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Energy Supplies in Eastern Europe: A Statistical Compilation

A Reference Aid

ER 79-10624
December 1979

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Energy Supplies in Eastern Europe: A Statistical Compilation

Introduction

The purpose of this Reference Aid is to assemble and organize data on East European energy supplies. Statistics on consumption, production, imports, and exports of energy are provided for Bulgaria, Czechoslovakia, the German Democratic Republic, Hungary, Poland, and Romania. Official government sources (usually statistical yearbooks) are used to the greatest extent possible. The data are presented for the years 1960-77 both in crude oil equivalents and in physical units.

The first section of this paper summarizes some of the main trends in the energy balances of Eastern Europe and presents a number of cross-country comparisons, both among the East European countries themselves and with the USSR and Western Europe. Special attention is paid to Eastern Europe's growing dependence on foreign trade for adequate supplies of energy.

The appendixes present for each East European country historical data on (a) the energy balance, (b) energy consumption, (c) energy production, (d) energy imports, (e) energy exports, (f) coal production and trade, (g) coal inventories and stocks (where possible), (h) oil production and trade, (i) natural gas production and trade, and (j) primary electricity production and trade. They also indicate the sources used in collecting or estimating the statistics and converting them to a consistent basis.

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Energy Supplies in Eastern Europe: A Statistical Compilation

Basic Trends

Since the early 1960s, Eastern Europe, in an effort to limit high-cost domestic production and generate more economic growth, has been shifting from almost exclusive reliance on domestic coal for its primary energy supply [1] to a more balanced pattern using increasing amounts of oil and natural gas (see table 1, figure 1, and the charts for individual countries, figures 2-7).[2] Because of the paucity of oil and gas in East European countries other than Romania, however, the bulk of their oil and natural gas has had to be imported, mainly from the USSR.

The rapid transformation of the East European economies to a hydrocarbon base has been threatened since the early 1970s by (a) hard currency payments problems that have precluded massive increases in oil imports from the West and (b) the Soviet decision in the early 1970s to limit oil deliveries to Eastern Europe during the 1976-80 period. Despite strenuous efforts, East European planners so far have been unable to reduce the energy consumption per unit of GNP or the growth of per capita energy consumption (tables 2, 3, and 4). Indeed, in contrast to West European experience the share of oil in energy consumption in Eastern Europe grew rapidly between 1970 and 1977 (table 5). Nevertheless, during 1974-77 the East Europeans were able to increase the rate of growth of coal consumption and slow the rate of increase of oil use (see tables 6 and 7).

Patterns of Energy Use

Coal

Eastern Europe began the 1970s as the only major industrialized area that still relied heavily on coal. In 1970, for example, coal supplied 69 percent of primary energy consumption in Eastern Europe compared with 43 percent in the USSR and 26 percent in Western Europe (table 8). The two largest economies—Poland and the German Democratic Republic (GDR)—depended on coal for over 80 percent of their energy supplies that year. Despite a steady decline, coal still represents nearly 60 percent of Eastern Europe's energy consumption (table 9).

During the 1971-75 plan period, as the East Europeans moved to reduce the growth of coal usage, production grew only 1.2 percent annually. Almost the entire increase was attributable to rising hard coal output in Poland. Production fell in Bulgaria, the GDR, and Hungary and rose only slightly in Czechoslovakia as these countries deliberately downplayed coal production in favor of imported oil. Some countries even closed less efficient mines. Because Poland exports about one-fourth of its coal output, consumption in Eastern Europe grew even more slowly than production, increasing by 0.7 percent annually.

Because of the limits on Soviet oil deliveries and the increased cost of Western oil, the East European countries were forced to reassess their domestic coal programs for the 1976-80 period. Current plans call for production to rise at an average annual rate of 3 percent in 1976-80, compared with the 1.2 percent achieved in 1971-75. Nonetheless, although all East European countries have raised their coal production targets through 1980, most will be unable to achieve much growth. The brown coals of Czechoslovakia and the GDR are increasingly inaccessible; GDR hard coal reserves have been exhausted. Hungary already is producing close to capacity. Romania and Bulgaria are falling far short of plan because of delays in developing new fields. Moreover, except for Poland, the East European countries are compelled to rely increasingly on poorer quality brown coal and lignite, and the calorific content of a ton of mined coal consequently has been steadily declining (tables 10 and 11). Poland,

[1] Primary energy in this paper includes production of coal, oil, gas, and electricity from hydroelectric and nuclear power plants plus net imports of coal, oil, oil products, gas, and electricity. It excludes electricity produced from any primary energy source (coal, oil, gas) and peat and firewood.

[2] The tables and graphics for this first section follow on page 4. Detailed country tables are to be found in the appendixes.

however, probably will meet its goal of a 21-percent hike in hard coal production above the 1975 level, to about 208 million tons by 1980.

Oil

Because of the lack of reserves, East European oil production grew only 1.4 percent annually in 1971-75 while oil consumption rose at the rate of 9.1 percent. Output totaled 364,000 barrels per day (b/d) in 1975 and accounted for about 20 percent of consumption (table 12). Romania accounted for all of the increase in output in 1971-75, producing 84 percent of the area's crude oil in 1975. The more industrialized countries of Eastern Europe (the GDR, Czechoslovakia, and Poland) produced neglible amounts of crude oil. Hungary, the only other significant producer in Eastern Europe, produced just 40,000 b/d in 1975.

Despite vigorous efforts to boost production, East European oil production is likely to fall slightly between 1975 and 1980. Apparently because of dwindling reserves, Romanian output declined in 1977 and again in 1978, although earthquake damage and industrial accidents also may have been a factor. A continued slow drop in Romanian output through 1980 is unlikely to be offset by expected small increases in Bulgarian and Polish production. Hungary probably will hold 1980 output at the 1975 level in order to husband reserves. In 1981-85, East European output should continue to fall as Romanian production drops.

Natural Gas

Eastern Europe has been somewhat successful in raising gas output in the 1970s, but limited reserves will prevent further significant increases in the area's output (table 13). During the 1971-75 period gas production grew by 5.8 percent annually. Although consumption climbed much faster (by 8.9 percent annually), output in 1975 still met 82 percent of Eastern Europe's needs. Romania continues to be the major producer, accounting for more than two-thirds of total East European production. Growth in 1971-75 also was spurred by new finds in the GDR, Hungary, and Poland.

During 1976-80, gas production probably will grow at approximately 3 percent annually—about one-half the 1971-75 rate. Growth would be even slower if Romania and Hungary were able to follow through on plans to hold down output to husband diminishing reserves. Energy shortages, however, have led these countries to raise production and draw down reserves more quickly than planned.

Beyond 1980, gas production is likely to fall steadily as the result of declining reserves. The Romanians have announced a 1985 output target of 262,000 b/d crude oil equivalent—9 percent below the 1978 level—but even this goal is probably optimistic. The GDR releases little information on gas production but has indicated sharp disappointment with the reserves at their major field in Salzwedel. Hungary and Poland will be fortunate to maintain 1980 production levels through 1985. The other countries—Czechoslovakia and Bulgaria—have little gas production and little prospect of any new finds.

Hydroelectric and Nuclear Power

The East European countries have little potential for hydroelectric power, and nuclear energy will have little impact before 1980, except for Bulgaria, where nuclear energy already is providing 20 percent of total electricity production. Two additional 440-megawatt (MW) units are scheduled to double Bulgaria's nuclear capacity by the end of 1980. In the GDR nuclear production's share of total electricity production should be about 10 percent in 1980. About 5 percent of electricity output in Czechoslovakia will be produced by nuclear energy by the end of the current plan period. Construction delays probably will prevent Hungary from bringing its first nuclear reactor on stream before 1981 (one year late); Romania and Poland are not likely to have reactors until the end of the 1980s.

Foreign Trade

Energy Imports

The sluggish growth of energy production has forced the East Europeans to rely heavily on imports to meet their growing energy needs (table 14). During the 1971-77 period, imports grew 9 percent annually, nearly four times the growth rate of domestic energy production. By 1977, imports of energy accounted for 34 percent of consumption, compared with 25 percent in 1970 and 14 percent in 1960. Excluding Poland (with its coal) and Romania (with its oil and gas), imports of energy for the other four countries rose from 33 percent of consumption in 1970 to 45 percent in 1977. Bulgaria and Hungary depend most heavily on imports, relying on them for more than half of their 1977 energy consumption (table 15).

Imports From USSR. The Soviet Union supplies most of the area's imports of crude oil, coal, natural gas, and electricity and accounts for about three-quarters of total energy purchases (table 16). The bulk of these deliveries is in the form of oil, although gas is becoming more important. Between 1970 and 1977, East European dependence on the USSR continued to grow, with the Soviet contribution to the region's energy imports rising from 73 percent in 1970 to 76 percent in 1977. The Soviet share of each type of energy import grew during this period, with the exception of oil. The fall in the USSR's share of East European oil imports from 84 percent to 78 percent occurred mainly because of the sharp rise in oil imports by Romania, which imports no oil from the USSR. The heavy dependence of the other five countries on the USSR for oil continued (table 17).

The dependence on the USSR varies widely by country. Bulgaria, Czechoslovakia, the GDR, and Hungary receive between 28 and 70 percent of their total energy requirements from the USSR (table 18). In 1971-77, moreover, larger Soviet deliveries accounted for almost all of the growth in energy consumption of these four countries. Poland, a large coal producer, is less dependent upon the USSR, and Romania imports little energy from the Soviet Union.

In the early 1970s, the East European countries were told that Soviet oil deliveries would be held to the 1975 level, but Moscow relented and subsequently increased deliveries somewhat. Thus, the Soviet share of total East European energy consumption has continued to rise in 1976-78. This share, however, is not increasing as fast as it did, mainly because of a slowdown in the growth of Soviet oil deliveries—3 percent annually in 1976-78 compared with nearly 10 percent a year in 1971-75. At the same time, the Soviets have raised oil prices to Eastern Europe annually since 1975 and have required the East Europeans to either pay in hard currency or to invest further in Soviet resource development for oil deliveries greater than called for in their trade agreements. But some of the burden of higher prices was eased when Moscow permitted the East Europeans to run large bilateral trade deficits with the USSR.

During the 1979-80 period, Soviet energy shipments are expected to accelerate, in line with earlier protocols. Although the growth of oil deliveries probably will decline, the startup of the Soyuz (Orenburg) gas pipeline system this year will more than make up the difference, doubling Soviet gas exports from 258,000 b/d oil equivalent in 1978 to 516,000 b/d oil equivalent in 1980. Total Soviet energy exports to Eastern Europe should increase from 2.1 million b/d oil equivalent in 1978 to 2.4 million b/d oil equivalent in 1980. Overall, Soviet energy shipments will meet 55 percent of the increment in Eastern Europe's energy needs during the next two years.

Imports From Other Countries. While energy purchases from the USSR have continued to rise, the East Europeans have strived to buy enough OPEC oil to satisfy their residual energy demands (table 19). At the same time, they have been wrestling with hard currency payments problems since (a) oil prices quadrupled in 1973-74, (b) the subsequent price explosion of raw materials raised the cost of East European imports, and (c) slower growth in the West

held down demand for their exports. Excluding imports for Romania, oil imports from OPEC countries grew at an average annual rate of almost 5 percent during 1974-78, but barely have risen as a share of total crude oil imports. Romanian oil imports, on the other hand, more than tripled during 1974-78 because domestic production peaked in 1976 and then fell.

In 1979-80, the East Europeans will continue to hold down non-Soviet imports, buying only an estimated 100,000 b/d more by 1980. Romania alone is expected to account for 60 percent of this growth. The other East European countries should have sufficient oil for their economies, the growth of which has been slowing, with the additional supplies from the USSR and the small increases planned in purchases from OPEC.

Energy Exports

Because of limited energy reserves, East European exports amounted to only 1 million b/d crude oil equivalent in 1977—about 13 percent of consumption and more than one-third of the import level (table 20). Poland—the only net energy exporter in the area—accounts for more than three-fifths of total energy exports (table 21). Romania, which imports crude oil from the West for processing and reexport to the West, accounts for the second largest share of East European exports.

Eastern Europe's energy exports are sold predominantly to the West in order to earn hard currency. The USSR received only 13 percent of the area's energy exports in 1977, and Polish coal accounted for virtually all Soviet imports. Polish coal also represents more than one-half of total East European energy sales to the West; sales of East European oil to the West comprise most of the remainder (table 22).

Table 1

Eastern Europe: Consumption of Primary Energy

	1960		1965		1970		1975		1977	
	Thousand b/d Oil Equivalent	Percent	Thousand b/d Oil Equivalent	Percent	Thousand b/d Oil Equivalent	Percent	Thousand b/d Oil Equivalent	Percent	Thousand b/d Oil Equivalent	Percent
Coal	3,192	84	3,747	78	4,093	69	4,247	60	4,465	57
Oil	318	8	593	12	1,072	18	1,660	23	1,926	25
Gas	232	6	386	8	676	11	1,033	14	1,221	16
Electricity [1]	49	1	72	2	105	2	186	3	234	3

[1] Including hydro and nuclear power and net imports of electricity.

Table 2

Thousand b/d Oil Equivalent

Eastern Europe: Basic Energy Statistics [1]

		Consumption	Production	Imports	Exports
Total	**1960**	**3,791**	**3,870**	**513**	**592**
	1970	**5,946**	**5,280**	**1,470**	**805**
	1977	**7,846**	**6,177**	**2,674**	**1,004**
Bulgaria	1960	131	109	24	2
	1970	391	151	247	7
	1977	591	154	442	4
Czechoslovakia	1960	798	761	101	64
	1970	1,136	906	332	101
	1977	1,457	948	607	98
GDR	1960	1,166	1,027	221	82
	1970	1,491	1,172	387	68
	1977	1,686	1,170	597	81
Hungary	1960	270	207	77	15
	1970	431	277	184	29
	1977	549	292	297	40
Poland	1960	1,050	1,278	74	303
	1970	1,653	1,895	232	474
	1977	2,319	2,479	472	632
Romania	1960	376	487	15	126
	1970	844	879	89	124
	1977	1,244	1,133	259	149

[1] Because of rounding, components may not add to the totals shown.

Table 3

Percent

Eastern Europe: Average Annual Growth of GNP and Energy Consumption [1]

	1966-70		1971-75		1970-73		1974-77	
	GNP	Energy Consumption	GNP	Energy Consumption	GNP	Energy Consumption	GNP	Energy Consumption
Total	**3.8**	**4.4**	**4.8**	**3.7**	**4.6**	**4.6**	**4.1**	**4.1**
Bulgaria	5.2	9.0	4.7	6.1	4.5	7.2	3.7	5.6
Czechoslovakia	3.4	2.9	3.4	2.7	3.1	3.7	3.2	4.0
GDR	3.1	2.3	3.5	1.2	2.8	2.2	3.7	2.1
Hungary	3.0	3.7	3.3	3.4	2.8	5.1	2.4	3.7
Poland	4.0	4.9	6.5	4.7	6.7	4.9	4.4	5.2
Romania	5.0	8.4	6.7	5.9	6.4	7.8	6.2	4.8

[1] Thad P. Alton, et al, *Economic Growth in Eastern Europe 1965-1978*, Economic Studies, L. W. International Financial Research, Inc., New York, N. Y., 1979.

Table 4 b/d Oil Equivalent

Eastern Europe: Per Capita Consumption of Energy [1]

	1960	1965	1970	1975	1977
Bulgaria	**0.017**	**0.031**	**0.046**	**0.060**	**0.067**
Oil	0.003	0.009	0.020	0.029	0.032
Coal	0.012	0.020	0.023	0.023	0.021
Gas	0	NEGL.	0.001	0.002	0.005
Electricity [2]	0.002	0.002	0.001	0.005	0.008
Czechoslovakia	**0.058**	**0.070**	**0.079**	**0.088**	**0.097**
Oil	0.004	0.008	0.014	0.022	0.026
Coal	0.052	0.058	0.059	0.057	0.060
Gas	0.002	0.001	0.003	0.005	0.009
Electricity [2]	0.001	0.003	0.003	0.003	0.003
GDR	**0.068**	**0.078**	**0.087**	**0.094**	**0.101**
Oil	0.002	0.005	0.011	0.017	0.020
Coal	0.066	0.073	0.075	0.070	0.071
Gas	NEGL	NEGL	0.001	0.006	0.007
Electricity [2]	NEGL	NEGL	0.001	0.002	0.003
Hungary	**0.027**	**0.036**	**0.042**	**0.048**	**0.052**
Oil	0.004	0.007	0.012	0.019	0.020
Coal	0.021	0.025	0.022	0.018	0.017
Gas	0.001	0.002	0.006	0.009	0.012
Electricity [2]	0.001	0.001	0.002	0.002	0.002
Poland	**0.036**	**0.041**	**0.051**	**0.061**	**0.067**
Oil	0.002	0.003	0.005	0.009	0.010
Coal	0.033	0.037	0.042	0.048	0.051
Gas	NEGL	0.001	0.003	0.004	0.005
Electricity [2]	NEGL	NEGL	NEGL	NEGL	NEGL
Romania	**0.020**	**0.030**	**0.042**	**0.053**	**0.057**
Oil	0.006	0.008	0.011	0.013	0.016
Coal	0.004	0.005	0.008	0.010	0.010
Gas	0.010	0.017	0.022	0.028	0.029
Electricity [2]	NEGL	NEGL	NEGL	0.001	0.002

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.

Table 5

Percent

Eastern and Western Europe: Share of Energy Consumption

	1960		1965		1970		1975		1977	
	East	West [1]	East	West [1]	East	West [1]	East	West [1]	East	West [1]
Coal	84	56	78	42	69	26	60	22	57	20
Oil	8	33	12	47	18	59	23	55	25	55
Gas	6	2	8	2	11	6	14	14	16	14
Electricity [2]	1	9	2	10	2	8	3	10	3	11

[1] CIA, *The World Oil Market in the Years Ahead*, ER 79-10327U, August 1979. Based principally on OECD annual energy statistics from *Energy Statistics*.
[2] Including hydro and nuclear power and net imports of electricity.

Table 6

Percent

Eastern Europe: Average Annual Growth of Energy Consumption

	1966-70	1971-75	1970-73	1974-77
Coal	1.8	0.7	1.3	1.9
Oil	12.6	9.1	13.2	5.8
Gas	11.9	8.8	8.3	9.3
Electricity [1]	7.9	12.2	14.8	13.8

[1] Including hydro and nuclear power and net imports of electricity.

Table 7 Percent

Eastern Europe: Average Annual Growth of Energy Consumption by Country

	1966-70	1971-75	1970-73	1974-77
Bulgaria				
Coal	4.1	0.4	1.7	−0.8
Oil	17.8	8.1	11.8	3.8
Gas	45.2	21.7	−19.3	89.1
Electricity [1]	−4.0	33.4	27.1	21.8
Czechoslovakia				
Coal	0.7	NEGL	0.7	1.5
Oil	11.6	9.7	12.6	6.3
Gas	21.9	14.4	13.8	25.4
Electricity [1]	4.3	1.9	6.7	−0.2
GDR				
Coal	0.6	−1.8	−0.7	−0.3
Oil	17.8	9.3	13.8	5.4
Gas	48.5	55.9	90.7	18.4
Electricity [1]	18.9	15.0	3.3	23.6
Hungary				
Coal	−2.1	−3.9	−2.5	−1.5
Oil	10.0	10.6	13.8	5.9
Gas	22.6	10.3	9.9	11.7
Electricity [1]	17.7	2.3	16.1	−2.7
Poland				
Coal	3.1	3.5	3.2	4.4
Oil	12.3	12.5	14.8	7.8
Gas	28.4	6.1	11.8	6.6
Electricity [1]	32.8	−2.4	−45.4	119.8
Romania				
Coal	11.5	4.9	6.8	2.6
Oil	8.4	5.4	12.8	5.3
Gas	7.5	5.7	5.0	4.6
Electricity [1]	−13.6	71.7	NA	22.0

[1] Including hydro and nuclear power and net imports of electricity.

Table 8 Percent

Primary Energy: Share of Coal in Consumption

	1960	1965	1970	1975
Eastern Europe	84	78	69	60
USSR	63	52	43	37
Western Europe	56	42	26	22
United States	23	22	19	19

Table 9 Percent

Eastern Europe: Consumption of Primary Energy by Country, 1977

	Coal	Oil	Gas	Electricity [1]
Total	**57**	**25**	**16**	**3**
Bulgaria	32	48	8	12
Czechoslovakia	62	26	9	3
GDR	71	20	7	3
Hungary	34	39	23	5
Poland	77	15	7	1
Romania	18	28	51	3

[1] Including hydro and nuclear power and net imports of electricity.

Table 10

Percent

Eastern Europe: Coal Production

	1960		1965		1970		1975		1977	
	Hard Coal	Brown Coal and Lignite	Hard Coal	Brown Coal and Lignite	Hard Coal	Brown Coal and Lignite	Hard Coal	Brown Coal and Lignite	Hard Coal	Brown Coal and Lignite
Bulgaria	4	96	2	98	1	99	1	99	1	99
Czechoslovakia	31	69	28	72	26	74	25	75	23	77
GDR	1	99	1	99	NEGL	100	NEGL	100	NEGL	100
Hungary	11	89	14	86	15	85	12	88	11	89
Poland	92	8	84	16	81	19	81	19	82	18
Romania	50	50	45	55	31	69	27	73	26	74

Table 11

Tons of Standard Fuel [1] Per Ton of Coal

Eastern Europe: Calorific Content Per Ton of Mined Coal

	1960	1965	1970	1975	1977
Bulgaria	0.4209	0.3573	0.3045	0.2981	0.2812
Czechoslovakia	0.6091	0.5830	0.5623	0.5421	0.5335
GDR	0.3198	0.3123	0.3132	0.3050	0.3029
Hungary	0.4765	0.4555	0.4677	0.4176	0.3975
Poland	0.7917	0.7557	0.7395	0.7340	0.7368
Romania	0.5439	0.5238	0.4360	0.3867	0.3862

[1] One ton of standard fuel contains 7,000 kilocalories per kilogram.

Table 12

Eastern Europe: Production and Consumption of Oil

	1970			1975			1977		
	Production [1] (Thousand b/d Oil Equivalent)	Consumption [1] (Thousand b/d Oil Equivalent)	Production as a Share of Consumption (Percent)	Production [1] (Thousand b/d Oil Equivalent)	Consumption [1] (Thousand b/d Oil Equivalent)	Production as a Share of Consumption (Percent)	Production [1] (Thousand b/d Oil Equivalent)	Consumption [1] (Thousand b/d Oil Equivalent)	Production as a Share of Consumption (Percent)
Total	**340**	**1,072**	**32**	**364**	**1,660**	**22**	**364**	**1,926**	**19**
Bulgaria	7	174	4	2	256	1	3	284	1
Czechoslovakia	4	206	2	3	326	1	2	383	1
GDR	1	183	1	1	286	NEGL	1	341	NEGL
Hungary	39	121	32	40	200	20	44	212	21
Poland	8	171	5	11	308	4	7	359	2
Romania	281	218	129	306	283	108	307	348	88

[1] Because of rounding, components may not add to the totals shown.

Table 13

Eastern Europe: Production and Consumption of Natural Gas

	1970			1975			1977		
	Production [1] (Thousand b/d Oil Equivalent)	Consumption [1] (Thousand b/d Oil Equivalent)	Production as a Share of Consumption (Percent)	Production [1] (Thousand b/d Oil Equivalent)	Consumption [1] (Thousand b/d Oil Equivalent)	Production as a Share of Consumption (Percent)	Production [1] (Thousand b/d Oil Equivalent)	Consumption [1] (Thousand b/d Oil Equivalent)	Production as a Share of Consumption (Percent)
Total	**638**	**676**	**94**	**848**	**1,033**	**82**	**936**	**1,221**	**77**
Bulgaria	8	8	100	2	21	10	NEGL	48	0
Czechoslovakia	18	38	47	14	76	18	15	133	11
GDR	10	11	92	45	98	46	53	111	48
Hungary	56	59	95	83	97	86	106	126	84
Poland	88	104	85	99	140	71	121	166	73
Romania	460	456	101	605	601	101	641	637	101

[1] Because of rounding, components may not add to the totals shown.

Table 14

Thousand b/d Oil Equivalent

Eastern Europe:
Imports of Energy [1]

	Total	Coal	Oil	Gas	Electricity [2]
1970 Total	**1,470**	**418**	**941**	**43**	**68**
Communist countries	1,303	377	817	43	66
USSR	1,072	213	789	39	31
Eastern Europe	223	164	21	4	34
Other Communist	8	NEGL	7	0	1
Non-Communist countries	168	41	123	1	3
1977 Total	**2,674**	**438**	**1,832**	**289**	**114**
Communist countries	2,252	404	1,447	289	111
USSR	2,022	252	1,424	286	60
Eastern Europe	224	152	22	4	47
Other Communist	6	0	1	0	4
Non-Communist countries	421	34	385	0	2

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.

Table 15

Percent

Eastern Europe: Energy Imports as a Share of Energy Consumption

	1960	1965	1970	1975	1977
Bulgaria	19	44	63	73	75
Czechoslovakia	13	22	29	39	42
GDR	19	23	26	34	35
Hungary	29	35	43	54	54
Poland	7	11	14	19	20
Romania	4	4	11	15	21

Table 16

Percent

Eastern Europe: Energy Imports From the USSR as a Share of Total Energy Imports

	1970	1975	1977
Total	**73**	**76**	**76**
Bulgaria	86	93	93
Czechoslovakia	80	86	85
GDR	66	79	80
Hungary	66	73	82
Poland	87	75	75
Romania	19	13	9

Table 17

Eastern Europe: Imports of Crude Oil

	1970	1971	1972	1973	1974	1975	1976	1977	1978 [1]
	Thousand b/d								
Total	**790**	**912**	**1,087**	**1,234**	**1,273**	**1,402**	**1,566**	**1,658**	**1,810**
Of which:									
USSR	687	770	888	998	1,066	1,166	1,234	1,306	1,360
	Percent								
Soviet share of total East European oil imports	87	84	82	81	84	83	79	79	75
Soviet share of total East European oil imports, excluding Romania	92	90	86	87	90	90	88	88	88

[1] Estimated.

Table 18

Percent

Eastern Europe: Energy Imports From the USSR as a Share of Energy Consumption

	1970	1975	1977
Total	**18**	**24**	**26**
Bulgaria	54	68	70
Czechoslovakia	23	33	35
GDR	17	27	28
Hungary	28	40	44
Poland	12	14	15
Romania	2	2	2

Table 19

b/d

Eastern Europe: Crude Oil Imports From Non-Communist Countries

	1970	1971	1972	1973	1974	1975	1976	1977	1978 [1]
Total	**102,440**	**141,940**	**199,460**	**235,880**	**206,780**	**236,340**	**331,840**	**351,840**	**452,440**
Bulgaria	18,740	34,940	38,280	42,780	32,400	11,960	16,340	18,280	26,840
Czechoslovakia	7,920	16,740	13,280	22,600	7,280	6,720	15,320	27,000	17,300
GDR	22,020	23,300	72,900	60,400	45,980	38,000	40,480	40,700	44,000
Hungary	7,940	9,800	17,540	15,840	13,820	29,480	21,200	16,440	29,260
Poland	0	0	0	11,400	16,540	48,480	69,000	72,540	76,300
Subtotal	56,620	84,780	142,000	153,020	116,020	134,640	162,340	174,960	193,700
Romania	45,820	57,160	57,460	82,860	90,760	101,700	169,500	176,880	258,740

[1] Estimated

Table 20

Thousand b/d Oil Equivalent

Eastern Europe: Exports of Energy [1]

	Total	Coal	Oil	Gas	Electricity
1970 Total	**805**	**556**	**208**	**5**	**35**
Communist countries	361	288	36	5	33
USSR	114	103	11	0	NEGL
Eastern Europe	230	176	18	5	32
Other Communist	17	9	7	0	1
Non-Communist countries	444	268	173	NEGL	2
1977 Total	**1,004**	**676**	**270**	**4**	**53**
Communist countries	374	298	24	4	47
USSR	132	131	1	0	NEGL
Eastern Europe	222	155	20	4	42
Other Communist	20	12	3	0	5
Non-Communist countries	631	379	247	NEGL	6

[1] Because of rounding, components may not add to the totals shown.

Table 21

Thousand b/d Oil Equivalent

Eastern Europe: Exports of Energy by Country,[1] 1977

	Total	Coal	Oil	Gas	Electricity
Total	**1,004**	**676**	**270**	**4**	**53**
Bulgaria	4	NEGL	0	0	4
Czechoslovakia	98	81	11	1	5
GDR	81	23	45	NEGL	13
Hungary	40	1	34	0	5
Poland	632	572	44	0	17
Romania	149	0	137	4	8

[1] Because of rounding, components may not add to the totals shown.

Table 22

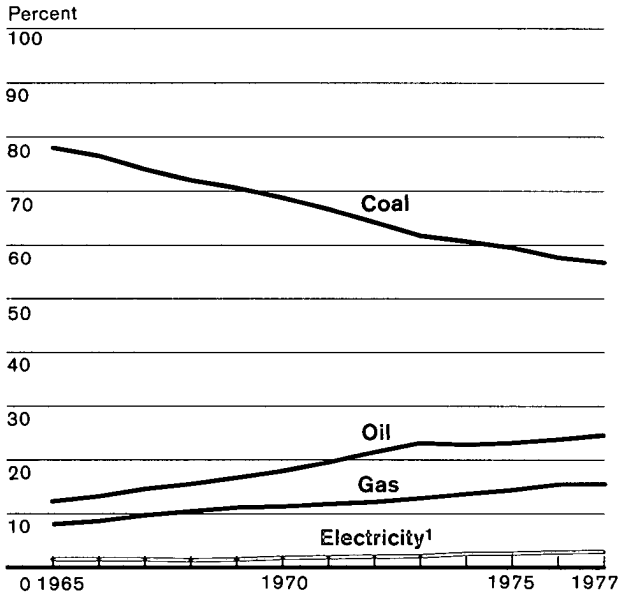
Thousand b/d Oil Equivalent

Eastern Europe: Energy Exports to Non-Communist Countries,[1] 1977

	Total	Coal	Oil	Gas	Electricity
Total	**631**	**379**	**247**	**NEGL**	**6**
Bulgaria	3	0	0	0	3
Czechoslovakia	40	30	9	0	1
GDR	47	10	36	NEGL	NEGL
Hungary	33	NEGL	31	0	2
Poland	381	338	43	0	0
Romania	127	0	127	0	NEGL

[1] Because of rounding, components may not add to the totals shown.

Eastern Europe Figure 1
Energy Consumption by Type

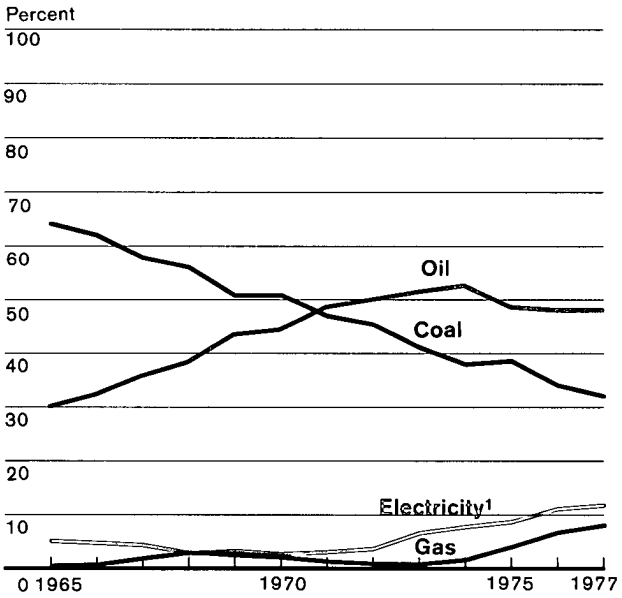


1. Including hydro and nuclear power and net imports of electricity.

Unclassified

580813 11-79

Bulgaria Figure 2
Energy Consumption by Type

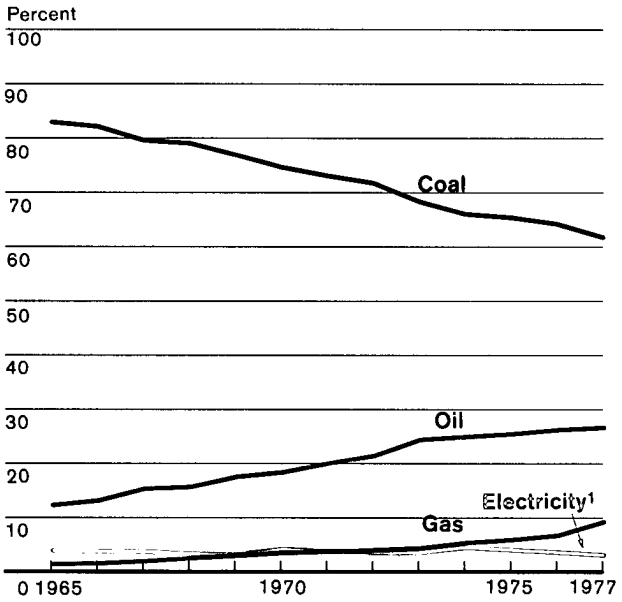


1. Including hydro and nuclear power and net imports of electricity.

Unclassified

580814 11-79

Czechoslovakia Figure 3
Energy Consumption by Type

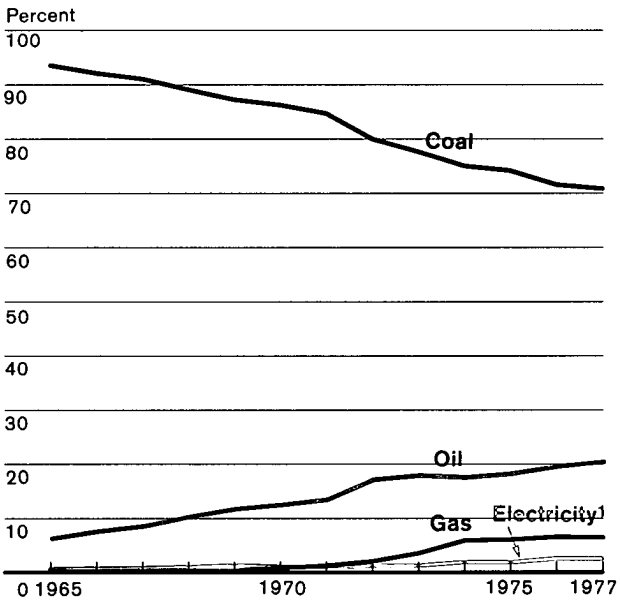


1. Including hydro and nuclear power and net imports of electricity.

Unclassified

580815 11-79

GDR Figure 4
Energy Consumption by Type

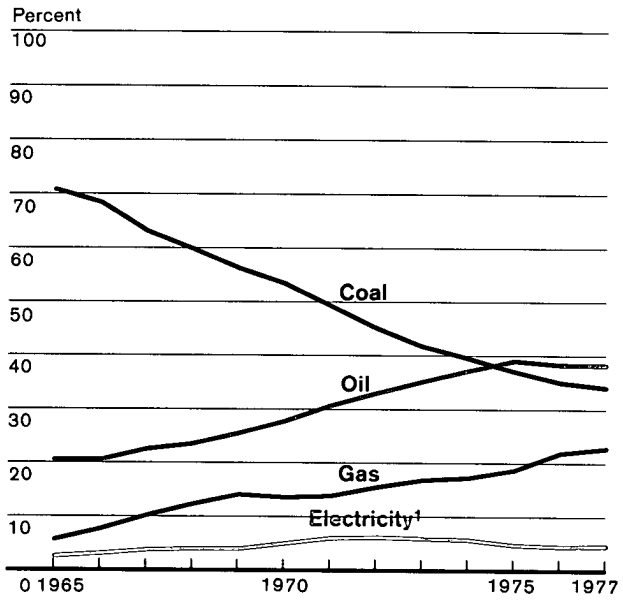


1. Including hydro and nuclear power and net imports of electricity.

Unclassified

580816 11-79

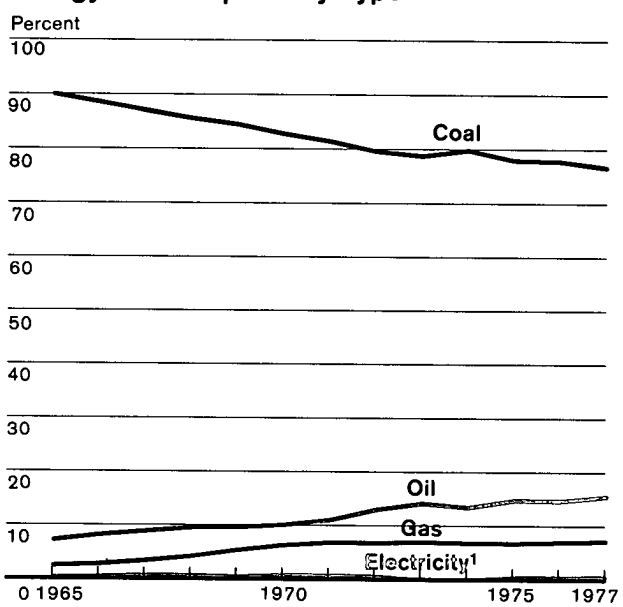
Hungary Figure 5
Energy Consumption by Type



1. Including hydro power and net imports of electricity.

Unclassified
580817 11-79

Poland Figure 6
Energy Consumption by Type

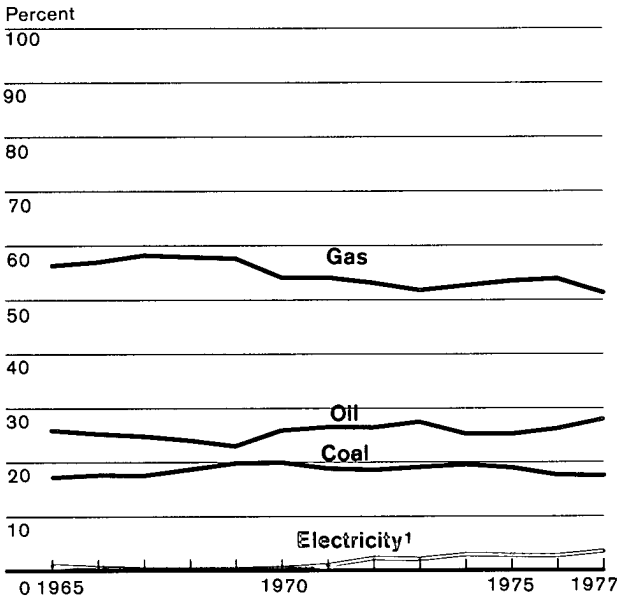


1. Including hydro power and net imports of electricity.

Unclassified
580818 11-79

Romania
Energy Consumption by Type

Figure 7



1. Including hydro power and net imports of electricity.

Unclassified

580819 11-79

Appendix A

Bulgaria: Energy Consumption, Production, and Trade

Consumption

Consumption data for all energy sources represents apparent consumption, compiled by adding production and imports and subtracting exports. Coal inventories, which appear in *Statisticheski godishnik na narodna republika Bulgariya* (the Bulgarian statistical yearbook), are reported for information but are not reflected in consumption.

Production

The source for coal data for 1960 and 1965-77 is *Statisticheskiy yezhegodnik stran chlenov soveta ekonomicheskoy vzaimopomoshchi* (CEMA statistical yearbooks). The source for 1961-64 is the Bulgarian statistical yearbooks. Coal production data for 1965-77 were converted to barrels per day of crude oil equivalent by using the tables on per capita production of coal in standard fuel in the CEMA yearbooks; data for 1960-64 were converted by extrapolation from the CEMA series. The source for oil and natural gas data is the Bulgarian statistical yearbooks; data were converted to barrels per day of crude oil equivalent by assuming 10,010 kcal/kg (kilocalories per kilogram) heat value for Bulgarian crude oil and 7.3 barrels per ton and 8,400 kcal/cubic meter for natural gas.

The source for hydroelectricity production for 1960 and 1965-77 is the CEMA yearbooks and for 1961-64 the Bulgarian statistical yearbooks. The source for nuclear power data is the UN *Annual Bulletin of Electric Energy Statistics for Europe*. Crude oil equivalents for hydroelectric and nuclear power are based on the average specific consumption of fuels in conventional thermal power plants for each year found in the same UN publication. The heat value of crude oil equivalent for all energy sources is assumed to be 10,010 kcal/kg.

Inventories and Stocks

The source for changes in coal inventories and other stocks is the coal balance tables in the Bulgarian statistical yearbooks. The category "other stocks" is listed in the Bulgarian yearbooks as "additional reserves" and apparently is not included in the inventory data, although no explanation is provided for the separate treatment.

Trade

The source for imports of hard coal, anthracite, and hard coal briquettes for 1960-76 is *vunshna turgoviya na narodna Bulgariya* (Bulgarian Foreign Trade). Data on coke imports for 1960-76 are from the Bulgarian statistical yearbooks. Coal and coke import data for 1977 are from the CEMA statistical yearbook. Exports of hard coal for 1960-63 and of metallurgical coke for 1972-76 are from the Bulgarian foreign trade books. Export data for coke for 1977 are estimated.

Coal imports were converted to crude oil equivalent by assuming 6,650 kcal/kg for hard coal and coke, 7,000 kcal/kg for anthracite, and 4,450 kcal/kg for briquettes. Coal exports were converted at 6,930 kcal/kg for metallurgical coke and 6,650 kcal/kg for hard coal. Crude oil equivalent is measured at a constant 10,010 kcal/kg and 7.3 barrels per ton.

The source for crude oil imports and exports for 1960 and 1965-77 is the CEMA statistical yearbooks; the source for 1961-64 is the Bulgarian trade books. Data on oil product imports for 1960-66 are from the Bulgarian statistical yearbooks and for 1967-73 *Statisticheski izvestia* (Bulgarian Statistical Monthly). For 1974-76, imports of oil products were estimated from the difference between Soviet exports of crude oil and oil products in *Vneshnaya torgovilya SSSR* (Soviet Foreign Trade) and Bulgarian data on crude oil imports from the USSR in the Bulgarian statistical yearbooks. Oil product imports in 1977 were estimated from the value of Soviet deliveries of crude oil and products in the Soviet foreign trade publication. Oil product exports for 1960-70 are from the Bulgarian statistical yearbooks and for 1971-72 from the CEMA statistical yearbooks. Imports and exports of

crude oil and products were converted to crude oil equivalent by using 10,010 kcal/kg heat value for crude oil and 7.3 barrels per ton and 10,150 kcal/kg for oil products.

The source for natural gas imports in 1974-76 is *Soviet Foreign Trade*; 1977 imports were estimated from the value of Soviet natural gas exports in *Soviet Foreign Trade*. Natural gas imports were converted to crude oil equivalent by assuming 8,190 kcal/cubic meter for Soviet natural gas from *Postroeniye i analiz energeticheskovo balansa* (Construction and Analysis of the Energy Balance), A. C. Nekrasov, Yu. V. Cinyak, and V. A. Yanpol'skiy, Moscow, 1974.

The source for electricity imports and exports is the electric power balances in the Bulgarian statistical yearbooks. Electricity trade was converted to crude oil equivalent based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN's *Annual Bulletin*.

Table A-1 b/d Oil Equivalent

Bulgaria: Energy Balance

	Consumption	Production	Imports	Exports
1960	131,170[1]	108,990[1]	24,500	2,340
1961	142,010[1]	115,100[1]	30,100	3,200
1962	172,010[1]	122,520[1]	52,590	3,100
1963	193,950[1]	129,160[1]	66,990	2,210
1964	232,470[1]	138,710[1]	95,800	2,040
1965	254,060	144,450	111,730	2,110
1966	269,600	144,850	130,400	5,640
1967	297,670	152,490	149,590	4,430
1968	321,380[1]	152,150	177,100[1]	7,900
1969	360,160	149,640	215,010	4,480
1970	391,220	151,380	246,900	7,080
1971	426,570	137,480	290,540	1,450
1972	434,330	134,420	303,310	3,410
1973	475,970	132,600	344,680	1,300
1974	497,940[1]	123,340	376,010[1]	1,430
1975	526,960[1]	143,340	386,880[1]	3,240
1976	552,720[1]	145,500	410,730[1]	3,510
1977	591,010	153,590	441,990[1]	4,570

[1] Estimated.

Table A-2

b/d Oil Equivalent

Bulgaria: Consumption of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	131,170 [3]	94,600 [3]	22,110	0	14,460
1961	142,010 [3]	101,120 [3]	26,870	0	14,020
1962	172,010 [3]	122,700 [3]	37,010	0	12,300
1963	193,950 [3]	131,410 [3]	46,740	0	15,800
1964	232,470 [3]	156,050 [3]	66,010	0	10,410
1965	254,060	162,830	76,500	1,230	13,500
1966	269,600	167,080	87,270	1,830	13,420
1967	297,670	171,960	106,700	5,520	13,490
1968	321,380 [3]	179,760 [3]	123,300	8,500	9,820
1969	360,160	182,550	156,550	8,810	12,250
1970	391,220	198,640	173,650	7,950	10,980
1971	426,570	200,170	207,300	5,490	13,610
1972	434,330	196,810	217,280	3,700	16,540
1973	475,970	195,330	244,960	3,730	31,950
1974	497,940 [3]	188,500	262,100 [3]	8,040	39,300
1975	526,960 [3]	203,080	256,220 [3]	21,250	46,410
1976	552,720 [3]	187,550	265,760 [3]	37,100	62,310
1977	591,010	188,610	284,480 [3]	47,660	70,260

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table A-3 b/d Oil Equivalent

Bulgaria: Production of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	108,990 [3]	90,750 [3]	4,000	0	14,240
1961	115,100 [3]	97,250 [3]	4,140	0	13,720
1962	122,520 [3]	106,730 [3]	3,980	0	11,800
1963	129,160 [3]	110,550 [3]	3,460	0	15,160
1964	138,710 [3]	124,940 [3]	3,200	0	10,580
1965	144,450	125,140	4,580	1,230	13,510
1966	144,850	121,730	8,080	1,830	13,210
1967	152,490	124,130	9,980	5,520	12,870
1968	152,150	126,190	9,500	8,500	7,980
1969	149,640	123,380	6,500	8,810	10,930
1970	151,380	124,560	6,680	7,950	12,190
1971	137,480	113,650	6,100	5,490	12,230
1972	134,420	113,950	4,960	3,700	11,810
1973	132,600	110,930	3,800	3,730	14,130
1974	123,340	100,750	2,880	3,020	16,700
1975	143,340	112,590	2,440	1,860	26,460
1976	145,500	99,350	2,340	620	43,180
1977	153,590	99,000	2,580	170	51,870

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table A-4

b/d Oil Equivalent

Bulgaria: Imports of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity
1960	24,500	4,560	19,740	0	210
1961	30,100	4,520	25,270	0	290
1962	52,590	16,650	35,360	0	590
1963	66,990	21,340	45,010	0	660
1964	95,800	31,120	64,670	0	10
1965	111,730	37,690	73,790	0	250
1966	130,400	45,340	84,760	0	290
1967	149,590	47,830	100,770	0	1,000
1968	177,100 [2]	53,560 [2]	121,440	0	2,100
1969	215,010	59,160	154,140	0	1,710
1970	246,900	74,080	172,240	0	570
1971	290,540	86,520	202,660	0	1,380
1972	303,310	84,170	213,540	0	5,610
1973	344,680	85,540	241,170	0	17,990
1974	376,010 [2]	89,160	259,220 [2]	5,020	22,620
1975	386,880 [2]	91,750	253,800 [2]	19,390	21,940
1976	410,730 [2]	89,050	263,420 [2]	36,480	21,780
1977	441,990 [2]	90,290	281,900 [2]	47,500 [2]	22,290

[1] Because of rounding, components may not add to the totals shown.
[2] Estimated.

Table A-5 b/d Oil Equivalent

Bulgaria: Exports of Primary Energy

	Total [1]	Coal	Oil	Electricity
1960	2,340	710	1,620	0
1961	3,200	650	2,540	0
1962	3,100	670	2,340	90
1963	2,210	480	1,710	30
1964	2,040	0	1,850	180
1965	2,110	0	1,850	260
1966	5,640	0	5,560	70
1967	4,430	0	4,050	380
1968	7,900	0	7,630	260
1969	4,480	0	4,100	390
1970	7,080	0	5,290	1,790
1971	1,450	0	1,450	0
1972	3,410	1,310	1,230	870
1973	1,300	1,130	0	170
1974	1,430	1,410	0	20
1975	3,240	1,260	0	1,990
1976	3,510	850	0	2,660
1977	4,570	680	0	3,890

[1] Because of rounding, components may not add to the totals shown.

Table A-6

Thousand Metric Tons

Bulgaria: Coal Production and Trade

	Production		Imports				Exports	
	Hard Coal	Brown Coal and Lignite	Hard Coal [1]	Anthracite	Hard Coal Briquettes	Coke	Hard Coal	Metallurgical Coke
1960	571	15,416	0	0	0	344	54	0
1961	591	16,966	0	0	0	341	50	0
1962	636	19,104	905	20	0	326	50	0
1963	658	20,275	1,180	103	0	317	36	0
1964	609	23,751	1,791	189	0	352	0	0
1965	553	24,489	2,112	346	142	264	0	0
1966	491	24,653	2,142	762	246	300	0	0
1967	468	27,740	1,913	1,249	69	325	0	0
1968	439	28,282	1,850 [2]	1,750 [2]	50 [2]	304	0	0
1969	370	28,632	1,807	2,256	30	250	0	0
1970	397	28,854	2,045	2,845	104	465	0	0
1971	389	26,620	2,510	3,400	97	355	0	0
1972	384	26,893	2,458	3,304	6	395	0	94
1973	351	26,459	2,449	3,336	149	375	0	82
1974	307	23,998	2,310	3,742	153	357	0	102
1975	330	27,515	2,411	3,863	105	357	0	91
1976	295	25,184	2,657	3,528	5	328	0	62
1977	287	24,887	6,251 [3]	NA	NA	359	0	49

[1] Excluding anthracite and briquettes
[2] Estimated.
[3] Including hard coal and anthracite.

Table A-7

Bulgaria: Changes in Coal Inventories and Stocks

	b/d Oil Equivalent		Thousand Metric Tons			
			Inventories		Other Stocks	
	Total Inventories	Total Other Stocks	Hard Coal and Anthracite	Brown Coal and Lignite	Hard Coal and Anthracite	Brown Coal and Lignite
1960	540	410	−7	111	32	20
1961	420	550	14	52	49	11
1962	640	600	127	−120	36	45
1963	−4,380	1,080	−372	−134	89	38
1964	3,790	800	237	287	61	38
1965	540	660	−26	163	65	2
1966	2,500	540	183	140	49	11
1967	2,600	790	161	224	77	4
1968	−4,600	530	−253	−484	51	6
1969	950	990	280	−438	93	14
1970	−80	0	−277	641	0	0
1971	3,190	120	351	−72	12	0
1972	160	90	−25	100	6	8
1973	6,660	180	192	1,169	18	0
1974	−6,090	360	−305	−751	36	0
1975	1,110	570	222	−274	53	12
1976	3,040	440	383	−201	39	15
1977	3,450	90	376	−75	3	15

Table A-8

b/d

Bulgaria: Oil Production and Trade

	Crude Oil			Oil Products	
	Production	Imports	Exports	Imports	Exports
1960	4,000	240	1,600	19,500	20
1961	4,140	280	2,520	24,990	20
1962	3,980	300	2,320	35,060	20
1963	3,460	9,020	1,600	35,990	110
1964	3,200	36,220	820	28,450	1,030
1965	4,580	44,000	80	29,790	1,770
1966	8,080	52,080	490	32,680	5,070
1967	9,980	56,060	780	44,710	3,270
1968	9,500	66,200	4,740	55,240	2,890
1969	6,500	96,140	960	58,000	3,140
1970	6,680	113,920	2,170	58,320	3,120
1971	6,100	150,940	0	51,720	1,450
1972	4,960	165,580	0	47,960	1,230
1973	3,800	193,040	0	48,130	0
1974	2,880	212,580	0	46,640[1]	0
1975	2,440	209,180	0	44,620[1]	0
1976	2,340	216,780	0	46,640[1]	0
1977	2,580	235,260	0	46,640[1]	0

[1] Estimated.

Table A-9 Billion Cubic Feet

Bulgaria: Natural Gas Production and Trade

	Production [1]	Imports
1965	3	0
1966	4	0
1967	12	0
1968	18	0
1969	19	0
1970	17	0
1971	12	0
1972	8	0
1973	8	0
1974	6	11
1975	4	42
1976	1	79
1977	NEGL	102 [2]

[1] Production includes associated gas.
[2] Estimated.

Table A-10 Million kWh

Bulgaria: Primary Electricity Production and Trade

	Production		Trade	
	Hydro	Nuclear	Imports	Exports
1960	1,886	0	28	0
1961	1,800	0	39	0
1962	1,691	0	84	13
1963	2,089	0	91	4
1964	1,471	0	2	26
1965	2,000	0	37	39
1966	2,009	0	44	11
1967	2,022	0	157	59
1968	1,305	0	344	43
1969	1,839	0	287	65
1970	2,152	0	101	315
1971	2,170	0	245	0
1972	2,095	0	994	154
1973	2,565	0	3,264	31
1974	2,080	928	4,074	4
1975	2,452	2,254	3,902	353
1976	2,954	4,989	3,943	480
1977	3,529	5,884	4,046	704

Appendix B

Czechoslovakia: Energy Consumption, Production, and Trade

Consumption

Consumption data for all energy sources represents apparent consumption, compiled by adding production and imports and subtracting exports. Coal inventories for 1971-77, which appear in *Statisticka rocenka CSSR* (Czechoslovak statistical yearbooks), are included for information but are not reflected in consumption.

Production

The source for coal data for 1960, 1965-77 is *Statisticheskiy yezhegodnik stran chlenov soveta ekonomicheskoy vzaimopomshchi* (CEMA statistical yearbooks). The source for 1961-64 is the Czechoslovak statistical yearbooks. Coal production data for 1970-77 were converted to barrels per day of crude oil equivalent by using the tables on per capita production of coal in standard fuel in the CEMA yearbooks; data for 1960-69 were estimated from coal production.

The source for oil data is the statistical yearbooks. Data were converted to barrels per day of crude oil equivalent by assuming 10,010 kcal/kg heat value for Czechoslovak crude oil and 7.3 barrels per ton. The source for natural gas data for 1960 and 1965-77 is the CEMA yearbooks. Data for 1961-64 from *World Energy Supplies 1960-63* Series J, No. 8 and *1963-66* Series J, No. 11, were adjusted to correspond with the CEMA series. Data were converted to barrels per day of crude oil equivalent by assuming 7,350 kcal/cubic meter for natural gas.

The source for hydroelectricity production for 1960 and 1965-77 is the CEMA yearbooks and for 1961-64 the UN *Annual Bulletin of Electric Energy Statistics for Europe*. The source for nuclear power data is the UN *Annual Bulletin of Electric Energy Statistics for Europe*. Crude oil equivalents for hydroelectric and nuclear power are based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin of Electric Energy Statistics for Europe*. The heat value of crude oil equivalent for all energy sources is assumed to be 10,010 kcal/kg.

Inventories

The source for changes in coal inventories is coal balance tables in the Czechoslovak statistical yearbooks.

Trade

The source for hard coal, brown coal, and coke trade is *Czechoslovak Foreign Trade*. Coal imports and exports were converted to crude oil equivalent by assuming 6,650 kcal/kg for hard coal and 6,600 kcal/kg for coke. Exported brown coal was assumed to have approximately 3,460 kcal/kg in 1960 and to have declined to 3,100 in 1977. Crude oil equivalent is measured at a constant 10,010 kcal/kg and 7.3 barrels per ton.

The source for crude oil imports is *Czechoslovak Foreign Trade*. The source for crude oil exports in 1965-70 and oil products imports for 1960, 1965, and 1970-77 is the CEMA yearbooks. Oil product imports and exports for 1961-64 and 1966-69 were estimated by extrapolation from the CEMA series and from disaggregated data in the CEMA yearbooks. Imports and exports of crude oil and products were converted to crude oil equivalent by using 10,010 kcal/kg heat value for crude oil and 7.3 barrels per ton and 10,150 kcal/kg for oil products.

The source for natural gas imports for 1965 and 1970-77 is *Czechoslovak Foreign Trade*. Data for 1966-69 are from *Vneshnaya torgovlya SSSR* (Soviet Foreign Trade) adjusted to correspond with the Czech trade series. The source for gas exports is the CEMA yearbooks. Natural gas imports were converted to crude oil equivalent by assuming 8,190 kcal/cubic meter for Soviet natural gas from *Postroeniye i analiz energeticheskovo balansa* (Construction and Analysis

of the Energy Balance), A. C. Nekrasov, Yu. V. Cinyak, and V. A. Yanpol'skiy, Moscow, 1974.

The source for electricity imports and exports is the electric power balances in the Czechoslovak statistical yearbooks. Electricity trade was converted to crude oil equivalent based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin of Electric Energy Statistics for Europe.*

Table B-1

b/d Oil Equivalent

Czechoslovakia: Energy Balance

	Consumption	Production	Imports	Exports
1960	798,350 [1]	761,480 [1]	101,230	64,360
1961	858,670 [1]	806,360 [1]	122,760 [1]	70,450 [1]
1962	920,500 [1]	842,940 [1]	151,330 [1]	73,760 [1]
1963	951,300 [1]	865,480 [1]	165,710 [1]	79,890 [1]
1964	988,740 [1]	876,320 [1]	200,590 [1]	88,170 [1]
1965	986,120 [1]	864,590 [1]	212,340	90,800
1966	975,310 [1]	856,920 [1]	214,140 [1]	95,750 [1]
1967	969,920 [1]	821,170 [1]	245,710 [1]	96,960 [1]
1968	1,005,900 [1]	838,110 [1]	265,900 [1]	98,110 [1]
1969	1,077,500 [1]	873,680 [1]	311,830 [1]	108,010 [1]
1970	1,136,320	905,720	332,010	101,440
1971	1,200,390	920,770	386,220	106,600
1972	1,212,470	913,300	410,560	111,410
1973	1,243,800	898,030	454,840	109,080
1974	1,278,380	907,890	480,250	109,730
1975	1,300,150	907,300	501,650	108,810
1976	1,364,000	930,990	538,260	105,260
1977	1,456,610	947,780	606,770	97,930

[1] Estimated.

Table B-2

b/d Oil Equivalent

Czechoslovakia: Consumption of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	798,350 [3]	706,820 [3]	52,900	21,190	17,450
1961	858,670 [3]	757,760 [3]	63,260 [3]	20,840	16,800
1962	920,500 [3]	798,420 [3]	81,380 [3]	17,690	22,990
1963	951,300 [3]	826,750 [3]	89,920 [3]	16,530	18,080
1964	988,740 [3]	844,750 [3]	107,410 [3]	15,370	21,190
1965	986,120 [3]	817,200 [3]	118,920	14,280	35,730
1966	975,310 [3]	800,390 [3]	125,680 [3]	15,720	33,510
1967	969,920 [3]	771,150 [3]	146,280 [3]	19,330	33,170
1968	1,005,900 [3]	794,530 [3]	155,410 [3]	25,990	29,990
1969	1,077,500 [3]	827,580 [3]	186,000 [3]	31,940	31,980
1970	1,136,320	847,970	205,690	38,480	44,180
1971	1,200,390	877,360	236,350	43,420	43,260
1972	1,212,470	869,520	256,100	48,300	38,550
1973	1,243,800	849,340	299,430	53,600	41,430
1974	1,278,380	844,490	313,510	67,030	53,350
1975	1,300,150	849,920	326,240	75,550	48,440
1976	1,364,000	875,960	353,340	89,470	45,230
1977	1,456,610	900,010	382,740	132,710	41,150

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table B-3

b/d Oil Equivalent

Czechoslovakia: Production of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	761,480 [3]	718,060 [3]	2,740	21,190	19,500
1961	806,360 [3]	763,170 [3]	3,080	20,840 [3]	19,270
1962	842,940 [3]	799,220 [3]	3,540	17,690 [3]	22,480
1963	865,480 [3]	828,320 [3]	3,600	16,530 [3]	17,030
1964	876,320 [3]	840,850 [3]	3,900	15,370 [3]	16,190
1965	864,590 [3]	816,060 [3]	3,840	14,170	30,510
1966	856,920 [3]	809,370 [3]	3,800	15,720	28,030
1967	821,170 [3]	778,670 [3]	4,000	14,940	23,570
1968	838,110 [3]	798,110 [3]	4,100	16,270	19,630
1969	873,680 [3]	836,560 [3]	4,200	17,400	15,520
1970	905,720	861,050	4,060	17,680	22,940
1971	920,770	882,320	3,880	17,940	16,630
1972	913,300	875,380	3,820	17,080	17,020
1973	898,030	863,410	3,420	15,300	15,900
1974	907,890	863,700	2,980	14,340	26,870
1975	907,300	867,220	2,840	13,640	23,600
1976	930,990	891,750	2,620	14,420	22,210
1977	947,780	904,380	2,460	14,700	26,240

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table B-4

b/d Oil Equivalent

Czechoslovakia: Imports of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity
1960	101,230	45,280	54,470	0	1,470
1961	122,760 [2]	55,350	66,050 [2]	0	1,340
1962	151,330 [2]	62,140	85,800 [2]	0	3,380
1963	165,710 [2]	64,750	97,100 [2]	0	3,870
1964	200,590 [2]	72,660	118,110 [2]	0	9,800
1965	212,340	64,840	137,610	110	9,780
1966	214,140 [2]	58,400	147,040 [2]	0	8,700
1967	245,710 [2]	60,470	166,970 [2]	4,390	13,870
1968	265,900 [2]	66,950	175,440 [2]	9,720	13,800
1969	311,830 [2]	69,130	208,100 [2]	14,540	20,060
1970	332,010	67,390	218,000	22,210	24,420
1971	386,220	77,910	250,280	27,160	30,870
1972	410,560	77,930	272,930	32,030	27,660
1973	454,840	74,050	309,170	39,020	32,590
1974	480,250	72,080	320,440	53,290	34,430
1975	501,650	72,140	338,360	62,530	28,620
1976	538,260	72,030	364,230	76,040	25,970
1977	606,770	76,630	391,200	118,560	20,390

[1] Because of rounding, components may not add to the totals shown.
[2] Estimated.

Table B-5

b/d Oil Equivalent

Czechoslovakia: Exports of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity
1960	64,360	56,520	4,320	0	3,520
1961	70,450 [2]	60,780	5,860 [2]	0	3,800
1962	73,760 [2]	62,930	7,940 [2]	0	2,880
1963	79,890 [2]	66,300	10,770 [2]	0	2,820
1964	88,170 [2]	68,760	14,600 [2]	0	4,810
1965	90,800	63,690	22,550	0	4,560
1966	95,750 [2]	67,360	25,160 [2]	0	3,230
1967	96,960 [2]	68,000	24,680 [2]	0	4,280
1968	98,110 [2]	70,520	24,140 [2]	0	3,460
1969	108,010 [2]	78,110	26,310 [2]	0	3,590
1970	101,440	80,470	16,370	1,410	3,190
1971	106,600	82,880	17,800	1,680	4,240
1972	111,410	83,800	20,670	800	6,140
1973	109,080	88,120	13,190	720	7,050
1974	109,730	91,280	9,920	590	7,940
1975	108,810	89,450	14,960	620	3,780
1976	105,260	87,810	13,510	990	2,950
1977	97,930	80,990	10,910	550	5,480

[1] Because of rounding, components may not add to the totals shown.
[2] Estimated.

Table B-6 Thousand Metric Tons

Czechoslovakia: Coal Production and Trade

	Production		Imports		Exports		
	Hard Coal	Brown Coal and Lignite	Hard Coal	Brown Coal	Hard Coal	Coke	Brown Coal
1960	26,400	57,888	2,402	1,932	2,195	1,317	1,443
1961	26,401 [1]	64,879 [1]	3,355	1,569 [1]	2,447	1,370	1,484
1962	26,322 [1]	69,033 [1]	4,023	1,274 [1]	2,385	1,570	1,546
1963	27,888 [1]	72,827 [1]	4,346	1,034 [1]	2,333	1,758	1,792
1964	27,958 [1]	75,114 [1]	5,044	840 [1]	2,588	1,888	1,410
1965	27,755	72,329	4,538	682	2,378	1,835	1,185
1966	26,864	73,456	4,030	732 [1]	2,077	2,297	1,233
1967	26,076	70,760	4,162	787 [1]	2,327	2,230	1,168
1968	26,065	74,306	4,623	845	2,420	2,337	1,159
1969	27,213	78,659	4,624	1,187	2,654	2,637	1,248
1970	28,195	81,298	4,569	1,039	2,970	2,500	1,250
1971	28,818	84,162	5,447	868	3,461	2,202	1,232
1972	27,925	84,930	5,535	694	3,310	2,417	1,255
1973	27,779	81,249	5,299	580	3,480	2,573	1,265
1974	27,972	82,165	5,158	546	3,717	2,519	1,391
1975	28,119	86,272	5,188	518	3,666	2,299	1,683
1976	28,266	89,468	5,209	454	3,770	2,105	1,607
1977	27,962	93,236	5,619	318 [1]	3,308	2,031	1,654

[1] Estimated.

Table B-7

Czechoslovakia: Changes in Coal Inventories

	b/d Oil Equivalent	Thousand Metric Tons	
	Total	Hard Coal and Briquettes	Brown Coal, Lignite, and Briquettes
1971	1,510	128	−26
1972	657	−4	110
1973	1,552	131	−18
1974	4,181	210	262
1975	2,937	248	1
1976	4,126	225	−232
1977	5,189	374	118

Table B-8

b/d

Czechoslovakia: Oil Production and Trade

	Crude Oil			Oil Products	
	Production	Imports	Exports	Imports	Exports
1960	2,740	45,140	0	9,330	4,320
1961	3,080	55,700	0	10,350 '	5,860 '
1962	3,540	74,320	0	11,480 '	7,940 '
1963	3,600	84,340	0	12,760 '	10,770 '
1964	3,900	103,960	0	14,150 '	14,600 '
1965	3,840	121,920	2,730	15,690	19,820
1966	3,800	130,240	2,500	16,800 '	22,660 '
1967	4,000	148,980	740	17,990 '	23,940 '
1968	4,100	156,200	0	19,240 '	24,140 '
1969	4,200	187,500	0	20,600 '	26,310 '
1970	4,060	195,960	940	22,040	15,430
1971	3,880	230,100	0	20,180	17,800
1972	3,820	251,420	0	21,510	20,670
1973	3,420	283,520	0	25,650	13,190
1974	2,980	293,100	0	27,340	9,920
1975	2,840	316,780	0	21,580	14,960
1976	2,620	341,640	0	22,590	13,510
1977	2,460	366,440	0	24,760	10,910

' Estimated.

Table B-9 Billion Cubic Feet

Czechoslovakia: Gas Production and Trade

	Production [1]	Trade		
		Imports	Exports	Exports of Manufactured and Coke Gas
1960	51	0	0	0
1961	50 [2]	0	0	0
1962	43 [2]	0	0	0
1963	40 [2]	0	0	0
1964	37 [2]	0	0	0
1965	34	NEGL	0	0
1966	38	0	0	0
1967	36	9 [2]	0	0
1968	39	21 [2]	0	0
1969	42	31 [2]	0	0
1970	43	48	3	0
1971	43	59	3	1
1972	41	69	0	4
1973	37	84	0	3
1974	34	115	1	0
1975	33	135	1	0
1976	35	164	2	1
1977	35	256	1	3

[1] Production includes natural and associated gas.
[2] Estimated.

Table B-10 Million kWh

Czechoslovakia: Primary Electricity Production and Trade

	Production		Trade	
	Hydro	Nuclear	Imports	Exports
1960	2,495	0	187	450
1961	2,509	0	174	496
1962	2,991	0	451	384
1963	2,289	0	520	379
1964	2,710	0	1,378	676
1965	4,430	0	1,427	665
1966	4,234	0	1,316	488
1967	3,714	0	2,187	674
1968	3,134	0	2,206	552
1969	2,496	0	3,224	578
1970	3,670	0	3,905	509
1971	2,684	0	4,982	683
1972	2,810	3	4,573	1,015
1973	2,403	232	5,437	1,177
1974	4,042	486	5,802	1,340
1975	3,816	187	4,852	640
1976	3,331	442	4,412	502
1977	4,375	114	3,488	938

Appendix C

German Democratic Republic: Energy Consumption, Production, and Trade

Consumption

Consumption data for all energy sources represent apparent consumption, compiled by adding production and imports and substracting exports.

Production

The source for all coal data for 1960 and 1965-77 is *Statisticheskiy yezhegodnik stran chlenov soveta ekonomicheskoy vzaimopomoshchi* (CEMA statistical yearbooks). The source for 1961-64 is *Statistisches Jahrbuch der Deutschen Demokratischen Republik* (GDR statistical yearbooks). Coal production data for 1960 and 1965-76 were converted to barrels per day of crude oil equivalent by using the tables on per capita production of coal in standard fuel in the CEMA yearbooks; data for 1961-64 were converted by extrapolation from the CEMA series. Coal production data from the GDR yearbooks were used to estimate data for 1977.

The source for oil data is the *International Petroleum Encyclopedia 1978*, Petroleum Publishing Company, Tulsa, Oklahoma. Data were converted to barrels per day of crude oil equivalent by assuming 10,010 kcal/kg heat value for GDR crude oil and 7.3 barrels per ton. The source for natural gas data for 1960 and 1963-66 is the GDR statistical yearbooks, for 1969-76 the UN *Statistical Yearbook*, and for 1977 the UN *Annual Bulletin of Gas Statistics for Europe*. Data for 1961, 1962, 1967, and 1968 were estimated by extrapolation from the GDR yearbook series. Data were converted to barrels per day of crude oil equivalent by assuming 5,130 kcal/cubic meter of natural gas in 1960-69, 3,960 kcal/cubic meter in 1970, and a decline to 3,120 kcal/cubic meter in 1977. GDR natural gas has very low calorific value because of its high nitrogen content.

The source for hydroelectricity production for 1960 and 1965-77 is the CEMA statistical yearbooks and for 1961-64 the GDR statistical yearbooks. The source for nuclear power data is the UN *Annual Bulletin of Electric Energy Statistics for Europe*. Crude oil equivalents for hydroelectric and nuclear power are based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin of Electric Energy Statistics for Europe*. The heat value of crude oil equivalent for all energy sources is assumed to be 10,010 kcal/kg.

Trade

The source of imports of hard coal, coke, and brown coal for 1960-67 and exports of briquettes is the GDR statistical yearbooks. The source for imports of brown coal in 1968-77 and exports of hard coal is *Rocznik Statystyczny Handlu Zagranicznego* (Polish Foreign Trade). Coal imports were converted to crude oil equivalent by assuming 6,650 kcal/kg for hard coal, 7,000 kcal/kg for coke, and 2,170 kcal/kg for brown coal. Briquette exports were converted at 4,200 kcal/kg and hard coal exports at 6,650 kcal/kg. Crude oil equivalent is measured at a constant 10,010 kcal/kg and 7.3 barrels per ton.

The source for crude oil imports is the GDR statistical yearbooks. Data on oil products imports and exports for 1960, 1965, and 1970-77 are from the CEMA statistical yearbooks. Imports and exports of oil products for 1961-64 and 1966-69 were estimated from disaggregated data in the CEMA statistical yearbooks. Imports and exports of crude oil and products were converted to crude oil equivalent by using 10,010 kcal/kg heat value for crude oil and 7.3 barrels per ton and 10,150 kcal/kg for oil products.

The source for natural gas imports for 1970-77 is the CEMA statistical yearbooks. The source for manufactured gas imports and exports is the GDR statistical yearbooks. Natural gas imports were converted to crude oil equivalent by assuming 8,190 kcal/cubic meter for Soviet natural gas from *Postroeniye i analiz energeticheskovo balansa* (Construction and Analysis

of Energy Balance), A. C. Nekrasov, Yu. V. Cinyak, and V. A. Yanpol'skiy, Moscow, 1974. Imports and exports of manufactured gas were converted to crude oil equivalent by assuming 3,430 kcal/kg from the UN *Annual Bulletin of Gas Statistics for Europe.*

The source for electricity imports and exports is the electric power balances in GDR statistical yearbooks. Electricity trade was converted to crude oil equivalent based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin of Electric Energy Statistics for Europe.*

Table C-1 b/d Oil Equivalent

GDR: Energy Balance

	Consumption	Production	Imports	Exports
1960	1,166,350	1,027,220	221,270	82,140
1961	1,224,660	1,077,550 [1]	232,980 [1]	85,870
1962	1,285,690	1,120,400 [1]	249,540 [1]	84,260
1963	1,326,460	1,150,590 [1]	266,390 [1]	90,510
1964	1,379,330	1,160,680 [1]	310,350 [1]	91,710
1965	1,331,930	1,113,200	311,090	92,360
1966	1,365,130	1,124,840	325,470 [1]	85,170
1967	1,324,250	1,086,500 [1]	307,650 [1]	69,910
1968	1,345,670	1,108,060 [1]	310,200 [1]	72,590
1969	1,424,170	1,144,070	343,060 [1]	62,960
1970	1,491,100	1,172,430	386,870	68,200
1971	1,529,590	1,188,360	394,250	53,020
1972	1,540,670	1,138,170	478,140	75,640
1973	1,553,710	1,105,470	522,140	73,890
1974	1,572,450	1,113,330	547,640	88,520
1975	1,586,100	1,125,830	545,440	85,170
1976	1,624,990	1,143,190	561,540	79,730
1977	1,685,840	1,170,500 [1]	596,570	81,230

[1] Estimated.

Table C-2

b/d Oil Equivalent

GDR: Consumption of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	1,166,350	1,130,750	32,460	1,090	2,040
1961	1,224,660	1,184,350	36,500 [3]	1,130 [3]	2,670
1962	1,285,690	1,237,690	43,190 [3]	1,230 [3]	3,580
1963	1,326,460	1,268,440	52,290 [3]	1,400	4,340
1964	1,379,330	1,300,860	72,000 [3]	1,330	5,130
1965	1,331,930	1,243,410	80,950	1,470	6,100
1966	1,365,130	1,254,770	100,870 [3]	1,500	8,000
1967	1,324,250	1,203,140	110,220 [3]	2,060 [3]	8,820
1968	1,345,670	1,195,750	135,540 [3]	2,950 [3]	11,430
1969	1,424,170	1,239,390	164,180 [3]	4,270	16,340
1970	1,491,100	1,282,680	183,300	10,630	14,490
1971	1,529,590	1,292,440	202,990	19,830	14,320
1972	1,540,670	1,229,350	261,730	32,220	17,360
1973	1,553,710	1,203,140	275,540	56,420	18,620
1974	1,572,450	1,175,930	272,910	94,480	29,130
1975	1,586,100	1,172,740	286,310	97,850	29,200
1976	1,624,990	1,159,950	314,760	108,600	41,690
1977	1,685,840	1,190,790	340,600	111,040	43,410

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table C-3 b/d Oil Equivalent

GDR: Production of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	1,027,220	1,020,700	1,000	270	5,240
1961	1,077,550 [3]	1,070,350 [3]	1,000	520 [3]	5,680
1962	1,120,400 [3]	1,113,560 [3]	1,000	770 [3]	5,060
1963	1,150,590 [3]	1,144,200 [3]	1,000	1,040	4,350
1964	1,160,680 [3]	1,154,540 [3]	1,000	1,100	4,030
1965	1,113,200	1,105,170	1,000	1,360	5,660
1966	1,124,840	1,114,400	1,000	1,190	8,240
1967	1,086,500	1,074,400	1,000	1,960 [3]	9,130
1968	1,108,060	1,093,420	1,000	2,730 [3]	10,900
1969	1,144,070	1,127,970	1,000	3,510	11,580
1970	1,172,430	1,149,930	1,000	9,750	11,750
1971	1,188,360	1,157,340	1,000	18,810	11,200
1972	1,138,170	1,094,120	1,000	32,320	10,710
1973	1,105,470	1,050,350	1,000	43,710	10,410
1974	1,113,330	1,041,960	1,000	48,200	22,170
1975	1,125,830	1,054,540	1,000	45,330	24,950
1976	1,143,190	1,048,670	1,000	53,750	39,760
1977	1,170,500 [3]	1,076,220 [3]	1,000	53,020	40,250

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table C-4

b/d Oil Equivalent

GDR: Imports of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity
1960	221,270	167,410	52,120	850	880
1961	232,980 [2]	171,050	57,570 [2]	640	3,720
1962	249,540 [2]	184,480	63,990 [2]	500	570
1963	266,390 [2]	187,830	75,430 [2]	410	2,730
1964	310,350 [2]	208,250	97,370 [2]	320	4,410
1965	311,090	193,290	114,010	250	3,540
1966	325,470 [2]	189,090	131,090 [2]	450	4,840
1967	307,650 [2]	166,430	135,540 [2]	250	5,430
1968	310,200 [2]	139,440	163,790 [2]	450	6,520
1969	343,060 [2]	144,900	187,230 [2]	980	9,960
1970	386,870	168,390	208,890	1,150	8,430
1971	394,250	162,800	222,070	1,200	8,180
1972	478,140	160,700	307,980	40	9,410
1973	522,140	175,660	322,890	12,840	10,760
1974	547,640	159,300	330,880	46,490	10,960
1975	545,440	141,120	342,950	52,780	8,590
1976	561,540	134,400	363,200	54,980	8,960
1977	596,570	137,200	384,720	58,110	16,560

[1] Because of rounding, components may not add to the totals shown.
[2] Estimated.

Table C-5

b/d Oil Equivalent

GDR: Exports of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity
1960	82,140	57,360	20,670	30	4,080
1961	85,870	57,050	22,070 [2]	30	6,730
1962	84,260	60,350	21,800 [2]	40	2,060
1963	90,510	63,590	24,140 [2]	40	2,740
1964	91,710	61,930	26,380 [2]	100	3,300
1965	92,360	55,050	34,070	140	3,100
1966	85,170	48,730	31,230 [2]	140	5,080
1967	69,910	37,700	26,320 [2]	150	5,730
1968	72,590	37,120	29,260 [2]	220	5,990
1969	62,960	33,480	24,060 [2]	220	5,200
1970	68,200	35,640	26,600	270	5,690
1971	53,020	27,700	20,080	180	5,060
1972	75,640	25,470	47,260	140	2,770
1973	73,890	22,870	48,350	130	2,540
1974	88,520	25,330	58,980	210	4,000
1975	85,170	22,920	57,650	270	4,340
1976	79,730	23,130	49,440	130	7,040
1977	81,230	22,630	45,100	100	13,400

[1] Because of rounding, components may not add to the totals shown.
[2] Estimated.

Table C-6

Thousand Metric Tons

GDR: Coal Production and Trade

	Production		Imports			Exports	
	Hard Coal	Brown Coal and Lignite	Hard Coal	Coke	Brown Coal	Briquettes	Hard Coal
1960	2,721	225,465	8,135	2,527	5,531	6,339	317
1961	2,671	236,926	7,936	2,843	5,952	6,324	304
1962	2,575	246,992	8,881	2,966	5,727	6,717	300
1963	2,483	254,219	8,849	3,230	5,787	7,095	302
1964	2,340	256,926	10,411	3,309	5,449	6,921	293
1965	2,212	250,839	9,464	3,205	5,218	6,087	301
1966	1,987	249,040	9,179	3,232	5,066	5,329	299
1967	1,789	242,027	8,274	2,879	3,732	4,015	300
1968	1,579	247,113	6,284	2,843	4,002	3,957	299
1969	1,334	254,553	6,750	2,777	4,040	3,509	299
1970	1,049	261,482	8,192	3,123	3,928	3,786	293
1971	857	262,814	7,973	3,045	3,561	2,760	337
1972	815	248,416	7,601	3,077	4,106	2,486	348
1973	753	246,245	8,341	3,199	4,968	2,255	300
1974	594	243,468	7,200	3,042	5,198	2,551	296
1975	539	246,706	6,440	2,971	3,434	2,286	283
1976	457	246,897	6,096	2,927	3,078	2,287	299
1977	349	253,705	6,058	3,065	3,387	2,243	282

Table C-7 b/d

GDR: Oil Production and Trade

	Crude Oil		Oil Products	
	Production	Imports	Imports	Exports
1960	1,000	38,820	13,300	20,670
1961	1,000	45,400	11,890 [1]	22,070 [1]
1962	1,000	51,820	12,170 [1]	21,800 [1]
1963	1,000	63,260	12,170	24,140 [1]
1964	1,000	85,200	12,170 [1]	26,380 [1]
1965	1,000	102,640	11,370	34,070
1966	1,000	128,800	2,290 [1]	31,230 [1]
1967	1,000	132,800	2,740 [1]	26,320 [1]
1968	1,000	160,780	3,010 [1]	29,260 [1]
1969	1,000	185,440	1,790 [1]	24,060 [1]
1970	1,000	206,680	2,210	26,600
1971	1,000	218,380	3,690	20,080
1972	1,000	297,160	10,820	47,260
1973	1,000	320,900	1,990	48,350
1974	1,000	328,680	2,200	58,980
1975	1,000	339,940	3,010	57,650
1976	1,000	360,720	2,480	49,440
1977	1,000	380,860	3,860	45,100

[1] Estimated.

Table C-8 Billion Cubic Feet

GDR: Gas Production and Trade

	Production of Natural Gas	Trade		
		Imports of Natural Gas	Imports of Manufactured Gas	Exports of Manufactured Gas
1960	1	0	4	NEGL
1961	2 [1]	0	3	NEGL
1962	3 [1]	0	3	NEGL
1963	4	0	2	NEGL
1964	4	0	2	1
1965	5	0	1	1
1966	4	0	2	1
1967	7 [1]	0	1	1
1968	9 [1]	0	2	1
1969	12	0	5	1
1970	44	NEGL	6	1
1971	101	2	2	1
1972	179	NEGL	NEGL	1
1973	248	28	NEGL	1
1974	273	100	0	1
1975	257	114	0	1
1976	306	119	0	1
1977	300	125	0	1

[1] Estimated.

Table C-9 Million kWh

GDR: Primary Electricity Production and Trade

	Production		Trade	
	Hydro	Nuclear	Imports	Exports
1960	617	0	103	481
1961	676	0	443	802
1962	611	0	69	248
1963	547	0	343	345
1964	536	0	586	439
1965	785	0	490	430
1966	1,050	156	708	742
1967	1,060	324	821	868
1968	1,197	420	966	888
1969	1,244	450	1,456	761
1970	1,251	464	1,230	830
1971	1,251	404	1,208	748
1972	1,224	385	1,415	416
1973	1,260	351	1,665	394
1974	1,339	2,183	1,742	635
1975	1,270	2,740	1,380	697
1976	1,175	5,271	1,453	1,140
1977	1,249	5,205	2,654	2,148

Appendix D

Hungary: Energy Consumption, Production, and Trade

Consumption

Consumption data for all energy sources represents apparent consumption, compiled by adding production and imports and subtracting exports.

Production

The source for coal data is *Statisztikai evkonyv* (Hungarian statistical yearbooks). Coal production data for 1960 and 1965-77 were converted to barrels per day of crude oil equivalent by using the tables on per capita production of coal in standard fuel in *Statisticheskiy yezhegodnik stran chlenov soveta ekonomicheskoy vzaimopomoshchi* (CEMA statistical yearbooks). Data for 1961-64 were estimated from coal production. The source for oil and gas data is the Hungarian statistical yearbooks; data were converted to barrels per day of crude oil equivalent by assuming 10,010 kcal/kg heat value for Hungarian crude oil and 7.3 barrels per ton and 8,050 kcal/cubic meter for natural gas.

The source for hydroelectricity production for 1960, 1965, and 1970-77 is the CEMA yearbooks and for 1961-64 the UN *Annual Bulletin of Electric Energy Statistics for Europe*. Crude oil equivalents for hydroelectric power are based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin*. The heat value of crude oil equivalent for all energy sources is assumed to be 10,010 kcal/kg.

Trade

The source for imports of hard coal, anthracite, and briquettes for 1960-70 is the Hungarian statistical yearbooks. The source for 1971-77 is *Kulkereskedelmi statisztikai evkonyv* (Hungarian Foreign Trade). The source for exports of briquettes for 1965 and 1969-70 is the Hungarian statistical yearbooks and for 1971-77 the Hungarian trade books. The source for exports of brown coal for 1960 and 1965-70 is the Hungarian statistical yearbooks and for 1971-77 *Hungarian Foreign Trade*. Data for exports of brown coal for 1961-64 were extrapolated from the Hungarian yearbook series. The source for imports and exports of coke for 1960-70 is the Hungarian statistical yearbooks and for 1971-77 the *Hungarian Foreign Trade*.

Coal imports were converted to crude oil equivalent by assuming 6,650 kcal/kg for hard coal and coke, 6,790 for foundry coke, and 4,690 for briquettes. Exported brown coal was assumed to have 3,424 kcal/kg in 1960 and to have declined to 3,118 kcal/kg in 1977. Exported briquettes were converted at 4,690 kcal/kg. Crude oil equivalent is measured at a constant 10,010 kcal/kg and 7.3 barrels per ton.

The source for oil imports is the Hungarian statistical yearbooks. The source for crude oil exports for 1960 and 1965-77 is the CEMA statistical yearbooks. Data for 1961-64 were extrapolated from the CEMA series. The source for oil products imports and exports for 1960, 1965 and 1970-77 is the CEMA statistical yearbooks. Oil products imports for 1961-64 and 1966-69 were estimated from disaggregated data in the Hungarian statistical yearbooks. Imports and exports of crude oil and products were converted to crude oil equivalent by using 10,010 kcal/kg heat value for crude oil and 7.3 barrels per ton and 10,150 kcal/kg for oil products.

The source for natural gas imports is the Hungarian statistical yearbooks. Natural gas imports were converted to crude oil equivalent by assuming 8,190 kcal/cubic meter for Soviet natural gas from *Postroeniye i analiz energeticheskovo balansa* (Construction and Analysis of the Energy Balance), A. C. Nekrasov, Yu. V. Ciryak, and V. A. Yanpol'skiy, Moscow, 1974.

The source for electricity imports and exports for 1960-68 is the UN *Annual Bulletin* and for 1969-77 the electric power balances in the Hungarian statistical yearbooks. Electricity trade was converted to crude oil equivalent based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin.*

Table D-1 b/d Oil Equivalent

Hungary: Energy Balance

	Consumption	Production	Imports	Exports
1960	269,740	207,380	77,230	14,870
1961	289,450 [1]	220,710 [1]	84,310 [1]	15,570 [1]
1962	293,200 [1]	226,350 [1]	86,340 [1]	19,480 [1]
1963	339,580 [1]	242,770 [1]	114,200 [1]	17,380 [1]
1964	363,860 [1]	250,430 [1]	132,530 [1]	19,100 [1]
1965	360,480	254,110	125,500	19,130
1966	362,290 [1]	254,540	139,180 [1]	31,430 [1]
1967	351,090 [1]	245,940	134,900 [1]	29,750 [1]
1968	374,490 [1]	262,250	144,290 [1]	32,060 [1]
1969	389,450 [1]	266,700	162,880 [1]	40,130
1970	431,370	277,130	183,680	29,440
1971	451,020	272,590	197,850	19,410
1972	443,960	263,680	214,980	34,700
1973	474,960	276,360	229,590	30,990
1974	489,440	275,760	235,790	22,110
1975	509,290	269,730	277,550	38,000
1976	533,750	285,550	288,680	40,490
1977	549,050	292,500	296,550	40,000

[1] Estimated.

Table D-2

b/d Oil Equivalent

Hungary: Consumption of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	269,740	214,320	41,420	8,820	5,160
1961	289,450	227,640 [3]	48,380	8,870	4,590
1962	293,200	227,920 [3]	51,190	9,120	4,980
1963	339,580	252,740 [3]	65,710	13,500	7,640
1964	363,860	265,720 [3]	73,000	16,600	8,530
1965	360,480	254,170	75,090	21,400	9,830
1966	362,290	246,500 [3]	75,280	28,540	11,950
1967	351,090	220,640 [3]	80,230	36,480	13,730
1968	374,490	223,000 [3]	89,320	46,800	15,360
1969	389,450	217,580 [3]	100,350	55,610	15,920
1970	431,370	228,910	120,960	59,370	22,130
1971	451,020	220,640	139,440	63,300	27,620
1972	443,960	198,960	147,560	69,680	27,740
1973	474,960	196,570	168,310	81,120	28,940
1974	489,440	191,850	183,650	85,620	28,340
1975	509,290	187,230	200,460	96,840	24,760
1976	533,750	185,180	206,250	117,900	24,420
1977	549,050	185,130	211,650	126,320	25,940

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table D-3

b/d Oil Equivalent

Hungary: Production of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	207,380	176,780	24,340	5,500	770
1961	220,710	185,720 [3]	29,140	5,220	640
1962	226,350	187,440 [3]	32,820	5,470	620
1963	242,770	197,190 [3]	35,140	9,830	600
1964	250,430	201,270 [3]	36,020	12,610	530
1965	254,110	199,690	36,060	17,820	540
1966	254,540	194,760	34,120	24,960	700
1967	245,940	178,760	33,720	32,900	570
1968	262,250	182,310	36,140	43,220	590
1969	266,700	178,980	35,080	52,030	610
1970	277,130	182,040	38,740	55,790	560
1971	272,590	173,290	39,100	59,590	600
1972	263,680	157,360	39,540	66,110	670
1973	276,360	158,450	39,780	77,540	600
1974	275,760	153,300	39,940	82,040	480
1975	269,730	145,340	40,120	83,340	920
1976	285,550	143,940	42,840	97,830	930
1977	292,500	141,510	43,820	106,340	830

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table D-4

b/d Oil Equivalent

Hungary: Imports of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity
1960	77,230	38,020	31,470	3,330	4,410
1961	84,310	42,470 [2]	34,000 [2]	3,650	4,200
1962	86,340	41,140 [2]	36,930 [2]	3,650	4,630
1963	114,200	56,420 [2]	46,460 [2]	3,660	7,650
1964	132,530	65,710 [2]	54,250 [2]	3,990	8,590
1965	125,500	56,450	55,480	3,580	9,990
1966	139,180	53,930	69,370 [2]	3,580	12,290
1967	134,900	44,340	73,370 [2]	3,580	13,610
1968	144,290	43,550	79,140 [2]	3,580	18,010
1969	162,880	41,860	91,910 [2]	3,580	25,520
1970	183,680	47,580	106,730	3,580	25,790
1971	197,850	48,090	114,250	3,710	31,790
1972	214,980	42,900	135,800	3,570	32,710
1973	229,590	39,820	151,340	3,580	34,850
1974	235,790	40,140	157,660	3,580	34,420
1975	277,550	42,880	187,640	13,500	33,540
1976	288,680	41,800	194,970	20,070	31,830
1977	296,550	44,170	201,820	20,000	30,560

[1] Because of rounding, components may not add to the totals shown.
[2] Estimated.

Table D-5 b/d Oil Equivalent

Hungary: Exports of Primary Energy

	Total [1]	Coal	Oil	Electricity
1960	14,870	480	14,390	10
1961	15,570	550 [2]	14,770 [2]	240
1962	19,480	660 [2]	18,560 [2]	270
1963	17,380	870 [2]	15,900 [2]	600
1964	19,100	1,260 [2]	17,270 [2]	570
1965	19,130	1,980	16,450	700
1966	31,430	2,170 [2]	28,210 [2]	1,050
1967	29,750	2,450 [2]	26,860 [2]	430
1968	32,060	2,860 [2]	25,960 [2]	3,240
1969	40,130	3,260 [2]	26,640 [2]	10,220
1970	29,440	710	24,510	4,210
1971	19,410	730	13,910	4,770
1972	34,700	1,300	27,760	5,640
1973	30,990	1,700	22,800	6,500
1974	22,110	1,600	13,950	6,560
1975	38,000	990	27,300	9,710
1976	40,490	570	31,570	8,350
1977	40,000	550	33,980	5,450

[1] Because of rounding, components may not add to the totals shown.
[2] Estimated.

Table D-6

Thousand Metric Tons

Hungary: Coal Production and Trade

	Production			Imports			Exports		
	Hard Coal	Brown Coal	Lignite	Hard Coal and Anthracite	Coke	Briquettes	Coke	Brown Coal	Briquettes
1960	2,847	19,447	4,230	1,430	1,074	428	4	63	0
1961	3,071	20,388	4,717	1,725	1,025 [1]	558	7	67 [1]	0
1962	3,341	20,648	4,662	1,712	1,029 [1]	430	14	70 [1]	0
1963	3,710	21,933	4,836	2,690	1,145 [1]	500	28	73 [1]	0
1964	4,125	22,363	5,060	3,280	1,205 [1]	565	56	76 [1]	0
1965	4,362	22,190	4,885	2,662	1,122	578	105	79	5
1966	4,360	21,563	4,425	2,384	1,258	503	122	73	5 [1]
1967	4,053	19,591	3,385	1,742	1,169	521	141	76	6 [1]
1968	4,242	19,881	3,090	1,661	1,211	491	180	61	7 [1]
1969	4,133	19,396	2,969	1,703	1,188	283	160	155	8 [1]
1970	4,151	19,008	4,671	1,986	1,216	446	1	91	8
1971	3,941	17,757	5,726	1,911	1,270	532	0	105	3
1972	3,671	15,534	6,636	1,660	1,193	441	58	77	1
1973	3,410	15,463	7,908	1,470	1,171	416	80	62	25
1974	3,209	15,281	7,271	1,430	1,164	518	43	68	63
1975	3,021	14,963	6,904	1,438	1,331	554	8	96	30
1976	2,934	14,779	7,544	1,297	1,417	515	5	55	16
1977	2,925	14,433	8,096	1,524	1,329	573	10	56	7

[1] Estimated.

Table D-7

b/d

Hungary: Oil Production and Trade

	Crude Oil			Oil Products	
	Production	Imports	Exports	Imports	Exports
1960	24,340	29,120	680	2,350	13,710
1961	29,140	28,240	1,020 '	5,760 '	13,750 '
1962	32,820	30,800	1,360 '	6,130 '	17,200 '
1963	35,140	36,560	1,700 '	9,900 '	14,200 '
1964	36,020	40,520	2,040 '	13,730 '	15,230 '
1965	36,060	45,020	2,420	10,460	14,030
1966	34,120	58,220	9,540	11,150 '	18,670 '
1967	33,720	59,120	3,380	14,250 '	23,480 '
1968	36,140	64,400	0	14,740 '	25,960 '
1969	35,080	75,280	2,260	16,630 '	24,380 '
1970	38,740	86,980	5,840	19,750	18,670
1971	39,100	97,840	3,760	16,410	10,150
1972	39,540	121,300	14,100	14,500	13,660
1973	39,780	131,100	9,820	20,240	12,980
1974	39,940	136,340	4,080	21,320	9,870
1975	40,120	168,620	16,660	19,020	10,640
1976	42,840	175,700	19,720	19,270	11,850
1977	43,820	170,760	16,460	31,060	17,520

' Estimated.

Table D-8 Billion Cubic Feet

Hungary: Natural Gas Production and Trade

	Production [1]	Imports
1960	12	7
1961	11	7
1962	12	7
1963	22	7
1964	28	8
1965	39	7
1966	55	7
1967	72	7
1968	95	7
1969	114	7
1970	123	7
1971	131	7
1972	145	7
1973	170	7
1974	180	7
1975	183	29
1976	215	43
1977	233	43

[1] Production includes associated gas.

Table D-9 Million kWh

Hungary: Primary Electricity Production and Trade

	Production	Trade	
	Hydro	Imports	Exports
1960	94	537	1
1961	80	528	30
1962	80	597	35
1963	79	1,010	80
1964	71	1,159	78
1965	75	1,392	97
1966	100	1,740	148
1967	82	1,968	63
1968	89	2,734	492
1969	96	4,002	1,602
1970	88	4,058	663
1971	96	5,112	767
1972	108	5,304	914
1973	99	5,732	1,070
1974	80	5,756	1,097
1975	160	5,802	1,678
1976	163	5,578	1,462
1977	148	5,408	965

Appendix E

Poland: Energy Consumption, Production, and Trade

Consumption

Consumption data for all energy sources represents apparent consumption, compiled by adding production and imports and subtracting exports. Coal inventories, which appear in *Rocznik Statystyczny* (Polish statistical yearbooks), are included for information but are not reflected in consumption.

Production

The source for coal data for 1960, 1965, and 1970-77 is *Statisticheskiy yezhegodnik stran chlenov soveta ekonomicheskoy vzaimopomoshchi* (CEMA yearbooks). The source for 1961-64 is the Polish statistical yearbooks. Coal production data for 1970-75 were converted to barrels per day of crude oil equivalent by using the tables on per capita production of coal in standard fuel in the CEMA yearbooks. Data for 1960-69 and 1976-77 were estimated from coal production.

The source for oil, natural gas, and coal mine gas is the Polish statistical yearbooks. Data were converted to barrels per day of crude oil equivalent by assuming 10,010 kcal/kg heat value for Polish crude oil and 7.3 barrels per ton. Data for natural gas were converted by assuming 8,750 kcal/cubic meter in 1960 and a decline to 8,260 kcal/cubic meter in 1977. Coal mine gas was converted at 8,960 kcal/cubic meter.

The source for hydroelectricity production for 1960 and 1965-77 is the CEMA yearbooks and for 1961-64 electric power balances in the Polish statistical yearbooks. Crude oil equivalents for hydroelectric power are based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin of Electric Energy Statistics for Europe*. The heat value of crude oil equivalent for all energy sources is assumed to be 10,010 kcal/kg.

Inventories

The source for changes in coal inventories is the coal balance tables in the Polish statistical yearbooks.

Trade

The source for imports and exports of all coal is *Rocznik Statystyczny Handlu Zagranicznego* (Polish Foreign Trade books).

Coal imports and exports were converted to crude oil equivalent by assuming 6,650 kcal/kg for hard coal, 6,600 kcal/kg for coke, 7,000 kcal/kg for anthracite, 2,000 kcal/kg for brown coal, 3,250 kcal/kg for brown coal and briquettes, and 4,500 kcal/kg for briquettes. Crude oil equivalent is measured at a constant 10,010 kcal/kg and 7.3 barrels per ton.

The source for crude oil imports and oil product imports and exports is *Polish Foreign Trade*. Imports and exports of crude oil and products were converted to crude oil equivalent by using 10,010 kcal/kg heat value for crude oil and 7.3 barrels per ton and 10,150 kcal/kg for oil products.

The source for natural gas imports is *Polish Foreign Trade*. Imports of coke gas for 1960-77, exports of coke gas for 1960-72, and imports and exports of liquefied gas for 1960-70 from *Polish Foreign Trade* were too small to be listed in physical units but their heat content was taken into account in calculating consumption. Natural gas imports were converted to crude oil equivalent by assuming 8,190 kcal/cubic meter for Soviet natural gas from *Postroeniye i analiz energeticheskovo balansa* (Construction and Analysis of the Energy Balance), A. C. Nekrasov, Yu. V. Cinyak, and V. A. Yanpol'skiy, Moscow, 1974. Coke gas was converted at 3,990 kcal/cubic meter and liquefied gas at 11,900 kcal per ton.

The source for electricity imports and exports is the electric power balances in Polish statistical yearbooks. Electricity trade was converted to crude oil equivalent based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin*.

Table E-1 b/d Oil Equivalent

Poland: Energy Balance

	Consumption	Production	Imports	Exports
1960	1,049,550 [1]	1,278,150 [1]	74,170	302,770
1961	1,103,340 [1]	1,317,380 [1]	88,800	302,840
1962	1,152,310 [1]	1,360,920 [1]	102,950	311,570
1963	1,225,730 [1]	1,417,650 [1]	119,230	311,130
1964	1,277,060 [1]	1,493,200 [1]	124,740	340,870
1965	1,300,200 [1]	1,531,050 [1]	142,480	373,330
1966	1,349,800 [1]	1,577,440 [1]	151,100	378,740
1967	1,382,500 [1]	1,602,190 [1]	174,180	393,890
1968	1,453,670 [1]	1,687,650 [1]	206,340	440,320
1969	1,559,990 [1]	1,791,510 [1]	220,520	452,040
1970	1,652,520	1,894,920	231,940	474,350
1971	1,717,690	1,942,670	258,760	483,750
1972	1,809,820	2,044,780	295,610	530,560
1973	1,892,150	2,132,980	340,170	581,010
1974	1,888,770	2,196,720	333,470	641,430
1975	2,078,350	2,294,120	398,870	614,640
1976	2,182,150	2,383,830	438,590	640,260
1977	2,319,430	2,479,090	472,440	632,080

[1] Estimated.

Table E-2 b/d Oil Equivalent

Poland: Consumption of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	1,049,550 [3]	979,060 [3]	49,960	13,350	7,180
1961	1,103,340 [3]	1,019,980 [3]	59,490	17,090	6,800
1962	1,152,310 [3]	1,060,940 [3]	67,210	18,860	5,300
1963	1,225,730 [3]	1,121,330 [3]	78,080	21,970	4,350
1964	1,277,060 [3]	1,162,560 [3]	87,310	26,130	1,060
1965	1,300,200 [3]	1,171,750 [3]	95,860	29,830	2,760
1966	1,349,800 [3]	1,198,060 [3]	111,900	34,990	4,850
1967	1,382,500 [3]	1,203,930 [3]	125,790	44,820	7,960
1968	1,453,670 [3]	1,243,080 [3]	142,670	59,700	8,220
1969	1,559,990 [3]	1,318,000 [3]	153,210	82,500	6,280
1970	1,652,520	1,366,070	171,090	103,980	11,380
1971	1,717,690	1,401,890	190,070	115,000	10,730
1972	1,809,820	1,464,320	213,340	122,300	9,860
1973	1,892,150	1,496,700	266,070	128,820	560
1974	1,888,770	1,500,070	259,990	130,350	−1,640
1975	2,078,350	1,619,900	308,250	140,120	10,080
1976	2,182,150	1,696,800	321,950	152,600	10,800
1977	2,319,430	1,781,160	359,090	166,100	13,080

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table E-3 b/d Oil Equivalent

Poland: Production of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	1,278,150 [3]	1,259,750 [3]	3,880	9,590	4,930
1961	1,317,380 [3]	1,295,970 [3]	4,060	12,790	4,560
1962	1,360,920 [3]	1,337,120 [3]	4,040	14,270	5,490
1963	1,417,650 [3]	1,391,690 [3]	4,240	17,020	4,700
1964	1,493,200 [3]	1,461,680 [3]	5,640	21,250	4,630
1965	1,531,050 [3]	1,495,060 [3]	6,780	23,710	5,490
1966	1,577,440 [3]	1,540,180 [3]	8,000	23,610	5,650
1967	1,602,190 [3]	1,560,330 [3]	9,000	26,850	6,010
1968	1,687,650 [3]	1,628,290 [3]	9,500	43,590	6,270
1969	1,791,510 [3]	1,710,750 [3]	8,780	66,620	5,360
1970	1,894,920	1,787,790	8,480	87,600	11,060
1971	1,942,670	1,832,950	7,900	90,690	11,140
1972	2,044,780	1,929,050	6,940	97,740	11,050
1973	2,132,980	2,014,210	7,840	100,800	10,140
1974	2,196,720	2,076,580	11,000	95,660	13,490
1975	2,294,120	2,171,220	11,060	99,000	12,850
1976	2,383,830	2,252,520	9,100	110,840	11,380
1977	2,479,090	2,338,000	7,280	120,890	12,910

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table E-4 b/d Oil Equivalent

Poland: Imports of Primary Energy

	Total [1]	Coal	Oil	Gas [2]	Electricity
1960	74,170	14,730	50,570	3,950	4,920
1961	88,800	16,920	59,520	4,460	7,920
1962	102,950	18,800	71,180	4,770	8,200
1963	119,230	22,330	85,800	5,070	6,030
1964	124,740	21,480	93,570	4,990	4,710
1965	142,480	20,710	109,910	6,230	5,640
1966	151,100	19,530	114,430	11,530	5,620
1967	174,180	17,990	130,440	18,170	7,590
1968	206,340	18,030	163,050	16,380	8,880
1969	220,520	16,760	178,800	16,290	8,670
1970	231,940	17,050	189,240	16,490	9,150
1971	258,760	17,380	203,860	24,380	13,150
1972	295,610	15,900	241,350	24,580	13,760
1973	340,170	15,900	285,240	28,020	11,010
1974	333,470	16,400	272,860	34,690	9,510
1975	398,870	15,070	329,660	41,120	13,020
1976	438,590	15,050	367,120	41,770	14,640
1977	472,440	14,940	395,530	45,210	16,760

[1] Because of rounding, components may not add to the totals shown.
[2] Including natural, coke, and liquefied petroleum gases.

Table E-5 b/d Oil Equivalent

Poland: Exports of Primary Energy

	Total [1]	Coal	Oil	Gas [2]	Electricity
1960	302,770	295,410	4,490	190	2,670
1961	302,840	292,910	4,080	170	5,680
1962	311,570	294,980	8,010	180	8,390
1963	311,130	292,680	11,960	130	6,380
1964	340,870	320,600	11,880	110	8,280
1965	373,330	344,030	20,830	100	8,360
1966	378,740	361,660	10,520	120	6,420
1967	393,890	374,390	13,640	210	5,640
1968	440,320	403,240	29,870	270	6,920
1969	452,040	409,510	34,370	410	7,750
1970	474,350	438,770	26,640	120	8,820
1971	483,750	448,450	21,680	70	13,570
1972	530,560	480,630	34,940	30	14,950
1973	581,010	533,410	27,010	0	20,590
1974	641,430	592,920	23,870	0	24,640
1975	614,640	566,380	32,470	0	15,790
1976	640,260	570,770	54,270	0	15,220
1977	632,080	571,780	43,720	0	16,590

[1] Because of rounding, components may not add to the totals shown.
[2] Including natural, coke, and liquefied petroleum gases.

Table E-6

Thousand Metric Tons

Poland: Coal Production and Trade

	Production		Imports				Exports		
	Hard Coal	Brown Coal and Lignite	Hard Coal	Anthracite	Coke	Brown Coal and Briquettes	Hard Coal	Coke	Brown Coal and Briquettes
1960	104,438	9,327	766	20	112	409	17,497	2,086	5,455
1961	107,000	10,300	910	20	53	592	17,053	2,139	5,872
1962	110,000	11,100	1,042	20	103	510	17,306	2,145	5,660
1963	113,000	15,300	1,233	19	175	520	16,892	2,352	5,736
1964	117,000	20,300	1,279	20	9	631	19,268	2,249	5,381
1965	118,831	22,626	1,210	35	0	637	21,045	2,324	5,199
1966	121,979	24,508	1,141	23	71	480	22,407	2,358	5,060
1967	123,881	23,922	1,213	30	0	223	24,029	2,355	3,706
1968	128,634	26,878	1,256	33	0	136	26,002	2,410	4,002
1969	135,010	30,865	1,088	25	0	301	26,374	2,324	4,381
1970	140,101	32,766	1,096	34	0	310	28,816	2,284	3,972
1971	145,491	34,517	1,264	38	0	6	30,301	2,398	3,561
1972	150,697	38,221	1,157	37	0	2	32,687	2,269	4,106
1973	156,630	39,215	1,165	30	0	0	35,857	2,780	5,022
1974	162,002	39,826	1,203	30	0	0	40,093	2,992	5,199
1975	171,625	39,865	1,096	36	0	0	38,479	3,137	3,442
1976	179,303	39,305	1,080	50	0	0	38,944	3,110	3,084
1977	186,120	40,760	1,080	42	0	0	39,317	2,718	3,387

Table E-7

Poland: Changes in Coal Inventories

	b/d Oil Equivalent	Thousand Metric Tons	
	Total	Hard Coal	Brown Coal
1960	−3,480	−304	18
1961	−800	70	7
1962	−940	−69	−30
1963	−1,540	−137	19
1964	730	51	30
1965	5,020	423	5
1966	17,710	1,502	−14
1967	3,150	269	−7
1968	−13,440	−1,138	2
1969	−3,550	302	3
1970	−9,180	−765	−30
1971	13,890	1,180	35
1972	18,870	1,615	−47
1973	28,840	2,433	−2
1974	−37,360	−3,156	−1
1975	760	65	−1
1976	−2,560	−220	2
1977	9,940	852	3

Table E-8 b/d

Poland: Oil Production and Trade

	Crude Oil		Oil Products	
	Production	Imports	Imports	Exports
1960	3,880	14,280	36,290	4,490
1961	4,060	14,800	44,720	4,080
1962	4,040	22,040	49,140	8,010
1963	4,240	28,320	57,480	11,960
1964	5,640	34,160	59,410	11,880
1965	6,780	64,320	45,590	20,830
1966	8,000	66,940	47,490	10,520
1967	9,000	72,160	58,280	13,640
1968	9,500	111,640	51,410	29,870
1969	8,780	130,200	48,600	34,370
1970	8,480	140,220	49,020	26,640
1971	7,900	157,880	45,980	21,680
1972	6,940	194,060	47,290	34,940
1973	7,840	222,800	62,440	27,010
1974	11,000	211,640	61,220	23,870
1975	11,060	266,120	63,540	32,470
1976	9,100	301,900	65,220	54,270
1977	7,280	328,080	67,450	43,720

Table E-9 Billion Cubic Feet

Poland: Natural Gas Production and Trade

	Production [1]	Imports
1960	19	9
1961	26	10
1962	29	10
1963	34	11
1964	44	10
1965	48	13
1966	49	25
1967	56	39
1968	91	35
1969	139	35
1970	183	35
1971	190	53
1972	206	53
1973	213	60
1974	203	75
1975	211	89
1976	237	90
1977	257	97

[1] Production includes associated and coal mine gases.

Table E-10 Million kWh

Poland: Primary Electricity Production and Trade

	Production	Trade	
	Hydro	Imports	Exports
1960	659	659	357
1961	618	1,074	770
1962	773	1,154	1,180
1963	668	856	906
1964	726	739	1,297
1965	913	937	1,391
1966	929	924	1,055
1967	994	1,256	934
1968	1,055	1,469	1,145
1969	908	1,470	1,312
1970	1,887	1,560	1,505
1971	1,920	2,266	2,339
1972	1,935	2,410	2,619
1973	1,853	2,011	3,765
1974	2,459	1,734	4,491
1975	2,379	2,411	2,924
1976	2,104	2,707	2,814
1977	2,397	3,111	3,081

Appendix F

Romania: Energy Consumption, Production, and Trade

Consumption

Consumption data for all energy sources represents apparent consumption, compiled by adding production and imports and subtracting exports.

Production

The source for hard coal for 1960 and 1965-70 is *Statisticheskiy yezhegodnik stran chlenov soveta ekonomicheskoy vzaimopomoshchi* (CEMA statistical yearbooks). Production for 1961-64 and 1977 was estimated from data in *Anuarul Statistic al Republicii Socialiste Romania* (Romanian statistical yearbooks) adjusted to correspond with the CEMA series. The source for brown coal and lignite is the Romanian statistical yearbooks. Coal production data for 1960 and 1965-76 were converted to barrels per day of crude oil equivalent by using the tables on per capita production of coal in standard fuel in the CEMA yearbooks. Data for 1961-64 and 1977 were estimated from coal production in the Romanian statistical yearbooks.

The source for oil data is the Romanian statistical yearbooks. Data were converted to barrels per day of crude oil equivalent by assuming 10,500 kcal/kg heat value for Romanian crude oil and 7.3 barrels per ton. The source for natural gas for 1960 and 1965-77 is the CEMA statistical yearbooks. For 1961-64, data from the Romanian statistical yearbooks were adjusted to correspond with the CEMA series. Data were converted to barrels per day of crude oil equivalent by assuming 9,590 kcal/cubic meter for natural gas.

The source for hydroelectricity production is the Romanian statistical yearbooks. Crude oil equivalents for hydroelectric power are based on average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin of Electric Energy Statistics for Europe*. The heat value of crude oil equivalent for all energy sources is assumed to be 10,010 kcal/kg.

Trade

The source for imports of hard coal and metallurgical coke is the Romanian statistical yearbooks. Coal imports were converted to crude oil equivalent by assuming 6,650 kcal/kg for hard coal and 6,930 kcal/kg for metallurgical coke. Crude oil equivalent is measured at a constant 10,010 kcal/kg and 7.3 barrels per ton.

The source for crude oil imports and oil product exports is the Romanian statistical yearbooks. Imports and exports of crude oil and products were converted to crude oil equivalent by using 10,010 kcal/kg heat value for crude oil and 7.3 barrels per ton and 10,150 kcal/kg for oil products.

The source for natural gas exports is the Romanian statistical yearbooks. Natural gas exports were converted to crude oil equivalent by assuming 8,960 kcal/cubic meter for Romanian natural gas.

The source for electricity imports and exports is the electric power balances in the Romanian statistical yearbooks. Electricity trade was converted to crude oil equivalent based on the average specific consumption of fuels in conventional thermal power plants for each year in the UN *Annual Bulletin.*

Table F-1 b/d Oil Equivalent

Romania: Energy Balance

	Consumption	Production	Imports	Exports
1960	375,730	486,770	14,620	125,650
1961	387,850 [1]	504,100 [1]	12,500	128,760
1962	448,900 [1]	553,430 [1]	19,920	124,450
1963	487,790 [1]	589,570 [1]	22,100	123,870
1964	511,050 [1]	619,290 [1]	23,320	131,550
1965	564,760	666,170	23,780	125,190
1966	601,180	701,720	27,330	127,870
1967	648,110	753,620	25,620	131,130
1968	690,390	788,170	31,120	128,900
1969	762,640	845,440	37,580	120,380
1970	843,790	878,700	89,090	124,000
1971	901,100	927,150	101,040	127,080
1972	952,080	972,310	103,960	124,180
1973	1,031,290	1,008,990	143,080	120,780
1974	1,044,150	1,038,960	154,780	149,600
1975	1,125,340	1,096,250	171,200	142,110
1976	1,219,410	1,145,090	246,350	172,030
1977	1,244,040 [1]	1,133,440 [1]	259,260	148,660

[1] Estimated.

Table F-2

b/d Oil Equivalent

Romania: Consumption of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	375,730	66,100	119,460	187,570	2,590
1961	387,850 [3]	68,120	118,150	198,670 [3]	2,900
1962	448,900 [3]	81,020	128,350	235,330 [3]	4,190
1963	487,790 [3]	87,260	136,570	260,590 [3]	3,380
1964	511,050 [3]	92,480	132,850	282,150 [3]	3,580
1965	564,760	97,590	145,540	317,790	3,840
1966	601,180	106,240	151,230	342,180	1,510
1967	648,110	114,200	160,060	376,880	−3,050
1968	690,390	129,520	165,270	398,970	−3,380
1969	762,640	151,600	174,430	438,880	−2,280
1970	843,790	168,320	217,550	456,070	1,850
1971	901,100	169,780	238,060	487,020	6,250
1972	952,080	177,190	250,820	505,160	18,900
1973	1,031,290	197,200	282,680	533,100	18,290
1974	1,044,150	204,610	262,880	549,140	27,530
1975	1,125,340	213,780	282,530	601,420	27,610
1976	1,219,410	215,110	318,850	656,220	29,210
1977	1,244,040 [3]	218,880 [3]	347,500	637,140	40,520

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table F-3

b/d Oil Equivalent

Romania: Production of Primary Energy

	Total [1]	Coal	Oil	Gas	Electricity [2]
1960	486,770	51,490	241,260	191,230	2,790
1961	504,100 [3]	55,620	242,980	202,340 [3]	3,160
1962	553,430 [3]	61,100	248,900	239,010 [3]	4,410
1963	589,570 [3]	65,270	256,640	264,250 [3]	3,400
1964	619,290 [3]	69,850	260,040	285,850 [3]	3,560
1965	666,170	75,330	263,730	321,380	5,720
1966	701,720	81,370	269,060	345,780	5,500
1967	753,620	88,580	277,050	380,480	7,510
1968	788,170	98,410	278,710	403,060	7,980
1969	845,440	114,180	277,890	442,480	10,900
1970	878,700	125,180	280,640	459,660	13,210
1971	927,150	126,200	289,370	490,600	20,950
1972	972,310	132,620	296,390	508,750	34,540
1973	1,008,990	138,130	299,730	536,600	34,530
1974	1,038,960	144,110	303,900	552,820	38,120
1975	1,096,250	146,500	306,080	604,910	38,750
1976	1,145,090	141,270	308,390	659,820	35,600
1977	1,133,440 [3]	144,150 [3]	307,340	640,780	41,160

[1] Because of rounding, components may not add to the totals shown.
[2] Including hydro and nuclear power and net imports of electricity.
[3] Estimated.

Table F-4 b/d Oil Equivalent

Romania: Imports of Primary Energy

	Total [1]	Coal	Oil	Electricity
1960	14,620	14,610	0	0
1961	12,500	12,500	0	0
1962	19,920	19,920	0	0
1963	22,100	21,980	0	120
1964	23,320	22,630	0	690
1965	23,780	22,260	0	1,510
1966	27,330	24,870	0	2,460
1967	25,620	25,620	0	0
1968	31,120	31,110	0	0
1969	37,580	37,430	0	150
1970	89,090	43,140	45,820	130
1971	101,040	43,580	57,160	300
1972	103,960	44,570	57,460	1,930
1973	143,080	59,070	82,860	1,150
1974	154,780	60,500	90,760	3,520
1975	171,200	67,280	101,700	2,240
1976	246,350	73,840	169,500	3,010
1977	259,260	74,720	176,880	7,650

[1] Because of rounding, components may not add to the totals shown.

Table F-5 b/d Oil Equivalent

Romania: Exports of Primary Energy

	Total [1]	Oil	Gas	Electricity
1960	125,650	121,800	3,660	200
1961	128,760	124,830	3,660	260
1962	124,450	120,540	3,670	220
1963	123,870	120,070	3,660	140
1964	131,550	127,190	3,690	660
1965	125,190	118,200	3,590	3,400
1966	127,870	117,830	3,590	6,450
1967	131,130	116,990	3,590	10,560
1968	128,900	113,440	4,090	11,360
1969	120,380	103,450	3,590	13,330
1970	124,000	108,910	3,590	11,500
1971	127,080	108,470	3,590	15,010
1972	124,180	103,030	3,590	17,570
1973	120,780	99,900	3,500	17,390
1974	149,600	131,780	3,690	14,130
1975	142,110	125,240	3,490	13,390
1976	172,030	159,040	3,600	9,400
1977	148,660	136,720	3,640	8,290

[1] Because of rounding, components may not add to the totals shown.

Table F-6 Thousand Metric Tons

Romania: Coal Production and Trade

	Production			Imports	
	Hard Coal	Brown Coal	Lignite	Hard Coal	Metallurgical Coke
1960	3,405	510	2,853	416	656
1961	3,764	526 [1]	3,004	441	480
1962	4,090	558 [1]	3,416	750	719
1963	4,357	530 [1]	3,757	698	918
1964	4,518	541 [1]	4,323	718	946
1965	4,658	569	5,064	706	930
1966	4,822	604	6,045	723	1,102
1967	5,112	623	7,230	793	1,089
1968	5,458	655	8,690	706	1,570
1969	5,863	662	10,451	633	2,096
1970	6,402	668	13,461	728	2,417
1971	6,793	621	13,187	743	2,435
1972	6,612	609	15,938	754	2,496
1973	7,172	622	17,057	1,356	2,965
1974	7,109	648	19,141	1,872	2,573
1975	7,320	616	19,155	2,420	2,537
1976	7,110	567	18,164	2,623	2,816
1977	7,061 [1]	599	19,028	3,440	2,096

[1] Estimated.

Table F-7 b/d Oil Equivalent

Romania: Oil Production and Trade

	Crude Oil		Oil Products
	Production	Imports	Exports
1960	241,260	0	121,800
1961	242,980	0	124,830
1962	248,900	0	120,540
1963	256,640	0	120,070
1964	260,040	0	127,190
1965	263,730	0	118,200
1966	269,060	0	117,830
1967	277,050	0	116,990
1968	278,710	0	113,440
1969	277,890	0	103,450
1970	280,640	45,820	108,910
1971	289,370	57,160	108,470
1972	296,390	57,460	103,030
1973	299,730	82,860	99,900
1974	303,900	90,760	131,780
1975	306,080	101,700	125,240
1976	308,390	169,500	159,040
1977	307,340	176,880	136,720

Table F-8 Billion Cubic Feet

Romania: Natural Gas Production and Trade

	Production [1]	Exports
1960	352	7
1961	373 [2]	7
1962	441 [2]	7
1963	487 [2]	7
1964	527 [2]	7
1965	592	7
1966	637	7
1967	701	7
1968	743	8
1969	816	7
1970	847	7
1971	904	7
1972	938	7
1973	989	7
1974	1,019	7
1975	1,115	7
1976	1,216	7
1977	1,181	7

[1] Production includes associated gas.
[2] Estimated.

Table F-9 Million kWh

Romania: Primary Electricity Production and Trade

	Production	Trade	
	Hydro	Imports	Exports
1960	397	0	28
1961	466	0	39
1962	652	0	33
1963	537	18	22
1964	585	113	109
1965	1,005	265	596
1966	1,035	462	1,213
1967	1,476	0	2,076
1968	1,562	0	2,223
1969	2,217	30	2,711
1970	2,773	28	2,413
1971	4,495	64	3,219
1972	7,343	411	3,736
1973	7,547	251	3,799
1974	8,476	785	3,140
1975	8,711	502	3,007
1976	8,107	684	2,140
1977	9,343	1,738	1,883