Shelf to a depth of 600 feet).

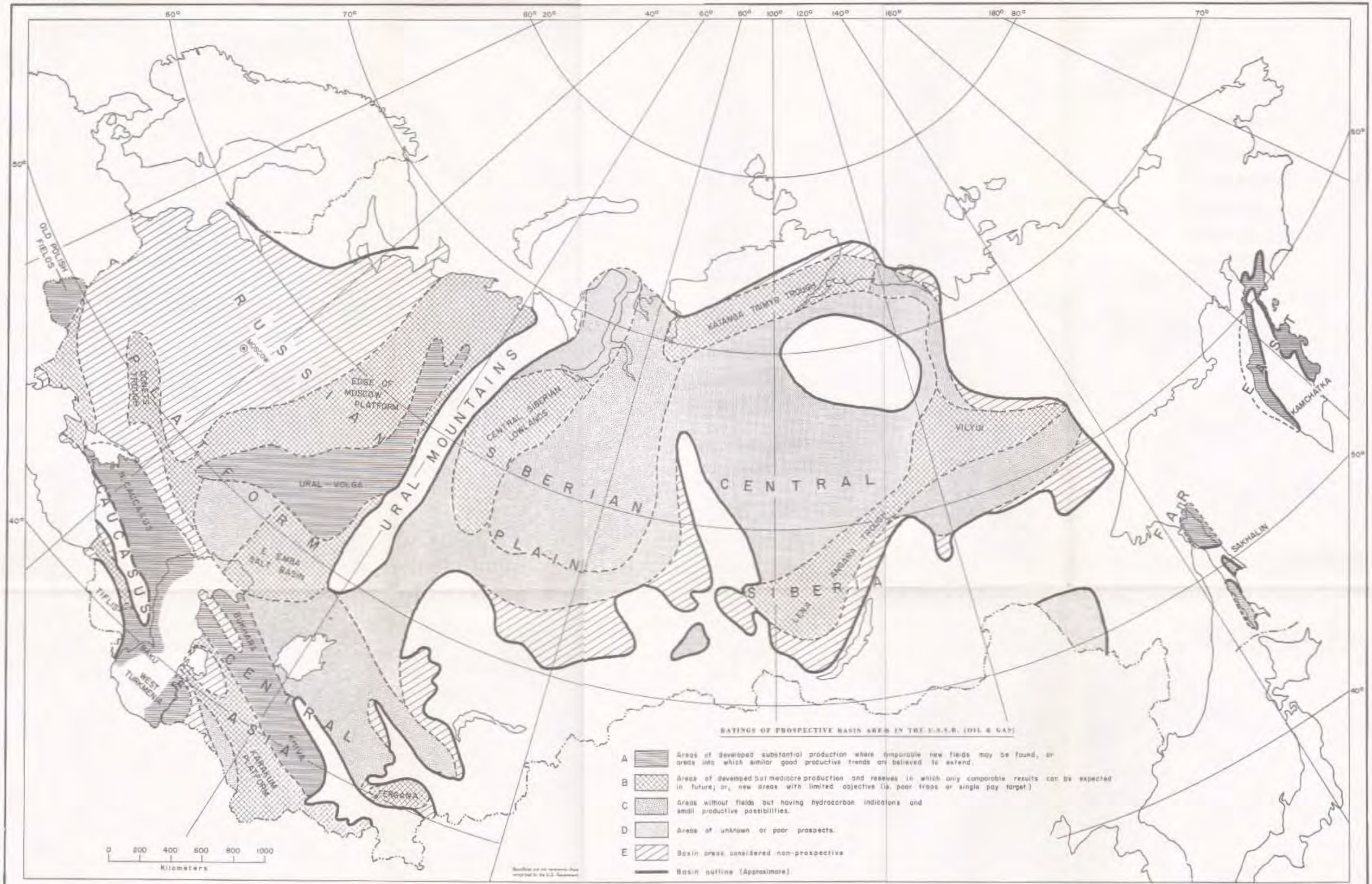
Thus the Committee concludes that the Soviet petroleum production levels will not be limited by geological factors for many years.

SECTION 7. GEOPHYSICAL AND CORE DRILLING ACTIVITIES

The USSR makes extensive use of core drilling and geophysical techniques of prospecting in its search for oil. According to Soviet press reports, during 1952-58, the USSR carried out 0.9 meters of core drilling for each meter of exploratory drilling. For the period 1959-65 this ratio will decline to 0.68 meters of core drilling per meter of exploratory drilling, even though the 1965 plan for core drilling has been set at 6 million meters (19.7 million feet), almost double that accomplished in 1958. During this same seven-year period (1959-65), the average depth of core wells drilled is to increase, from 502 meters in 1958 to 935 meters in 1965.

Because of the nature of the Soviet terrain, with geological surface indications not prominent, use of the geophysical techniques of prospecting has become particularly important. In 1961, 850 seismic parties, 200 electric parties and 100 gravity parties were reported in operation. The Committee estimates that by 1965 almost 1,700 geophysical parties employing various methods of search will be employed.

MAP NO. 2



RATINGS OF PROSPECTIVE BASIN AREAS IN THE U.S.S.R. (OIL & GAS)

A — Areas of developed substantial production where comparable new fields may be found, or areas into which similar good productive trends are believed to extend.

B — Areas of developed but mediocre production and reserves in which only comparable results can be expected in future; or, new areas with limited objective (ie. poor traps or single pay target.)

C — Areas without fields but having hydrocarbon indications and small productive possibilities.

D — Areas of unknown or poor prospects.

E — Basin areas considered non-prospective

Basin outline (Approximate)

SECTION 8. DRILLING

Drilling for oil and gas in the USSR has been hampered by poor quality bits, poor quality drill pipe and reduced efficiency of the turbodrill at increased depths. These shortcomings have been of particular consequence to the exploratory drilling program, which failed to meet any of the annual goals during 1957-61. For the first two years of the Seven Year Plan, less than 88 percent of the cumulative plan for exploratory drilling was completed. Even so, the amount of drilling has increased rapidly, and future targets are set high.

EXPLORATORY AND DEVELOPMENT DRILLING FOR OIL AND GAS IN THE USSR

	MILLION FEET		
YEAR	EXPLORATORY	DEVELOPMENT	TOTAL
1950	7.0	7.1	14.1
1955	7.4	9.1	16.5
1960	13.3	12.1	25.4
1961	14.9	12.5	27.4
1965 Plan	33.2	19.5	52.7
1961-80 Plan(Total for Period)	492.0-591.0	1,066.0	1,558-1,657

Exploratory drilling for natural gas, whose share of total exploratory drilling (as allocated by Soviet planners) has steadily risen from 16 percent in 1955 to 33 percent in 1961, has been particularly effective so far in the Soviet Union. It was reported that for each meter of exploratory drilling for natural gas during 1951-55, 304.6 thousand cubic meters of natural gas were found (3.3 million cubic feet per foot drilled), and for the subsequent five-year period 335.4 thousand cubic meters (3.6 million cubic feet per foot) were found. The Committee estimates that exploratory drilling allocated by Soviet planners to crude oil during 1951-55 yielded 89.1 tons of crude oil found for each meter drilled (198 barrels per foot), but during 1956-60, the level of effectiveness increased to 375 barrels found per foot drilled. Analysis of plans for 1959-65 indicate that allowance has been made for the effectiveness of exploratory drilling for crude oil to fall back to about the 1951-55 level, while that for natural gas is to be approximately midway between the 1951-55 level and the 1956-60 level.

As applied in the USSR, all wells are considered to be exploratory until the limits of the oil or gas deposit has been completely defined. Thus, under Soviet practice, depending upon the size of the field, geologists may drill a number of exploratory wells on the prospect that it was proved productive by the first exploratory well. Use of this definition allows the USSR to show that in 1960, for example, 44 percent of the number of exploratory wells drilled and tested in that year produced either crude oil or natural gas.

Difficulties similar to those in the exploratory drilling program also have prevented Soviet drillers from achieving the planned amounts of development drilling for the first three years of the Seven Year Plan, and only 94.6 percent of the cumulative plan was achieved. Only a small portion of the annual development drilling has been allocated to natural gas. In 1956, the last year for which data are available, development drilling reportedly allocated for natural gas represented only 1.7 percent of total development drilling. For the Seven Year Plan, 7.6 percent of the total has been allocated to natural gas.

In terms of annual meters drilled, exploratory drilling exceeded that for development for the first time in 1959. The Seven Year Plan calls for about 1.5 meters of exploratory drilling for each meter of development drilling. But for the twenty-year period 1961-80, emphasis is to shift again to development drilling and it is estimated that during these years the amount of exploratory drilling will be about one-half that for development.

The Committee estimates that in 1961, the Soviet Union had 1,279 drilling rigs in operation, compared with the 1,135 rigs in use in 1950, and with 1,360 rigs planned for operation in 1965. As a result of current declines in drilling rates, rig requirements by 1965 probably will exceed those planned, which could lead to shortages. It seems likely, however, that rig manufacture plans have been altered. At the same time, the USSR may look to Western suppliers of rigs.

The turbodrill probably can be singled out as the tool of greatest significance in the rapid development of the oil fields of the Urals-Volga and of the USSR as a whole. But the Soviet Union is entering a new phase in its search for additional crude oil and natural gas. In this phase, which

calls for penetration to average depths of 3,000 to 4,000 meters (9,800 to 13,200 feet) and even greater, the performance of the turbodrill so far has been wholly unsatisfactory. As evidence of turbodrill difficulties persisted, Soviet engineers began to recommend limiting the turbodrill technique to 2,000 meters (6,600 feet) in depth and to suggest the electrodrill technique for deeper drilling. But the electrodrill has its own operations disadvantages, and as a consequence, drillers in the field have called for the almost exclusive use of rotary drilling in the deep drilling program. Until improvement can be made in turbodrilling techniques, a combination of turbo and rotary drilling will be used. Use of this combination necessitates the development of rotary drilling know-how, the training of drilling crews in rotary practice, and the development of better drill pipe, tool joints and bits required for rotary drilling. The Committee believes there will be increasing tendencies on the part of the Soviet oil industry to seek technology and equipment in Free World markets.

The major problems confronting the drilling program of the Soviet Union have served to raise both exploratory and development drilling costs. Reported exploratory drilling costs in 1960 were the highest since 1955, and development drilling costs were the highest in the past six years. It is unlikely that the 1965 planned reductions in drilling costs will be achieved.

Requirements of steel for use as drill pipe and casing during 1959-65 are to exceed 3.8 million tons. Additional requirements for steel pipe for pumps and compressors probably will increase this figure to about 6.3 million tons. The current effort to reduce steel requirements in the oil industry points up a probable shortage of oil field tubular goods.

SECTION 9. PRODUCTION OF PETROLEUM

A. Crude Oil

Of all of the major forms of primary energy in the Soviet Union, only the production of crude oil has been in excess of the annual goal for each of the first three years of the Seven Year Plan. Performance is illustrated

by Figure No. 3. The major portion of the growth in production of crude oil during the post-war period can be attributed to the continued development of new capacity in the Urals-Volga, which in 1960 accounted for 73 percent of total national output, or almost that proportion--74 percent--planned for 1965. In the next most important area--Azerbaydzhan--the absolute production has increased some but the relative proportion has been steadily declining, from 39.1 percent of total USSR production of crude oil in 1950 to 11.3 percent in 1961. There have been no changes of significance in other areas of the country. Map No. 3 depicts the current major oil and gas producing areas in the Soviet Union.

The reported actual and planned production of crude oil is as follows:

PRODUCTION OF CRUDE OIL IN THE USSR

YEAR	MILLION METRIC TONS	MILLION BARRELS PER DAY
1950	37.9	0.7
1955	70.8	1.4
1956	83.8	1.7
1957	98.3	2.0
1958	113.2	2.3
1959	129.6	2.6
1960	147.9	2.9
1961	166.0	3.3
1962 Plan	185.0	3.7
1965 Plan	240.0	4.8
1965 Committee Estimate	265.0	5.3
1970 Plan	390.0	7.8
1975 Plan	545.0	10.9
1980 Plan	690.0-710.0	13.8-14.2

The Committee believes that the production of crude oil in the USSR in 1965 will be well in excess of the plan of 240 million tons (4.8 million barrels per day), and may reach as much as 265 million tons (5.3 million barrels per day). Much of the probability of achieving the latter level of production depends upon the assistance the USSR is able to secure from the Free World in obtaining supplies

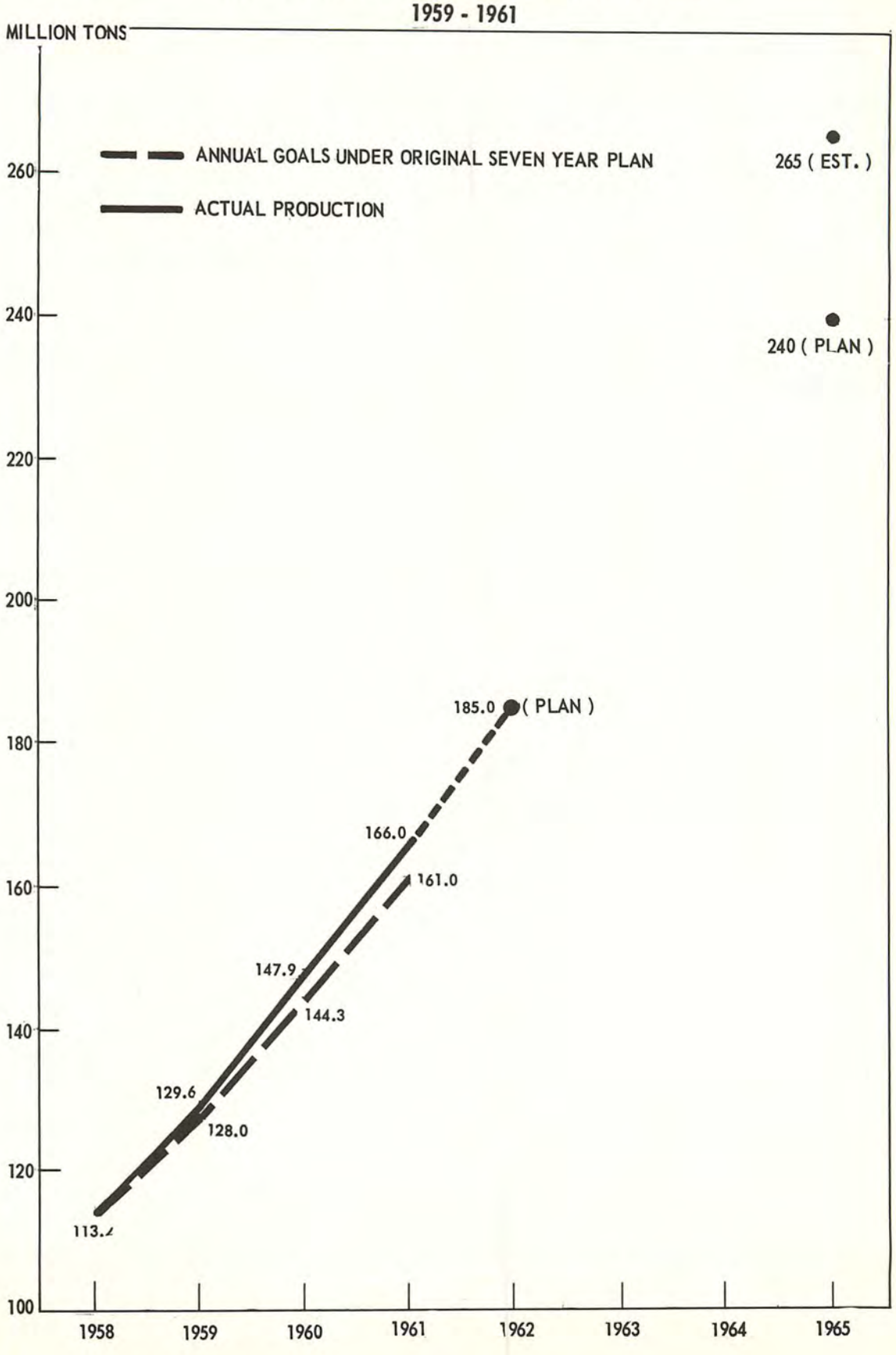

MAP NO. 3
MAJOR OIL AND GAS PRODUCING AREAS OF THE USSR
1961
Predominately Crude Oil
Predominately Natural Gas
Economic region boundary
1960 Production, by Economic Region
Crude Oil (million metric tons)
Natural Gas (billion cubic meters)
1 metric ton equals 7.3 barrels
1 cubic meter equals 35.314 cubic feet
ARCTIC OCEAN
NOVAYA ZEMLYA
Ia
Ib
IIa
IIb
III
IV
V
VI
VII
VIII
IX
Xa
Xb
XI
XII
Gazli-Kagan Group
Fergana Valley

Figure No. 3

CRUDE OIL PRODUCTION AND GOALS

IN FIRST THREE YEARS OF SEVEN YEAR PLAN

1959 - 1961



of critical materials and equipment, and upon the value Soviet authorities place upon petroleum exports as a political and economic weapon.

Average costs of production of crude oil (and associated natural gas), as reported by the USSR, have declined from 5.9 rubles per ton ($0.90 per barrel) in 1950 to 3.2 rubles per ton ($0.49 per barrel) in 1960. The widespread program of water injection has been a major factor in this drop. Continued declines are forecast by the Soviet planners. It should be noted, however, that in the Soviet accounting system expenditures in geological prospecting and exploratory drilling are not taken into consideration in their reported production costs. When these expenditures are included, average costs are raised by 30 to 40 percent.

Costs of production vary widely within the USSR. Soviet figures indicate that by far the cheapest oil obtainable in the country is found in the Urals-Volga, where crude costs from the Tatar ASSR in 1958 averaged only 40 percent of the national average. On the other hand, producing crude in Sakhalin cost 3.3 times the national average.

The USSR has not published any definitive information on proved reserves of crude oil since the 1930's, but available information indicates that the proved reserves/production ratio is on the order of 20 to 1. On this basis the Committee estimates proved reserves were 24 billion barrels in the USSR in 1961.

In October, 1961, the Soviet Union announced plans for the development of production of crude oil for the twenty-year period 1961-80. According to the plan, in 1980 crude oil output is to reach 690-710 million tons (13.8-14.2 million barrels per day), with output in the intervening years to reach 390 million tons (7.8 million barrels per day) in 1970, and 545 million tons (10.9 million barrels per day) in 1975.

If these goals are to be reached, it is apparent that a very substantial volume of crude oil must be found. In-ground reserves at the end of 1980 may be estimated at about 77 billion barrels for a reserves/production ratio of about 15 to 1. New finds during 1961-80 thus must amount to 115 billion barrels, including oil produced.

For comparison, during 1946-60, 26 billion barrels were found. The plans announced for total crude oil drilling in the 1961-80 period appear consistent with the 115 billion barrels required to be found, when comparing with past success ratios.

If the Soviet plans are realized, the Urals-Volga will continue to be the major source of crude oil production, although the share anticipated for 1980--slightly more than 50 percent--will represent a decline from the current position. The North Caucasus is to emerge as a major producer of crude oil, although this area has not been given the publicity comparable to the new discoveries on the Nangyshlak Peninsula in Western Kazakhstan and the first discoveries of commercial crude oil in Siberia.

While it is not feasible to forecast whether the USSR will succeed or fail in achieving these long range production goals, such goals appear consistent with the announced plans for prospecting and drilling and are not unreasonable in view of the probable oil reserves of the USSR. Probably the greatest problems in reaching the 1961-80 plans will be overcoming the deficiencies present in Soviet drilling and producing equipment and technology and the shortage of oil field tubular goods and other related material. The Committee believes that in an attempt to overcome these problems, the Soviet Union will look increasingly to the Free World for the supply of equipment and technology.

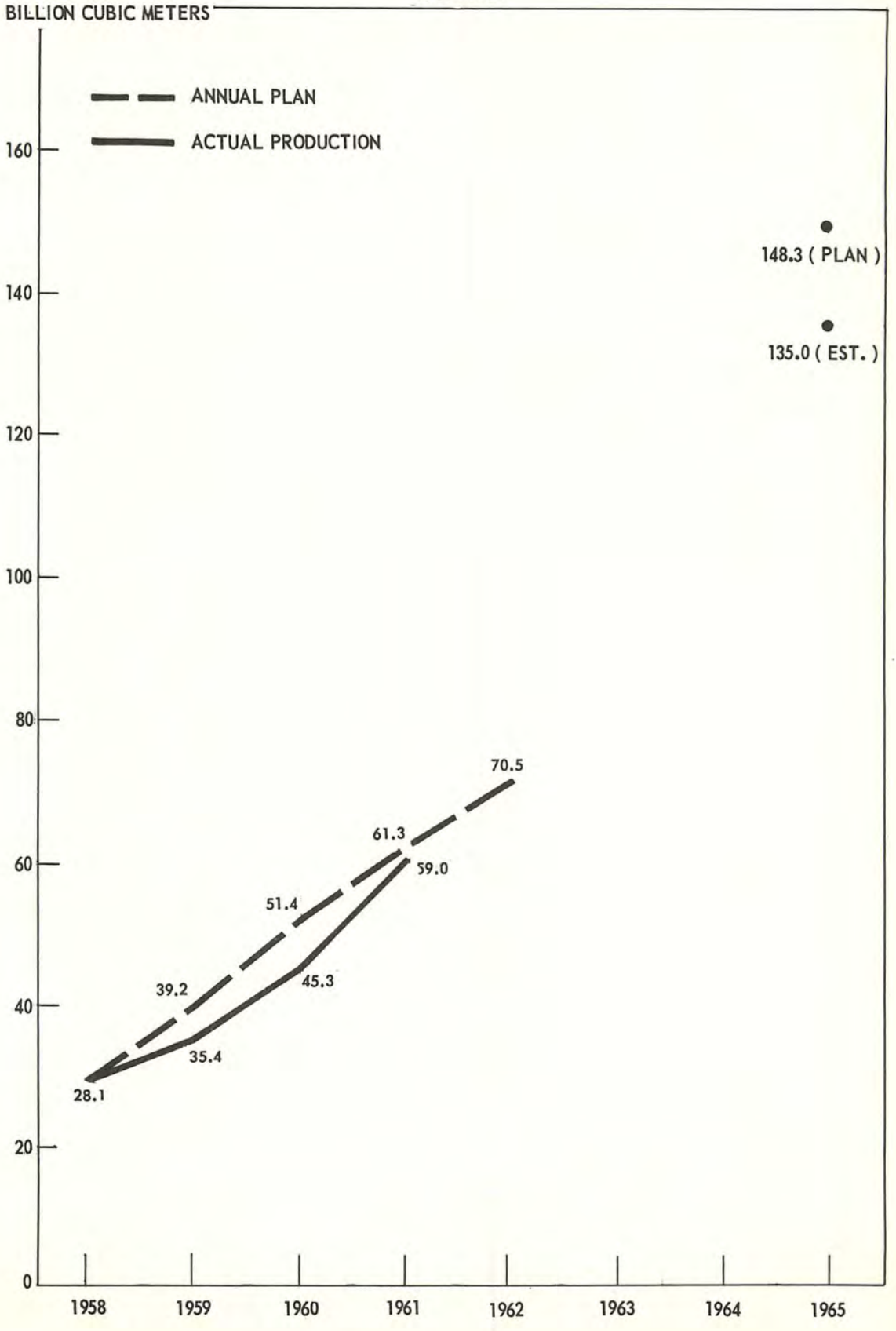
B. Natural Gas

The performance of the natural gas industry in recent years has been a source of disappointment to Soviet planners. Largely because of continued lags in the installation of compressors on existing gas pipelines, the failure to ready potential consumers for the use of natural gas, and the lack of storage facilities to meet peak load demands, the natural gas industry has not been able to meet a single annual production goal since 1956.

The Seven Year Plan, introduced in 1959, established 148.3 billion cubic meters (5.24 trillion cubic feet) as the goal for production of natural gas in 1965. No intermediate goals were provided in the original plan. From year to year annual goals have been set, but they have not been attained, as shown on Figure No. 4. In light of the production deficiencies during 1959-61 and the likelihood that the problems

Figure No. 4

SHORTFALLS IN THE PRODUCTION OF NATURAL GAS
IN THE FIRST THREE YEARS OF THE SEVEN YEAR PLAN
1959-1961



facing the gas industry will not be corrected easily, the Committee estimates that the production of natural gas in the USSR in 1965 will reach no more than 135 billion cubic meters (4.8 trillion cubic feet).

PRODUCTION OF NATURAL GAS IN THE USSR

YEAR	BILLION CUBIC METERS	TRILLION CUBIC FEET
1950	5.8	0.2
1955	9.0	0.3
1960	45.3	1.6
1961	59.0	2.1
1965 Plan	148.3	5.2
1965 Committee Estimate	135.0	4.8
1970 Plan	310.0-325.0	10.9-11.5
1980 Plan	680.0-720.0	24.0-25.4

The North Caucasus and the Ukraine together accounted for almost 62 percent of total national production in 1960, and the growth rate in these two producing areas has been rapid.

Additions to proved reserves of natural gas since 1955 have been well in excess of plan. Proved reserves of non-associated natural gas have been reported by the USSR to be 2.0 trillion cubic meters (71.8 trillion cubic feet) as of January 1, 1961. The early successes in meeting the goals for increments to proved reserves have permitted an upward revision of the 1965 goal by almost 23 percent, to 4.2 trillion cubic meters (147.8 trillion cubic feet).

The cost of production of non-associated natural gas has been steadily declining since 1955 and according to the plan will continue to decline through 1965. Soviet publications state that in 1960, the cost of producing 1,000 cubic meters of non-associated natural gas was 0.59 rubles ($0.019 per thousand cubic feet). It should be noted that reported costs do not include expenditures in geological-exploratory work and, therefore, probably represent a substantial understatement of the real costs. The continuing decline in cost of production has been possible through the increased exploitation of the very rich gas deposits at Gazli in the Uzbek Republic and the multiple fields in Krasnodar Kray.

Only minor quantities of natural gas are exported from the USSR. In 1960 they totaled 242 million cubic meters (8.5 billion cubic feet) which were delivered to Poland by means of a pipeline originating in the Western Ukraine. A second pipeline from the same fields to Poland is scheduled for completion in 1965, after which exports probably will be in excess of 1 billion cubic meters (35.3 billion cubic feet) per year.

Long range plans for the development of the natural gas industry through 1980 have been established as they have for coal and crude oil. They call for the production of natural gas to reach to 680-720 billion cubic meters (24.0-25.4 trillion cubic feet) by 1980. By January 1, 1981, proved reserves of non-associated natural gas are planned to reach 13.0 trillion cubic meters (459 trillion cubic feet), which will provide a reserves/production ratio of about 20 to 1 based on planned production. The most dramatic shift in the regional production of natural gas which is planned to take place during 1961-80 is the growth in the share of the Central Asian Republics, from 1.6 percent of the national output in 1960 to 24.3 percent by 1980. Both in terms of percentage and absolute growth, that planned for Central Asia far exceeds any other area of the Soviet Union. The second leading producer of natural gas in 1980 is to be the Urals-Volga (21.5 percent), followed by the Ukraine (15.4 percent).

C. Natural Gas Liquids

Development of the production and consumption of LPG and of natural gas liquids in general in the USSR has lagged considerably behind the potential available. Major problems have been the lack of consuming equipment, a lack of transport and storage facilities and a failure to meet natural gasoline plant construction schedules.

The consumption of LPG in the USSR (excluding output from refineries) has increased from 73,000 tons in 1957 (about 1.5 thousand barrels per day) to 487,000 tons in 1961 (about 9.7 thousand barrels per day).

No data are available on the output of natural gasoline.

Although current Soviet plans call for the output of 6.5 million tons of natural gas liquids in 1965 (130 thousand barrels per day), the Committee views this level of production and estimate that output probably will fall within the range of 3 to 4 million tons (60 to 80 thousand barrels per day).

SECTION 10. REFINING OF CRUDE OIL

The Committee estimates that during the current Seven Year Plan the USSR is attempting to increase its capacity for crude distillation by 130 million tons per year (2.6 million barrels per day) to a total of 250 million tons per year (5.0 million barrels per day) by 1965. If operated according to current Soviet practice (i.e., about 85 percent of stated capacity), 250 million tons design capacity will be sufficient to process 214 million tons per year (4.3 million barrels per day). This would supply for domestic consumption an estimated 180 million tons per year of non-gaseous products and for export an estimated 17 million tons per year. On this basis, the Committee predicts that total export of products from the USSR to both Free World and satellites, including the equivalency of synthetics and liquefied petroleum gas, would be 22 million tons per year (440,000 barrels per day).

The 2.6 million barrels per day addition in capacity will require the expenditure of 3.6 billion rubles ($4.0 billion) during the seven year period, according to the Soviet Plan, including about 20 percent for the expansion and modernization of existing facilities. Ninety-five million tons capacity (1.9 million barrels per day) will be provided by 17 major new refineries with the remainder in the expansion of existing refineries. There will then be a total of 63 refineries in the USSR. The location of existing refineries is shown on Map No. 4.

A comparison of the Committee's estimated 1965 crude charge and yields with 1960 is given in the following table:

MAP NO. 4

REFINERIES AND REFINING CAPACITY IN THE USSR

REFINING CAPACITY (1 January 1961)

- More than 12 million tons per year
- 4 million to 12 million tons per year
- 1 million to 4 million tons per year
- 100,000 to 1 million tons per year
- Less than 100,000 tons per year

REGIONAL DISTRIBUTION OF REFINING CAPACITY
1958 and 1965 (million metric tons)

KAZAKHSTAN AND CENTRAL ASIA: 1958 12.3, 1965 30.9

1 metric ton equals 7.2 barrels

Economic region boundary

ESTIMATED REFINERY YIELDS
IN THE USSR

REFINERY YIELD	1960 MILLION METRIC TONS	1960 THOUSAND BARRELS PER DAY	1960 YIELD WEIGHT PERCENT	COMMITTEE ESTIMATE 1965 MILLION METRIC TONS	COMMITTEE ESTIMATE 1965 THOUSAND BARRELS PER DAY	COMMITTEE ESTIMATE 1965 YIELD WEIGHT PERCENT
Gasoline	26.0	615	20.0	35.4	836	16.5
Kerosine	15.3	325	11.8	24.0	510	11.2
Light Diesel	24.2	491	18.6	31.8	645	14.9
Heavy Diesel	4.9	99	3.8	11.2	227	5.2
Lube Base	5.5	105	4.2	7.9	161	3.7
Residual and Others	43.7	755	33.6	86.7	1,495	40.5
TOTAL NON-GAS	119.6	2,390	92.0	197.0	3,874	92.0
Refinery Gas Plus Losses	10.4	-	8.0	17.0	-	8.0
TOTAL REFINERY CHARGE	130.0	2,600	100.0	214.0	4,280	100.0

Should the total capacity of 250 million tons per year (5.0 million barrels per day) not be reached by 1965, domestic requirements will probably not be in jeopardy, since a charge of 196 million tons per year will satisfy this internal demand. Export of products would be less, however, and exports of crude would be substituted. Also it seems quite likely that the USSR could operate its refineries above the historical 85 percent of capacity rate.

Although the Committee believes that total crude distillation capacity will be adequate, it is not equally certain that there will be sufficient secondary refining facilities to insure the desired quality or proportions in the product mix. The USSR has a problem of disposing of naphtha and getting adequate yields of diesel oil and fuel. To some extent this problem is being solved by maximizing naphtha in diesel oil blends and, in the future, they may try to push virgin naphtha into the Free World. The Western gasoline markets have not yet been penetrated to any appreciable extent, and probably will not be in the near future, because of poor octane quality of Soviet gasolines due to a lack of catalytic reforming capacity and mild operations on the catalytic cracking units to minimize gasoline yield.

SECTION 11. TRANSPORTATION OF PETROLEUM

A. Railroads

Railroads not only have been the backbone of the transportation system of the USSR, but also have provided the major means of transport of petroleum as shown below.

TRANSPORT OF PETROLEUM FREIGHT IN THE USSR, BY TYPE OF CARRIER

CARRIER	1958 BILLION TON-KILOMETERS	1958 BILLION TON-MILES	1958 PERCENT OF TOTAL	1965 PLAN BILLION TON-KILOMETERS	1965 PLAN BILLION TON-MILES	1965 PLAN PERCENT OF TOTAL
Rail	154.0	95.5	62.7	251 a/	156 a/	46.1
Maritime	42.0	26.1	17.1	85	53	15.6
Inland Waterway	15.8	9.8	6.4	24	15	4.4
Pipeline	33.8	21.0	13.8	185	115	33.9
TOTAL	245.6	152.4	100.0	545	339	100.0

a/ Soviet estimates of transport of petroleum by rail in 1965 have been recently revised upward to 270 billion ton-kilometers.

It will be noted that the railroads accounted for 62.7 percent of the total petroleum movement in 1958. Recently, Soviet plans for a spectacular increase in the petroleum pipeline system have been given wide publicity. Although successful implementation of this construction program will significantly increase the role of pipeline transport in the movement of petroleum freight, railroads will continue to account for the largest share--more than 46 percent in 1965--of petroleum traffic.

It is significant that according to Soviet plans, petroleum freight carried by pipelines in 1965 will be equivalent to only 10 percent of the total rail freight in the USSR, and the petroleum freight carried by ship and inland waterways will be equivalent to only 6 percent of total rail freight. Hence any failure to completely achieve plans for modes of petroleum transportation other than rail would not throw a relatively large burden on the railroads.

At the present time, tank car inventory is the principal limitation in rail transportation of petroleum, but the USSR has announced plans to bring the 1965 inventory to 87 percent above 1958. Furthermore, since the tank cars required depend to some extent on turnaround time, additional capacity may be gained by future improvements in utilization.

B. Inland Waterways

Inland waterways play only a minor and decreasing role in the movement of petroleum freight within the USSR. Largely as a result of the increasing importance of pipelines, the planned share of inland waterways in the total movement of petroleum freight is to decline from 6.4 percent in 1958 to

4.4 percent in 1965. All water transport (including both maritime and inland waterway) accounted for 23.5 percent of petroleum traffic in 1958, but is to decline to 20 percent by 1965. Until recently, river transport was the cheapest means of petroleum transport in the USSR, but introduction of large-diameter pipe in the construction of pipelines will probably lower pipeline transport cost to a level below that of inland waterways.

C. Pipeline Transportation (Petroleum and Natural Gas)

At the end of 1958 the Soviet Union had in operation only 14.5 thousand kilometers (8.9 thousand miles) of crude oil and petroleum product pipelines and 13.2 thousand kilometers (8.2 thousand miles) of gas pipelines. The Seven Year Plan (revised) calls for construction of 31.8 thousand kilometers (19.7 thousand miles) of oil pipelines and 29.5 thousand kilometers (18.3 thousand miles) of gas pipelines. Thus in seven years the USSR plans to install about twice as much trunk line as existed at the end of 1958.

Of the major petroleum pipeline systems planned for 1959-65, most are designed to increase the export capability of the Soviet Union. These systems include the much publicized Comecon pipeline, or the so-called "pipeline of friendship", shown on Map No. 7. The Comecon line is a 5,800 kilometer (3,595 miles) system, including all branches, which is designed to transport Urals-Volga crude oil to Poland, East Germany, Czechoslovakia and Hungary, in addition to branch export lines to the Baltic ports of Ventspils and Klaipeda. The Committee has calculated that the Comecon line will have a carrying capacity of 740,000 barrels per day over the initial 40-inch sector leading out of the Urals-Volga, based on 85-90 percent load factor. The entire system is to be completed for use in 1964, although the section from Brody (USSR) to Bratislava (Czechoslovakia) already is in operation, and that from Sahy (Czechoslovakia) to Szazhalombatta (Hungary) will be in operation shortly.

Other important pipelines, some of which are also shown on Map No. 7, include:


MAP NO. 7
COMECON AND NEW MAJOR CRUDE OIL EXPORT LINES
EUROPEAN AREA
AS OF MARCH 1, 1962
FINLAND
SWEDEN
STOCKHOLM
DENMARK
BALTIC SEA
LENINGRAD
KIRISHI
VENTSPILS
KLAIPEDA
POLOTSK
YAROSLAVL
GORKIY
AL' MET' YEVSK
MOSCOW
KUYBYSHEV
WEST GERMANY
EAST GERMANY
BERLIN
SCHWEDT
PLOCK
WARSAW
FRANKFURT
POLAND
SOVIET UNION
PRAGUE
CZECHOSLOVAKIA
MOZYR
UNECHA
MICHURINSK
OVRUCH
BRODY
LISKI
VIENNA
AUSTRIA
BRATISLAVA
SAHY
UZHGOROD
BUDAPEST
SZAZHALOMBATTA
HUNGARY
KREMENCHUG
STALINGRAD
RUMANIA
BUCHAREST
NOVOROSSIYSK
TUAPSE
TIKHORETSK
BLACK SEA
CASPIAN SEA
BASIS FOR CAPACITY CALCULATIONS
CRUDE OIL CHARACTERISTICS
34° API (.885 SP GR.)
80 SSU (16 CENTISTOKES)
PIPE WORKING PRESSURE, (GRADE X-52)
12" DIA. — 13/64" WALL — 1192 PSI
20" DIA. — 5/16" WALL — 1168 PSI
21" DIA. — 5/16" WALL — 1115 PSI
24" DIA. — 5/16" WALL — 973 PSI
28" DIA. — 15/32" WALL — 1252 PSI
32" DIA. — 15/32" WALL — 1100 PSI
40" DIA. — 15/32" WALL — 876 PSI
AVERAGE STATION SPACING
100MI. TO 120MI. (ASSUMED)
CARRYING CAPACITY BASED ON 85% TO 90% LOAD FACTOR.
PIPE LINE STATUS
COMPLETED
UNDER CONSTRUCTION
PLANNED
LEGEND
REFINERY, TANKAGE & PUMP STA.
MARINE TERMINAL
TANKAGE & PUMP STATION
BOOSTER STATION
50,000 B/D — CARRYING CAPACITY BARRELS PER DAY
SCALE IN MILES
W.D. 4-6-62

ORIGIN	TERMINUS	LENGTH, MILES	SERVICE	CARRYING CAPACITY, BARRELS PER DAY[a]	COMMITTEE ESTIMATE OF COMPLETION DATE
Urals-Volga	Leningrad	935	Crude	320,000	Early 1963
Stalingrad	Tuapse	520	Crude	210,000	1965
	Novorossiysk	520		210,000	
Tuymazy	Irkutsk	2,300	Crude	320,000	Early 1963

a/ Committee estimate, assuming 85-90 percent load factor.

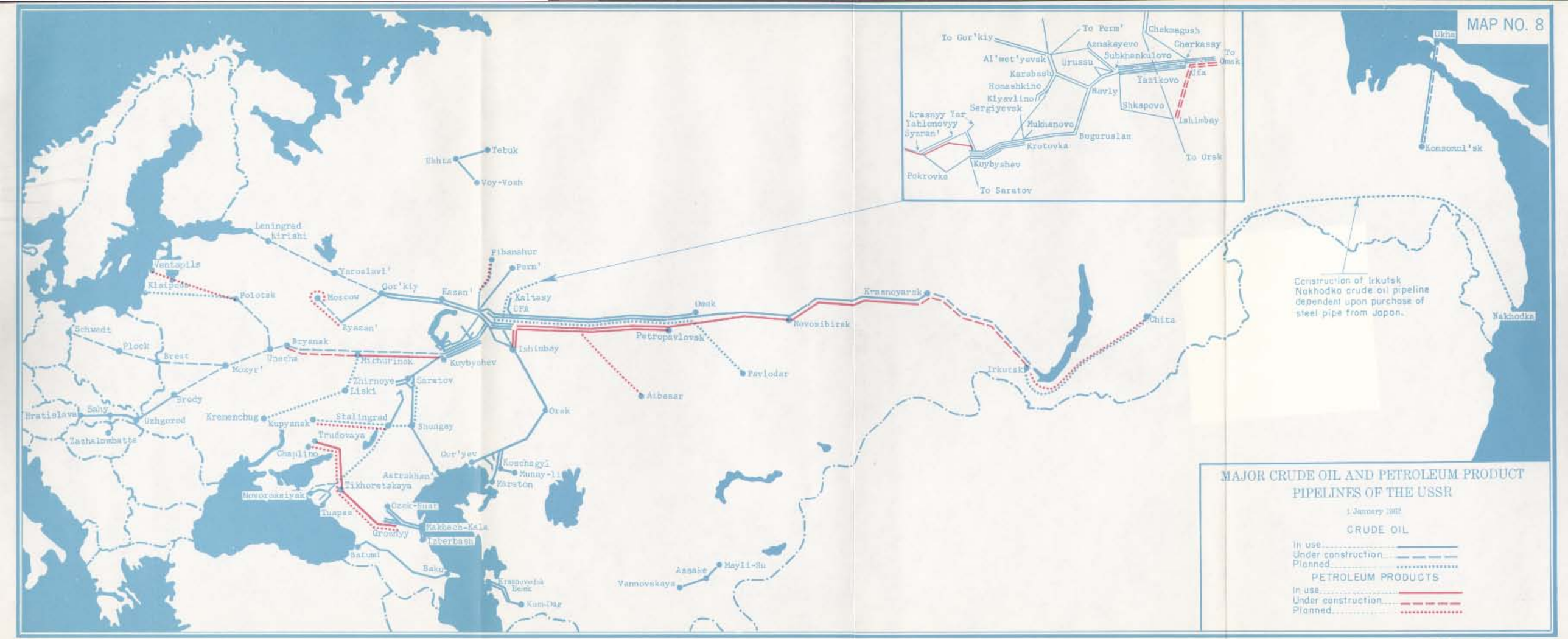
Negotiations are still underway between the USSR and Japan concerning the barter of Soviet crude for Japanese steel pipe for use in construction of a 28-inch (or possibly 32-inch), 2,730 mile crude oil pipeline between Irkutsk in East Siberia and the Pacific Ocean port of Nakhodka. This line is not considered part of the Seven Year Plan.

Finally, two additional pipelines, under construction or planned, may have an ultimate effect on the petroleum export capability of the USSR. These are the Okha (Sakhalin)-Komsomol'sk crude pipeline and a Baku-Batumi product pipeline.

Map No. 8 shows major crude oil and petroleum product pipelines in the USSR.

The savings to the economy which will result from the increased role of pipelines in petroleum freight movement in the USSR can be illustrated by comparing rail transport costs from Kuybyshev to Klaipeda on the Baltic Sea with estimated pipeline costs over the same route. The Committee estimates that rail costs to move crude oil from Kuybyshev to Klaipeda are about $1.05 per barrel. But pipeline costs, following completion of the line to Klaipeda, will be only 29 cents per barrel, by Committee estimate.

On the other hand, the estimated pipeline cost of delivering crude oil from Tuymazy to Nakhodka would be about $1.18 per barrel, which slightly exceeds a comparable cost of $1.15 per barrel by pipeline to the Black Sea and tanker through the Suez Canal. Thus it is probable that the greater benefit from the construction of the Irkutsk-Nakhodka pipeline will accrue to internal interests of the USSR, since the line would also be used to supply consumers enroute to Nakhodka.



The Soviet capability to export increasing quantities of oil depends to a considerable degree on the completion of its pipeline construction plans. The lack of progress during 1956-60 cast some doubts at one time on the capability to complete the plan on schedule. This delay resulted primarily from shortages of large diameter pipe. There now seems little doubt, however, that the essential parts of this program will be completed on schedule. This abrupt reversal in trend has been accomplished by resorting to purchases of pipe and other facilities from Western suppliers. In the period 1959-mid-1962, the Soviet Union either has purchased or arranged to purchase at least the following amounts of 40-inch steel pipe:

SUPPLIER	METRIC TONS
West Germany	680,000
Italy	240,000
Sweden	135,000
TOTAL	1,055,000

With these purchases, the USSR will be able to meet almost 40 percent of the Seven Year Plan requirements for 40-inch pipe. Total requirements for all large diameter pipe for use in oil and gas pipeline construction during these years is estimated at about 9.5 million tons, and pipe requirements for construction of oil and gas gathering lines plus gas distribution systems may total an additional 4 million tons.

The major gas pipeline system planned for construction during 1959-65 is the dual 40-inch designed to transport gas from the Central Asian Republic of Uzbekistan to industrial consumers in the Urals. Total length of this system will be 2,770 miles.

Poor performance in utilization of transmission gas pipelines in the USSR has been a major factor in the failure to meet the annual goals for gas production. This poor performance can be attributed to the inability of the USSR to develop compressors adequate for use on large diameter pipelines.

The Soviet Union has grandiose plans for pipeline installation through 1980. These plans call for the

installation of more than 250,000 kilometers (155,000 miles) of pipeline during 1961-80, of which 150-170 thousand kilometers (93,000-105,000 miles) are planned for gas. According to Soviet announcements, about one-third of the pipe required will be 40,48 and 56 inches in diameter.

In summation, the oil and gas pipeline systems of the USSR are designed to accomplish four primary objectives:

(1) To supply industry with secure, cheap and convenient fuels.

(2) To supply a much needed form of energy to the European satellites, thus making these countries dependent upon the USSR and preventing an alignment with Western sources.

(3) To provide facilities for the export of oil to the Free World in the drive to acquire foreign exchange and equipment and to disrupt established Free World industry.

(4) To reduce present cost of delivering oil and gas to internal consumers and to export bases.

D. Ability To Transport Exportable Petroleum Surpluses

The Committee concludes that internal transportation will not limit the Bloc's ability to deliver petroleum to points of export, nor would petroleum port facilities or availability of tankers appear to be a limiting factor either. In making this appraisal, the Committee has recognized that the existing Soviet transportation system has been adequate to move more than 800,000 barrels of petroleum per day in 1961 to the Soviet border for export.

According to the Committee's estimates, the deliverability of the new pipelines currently planned or under construction through 1965 will aggregate approximately 1,500,000 barrels per day upon completion. It is significant that all of this new pipeline capacity will be built into Baltic, Central Europe, and Black Sea destinations. While the Black Sea ports are currently the point of origin for the

great bulk of Soviet exports of petroleum, new pipeline capacity to the Baltic Sea will, in essence, provide a new system for delivering petroleum to the Free World giving, in particular, greater access to northern Europe. The pipeline system to Schwedt in East Germany and Bratislava in Czechoslovakia will add a tremendous amount of transportation potential toward West Europe's border. Delivery of petroleum to Black Sea terminals will also be facilitated by new pipelines, thus providing supplemental capacity to the Soviet Union's traditional area of export.

Finally it should be recognized that the Trans-Siberian line now under consideration for extension beyond Irkutsk to Nakhodka would provide an outlet for petroleum to foreign markets in addition to those mentioned above, if it is actually constructed.

SECTION 12. ESTIMATED INVESTMENT IN PETROLEUM INDUSTRY

The Soviet Seven Year Plan provides for a total productive capital investment in the oil and gas industry of 17.0-17.3 billion rubles (about $US 18.9 million to 19.2 million) during the period 1959-65. Of this amount 42 percent is to be invested in oil exploratory and development drilling and extraction, 75.9 percent in the oil sector as a whole, and 24.1 percent in the gas sector.

SECTION 13. CONSUMPTION

A. Petroleum Products

Consumption of petroleum in the USSR has not kept pace with production. In 1955 the apparent demand for non-gaseous petroleum products was 87 percent of production. In 1960 the ratio was 72.6 percent, and a further decline in the proportion is anticipated by 1965, to about 68 percent of crude oil production in that year.

The very nature of the Soviet economy makes it impossible to conclude merely that the production of crude oil has increased more rapidly than the domestic needs. It is more probable that the exports of petroleum have grown at the expense of the internal economy. This is supported by the fact that diesel fuel, which in 1960 accounted for more than

one-third of total Soviet exports of petroleum products, admittedly has been in short supply internally, at least since the beginning of the Seven Year Plan.

Of the apparent domestic consumption of 2.15 million barrels of non-gaseous petroleum products per day in 1960, the category "residuals and others" accounted for the major share, as shown in the following:

TYPE OF PRODUCT	1960 PERCENT OF TOTAL
Gasoline	23.7
Kerosine	13.5
Diesel Fuel	22.5
Lubricants	4.8
Residuals and Others	35.5
TOTAL	100.0

Gasoline has been a surplus commodity for several years, but the low quality of this product effectively precludes its export to the West.

The major portion of the domestic availability of petroleum products is allocated to the industrial sector, and the smallest portion--only 2.6 percent in 1959--goes for heating, cooking, illumination and the like.

CONSUMER	1959 PERCENT OF TOTAL
Industry	45.0
Agriculture	20.0
Transport	16.0
Communal-Everyday	2.6
Military and Other	16.4
TOTAL	100.0

B. Natural Gas

In 1960, of the total consumption of natural gas in the USSR, only about one-eighth was consumed by the so-called communal-household enterprises, the remainder being used for industrial purposes. Long-range plans for the gas industry anticipate a slight decline in the communal-household share of total consumption, to 10 percent in 1980. Of the industrial consumers, thermal electric power stations account for the largest share of the national total in 1960 (27.1 percent). By 1980, this share is to increase to slightly more than 40 percent.

In 1958, almost one-third of the available natural gas was consumed in the South economic region, but the construction of gas pipelines in the Seven Year Plan will be of particular benefit to the Urals, Siberia, and Central Asia, where the consumption of gas is planned to increase from 6.7 percent of the national total in 1958 to 26.5 percent in 1965. At the same time, there is to be a sharp relative decline in gas consumption in the South, to about 18.7 percent of the total in 1965.

SECTION 14. EXPORTS OF PETROLEUM

A. Historical Volumes

In recent years the USSR has moved from a negligible trader in petroleum to an exporter of worldwide significance. In 1950 the Soviet Union exported 1.1 million tons (22,000 barrels per day) of petroleum, but imported 2.6 million tons (52,000 barrels per day) from the satellites and hence was a net importer. By 1955 the USSR exports had increased to more than 8 million tons (160,000 barrels per day), and by 1961 had reached 40 million tons (800,000 barrels per day), according to the Committee's estimate. The growth rate in exports was thus 31 percent per year from 1955 to 1961.

TOTAL USSR CRUDE AND PRODUCT EXPORTS

DESTINATION	1955 THOUSAND METRIC TONS	1955 BARRELS PER DAY	COMMITTEE ESTIMATE 1961 THOUSAND METRIC TONS	COMMITTEE ESTIMATE 1961 BARRELS PER DAY
Western Hemisphere	637	12,700	4,400	88,000
Free Europe	2,535	50,700	15,600	312,000
Other Free Eastern Hemisphere	387	7,700	6,000	120,000
TOTAL TO FREE WORLD	4,049 a/	80,800 a/	26,000	520,000
Sino-Soviet Bloc	3,967	79,300	14,000	280,000
TOTAL TO WORLD	8,006 a/	160,100 a/	40,000	800,000

a/ Totals include volumes of petroleum not accounted for in export figures to individual countries.

While exports were divided evenly between the Free World and the Bloc destinations in 1955, 65 percent of total exports, or 26 million tons (520,000 barrels per day), went to the Free World by 1961. This volume represented about 5 percent of the Free World demand outside the U.S. Crude oil accounted for about one-third of oil exports from the USSR in 1955, but in 1961 represented 60 percent of the total.

Petroleum represents an increasing proportion of the materials which the Soviet Union finds merchantable in world markets. According to Soviet figures, the value of USSR petroleum exports increased from 6.7 percent of her total exports in 1955 to 11.8 percent in 1960. The 1960 oil exports were equivalent to $US 657 million at the current official exchange rate. In the trade of the USSR with the Free World, petroleum represented 20 percent of total exports by value. Oil is the largest single item in Soviet export trade to the Free World and is growing more rapidly than any other.

The list of major Free World importers reflects two facets of the Soviet trade program. First, oil represents an important medium of exchange in countries where Soviet purchases of goods important to her economy are large (e.g. Italy, Japan, West Germany and Sweden). Second, exports of petroleum are substantial to those countries where important political relationships are being fostered (e.g. Cuba and Finland).

B. Prediction of Future Export Volumes

The Committee estimates that the USSR may have available

as much as 73 million tons (1,460,000 barrels per day) of petroleum for export by 1965. Of this exportable supply, the satellites may require 27 million tons (540,000 barrels per day) in that year, leaving 46 million tons (920,000 barrels per day) available for the Free World. (In addition, the satellites will have about 100,000 barrels per day to export outside the Bloc, as discussed later.) Whether this volume will actually be absorbed in the Free World depends on whether corrective action is taken by the importing countries, but without doubt severe pressures will exist to move this Soviet oil into Free World channels. Analysis of facilities of those customers who are likely to be willing purchasers of Soviet Bloc oil shows that there will be ample markets in the Free World for the oil if restrictive steps are not taken. The absorption of Soviet Bloc oil will be at the expense of Free World production.

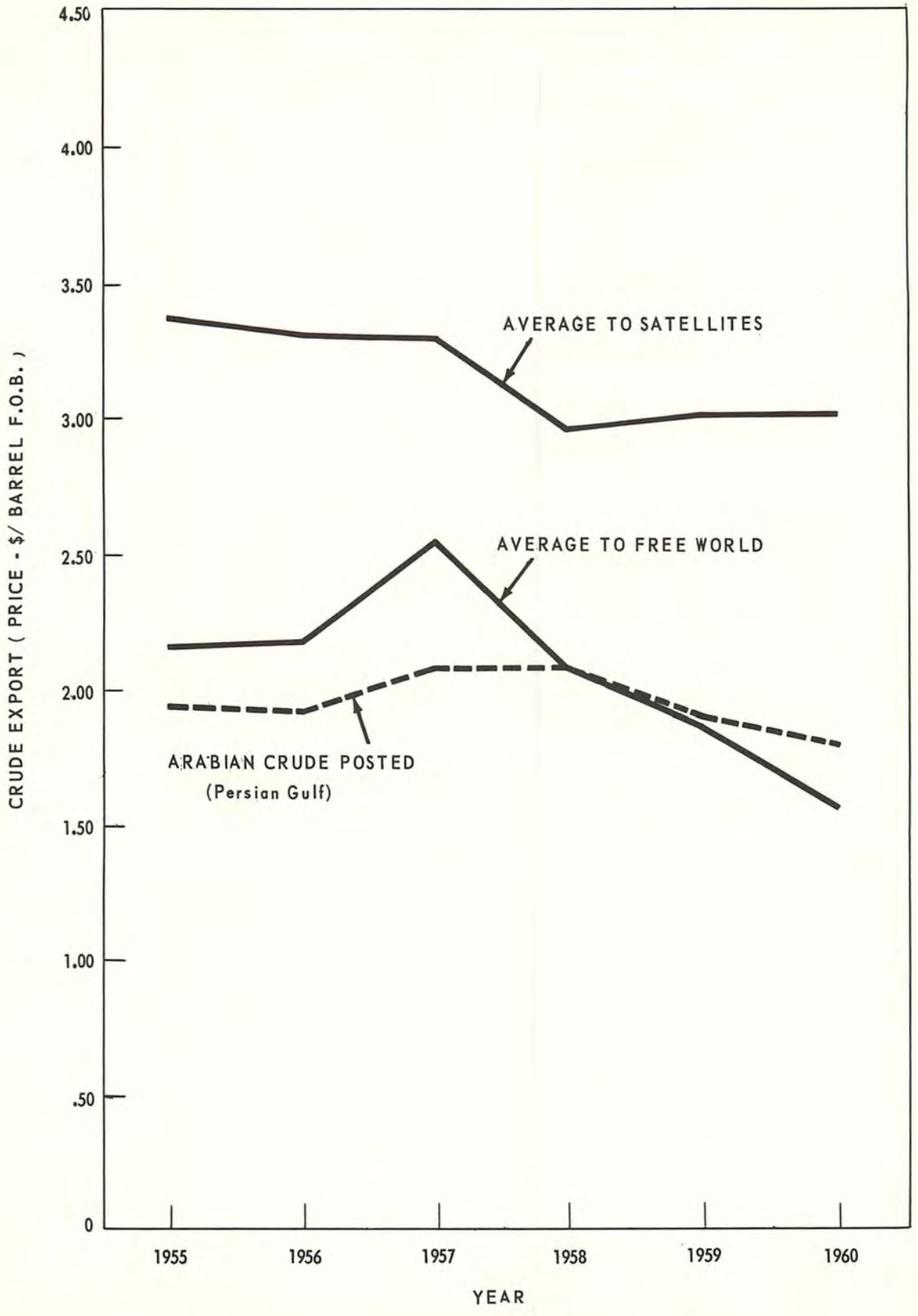
The Committee did not consider it feasible to predict the surplus beyond 1965. However, taking the published statements of the USSR on percentage growth in production and demand would indicate an exportable surplus of from 90 to 185 million tons per year (1.8 to 3.7 million barrels per day) in the period 1972 to 1975 is expected by the Soviet Union.

C. Pricing

Published Soviet trade statistics for the years 1955 through 1960 show that prices to the Free World have been gradually decreasing as greater supplies of Soviet oil became available. The trend for crude prices is shown in Figure No. 11. By 1960, for example, crude was sold to the Free World at an average price of $1.56 per barrel (f.o.b. Soviet border) compared with a Persian Gulf posted price of $1.80 per barrel for Arabian crude of approximately equivalent gravity. The $1.56 per barrel nets back to the Persian Gulf at approximately $1.30 per barrel from Southern Europe and hence represents a discount of about $0.50 per barrel below posted prices for crude oil sold in the Southern European area in 1960. More recent spot price information indicates 1961 and 1962 crude oil sales to Italy at discounts as much as $0.95 per barrel off Persian Gulf postings, $0.71 per barrel discount to Germany and $0.40 discount to Japan.

Figure No. 11

USSR CRUDE EXPORT PRICES



SOURCE: "1955-1959 FOREIGN TRADE OF THE USSR," MOSCOW, 1961

"1960 FOREIGN TRADE OF THE USSR," MOSCOW, 1961.

At the same time that the Soviet traders have been making crude available at very attractive prices to the Free World customers, price advantage was taken of the captive markets in the satellite countries.

AVERAGE EXPORT PRICES FOR SOVIET CRUDE OIL

	TO FREE WORLD		TO SATELLITES	
YEAR	RUBLES PER METRIC TON	$US PER BARREL	RUBLES PER METRIC TON	$US PER BARREL
1955	14.2	2.16	22.2	3.37
1956	14.3	2.17	21.7	3.30
1957	16.8	2.55	21.6	3.29
1958	13.7	2.08	19.5	2.96
1959	12.4	1.87	19.8	3.01
1960	10.3	1.56	19.8	3.01

The nations of the Bloc on the average have been paying premiums over the Free World for crude ranging from a minimum of 29 percent in 1957 to 92 percent in 1960. The variations in crude prices charged in 1960 are shown by several specific examples:

AVERAGE SOVIET CRUDE OIL EXPORT PRICES, 1960

EXPORTED TO:	FOB PRICE, $US PER BARREL
Selected Baltic Countries	
East Germany	2.69
Finland	1.72
West Germany	1.38
Selected South European Countries	
Hungary	3.06
Yugoslavia	2.27
Italy	1.41
Selected Far East Countries	
China	2.92
Japan	1.34

In all cases the satellite countries paid substantially higher prices than the Free World countries in the same geographical areas. The non-Bloc nations which have very strong economic ties with the USSR, (e.g. Finland and Yugoslavia) paid intermediate prices.

The same pattern of cut-rate prices to the Free World and high prices to the Bloc is shown in Soviet charges for petroleum products.

Thus, the satellite countries are subsidizing Soviet costs which in turn permits exports at attractive prices to the Free World, a situation which is also true for many other materials sold by the USSR in international commerce.

A rough comparison has been made by the Committee between the f.o.b. sales prices and the actual cost of production and transportation to Soviet export points. The analysis is complicated by the fact that crude production costs vary widely between fields and that the petroleum industry is known to use a number of alternative transportation routes which show large variations in cost to export points. In addition, ruble costs are not accurately known, and there is considerable doubt whether the rubles in which sales prices are reported are equivalent to the rubles for reported costs. However, analysis indicates that under favorable conditions the total cost of laying down crude or products at export points is apparently less than sales price, thereby permitting a small average profit, but that in some instances, under less favorable marginal conditions, expenses are actually much higher than f.o.b. sales prices. By far the over-riding factor in determining whether the oil trade is profitable to the Soviet Union, however, lies in the type of goods which she is receiving in trade in return and the political influence she is gaining through trade. As discussed in other sections of this report, there is no doubt that the USSR is receiving relatively high value on both counts, and that the trade, therefore, should be considered "profitable" to the USSR.

SUMMARY OF PART FOUR

THE EUROPEAN SATELLITES

CHAPTER IV

SUMMARY OF ENERGY DEVELOPMENTS

SECTIONS 15-17

The limited reserves of crude oil and natural gas in the East European satellite countries do not permit any substantial shift from a dependence on coal as a major source of energy. As shown in the following table, there has been very little change in the make up of primary energy production in recent years.

PRODUCTION OF PRIMARY ENERGY IN THE EUROPEAN SATELLITES a/

	1956		1961	
	MILLION METRIC TONS OF STANDARD FUEL	PERCENT TOTAL	MILLION METRIC TONS OF STANDARD FUEL	PERCENT TOTAL
Coal	205.8	86.5	248.7	85.4
Crude Oil	19.2	8.1	21.4	7.3
Natural Gas	10.7	4.5	17.8	6.1
Hydroelectric Power	2.1	0.9	3.4	1.2
TOTAL	237.8	100.0	291.3	100.0

a/ Excluding peat and shale. Albanian energy production is not included in this total.

Poland is the largest producer of energy in the European satellites, followed by East Germany and Czechoslovakia.

DISTRIBUTION OF PRODUCTION OF PRIMARY ENERGY IN THE EUROPEAN SATELLITES, BY COUNTRY

	1956		1961	
	MILLION METRIC TONS OF STANDARD FUEL	PERCENT OF TOTAL	MILLION METRIC TONS OF STANDARD FUEL	PERCENT OF TOTAL
Albania	0.5	0.2	1.4	0.5
Bulgaria	6.2	2.6	10.5	3.6
Czechoslovakia	38.4	16.2	54.5	18.7
East Germany	67.4	28.4	76.8	26.4
Hungary	12.4	5.2	16.3	5.6
Poland	84.5	35.5	95.9	32.9
Rumania	28.4	11.9	35.9	12.3
TOTAL [a]	237.7	100.0	291.2	100.0

[a] Totals do not agree with the sum of the components because of rounding.

All three of these countries maintain their position as energy producers by virtue of their large coal production. Rumania, by far the largest oil producer in the satellite countries, nevertheless ranks a poor fourth as a source of total energy.

There are only limited possibilities for the expansion of the production of energy in any of the European satellite nations. However, since consumption is increasing rapidly, the region will become energy deficient in the near future. Recognizing this coming deficiency, the planners of the bloc have laid out a fuels production program wherein each country will concentrate on the production of that source of energy most expedient economically. Thus the USSR will make available crude oil and products, as will Rumania; Poland will continue to export coal; Czechoslovakia will export coking coal and import energy coals; minor amounts of natural gas will be moved from Rumania to Hungary and from the USSR to Poland. The result aimed for is to maximize the energy producing potential of the group, even though not one of the satellite nations will meet all of its energy needs from its own sources.

Crude Oil

The current production of crude oil in East Europe is less than 9 percent of the output of the USSR. This ratio will continue to decline, to perhaps as little as 6 percent by 1965.

PRODUCTION OF CRUDE OIL
IN THE EUROPEAN SATELLITES

	1961		COMMITTEE ESTIMATE 1965		
	THOUSAND METRIC TONS	BARRELS PER DAY	THOUSAND METRIC TONS	BARRELS PER DAY	
Albania	800	16,000	1,100	22,000	
Bulgaria	220	4,400	300	6,000	
Czechoslovakia	150	3,000	200	4,000	
East Germany	6	100	1,000	20,000	a/
Hungary	1,440	28,800	1,750	35,000	
Poland	200	4,000	300	6,000	
Rumania	11,650	233,000	12,500	250,000	a/
Total	14,466	289,300	17,150	343,000	

a/ Announced plans.

The 1965 estimates shown above represent a 4 percent per year increase from 1961 to 1965 compared with an average of 2 percent per year over the 1956 to 1961 period.

Albania and Rumania are the only satellite countries which have sufficient production to satisfy their own needs and permit export to the other bloc countries or the Free World. Taken as a group, the East European satellites have shifted from net exporters of petroleum in 1956 to substantial importers in 1961. The following petroleum balance illustrates the increased dependence on the Soviet Union for liquid fuels.

PETROLEUM SUPPLY AND DEMAND BALANCE
IN EAST EUROPEAN SATELLITES

	1956		1961 COMMITTEE ESTIMATE		1965 COMMITTEE ESTIMATE	
SUPPLY	MILLION METRIC TONS	THOUSAND BARRELS PER DAY	MILLION METRIC TONS	THOUSAND BARRELS PER DAY	MILLION METRIC TONS	THOUSAND BARRELS PER DAY
Production of Crude Oil	12.9	258	14.4	289	17.2	343
Production of Natural Gas Liquids and Synthetics	2.4	48	2.4	48	1.4	28
Imports of Crude Oil & Products from USSR	2.9	58	10.5	210	20.2	404
TOTAL SUPPLY	18.2	364	27.3	547	38.8	775
DEMAND						
Exports of Crude Oil & Petroleum Products -						
To USSR	3.9	78	3.4	68	3.0	60
To Free World	1.8	36	4.5	90	5.0	100
TOTAL EXPORTS	5.7	114	7.9	158	8.0	160
Apparent Internal Demand	12.5	250	19.4	389	30.8	615
TOTAL DEMAND	18.2	364	27.3	547	38.8	775

Liquid fuel internal demand in the Bloc, which grew 9 percent per year from 1956 to 1961, is predicted to grow 11 percent per year for the next four years. The increase, however, will be largely supplied by Soviet crude.

The satellites are undertaking a substantial program of refining expansion to handle this demand. Thus while total imports from the USSR are estimated by the Committee at 20.2 million tons (404,000 barrels per day) by 1965, about 90 percent of this amount will be in crude. The satellites will be essentially self-sufficient in refining capacity, and will have the potential to export some products to the Free World (estimated at 5 million tons or 100,000 barrels per day by 1965). Map No. 13 gives available information on the location of current and planned refineries and other petroleum facilities in East Europe.

Natural Gas

The production of natural gas in the East European satellites, of which about 80 percent originates in Rumania, is equal to about 23 percent of the USSR production. This

MAP NO. 13

BALTIC SEA

GERMANY

POLAND

East Germany

U S S R

CZECHOSLOVAKIA

GERMANY

AUSTRIA

HUNGARY

RUMANIA

YUGOSLAVIA

ITALY

BULGARIA

ALBANIA

GREECE

TURKEY

PETROLEUM FACILITIES OF EAST EUROPE

March 1951

SCALE

ratio will be drastically reduced by 1965 if the USSR continues the rapid expansion of its production areas. East Europe lacks adequate resources for any significant increase.

PRODUCTION OF NATURAL GAS IN THE EUROPEAN SATELLITES

	1956		1961	
	MILLION CUBIC METERS	BILLION CUBIC FEET	MILLION CUBIC METERS	BILLION CUBIC FEET
Albania	0	0	0	0
Bulgaria	0	0	0	0
Czechoslovakia	274	9.7	1,500	52.8
East Germany	20	0.7	40	1.4
Hungary	452	16.0	320	11.3
Poland	435	15.4	700	24.7
Rumania	6,756	238.6	10,700	377.9
TOTAL	7,937	280.4	13,260	468.1

Coal

Eighty-five percent of the production of primary energy in the East European satellites is in the form of coal. Poland has by far the largest reserves of hard coal, estimated at 135 billion tons, representing over 95 percent of the area's hard coal reserves. She also has the largest reserves of brown coal and lignite, followed closely by East Germany. These two countries have over 80 percent of the brown coal and lignite reserves, the total of which are 79 billion tons.

Production of coal in East Europe for 1956 and 1961 was as follows:

PRODUCTION OF COAL IN THE EUROPEAN SATELLITES

MILLION METRIC TONS

	1956			1961		
	HARD COAL	BROWN COAL AND LIGNITE	TOTAL	HARD COAL	BROWN COAL AND LIGNITE	TOTAL
Albania	0	0.2	0.2	0	0.3	0.3
Bulgaria	0.4	10.4	10.8	0.7	18.4	19.1
Czechoslovakia	21.8	42.3	64.1	26.0	63.7	89.7
East Germany	2.7	205.9	208.6	2.6	236.0	238.6
Hungary	2.4	18.2	20.6	3.0	25.4	28.4
Poland	95.1	6.2	101.3	106.6	10.2	116.8
Rumania	3.5	3.0	6.5	4.7	4.0	8.7
TOTAL	125.9	286.2	412.1	143.6	358.0	501.6

East Germany is the outstanding producer of soft coal and Poland the leading producer of hard coal. Total coal production of the area has grown at the average rate of 4 percent per year from 1956 to 1961. Data on consumption are not so complete as for production. However, it is known that in 1960 the European satellites were net exporters of about 4 percent of the coal energy produced.

Hydroelectric Power

Hydroelectric power has shown a slight gain in relative output compared with the USSR. In 1961, the generation in East Europe reached an estimated 6.7 billion kilowatt hours, which was about 12 percent of the Soviet output.

PRODUCTION OF HYDROELECTRIC POWER IN THE EUROPEAN SATELLITES
(Million Kilowatt Hours)

	1956	COMMITTEE ESTIMATE 1961
Albania	60	125
Bulgaria	754	1,680
Czechoslovakia	1,899	3,000
East Germany	522	630
Hungary	35	105
Poland	637	725
Rumania	287	465
TOTAL	4,194	6,730

Of particular importance is the problem of international exchange of electric power. Plans are being made to unite the electric power systems of East Germany, Poland, Czechoslovakia and Hungary; Rumania and Czechoslovakia; and Hungary, Poland and the USSR.

CHAPTERS V - XI

INDIVIDUAL EUROPEAN SATELLITES

SECTIONS 18-20. ENERGY IN ALBANIA

The major sources of energy in Albania are crude oil, representing 78.6 percent of 1961 primary energy production, and brown coal and lignite, representing 14.3 percent of the total. The reserves and production of crude oil meet the internal needs of the economy and allow significant export to other countries in addition. The production of crude oil in 1960 was 700 thousand tons (14,000 barrels per day) and is predicted to be 1,100 thousand tons (22,000 barrels per day) in 1965. Apparent consumption was 7,900 barrels per day in 1960 and is forecast by the Committee to be 13,000 barrels per day in 1965. Thus, 9,000 barrels per day will be available for export in that year. Hydroelectric power is currently a small portion of total energy production but utilization of reserves could be important in the future.

SECTIONS 21-23. ENERGY IN BULGARIA

Coal accounted for 89.5 percent of primary energy production in Bulgaria in 1961. Petroleum reserves are small. Production of crude was 200 thousand tons (4,000 barrels per day) in 1960 and may increase to 6,000 barrels per day in 1965. More than 80 percent of Bulgaria's liquid fuel requirements must be imported from other bloc countries. At present Bulgaria has one small refinery with capacity for about 10 percent of her petroleum product demand, but by 1965 sufficient refineries will be constructed to make Bulgaria approximately self-sufficient in refining capacity.

SECTIONS 24-26. ENERGY IN CZECHOSLOVAKIA

Coal represents about 93 percent of all primary energy produced in Czechoslovakia. Natural gas and hydroelectric power each provide several percent of the energy produced, but because of the absence of crude oil reserves of consequence the production of this fuel is less than one percent of the total energy. In 1960, 137 thousand tons (2,700 barrels per day) of crude oil were produced and in 1965 this rate may grow to 4,000 barrels per day. The Committee estimates that required imports, however, were about 47,000 barrels per day and will probably

grow to 120,000 barrels per day by 1965. By that year, refining capacity should be sufficient for Czechoslovakia's needs and will be about 3 times current refining capacity.

SECTIONS 27-29. ENERGY IN EAST GERMANY

More than 99 percent of the primary energy produced in East Germany comes from coal, the major portion of which is brown coal and lignite. Crude oil and natural gas production are negligible, and East Germany is dependent on imports or on synthetic oils from coal for its liquid fuel requirements. However, appreciable crude oil production (one million tons or 20,000 barrels per day) is forecast by East German planners for 1965. In 1960 East German apparent domestic demand for liquid fuel products was estimated at about 60,000 barrels per day, assuming that she produced about 40,000 barrels per day of synthetic oils. Petroleum imports were slightly greater than that amount; this balance permitted an export of about 24,000 barrels per day. The Committee predicts that by 1965 East Germany's apparent domestic petroleum demand will reach about 100,000 barrels per day, and, in addition, she will export about 40,000 barrels per day.

There are no large hydroelectric power stations in East Germany and none are planned for construction.

SECTIONS 30-32. ENERGY IN HUNGARY

Coal provides about 85 percent of total primary energy produced in Hungary. Crude oil production in 1960 was 1,215 thousand tons (24,300 barrels per day), compared with an apparent domestic demand of 53,000 barrels per day, the balance being imported from the USSR. By 1965, crude oil production may reach 35,000 barrels per day and the Committee estimates that about 60 percent of the liquid fuel demand will be met by imports. Minor quantities of natural gas are produced. Hungary has only one major crude oil refinery in operation today.

SECTIONS 33-35. ENERGY IN POLAND

Coal provides over 98 percent of total primary energy in Poland, and coal--particularly hard coal--is a chief article of export. Hard coal is exported to other East European countries and to such Western European nations as Finland, Austria and Sweden. In 1960, 194 thousand tons (3,900 barrels per day) of crude oil were produced compared with an internal

apparent demand of about 53,000 barrels per day. By 1965, the Committee believes that production may reach 6,000 barrels per day and consumption about 100,000 barrels per day. Total refinery crude oil charge capacity available in 1961 is estimated at 1.3 million tons (26,000 barrels per day). Substantial refining capacity increases are planned.

SECTIONS 36-38. ENERGY IN RUMANIA

Rumania ranks second to the Soviet Union among the countries of the Sino-Soviet Bloc in terms of proved reserves of crude oil and natural gas. These fuels account for 89 percent of the energy production in the country, with the remainder being largely coal. In 1960 crude oil production was 11,500 thousand tons (230,000 barrels per day), about one-half of which was consumed internally, leaving the remainder for export to the Bloc and the Free World. Refining capacity in Rumania is sufficient to handle total production. The Free World purchased over 50,000 barrels per day of petroleum products from Rumania in 1960 and over 60,000 barrels in 1961. Rumanian crude oil production has been quite static in recent years. However, it is planned to reach 250,000 barrels per day by 1965 compared with an apparent domestic demand estimated by the Committee of 155,000 barrels per day. Total natural gas production reached 10.7 billion cubic meters (378 billion cubic feet) in 1961.

SUMMARY OF PART FIVE

COMMUNIST CHINA

AND MONGOLIA

CHAPTERS XII - XV

COMMUNIST CHINA

SECTIONS 39-44.

The economy of Communist China is based on coal so far as primary commercial energy is concerned.

PRODUCTION OF PRIMARY ENERGY IN COMMUNIST CHINA

	1957		1960	
SOURCE	MILLION METRIC TONS OF STANDARD FUEL	PERCENT OF TOTAL	MILLION METRIC TONS OF STANDARD FUEL	PERCENT OF TOTAL
Coal	91.5	87.6	297.5	88.7
Petroleum	2.2	2.1	7.5	2.2
Natural Gas	0.2	0.2	N.A.	N.A.
Hydroelectric Power	10.6	10.1	30.5	9.1
	104.5	100.0	335.5	100.0

Total primary energy produced in 1960 was equivalent to about 335 million tons of standard fuel, which was about 20 percent greater than the energy produced in the combined European Satellites in that year.

The "leap forward" program of Communist China has brought about a striking increase in the consumption of energy--from 107 million tons of standard fuel in 1957 to 340 million in 1960. The apparent consumption for petroleum was 3.26 million tons (65,200 barrels per day) in 1957 and 7.96 million tons (159,200 barrels per day) in 1960. To meet this consumption,

it was necessary to import 36,000 barrels per day in 1957 and 60,000 barrels per day in 1960, or 37 percent of the domestic consumption in that year. These imports were provided primarily by the USSR. A petroleum deficit will probably prevail for some time, and the Committee estimates that imports of petroleum from the USSR in 1965 may reach as much as 5 million tons (100,000 barrels per day).

Although Communist China has a large sedimentary basin area, it has not been able to develop a producing industry of significance. In 1958 the production of crude oil (natural, shale, and synthetic) was 2.25 million tons (45,000 barrels per day). Of this amount, about 35 percent was produced from shale and synthetically from coal. The proportion of natural crude oil has been rising with the acceleration of the crude oil producing program. Total production of crude oil (natural, shale, and synthetic) is planned to reach 5.5 million tons (110,000 barrels per day) in 1962. The Committee estimates that total production of crude oil reached 5.25 million tons (105,000 barrels per day) in 1961 and may increase to as much as 6.9 million tons (138,000 barrels per day) by 1965. China has a refining capacity of 5.5 million tons. More than 50 percent of this capacity is located at three refineries--Sinkiang (20,000 barrels per day), Lan-Chou (20,000 barrels per day) and Yu-men (16,000 barrels per day).

CHAPTER XVI

MONGOLIA

Mongolia produced about 400 thousand tons of coal in 1959. Only one oil field is currently being exploited. The crude oil production in 1961 was 53 thousand tons (1,100 barrels per day). Production is charged to two refineries which have sufficient capacity to meet most of the needs of the country.

SUMMARY OF PART SIX
ENERGY AND PETROLEUM SUPPLY-DEMAND BALANCE FOR THE SINO-SOVIET BLOC

The energy balance for the entire Sino-Soviet Bloc for 1960 may be summarized as follows:

ENERGY BALANCE FOR
THE SINO-SOVIET BLOC
1960

	PRODUCTION		APPARENT CONSUMPTION	NET EXPORT
	MMTSF*	PERCENT OF TOTAL	MMTSF*	MMTSF*
Coal	909.2	71	892.9	16.3
Liquid Petroleum	239.7	19	204.4	35.3
Natural Gas	71.2	6	71.2	0
Hydroelectric	57.3	4	57.3	0
TOTAL FOR BLOC	1,277.4	100	1,225.8	51.6

* MMTSF = Million Metric Tons of Standard Fuel.

The tabulation highlights the great importance of coal as a source of energy to the Bloc as a whole. In spite of the large increases expected in the production of crude oil and natural gas in the USSR, coal is destined to be the major Bloc energy source for many years to come.

The role of the Soviet Union as an energy producer in the Bloc is not so significant as its role as a petroleum producer. Of the total Bloc primary commercial energy produced in 1960, 52 percent was supplied by the USSR, with the remainder produced in roughly equal amounts by China and the European Satellites. Thus, the USSR has an obvious interest in the continued exploitation of the vast coal and hydroelectric resources of the Satellite countries.

In petroleum production, however, the Soviet Union is clearly the force to be reckoned with, as shown in the following:

PRODUCTION AND CONSUMPTION OF PETROLEUM IN THE SINO-SOVIET BLOC [a]

	1961 ESTIMATE			1965 ESTIMATE		
	PRODUCTION		CONSUMPTION	PRODUCTION		CONSUMPTION
	MILLION METRIC TONS	THOUSAND BARRELS PER DAY	THOUSAND BARRELS PER DAY	MILLION METRIC TONS	THOUSAND BARRELS PER DAY	THOUSAND BARRELS PER DAY
USSR	166.0	3,320	2,600	270.0	5,400	4,000
East Europe						
Albania	0.8	16	9	1.1	22	13
Bulgaria	0.2	4	24	0.3	6	36
Czechoslovakia	0.5	10	66	0.6	11	121
East Germany	2.0	40	68	2.0	40	101
Hungary	1.5	29	56	1.8	36	91
Poland	0.2	4	61	0.3	6	98
Rumania	11.6	233	106	12.5	250	155
Total East Europe	16.8	336	390	18.6	371	615
China and Far East	5.3	106	176	7.0	140	276
GRAND TOTAL FOR BLOC	188.1	3,762	3,166	295.6	5,911	4,891
NET EXPORTS FROM BLOC [b]			596			1,020 [c]

[a] Including natural gas liquids and synthetics, except for USSR in 1956 and 1961.
[b] Equivalent to total exports less imports from Free World.
[c] Represents an estimated surplus available for export from the Bloc if Free World markets are found.

The Committee estimates that total Bloc petroleum production was 188.8 million tons (3.8 million barrels per day) in 1961, and predicts that this total will reach between 295 and 300 million tons (about 6.0 million barrels per day) by 1965, including natural gas liquids and synthetics. The great bulk of the petroleum production increase has in the past and will in the future come from the USSR. The USSR provided 83 percent of Bloc petroleum production in 1956, 88 percent in 1961, and is expected to provide 91 percent in 1965. Despite an increasing deficiency of supplies with respect to consumption in the satellite countries, the Soviet production of crude oil will be adequate not only to meet this deficiency but to permit increasing exports to the Free World. The Committee predicts a surplus of 51.0 million tons (1.02 million barrels per day) available for export from the Bloc in 1965.

SUMMARY OF PART SEVEN

SINO-SOVIET BLOC TRADE WITH THE FREE WORLD

CHAPTER XVII

TOTAL TRADE

SECTION 45. HISTORICAL

In 1918 the USSR established a state monopoly over foreign trade. While the original purpose of this move was to subordinate such trade to the aims of national economic planning, it is now serving other purposes as well and has given the Communists a big advantage in dealing with free enterprise countries.

Soviet Bloc trade is being used to extend Communist influence, destroy operations of private companies that pose a threat to the spread of their own ideology of state control, create unrest in key foreign areas, and to obtain vital strategic materials and technical know-how from the Free World.

In the initial years following World War II, the trade of the Sino-Soviet Bloc was heavily oriented to an exchange of materials between the Bloc countries. This resulted from a deliberate policy of promoting economic self-sufficiency as well as from a failure of the Communist countries to develop sizeable surpluses for export to the Free World. After the death of Stalin in 1953, the commercial policy of the Bloc was immediately reversed with the aim of expanding economic relations with the Free World. The result was a spectacular increase in the trade of Free World countries with the Soviet Bloc.

FREE WORLD TRADE WITH SINO-SOVIET BLOC
($U.S. MILLION)

YEAR	USSR	EUROPEAN SATELLITES	CHINA AND FAR EAST	TOTAL	BLOC AS PERCENT OF WORLD
FREE WORLD IMPORTS FROM:					
1947	273.9	732.9	417.9	1,424.7	2.5
1953	374.1	803.2	442.7	1,620.0	2.1
1956	806.1	1,473.1	657.5	2,936.9	3.0
1960	1,504.3	2,117.7	784.0	4,406.0	3.7
FREE WORLD EXPORTS TO:					
1947	477.0	856.5	672.3	2,005.8	3.9
1953	423.5	677.8	287.6	1,388.9	1.8
1956	784.1	1,318.5	434.2	2,536.8	2.7
1960	1,565.0	2,175.4	702.4	4,442.8	3.9

By 1960 Free World trade with the Bloc had increased three-fold over 1953 levels, to $U.S. 4.4 billion in each direction. The Communists share of total international trade rose from about 2 percent to almost 4 percent over this period. Two-thirds of Soviet Bloc trade in 1960 was with Western Europe.

The bulk of Free World exports to the Bloc in 1960 consisted of crude materials, metals, chemicals, machinery and plants and manufactured goods. Half of the total crude materials exports of $U.S. 1.3 billion were textile fibers, including synthetics. Rubber accounted for about one-fourth of the crude materials and the remaining quarter included such items as ores, minerals, hides, pulp and wood. Food, crude materials, manufactured goods and fuels represented the major Free World imports from the Bloc in 1960. Petroleum (including products) was the largest single item and represented between 10 and 11 percent by value of all imports from the USSR and her Satellites.

SECTION 46. LESS DEVELOPED NATIONS

In less developed areas, a major objective of Soviet trade policy is to exert political pressure and extend Communist influence. The USSR combines the extending of economic assistance with an aggressive expansion of trade under conditions ostensibly quite favorable to the less developed countries. Although the latter cannot export products that are as important to the Communists as those of highly industrialized countries, Bloc trade with less developed areas has grown much faster (127

percent from 1955 to 1960) than Bloc trade with the industrialized nations (76 percent in the same period). In 1960, 46 percent of the Bloc trade was with less developed areas. From these areas the USSR receives agricultural commodities and raw materials. In turn, she sells them machinery, petroleum, food and ferrous metals.

It is evident that the USSR can abrogate contracts or interrupt supplies unilaterally and arbitrarily. This enables the Communists, when it suits their purposes, to exert strong influence on customers who are dependent on Soviet Bloc trade. Yugoslavia, Finland and Israel are major examples of instances where political pressure has been applied through the sudden withholding of trade. The political flavor of trade with the underdeveloped nations is underlined by the fact that Soviet exhibitions and participation in trade fairs held in the countries of Asia, Africa and Latin America, follow closely on the development of trade relations. These exhibitions are designed not only to advertise merchandise but also to give glowing pictures of the Soviet political system and social, scientific, industrial and cultural achievements. The Bloc gains additional political influence in the less developed countries by grants of credits, technical assistance and outright gifts.

Some of the less developed countries have a very high percentage of their trade with the Communists. Cuba is now inextricably committed, both politically and economically. Among other developing nations, Afghanistan and Guinea are highly dependent, each having more than 40 percent of her trade with the members of the Communist group. In total volume, Egypt and Yugoslavia are the largest traders with the Soviet Bloc among developing countries. In 1960, 25 percent of Egypt's total imports trade and 44 percent, or $US 244.3 million, of her exports trade were with the USSR and Satellites. India, an ideological leader in Asia, also has a large volume of trade with the Bloc. The economic ties of Iceland and Greece with the Communist countries are important from the point of view of Western military strategy.

SECTION 47. INDUSTRIALIZED COUNTRIES

The Sino-Soviet Bloc obtains important strategic materials from industrialized countries in the Free World. About 60 to 90 percent of the exports of these countries to the Bloc consist of metals, metal shapes, transportation equipment,

machinery, complete plants and other manufactured goods. The items of major interest to the Bloc are products of advanced technology. Particularly desirable, from the communist point of view, are complete plants which represent an import of technology that can be duplicated directly, and thus multiply many fold the yield from a relatively small purchase. Many of the items--for example, equipment used for an expanding oil transportation network--have obvious potential military value. In return, the industrialized nations buy large amounts of food, crude materials and fuels from the Bloc. It is evident that many Western nations are making significant contributions to the economic and military strength of the Sino-Soviet Bloc.

West Germany, Japan, France, Austria and Italy have expanded their trade with the Soviet Union more rapidly than other major industrial countries. Exports to the USSR and her Satellites in 1960 from these five countries were four to ten times their exports in 1948-1952. West Germany is by far the largest exporter to the Bloc, with $U.S. 765 million exported in 1960. The United Kingdom, France and Italy follow among the industrialized countries.

The threat of Soviet political leverage in the internal affairs of Free World countries hangs over the industrialized nations as well as over the less developed ones. Many of the industrialized nations have interests which are concerned with maintaining export outlets to the Soviet Bloc. If the USSR closed its markets to such nations, the enterprises affected would undoubtedly pressure their governments to try to reopen these trade outlets. Since the markets would have been closed for political purposes, regaining access to them might well involve concessions that would be advantageous to the Soviet Union.

In many cases, the role of communist oil, specifically, can be seen to be significant in maintaining such export outlets.

CHAPTER XVIII

PETROLEUM TRADE

SECTION 48. CONSUMING COUNTRIES

Oil is the major weapon of the Soviet trade offensive in the Free World. The Communists fully recognize the potential they have for attacking the operations of private oil companies, whose oil concessions the USSR considers to be highly important to the Free World's economic and military strength.

From 1955 to 1961 Bloc oil exports to the Free World increased from 5.8 million tons (116,300 barrels per day) to 30.5 million tons (610,000 barrels per day) for an average growth rate of 32 percent per year. Eighty-five percent of the total in 1961 came from the USSR. Fifty-three percent of the total was crude oil, with the remainder in various products.

TOTAL SOVIET BLOC CRUDE AND PRODUCT EXPORTS TO FREE WORLD

	1955		1961 COMMITTEE ESTIMATES	
DESTINATION	THOUSAND METRIC TONS	BARRELS PER DAY	THOUSAND METRIC TONS	BARRELS PER DAY
Western Hemisphere	641.9	12,800	4,460	89,200
Free Europe	4,064.5	81,300	19,700	394,000
Other Eastern Hemisphere	632.0	12,600	6,340	126,800
TOTAL TO FREE WORLD	5,818.2[a]	116,300[a]	30,500	610,000

a/ Totals include volumes not accounted for in geographic areas.

In 1960 the value of Free World petroleum imports from the Bloc was $U.S. 460 million and represented 11 percent of all imports from the Bloc--by far the largest item purchased from the Communists by the West.

Eighty percent of the volume of Bloc oil is absorbed by a handful of customers--Italy, West Germany, Cuba, Japan, Sweden, Egypt and Finland. While the total amount of 1961 imports of Soviet Bloc oil was 6 percent of the Free World demand (outside the U.S.), certain countries import much more than this percentage in relation to their local requirements.

ESTIMATED SOVIET BLOC PETROLEUM
IMPORTS OF SELECTED CONSUMERS

	1961		
IMPORTERS	THOUSAND METRIC TONS	BARRELS PER DAY	PERCENT OF LOCAL DEMAND
Austria	670	13,400	21
Cuba	3,900	78,000	100
Egypt	2,350	47,000	48
Finland	2,385	47,700	78
West Germany	4,125	82,500	10
Greece	900	18,000	35
Iceland	300	6,000	88
Italy	6,330	126,600	22
Japan	2,740	54,800	7
Sweden	2,565	51,300	19

An analysis of the types of companies which buy Bloc oil shows that in 1961, 63 percent of the known Free World purchasers of Soviet crude were government oil companies and 35 percent were refineries of non-integrated oil companies. Government oil companies bought 22 percent of the Bloc petroleum products, where purchasers were known, while non-integrated marketers and large consumers accounted for 63 percent.

Supply and demand projections for the countries of the Sino-Soviet Bloc lead to Committee predictions that in 1965 the Bloc will have 51 million tons (1.02 million barrels per day) of crude and products available for export to the Free World. Whether this amount of oil is actually sold depends upon political and economic climates at that time. There is no doubt, however, that pressures to move it into the Free World will be intense.

SECTION 49. EFFECT ON PETROLEUM EXPORTING COUNTRIES

The Committee estimates that between 1953 and 1961 the producing countries of the Middle East and Venezuela have lost nearly $U.S.500 million in direct royalties and taxes due to the expansion of Soviet Bloc oil sales into traditional Free World markets. In 1961 alone the loss ammounted to $U.S.145 million. Furthermore, because of their decreased volume of sales, these countries have suffered appreciable losses in wages and salaries, personal income taxes, payments to local contractors and payments for the local purchase of goods. The additional costs to the exporting countries due to the contribution of Communist cut-rate policies to the softening of world petroleum prices cannot be estimated. For most of these governments, petroleum sales represent the major portion of their incomes.

SECTION 50. SOVIET BLOC MARINE ACTIVITIES

The Soviet Bloc tanker fleet currently (September 1, 1962) consists of:

(a) 112 vessels in reported ocean petroleum service aggregating 1,556,000 dwt (equivalent to 90.7 T-2's).

(b) 35 vessels unreported in ocean petroleum service aggregating 302,000 dwt (equivalent to 14.7 T-2's).

Thus, the total tonnage amounts to 1,858,000 dwt or 105.4 T-2's, of which 78 percent flies the USSR flag. If the Yugoslav fleet (which is largely in Bloc trade) is added, the total fleet becomes 109.7 T-2 equivalents. This excludes 10 USSR flag vessels which are designed as combination oil/ore carriers.

The fleet is comparatively young as shown by the fact that in 1950 there were only 28 USSR tankers totaling less than 175,000 dwt.

The Soviet Seven Year Plan (1959 through 1965) called for increasing the tanker fleet by 80 percent. However, this is to be far exceeded. Currently, known new buildings show that the USSR fleet will increase about fourfold. Undoubtedly new orders will be placed for delivery before the end of 1965

so the fleet will probably grow even more. This emphasizes the importance the Bloc has placed on controlling the tonnage required to move their petroleum.

Almost twice as much of this new tonnage is being acquired in Free World yards as is being constructed in Bloc yards. The breakdown in known new buildings is as follows:

YARD	NUMBER OF SHIPS	T-2 EQUIVALENT
USSR	14	31.6
Poland	9	10.7
Sub-Total Bloc	23	42.3
Japan	14	32.6
Italy	6	19.7
Finland	15	4.4
Yugoslavia	16	25.7
Sub-Total Free World	51	82.4
GRAND TOTAL	74	124.7

Elsewhere in this report it has been pointed out that in the absence of corrective action, Bloc exports to the Free World would reach 51 million tons (1.02 million barrels per day) by 1965. At this level, the Bloc requirements for tankers, for both Free World and intra-Bloc movement, have been estimated by the Committee at 274 T-2 equivalents. The Committee finds that the Soviet Bloc will have sufficient owned tonnage to meet this requirement except for a small amount of transportation that their customers will provide. This is shown below:

	T-2 EQUIVALENTS
Average Requirements 1965	274
Availability Mid-year 1965:	
Existing Bloc and Yugoslav Fleet*	94
Known new Construction	116
Assumed New Orders	19
Customer Arranged Transportation	35
	264
Apparent Deficit	10

* Less scrappage.

Apparently the Bloc is placing great importance in owning the bulk of the ships needed to transport their export oil.

Assuming that operating costs will be comparable to a typical Western European fleet, average costs for Soviet-owned tankers are forecast to decrease from $1.13 per thousand loaded ton miles (excluding port and canal taxes) to $0.86 in 1965, because of the increasing average size of the tankers.

In 1959, 69 percent of the Soviet Black Sea chartering was of the single voyage type fixture. In the first half of 1960, they began to make contracts of affreightment and also considerably more time charters. By 1961, the USSR had made enough long-term contracts for transportation so that their chartering fell to a very low level--less than one million tons total. This compares with over 13 million tons of fixtures made in 1960.

In July, 1960, a major oil company initiated its "Black Sea" policy which denied shipping contracts to any tanker owner moving Soviet oil. This policy apparently caused an increase in the cost of Soviet charters, but it did not reduce the volume of oil shipments. The results of the "Black Sea" policy indicates that individual action by one company has little effect on the oil movements by the Soviet Bloc.

The Committee believes that tankers will be available to the Soviet Bloc in sufficient quantity to move all the oil that the Bloc has available for export in 1965. However, if the Free World were suddenly to be cut off from Soviet Bloc oil in 1965, a considerable strain would be put on the tanker fleet, for some 231 T-2's would be required to move the supplies needed to replace Russian oil from the Caribbean and the Persian Gulf to consuming countries.

Existing port facilities in the Communist Bloc, plus planned new construction, appear to be adequate to handle Soviet Bloc oil tanker freight traffic. Port costs seem to be about the same as those prevailing in the West.

CHAPTER XIX

FREE WORLD EXPORT TRADE CONTROLS

SECTION 51. UNITED STATES

The basic controls over exports of commondities from the United States are provided by three acts of Congress:

(a) The Export Control Act of 1949

(b) The Mutual Defense Assistance Control Act of 1951 ("Battle Act").

(c) Trading With The Enemy Act of October 6, 1917 as amended.

These controls essentially prohibit all U.S. trade with Communist China, North Korea and North Vietnam; and embargo shipment to the rest of the Soviet Bloc of arms, ammunition, atomic energy materials, petroleum equipment and transportation materials of strategic value, and items of strategic significance in the production of arms and ammunition. They require that all United States assistance--military, economic and financial--be terminated to countries which knowingly ship certain of most highly strategic items to the Soviet Bloc.

The controls require validated licenses to ship certain petroleum producing and transportation equipment to the Soviet Bloc, but there are no restrictions on the shipment of drill pipe, drill collars, tool joints and diamond bits--items the Soviet oil industry has great need for if it is to meet its production targets.

SECTION 52. OTHER INDUSTRIALIZED NATIONS

In 1950 a Consultative/Coordinating Committee (COCOM) was established to form a coordinating trade control program between certain Free World countries relative to the Sino-Soviet Bloc. The membership consists of 15 nations--all the NATO countries plus Japan, except Iceland. Its agreements represent moral obligations only.

The COCOM group maintains a list of arms, atomic energy materials and other stragetic materials that are to be embargoed or kept under surveillance. The scope of the list is much narrower than those items under U.S. control, and has been reduced considerably since 1950. It is not aimed at curbing the industrial potential of the Bloc. There are no embargoes on equipment that the Bloc has sought or might seek in the future to accelerate their petroleum development.