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IP 427

6 February 1956

MEMORANDUM FOR: Director of Central Intelligence
THROUGH: Deputy Director/Intelligence
SUBJECT: Primary Energy Production in the Sino-Soviet Bloc and the Free World

1. This memorandum is in response to your request for comparative data on the growth of primary energy production in the Sino-Soviet bloc and the free world, as derived principally from solid fuels, petroleum and water power.
 2. During the next five years the Sino-Soviet bloc plans a higher rate of growth in energy production than the free world. Bloc energy production in 1955 equaled about 30 percent of free world production. In 1960 it will increase to about 40 percent. Despite this relative increase, however, the absolute gap between energy production in the bloc and the free world will not decrease. In fact the free world's primary energy production will increase 15,200 trillion Btu while bloc production will increase only 12,600 trillion Btu. Thus the gap will grow about 5 percent.
 3. Soviet bloc energy production depends primarily on solid fuels, while over half of free world energy production comes from petroleum. As production of petroleum increases, however, the importance of solid fuels to the bloc will decline slightly. By 1960, solid fuels are expected to supply only about 75 percent of total bloc energy production compared with about 81 percent in 1955..
- The USSR is just beginning to utilize natural gas produced with oil rather than waste it. The Sixth Five-Year Plan calls for increasing natural gas production from 8.1 million metric tons in 1955 to 32 million metric tons in 1960--equivalent to one quarter of crude oil production. In contrast, US natural gas production was 200 million metric tons in 1955--equivalent to over half of crude oil production.

CIA HISTORICAL REVIEW PROGRAM
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4. In 1955, hydroelectric power contributed only 0.5 percent of total Sino-Soviet bloc energy production and only 2 percent of the free world total. These ratios will not change significantly by 1960.

5. Electricity produced from nuclear energy will not affect significantly the world output of primary energy in 1960. In fact, in 1960 production of fissionable material for military and "peaceful" purposes will still use appreciably more electricity than will be generated by plants powered with nuclear fuel.

The USSR has announced that by 1960 it will have from 2,000,000 to 2,500,000 kilowatts of generating capacity in plants powered with nuclear fuel. If completed, these power plants could supply over 3 percent of total Soviet electric power output. Announced US plans provide for generating capacity of only 800,000 kilowatts by 1960 which could supply about 0.5 percent of total US electric power output forecast for that year.

6. The USSR, having produced 58 percent of the bloc's total primary energy output in 1955, will increase this share to 62 percent in 1960. Conversely, the US share of the free world's total will drop very slightly and will amount to about one half of the free world total in 1960.

7. The attached charts present the above data graphically. The attached table presents detailed data on the regional growth of primary energy production by principal categories.

Assistant Director
Research and Reports

Enclosures:

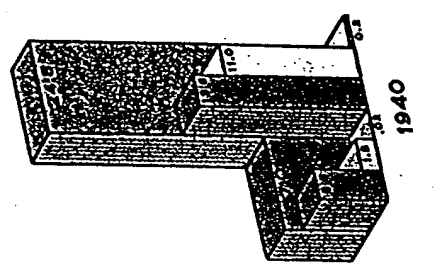
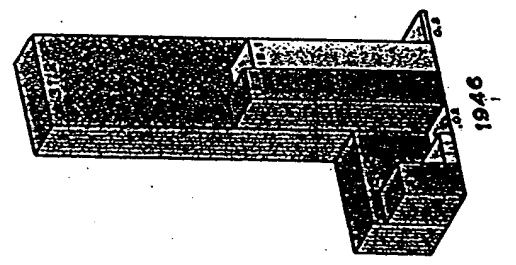
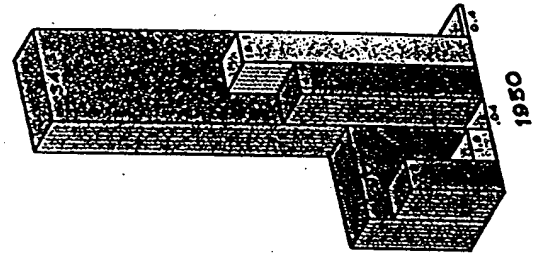
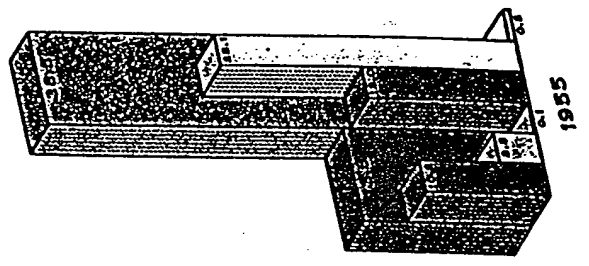
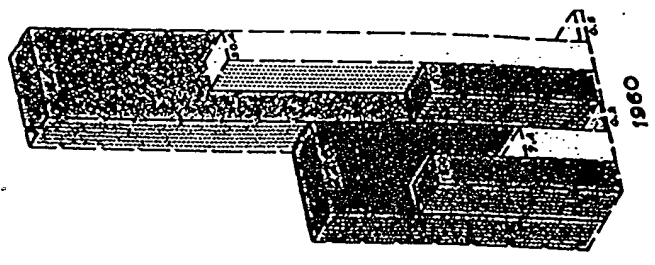
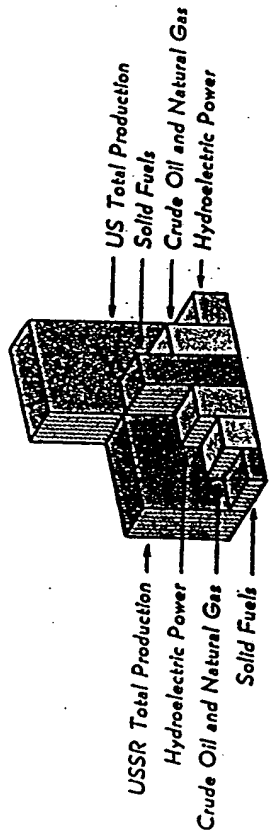
1. Chart of USSR-US Energy Production
2. Chart of Bloc-Free World Energy Production
3. Table of Primary Energy Production

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PRODUCTION OF PRIMARY ENERGY

USSR - US 1940 - 1960

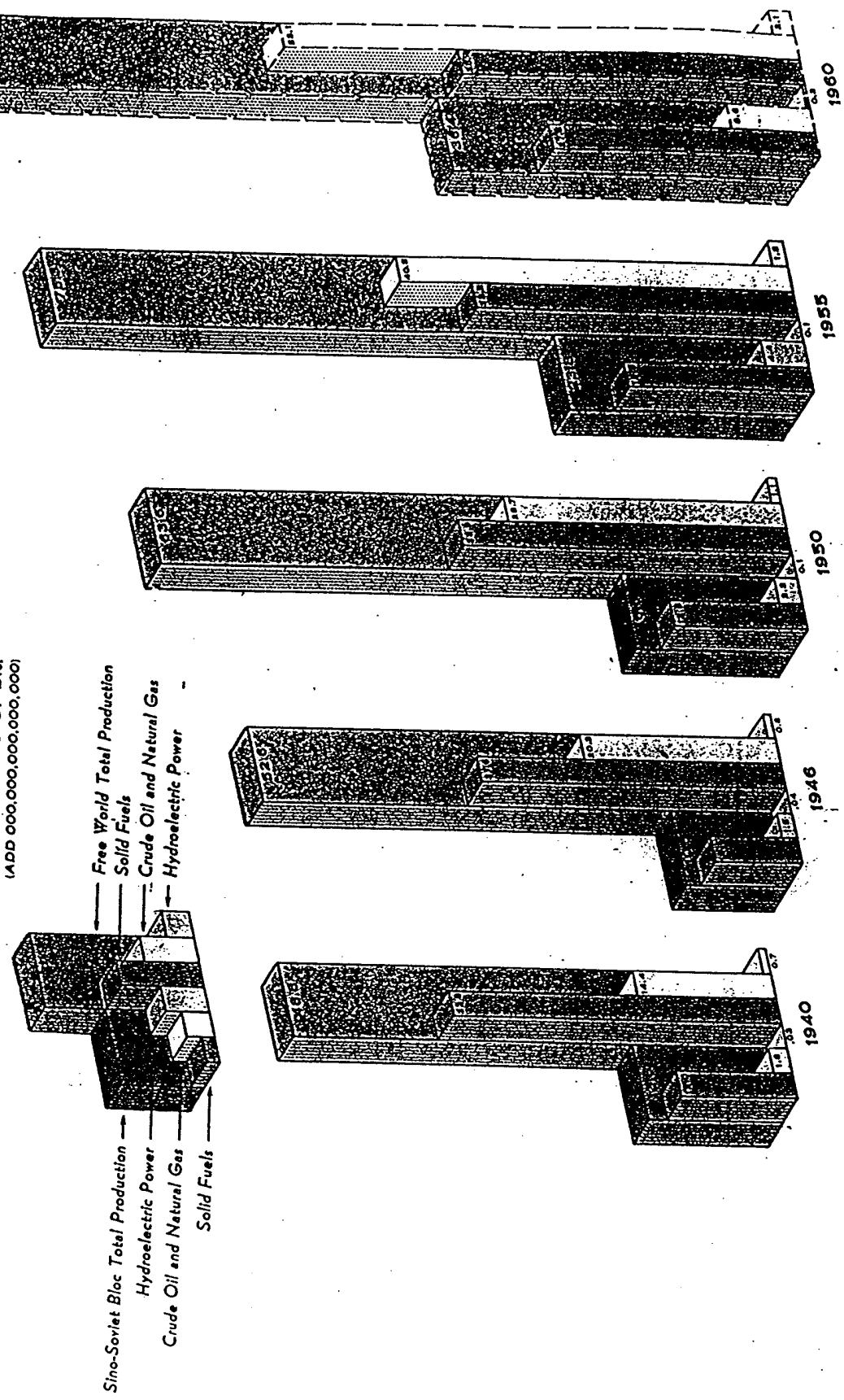
QUADRILLIONS OF BTU
(455 000,000,000,000,000)



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PRODUCTION OF PRIMARY ENERGY SINO-SOVIET BLOC - FREE WORLD

1940 - 1960
QUADRILLIONS OF BTU.
(ADD 000,000,000,000,000)



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GROWTH OF PRIMARY ENERGY PRODUCTION IN THE SINO-SOVIET BLOC AND FREE WORLD, 1940-1960

Region and Category	Production (Btu x 10 ¹²)		Average Annual Growth (Percent)		Production (Btu x 10 ¹²)		Average Annual Growth (Percent)		Estimated Production (Btu x 10 ¹²)		Average Annual Growth (Percent)	
	1940	1946	1941-1946	1947-1950	1950	1955	1951-1955	1956-1960	1960	1956-1960	1956-1960	1956-1960
Sino-Soviet Bloc												
USSR												
Solid fuels a/	5,510	5,080	-1.4	9.3	7,770	10,230	11.2	5.7	15,030	8.0		
Crude oil, natural gas b/	1,100	1,480	-4.9	6.6	1,880	3,450	14.3	12.9	7,380	16.4		
Hydroelectric power c/	16	18	2	0	43	80	24.3	13.2	200	20.2		
Total	7,016	6,198	-2.1	9.1	9,593	13,750	11.8	7.3	22,610	10.4		
European Satellites d/												
Solid fuels	4,880	3,450	-5.9	9.3	4,930	6,660	9.3	6.2	8,750	5.6		
Crude oil, natural gas	340	346	0.3	6.6	446	14	0	15.6	1,180	4.5		
Hydroelectric power	4	7	10	0	7	14	0	14.9	20	7.4		
Total	5,304	3,803	-5.4	9.1	5,383	7,694	9.1	7.1	9,950	5.5		
Communist Asia e/												
Solid fuels	1,490	560	-15.0	21.5	1,220	2,440	21.5	14.9	3,700	8.7		
Crude oil, natural gas	negligible	4	7 f/	0	4	20	0	38	70	28.5		
Hydroelectric power	10	15	7	21.1	20	18	21.1	4	50	25.6		
Total	1,500	579	-13.7	21.1	1,244	2,478	21.1	14.3	3,820	9.1		
Sino-Soviet Bloc												
Solid fuels	11,960	9,090	-4.5	11.2	13,920	19,330	11.2	6.8	27,480	7.3		
Crude oil, natural gas	1,830	1,450	-3.8	12.6	2,330	4,400	12.6	13.5	8,610	14.4		
Hydroelectric power	30	40	5	15	70	110	15	9.5	270	19.7		
Total	13,820	10,580	-4.4	11.4	16,320	23,840	11.4	7.9	36,360	8.8		
Free World												
US												
Solid fuels	13,580	15,810	2.6	-1.5	14,860	13,020	-1.5	-2.6	14,020	1.5		
Crude oil, natural gas	11,020	15,080	5.4	6.0	19,070	25,050	6.0	8.6	30,400	3.9		
Hydroelectric power	21,210	320	7.3	5.1	390	450	2.9	2.9	44,900	1.3		
Total	44,810	31,210	3.9	2.4	34,320	38,520	2.4	2.3	49,320	3.1		
Free World less US												
Solid fuels	20,220	15,750	-4.1	4.9	19,080	20,210	4.9	1.2	21,350	1.1		
Crude oil, natural gas	3,330	5,190	7.7	16.6	9,580	15,490	16.6	10.1	22,700	7.9		
Hydroelectric power	450	480	0.4	9.9	670	1,060	9.9	9.6	1,570	8.2		
Total	24,000	21,400	-1.9	8.2	29,330	36,760	8.2	4.8	43,820	4.4		
Free World												
Solid fuels	33,800	31,560	-1.1	1.8	33,920	33,230	1.8	-0.4	35,370	1.3		
Crude oil, natural gas	14,350	20,270	5.9	9.0	28,650	40,540	9.0	7.2	53,100	5.5		
Hydroelectric power	660	780	2.8	8.0	1,060	2,050	8.0	7.3	2,050	6.3		
Total	48,810	52,610	1.3	4.9	63,630	75,280	4.9	3.4	90,520	3.8		

Relationships in the Production of Primary Energy (Percent)

	1940	1946	1950	1955	1960
Sino-Soviet Bloc/Free World	28.3	20.1	25.6	31.7	40.2
USSR/US	28.3	19.9	28.2	35.7	50.4

a. Includes coal, peat, oil shale and firewood.
 b. Including natural gas liquids.
 c. Available for transmission from power plant.

d. Includes Albania, Bulgaria, Czechoslovakia, East Germany, Hungary, Rumania and Poland. Soviet Zone Austria included through 1955.
 e. Includes Communist China, North Korea, Outer Mongolia and North Vietnam.
 f. Not computed.

Table 1. Primary Energy Production for Selected Years and Growth Rates for Selected Periods Sino-Soviet Bloc VS. Free World by Principal Regions and Categories

Trillions of BTU (BTU x 10¹²)

Item No.	Region and Category	1940		1946		1950		1955		1960	
		Production	Production	Production	Production	Production	Production	Production (Plan or Forecast)	Aver. Ann. Growth, % 1951-55	Aver. Ann. Growth, % 1956-60	
I Sino-Soviet Bloc a/											
1.	USSR - Total	7,016	6,198	9,693	11.8	13,760	7.3	22,610	10.4		
	a. Solid fuels	5,520	5,080	7,770	11.2	10,230	5.7	15,030	8.0		
	b. Oil and gas	1,490	1,100	1,880	15.0	3,150	12.9	7,380	16.4		
	c. Hydroelectric power	16	18	13	22	80	13	200	20		
2.	European Satellites - Total	5,324	3,803	5,383	9.1	7,604	7.1	9,930	5.5		
	a. Solid fuels	4,960	3,450	4,930	9.3	6,660	6.2	8,750	5.6		
	b. Oil and gas	300	346	446	6.6	930	15.8	1,160	4.5		
	c. Hydroelectric power	4	7	7	0	14	15	20	7		
3.	Communist China by	1,500	579	1,244	21.1	2,476	14.8	3,820	8.1		
	a. Solid fuels	1,490	560	1,220	21.5	2,440	14.9	3,700	8.7		
	b. Oil and gas	5/	4	4	0	20	38	70	28.5		
	c. Hydroelectric power	10	15	20	7	16	-4	50	26		
4.	Sino-Soviet Bloc ^b Total	13,820	10,580	16,320	11.4	23,840	7.9	36,360	8.8		
	a. Solid fuels	11,960	9,090	13,920	11.2	19,330	6.8	27,480	7.3		
	b. Oil and gas	1,830	1,450	2,330	12.6	4,400	13.5	8,610	14.4		
	c. Hydroelectric power	30	40	70	15	110	9.5	270	19.7		
II Free World											
1.	US - Total	24,810	31,210	34,320	2.4	38,520	2.3	44,900	3.1		
	a. Solid fuels	13,580	15,810	14,860	-1.5	13,020	-2.6	14,020	1.5		
	b. Oil and gas	11,020	15,080	19,070	6.0	25,050	5.6	30,400	3.9		
	c. Hydroelectric power	210	320	390	5.1	450	2.9	480	1.3		
2.	Free World Less US - Total	24,000	21,400	29,210	8.2	36,760	4.6	45,620	4.4		
	a. Solid fuels	20,220	15,750	19,060	4.9	20,210	1.2	21,350	1.1		
	b. Oil and gas	3,330	5,190	9,580	16.6	15,490	10.1	22,700	7.9		
	c. Hydroelectric power	450	460	670	9.9	1,060	9.6	1,570	8.2		
3.	Free World - Total	48,810	52,610	63,630	4.9	75,280	3.4	90,520	3.8		
	a. Solid fuels	33,800	31,560	33,920	-1.1	32,230	-0.4	35,370	1.3		
	b. Oil and gas	14,350	20,270	28,650	5.9	40,560	7.2	53,100	5.5		
	c. Hydroelectric power	660	780	1,060	8.0	1,510	7.3	2,050	6.3		
III Sino-Soviet Bloc/Free World											
1.	Sino-Soviet Bloc/Free World	28.3	20.1	25.6		31.7		40.2			
2.	USSR/US	28.3	19.9	28.2		35.7		50.4			

a. For 1940 and 1946, data cover same countries as in 1950, 1955 and 1960.
 b. Includes North Korea, Outer Mongolia and Viet Minh.
 c. Less than 0.5 trillion BTU.
 d. Not computed.