

The Mineral Industry of Poland

By Tatiana Karpinsky¹

In 1983, Poland continued to be a large producer of coal, lignite, sulfur, and copper. Other minerals produced in Poland included lead, zinc, aluminum, nickel, silver, cadmium, natural gas, and crude oil. Iron ore was extracted on a small scale. Shortage of coking coal remained a problem; the use of coking coal did not increase, and demand exceeded production.

After 4 years of depression, starting in 1979, the Polish economy showed slow overall growth in 1983.² Gross industry production increased by 6.7% compared with that of 1982; production of the manufacturing industry increased by 7.1%; and production of the mining industry increased by 2.3%. However, total industry production was still 10.3% below that of 1979.

At the end of 1983 the national debt to Western creditors totaled \$26.4 billion. Ad-

ditionally, liabilities to the Council for Mutual Economic Assistance (CMEA) countries, in particular the Soviet Union, amounted to 3.8 billion rubles.

Government Policies and Programs.—In April 1983, the Sejm (Parliament) adopted the 1983-85 Socioeconomic Plan. The main goal stipulated by the plan was to restore the economy and ensure development. Industrial production was planned to increase by 4.5% to 5.5% over that of 1983. The supply of fertilizers, lignite, oil, soda ash, and sulfur was planned to increase over 5%. The production of electric energy, cold-rolled metal sheets, aluminum, and cement was to increase moderately, up to 5%. The production of bituminous coal, natural gas, coke, rolled products, piping, zinc sheets, rods, copper, zinc, lead, and tin was to be stabilized, or to continue at the 1983 level.

PRODUCTION

Reportedly, the basic tasks of the 1983 economic plan for the mineral industry were fulfilled, and were exceeded in lignite, copper, sulfur, and electric energy production. Production of petroleum products, crude steel, steel rolled products, zinc, and lead slightly increased, but production of many minerals was less than that of 1982. Coke from bituminous coal, crude oil, and natural gas production decreased slightly. The amount of bituminous coal and lignite extracted and the production of electric energy fully met domestic and export de-

mands. Polish aluminum production fell by 35% in 1982 and remained at that low level. The fuel and power industries contributed 14.7% to Poland's total industrial output; ferrous industry, 5.6%; nonferrous industry, 3.2%; and nonmetallic mineral industry, 3.6%.³

Total population of the country was 36.6 million. Employment in industry was about 5 million, of which 4.6 million were in large socialized enterprises, including 11.7% in mining.

Table 1.—Poland: Production of mineral commodities¹

(Metric tons unless otherwise specified)

Commodity ²	1979	1980	1981	1982 ^p	1983 ^e
METALS					
Aluminum metal, primary	96,600	95,100	66,000	42,700	³ 44,400
Cadmium metal, primary	773	698	580	500	570
Copper:					
Mine output, metal content, recoverable	325,000	346,125	315,250	376,000	387,000
Metal:					
Smelter including secondary	341,000	363,500	330,770	^e 351,000	362,000
Refined including secondary	335,800	357,300	327,210	348,000	³ 360,000
Iron and steel:					
Iron ore and concentrate, gross weight					
thousand tons	249	104	105	49	³ 10
Pig iron	10,966	11,600	9,350	8,523	³ 9,716
Ferroalloys:					
Blast furnace	138	126	126	126	126
Electric furnace	176	170	170	170	170
Steel:					
Crude	19,218	19,485	15,719	14,795	³ 16,236
Semimanufactures:					
Rolled excluding pipe	13,577	13,551	11,064	10,477	³ 11,731
Pipe	1,161	1,132	1,043	940	³ 995
Lead:					
Mine output, metal content, recoverable	61,900	60,040	50,434	57,495	59,200
Metal, smelter	84,200	82,000	69,000	78,800	³ 81,000
Nickel: ^e					
Mine output, metal content, recoverable	2,100	2,100	2,100	2,100	2,100
Metal, smelter	2,100	2,000	2,100	2,100	2,100
Silver, mine output, metal content, recoverable					
thousand troy ounces	2,600	24,665	20,576	21,123	³ 21,798
Zinc:					
Mine output, metal content	182,700	187,800	146,484	^e 145,000	149,000
Metal, refined, including secondary	209,000	215,300	167,100	165,400	³ 170,300
NONMETALS					
Barite	96,000	96,300	85,300	90,600	100,000
Cement	19,176	18,443	14,226	16,100	³ 16,200
Clays:					
Crude:					
Bentonite ^e	50	50	50	70	70
Fire clay	1,251	1,200	1,200	^e 1,200	1,200
Kaolin	49	51	43	^e 45	45
Products	687	600	600	^e 600	600
Feldspar ^e	40	40	82	80	80
Gypsum and anhydrite, crude ^{e 4}	1,360	1,300	³ 1,311	1,400	1,300
Lime, hydrated, and quicklime	^r 4,782	^r 4,830	4,179	4,061	³ 4,209
Magnesite, crude	20,000	19,600	11,300	16,100	16,000
Nitrogen: N content of ammonia					
thousand tons	1,525	1,543	1,389	1,423	1,400
Salt:					
Rock	1,458	1,465	1,313	1,338	³ 1,131
Other	2,971	3,069	2,958	2,518	2,500
Sodium and potassium compounds, n.e.s.:					
Sodium carbonate (soda ash)	684	762	701	^e 700	700
Caustic soda (96% NaOH)	454	433	417	378	³ 408
Stone:					
Dolomite	3,296	3,437	3,070	^e 3,100	3,100
Limestone	NA	60,877	50,000	NA	NA
Other	17,610	16,000	16,000	NA	NA
Sulfur:					
Native:					
Frasch ^e	4,310	4,667	4,295	4,428	4,460
Other than Frasch ^e	520	518	478	492	500
Total	4,830	5,185	4,773	4,920	³ 4,960
Byproduct: ^e					
From metallurgy	310	300	300	300	300
From petroleum	35	30	30	30	30
Total	345	330	330	330	330
From gypsum ^e	20	20	20	20	20
Total sulfur	5,195	5,535	5,123	5,270	5,310
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Bituminous	201,004	193,121	163,022	189,300	³ 191,100
Lignite and brown	38,083	36,866	35,600	37,600	³ 42,500
Total	239,087	229,987	198,622	226,900	³ 233,600

See footnotes at end of table.

Table 1.—Poland: Production of mineral commodities¹ —Continued

(Metric tons unless otherwise specified)

Commodity ²	1979	1980	1981	1982 ^D	1983 ^e
MINERAL FUELS AND RELATED MATERIALS					
—Continued					
Coke:					
Coke oven ----- thousand tons...	19,324	19,244	17,346	17,300	³ 17,000
Gashouse ----- do.....	950	940	573	600	600
Total ----- do.....	20,274	20,184	17,919	17,900	17,600
Fuel briquets, all grades ----- do.....	1,800	1,700	1,511	1,575	1,500
Gas:					
Manufactured:					
Town gas ----- million cubic feet...	14,233	14,000	11,763	11,500	11,500
Coke oven gas ----- do.....	261,015	250,000	229,546	^e 200,000	200,000
Natural, marketed ----- do.....	259,072	223,501	205,248	³ 195,370	³ 193,230
Natural gas liquids:					
Natural gasoline ^e					
thousand 42-gallon barrels...	85	80	80	80	80
Propane and butane ^e ----- do.....	58	53	53	53	53
Peat: Fuel and agricultural -----	200,000	202,700	201,645	^e 200,000	200,000
Petroleum:					
Crude:					
As reported ----- thousand tons...	331	329	315	241	210
Converted - thousand 42-gallon barrels...	2,456	2,441	2,337	1,789	1,558
Refinery products ⁵ ----- do.....	110,465	105,978	101,078	100,910	101,200

^eEstimated. ^DPreliminary. ^rRevised. NA Not available.¹Table includes data available through July 15, 1984.²In addition to the commodities listed, antimony, cobalt, germanium, gold, a variety of crude nonmetallic construction materials, and carbon black are also produced, but available information is inadequate to make reliable estimates of output levels. Poland may also produce alumina in small quantities, but details of such an operation, if it exists, are not available.³Reported figure.⁴Includes building gypsum, as well as an estimate for gypsum used in production of cement.⁵Includes virtually all major products, but not some minor products, or refinery fuel or losses.

TRADE

Exports were valued at 1,057 billion zloty (Z)⁴ and imports at Z961 billion. More than one-half of Poland's foreign trade was transacted with the centrally planned economy countries, primarily the U.S.S.R. Exports by the fuel and electric power industries contributed about 17% of Poland's total export value; ferrous and nonferrous industries, about 10%; and chemical industry, 9%. Imports by the fuel and electric power industry accounted for about 26% of total imports; chemical industry, 14%; and ferrous and nonferrous industries, 10%.

Coal exports were traditionally Poland's principal hard currency earner. Exports of coal increased substantially in 1983 but they have not returned to the precrisis, 1979 level.

On the import side, Poland maintained a steady or slightly increased level of crude oil, petroleum products, iron ore and concentrates, aluminum, manganese, chromium, magnesite, and other commodities mainly imported from the U.S.S.R.

According to a bilateral agreement, Poland will purchase from the U.S.S.R. in 1984

about 15 million tons of crude oil and petroleum products, 6 billion cubic meters of natural gas, 7.7 million tons of iron ore, 1.35 million tons of pig iron, 53,000 tons of aluminum, and 120,000 tons of ammonia. Poland will supply the U.S.S.R. with coal, sulfur, copper, and metallurgical products.

The Polish balance-of-payments situation in 1983 was precarious. Western government and private creditors agreed to re-schedule Polish obligations due in 1981. In 1982, however, Western governments balked in response to the imposition of martial law. These governments insisted that Poland meet its obligations as they became due. Poland failed to do so. Western bankers did agree to reschedule Poland's 1982 obligations due them and, additionally, agreed to extend short-term, renewable trade credits to Poland in an amount equal to one-half the interest Poland paid to the bankers. In any case, Poland maintained that, absent a comprehensive rescheduling of debt coupled with the extension of new credits, it will remain deeply in debt without any chance of meeting its financial obligations.

Table 2.—Poland: Apparent exports of selected mineral commodities¹

(Metric tons unless otherwise specified)

Commodity	1981	1982 ^p	Destinations, 1982	
			United States	Other (principal)
METALS				
Aluminum:				
Ore and concentrate	—	2,129	—	Peru 2,114.
Ash and residue containing aluminum	4,413	3,296	—	All to West Germany.
Metal including alloys:				
Scrap	4,034	3,469	—	Austria 2,532; West Germany 779.
Unwrought	1,696	² 2,317	—	Czechoslovakia 1,935; Italy 217.
Semimanufactures	54	91	(³)	Italy 60; Sweden 11.
Cadmium: Metal including alloys, all forms	—	43	—	All to West Germany.
Chromium: Oxides and hydroxides	243	417	86	Sweden 120; United Kingdom 83.
Copper:				
Ore and concentrate	4,008	5,937	—	All to Finland.
Metal including alloys:				
Scrap	617	1,587	—	Austria 1,031; West Germany 475.
Unwrought ²	142,514	176,447	2,201	West Germany 93,776; United Kingdom 36,981.
Semimanufactures ²	45,327	47,071	143	Czechoslovakia 17,116; U.S.S.R. 10,129.
Iron and steel: Metal:				
Scrap ²	79,787	257,912	—	Austria 95,930; Yugoslavia 84,389.
Pig iron, cast iron, related materials	20	61	—	All to Norway.
Ferroalloys:				
Ferrochromium	—	22	—	All to Sweden.
Ferrosilicon	—	4,653	—	All to Norway.
Steel, primary forms — thousand tons	116	108	—	Yugoslavia 47; Austria 27.
Semimanufactures — do.	1,691	1,644	30	U.S.S.R. 320; West Germany 250; Yugoslavia 164.
Lead: Metal including alloys, unwrought	—	374	—	All to Belgium-Luxembourg.
Nickel: Metal including alloys, all forms	30	14	—	France 6; Yugoslavia 2.
Platinum-group metals: Metals including alloys, unwrought and partly wrought value, thousands				
	\$3	\$176	—	All to West Germany.
Silver:				
Ore and concentrate — do.	\$39	\$128	—	Do.
Metal including alloys, unwrought and partly wrought ² thousand troy ounces	12,764	11,896	804	United Kingdom 7,202; West Germany 2,122.
Tin: Metal including alloys:				
Scrap	150	233	—	All to United Kingdom.
Unwrought	1	900	—	All to Indonesia.
Titanium: Oxides	36	47	—	Singapore 19; Japan 18.
Tungsten: Metal including alloys, all forms	19	NA	—	
Zinc:				
Ash and residue containing zinc	—	540	—	All to West Germany.
Metal including alloys: ²				
Unwrought	22,161	22,519	476	United Kingdom 10,839; Hungary 5,856.
Semimanufactures	4,870	4,514	23	U.S.S.R. 1,930; Czechoslovakia 1,468.
Other:				
Oxides and hydroxides	(³)	4,642	—	All to Austria.
Ashes and residues	4,382	766	—	Sweden 495; Austria 150.
Base metals including alloys, all forms	4	1,372	—	Czechoslovakia 1,371.
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc	1,610	35	—	Thailand 18; Yugoslavia 17.
Artificial:				
Corundum	—	687	—	West Germany 422.
Silicon carbide	1,768	2,196	—	France 943; Italy 650.
Grinding and polishing wheels and stones ⁴	168	175	(⁴)	Yugoslavia 90; Pakistan 37.
Cement ²	510,576	557,094	—	West Germany 218,542; Sweden 114,092.
Clays, crude:				
Andalusite, kyanite, sillimanite	6,117	NA	—	
Chamotte earth ²	7,289	7,070	—	Yugoslavia 4,623; Hungary 1,795.
Fire clay	² 19,752	19,988	—	Hungary 17,074.
Fertilizer materials: Manufactured:				
Nitrogenous ²	27,875	32,219	—	West Germany 14,667; Pakistan 8,000.
Phosphatic	—	7,625	—	Pakistan 7,600.
Gypsum and plaster	17	134	—	Hungary 94; Finland 20.
Lime	² 13,467	110	—	Denmark 66; West Germany 44.
Nitrates, crude	36	18	—	All to Portugal.
Phosphates, crude	—	1,000	—	All to Netherlands.
Pigments, mineral: Iron oxides and hydroxides, processed				
	20	40	—	All to Italy.
Salt and brine ²	240,966	337,396	—	Finland 112,746; Sweden 92,886; Hungary 81,794.
Sodium compounds, n.e.s.: Carbonate, manufactured ²				
	125,084	127,700	2,000	U.S.S.R. 37,976; China 35,268; Czechoslovakia 23,586.

See footnotes at end of table.

Table 2.—Poland: Apparent exports of selected mineral commodities¹ —Continued

(Metric tons unless otherwise specified)

Commodity	1981	1982 ^p	Destinations, 1982	
			United States	Other (principal)
NONMETALS —Continued				
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked	12,172	13,725	--	West Germany 6,129; Belgium-Luxembourg 4,447.
Worked	13,623	14,286	--	West Germany 10,389; Sweden 1,222.
Dolomite, chiefly refractory-grade ²	--	8,913	--	West Germany 5,941.
Gravel and crushed rock ²	302,547	251,967	--	All to West Germany.
Limestone other than dimension	636	8,321	--	West Germany 5,941; Sweden 2,370.
Sand other than metal-bearing	168,943	125,813	--	West Germany 125,726.
Sulfur:				
Elemental:				
Crude including native and byproduct ² thousand tons	3,817	3,973	--	U.S.S.R. 818; Czechoslovakia 487; Morocco 461.
Colloidal, precipitated, sublimed	4,719	322	--	Yugoslavia 207; Singapore 75.
Sulfuric acid ²	115,088	93,462	--	U.S.S.R. 89,269.
Other:				
Crude	4,378	3,271	--	West Germany 2,159.
Slag and dross, not metal-bearing	13,801	1,084	--	West Germany 745; Austria 213.
MINERAL FUELS AND RELATED MATERIALS				
Coal: ²				
Anthracite and bituminous thousand tons	15,159	28,462	--	U.S.S.R. 8,869; Finland 2,130; France 1,953.
Lignite including briquets do	1,383	941	--	East Germany 938.
Coke and semicoke ² do	1,515	1,720	--	U.S.S.R. 718; Romania 203; Austria 186.
Peat including briquets and litter	28,695	5,880	--	West Germany 2,269; Austria 1,687.
Petroleum refinery products ² thousand 42-gallon barrels	6,115	4,684	3	West Germany 1,815; Belgium-Luxembourg 422; Switzerland 422.

^pPreliminary. NA Not available.¹Table prepared by Jozef Plachy. Owing to a lack of official trade data published by Poland, this table should not be taken as a complete presentation of this country's mineral trade. Unless otherwise specified, these data have been compiled from United Nations information and data published by the partner trade countries.²Official Trade Statistics of Poland.³Less than 1/2 unit.⁴Totals exclude unreported quantities valued at \$108,000 in 1981 and \$186,000 in 1982, of which \$69,000 was imported in 1982 by the United States.Table 3.—Poland: Apparent imports of selected mineral commodities¹

(Metric tons unless otherwise specified)

Commodity	1981	1982 ^p	Sources, 1982	
			United States	Other (principal)
METALS				
Aluminum:				
Ore and concentrate ²	39,436	41,015	--	Hungary 22,269; Australia 18,746.
Oxides and hydroxides ²	240,400	206,716	85	Hungary 100,023; United Kingdom 42,006.
Metal including alloys:				
Unwrought	11,898	283,826	--	U.S.S.R. 34,443; Romania 31,451.
Semimanufactures ²	14,141	20,188	(³)	U.S.S.R. 4,728; West Germany 3,942.
Bismuth: Metal including alloys, all forms	--	8	--	All from Japan.
Chromium: Ore and concentrate ²	181,902	203,835	--	U.S.S.R. 157,977; Albania 31,021.
Cobalt: Metal including alloys, all forms	24	10	(³)	France 5; West Germany 5.
Copper: Metal including alloys:				
Unwrought	3,609	21,295	--	U.S.S.R. 1,294.
Semimanufactures ²	780	816	16	West Germany 363; U.S.S.R. 152.
Iron and steel:				
Iron ore and concentrate excluding roasted pyrite ² thousand tons	15,870	13,493	--	U.S.S.R. 11,515; Brazil 1,652.
Metal:				
Pig iron, cast iron, related materials do	1,449	1,273	--	Mainly from U.S.S.R.
Ferroalloys:				
Ferromanganese	1,450	NA	--	NA.
Ferromanganese	25,000	35,000	--	NA.

See footnotes at end of table.

Table 3.—Poland: Apparent imports of selected mineral commodities¹ —Continued

(Metric tons unless otherwise specified)

Commodity	1981	1982 ^p	Sources, 1982	
			United States	Other (principal)
METALS —Continued				
Iron and steel —Continued				
Metal —Continued				
Ferroalloys —Continued				
Ferromolybdenum -----	2	5	--	All from Sweden.
Ferrosilicon -----	11,881	NA	--	
Silicon metal -----	3,351	2,911	--	All from Norway.
Unspecified -----	27,667	34,084	--	Yugoslavia 5,342; undetermined 22,329.
Steel, primary forms				
thousand tons -----	15	185	--	Yugoslavia 19; undetermined 165.
Semimanufactures -----	1,399	1,190	(³)	U.S.S.R. 719; Czechoslovakia 249.
Lead:				
Oxides -----	463	726	--	France 533; West Germany 193.
Metal including alloys:				
Unwrought -----	3,060	26,358	--	United Kingdom 4,311; West Germany 1,200.
Semimanufactures -----	91	1	--	All from West Germany.
Magnesium: Metal including alloys, unwrought ² -----	1,079	2,027	--	Belgium-Luxembourg 835; United Kingdom 745.
Manganese:				
Ore and concentrate, metallurgical-grade ² -----	583,207	689,370	--	U.S.S.R. 525,637; Brazil 86,061.
Oxides -----	253	48	--	France 46.
Metal including alloys, all forms -----	--	281	--	All from France.
Mercury ----- 76-pound flasks -----	--	145	--	All from United Kingdom.
Molybdenum: Metal including alloys, all forms -----	5	(³)	--	All from Switzerland.
Nickel: Metal including alloys, all forms -----	206	68	(³)	West Germany 27; Sweden 15.
Platinum-group metals: Metals including alloys, unwrought and partly wrought value, thousands -----	\$476	\$3,096	\$42	United Kingdom \$2,785.
Silver: Metal including alloys, unwrought and partly wrought -----	\$744	\$729	--	West Germany \$412; France \$223.
Tin: Metal including alloys, all forms -----	2,226	4,602	--	United Kingdom 3,595.
Titanium:				
Ore and concentrate -----	500	257,426	--	U.S.S.R. 25,909; Norway 23,968.
Oxides -----	575	844	--	United Kingdom 658.
Metal including alloys, all forms -----	--	1	--	All from France.
Tungsten:				
Ore and concentrate -----	806	2,461	--	United Kingdom 1,323; China 1,109.
Metal including alloys, all forms -----	62	1	(³)	United Kingdom 1.
Zinc:				
Oxides -----	--	132	--	United Kingdom 121.
Metal including alloys, unwrought ² -----	4,116	5,419	--	U.S.S.R. 5,417.
Zirconium: Ore and concentrate -----	6	900	--	Netherlands 700.
Other:				
Ores and concentrates -----	48,073	24	--	All from Netherlands.
Oxides and hydroxides -----	2,279	2,967	--	Austria 2,683; West Germany 260.
Nonferrous alloys ² -----	1,764	3,095	--	All from U.S.S.R.
Base metals including alloys, all forms -----	228	39	--	West Germany 20; Austria 9.
NONMETALS				
Abrasives, n.e.s.:				
Natural: Corundum, emery, pumice, etc -----	(³)	388	47	Italy 334.
Artificial: Corundum -----	1,022	3,781	--	Yugoslavia 2,064; Japan 680; Hungary 622.
Grinding and polishing wheels and stones ⁴ -----	884	1,048	(⁴)	Austria 410; Yugoslavia 288.
Asbestos, crude ² -----	79,837	72,705	--	U.S.S.R. 66,863; Italy 1,700.
Boron materials: Oxides and acids -----	906	55	--	All from West Germany.
Cement ² -----	88,509	26,220	--	U.S.S.R. 26,214.
Clays, crude:				
Bentonite -----	5,021	4,605	36	Hungary 4,569.
Chamotte earth ² -----	21,677	17,905	--	France 12,379; West Germany 5,319.
Fire clay -----	26,199	5,140	--	All from West Germany.
Kaolin ² -----	139,379	137,028	--	Czechoslovakia 76,194; U.S.S.R. 39,942.
Diamond:				
Gem, not set or strung value, thousands -----	\$5	\$7	--	All from Belgium-Luxembourg.
Industrial -----	\$582	\$1,982	--	Belgium-Luxembourg \$1,466; Switzerland \$422.
Diatomite and other infusorial earth -----	2,135	833	752	Denmark 60.
Feldspar, fluorspar, related materials ² -----	31,246	35,756	--	Mexico 25,438; East Germany 9,884.
Fertilizer materials: Manufactured: ²				
Ammonia ----- thousand tons -----	115	118	--	All from U.S.S.R.
Nitrogenous ----- do -----	156	150	--	Romania 96; Hungary 33.
Potassic ----- do -----	2,865	2,377	--	U.S.S.R. 1,781; East Germany 554.
Graphite, natural ² -----	7,972	6,775	8	Austria 5,174.
Gypsum and plaster -----	11,594	4,873	--	West Germany 4,848.

See footnotes at end of table.

Table 3.—Poland: Apparent imports of selected mineral commodities¹ —Continued

(Metric tons unless otherwise specified)

Commodity	1981	1982 ^P	Sources, 1982	
			United States	Other (principal)
NONMETALS —Continued				
Magnesium compounds:				
Magnesite ² -----	223,004	223,455	--	North Korea 79,963; Brazil 68,387; Czechoslovakia 64,950.
Oxides and hydroxides -----	185	451	--	France 400.
Other -----	4,578	13	--	All from Austria.
Mica:				
Crude including splittings and waste ² -----	1,442	1,066	--	India 959; France 100.
Worked including agglomerated splittings -----	26	14	--	Austria 7; United Kingdom 7.
Phosphates, crude ² ----- thousand tons	2,938	3,280	432	Morocco 1,300; U.S.S.R. 644; Jordan 372.
Phosphorus, elemental -----	10,360	11,659	--	All from U.S.S.R.
Pigments, mineral: Iron oxides and hydroxides, processed -----	830	483	1	West Germany 356.
Stone, sand and gravel:				
Dimension stone:				
Crude and partly worked -----	2,118	181	--	All from Hungary.
Worked -----	--	110	--	All from Italy.
Dolomite, chiefly refractory-grade ² -----	--	15,090	--	All from Hungary.
Gravel and crushed rock ² -----	10,151	7,928	--	Norway 6,253.
Quartz and quartzite -----	2,854	1,652	130	West Germany 1,350.
Sand other than metal-bearing -----	9	6	--	Sweden 4.
Talc, steatite, soapstone, pyrophyllite ² -----	12,818	15,226	--	Czechoslovakia 6,670; North Korea 4,818.
Other, crude -----	15,474	16,085	NA	Hungary 15,014.
MINERAL FUELS AND RELATED MATERIALS				
Asphalt and bitumen, natural -----	--	165	--	United Kingdom 130.
Carbon: Carbon black ² -----	21,469	15,601	--	Romania 8,001; U.S.S.R. 4,617.
Coal: ²				
Anthracite ----- thousand tons	31	30	--	All from U.S.S.R.
Bituminous ----- do	1,072	972	--	U.S.S.R. 671; Czechoslovakia 301.
Gas, natural: Gaseous ²				
----- million cubic feet	185,791	198,503	--	All from U.S.S.R.
Peat including briquets and litter -----	23	41	--	All from Sweden.
Petroleum: ²				
Crude ----- thousand 42-gallon barrels	99,299	97,196	--	U.S.S.R. 95,154.
Refinery products ----- do	29,585	23,608	NA	U.S.S.R. 15,963; Romania 739; Hungary 377.

^PPreliminary. NA Not available.¹Table prepared by Jozef Plachy. Owing to a lack of official trade data published by Poland, this table should not be taken as a complete presentation of this country's mineral trade. Unless otherwise specified, these data have been compiled from United Nations information and data published by the partner trade countries.²Official Trade Statistics of Poland.³Less than 1/2 unit.⁴Totals exclude quantities valued at \$186,000 in 1981 and \$117,000 in 1982, of which \$2,000 was exported in 1982 by the United States.

COMMODITY REVIEW

METALS

Copper.—Copper production increased in 1983. Copper ore was extracted from five mines: Lubin, Polkowice, Rudna, Konrad, and Sieroszowice (under development) in the Legnica-Glogow region. Ore was extracted from depths of 600 to 1,100 meters. The underground output, all by full mechanized methods, amounted to 9.2 tons of ore per work day in 1982; total production was 2,250 tons per day at the Rudna Mine. These mines and beneficiation plants were under management of the Copper Mining

and Metallurgical complex at Lubin. The Legnica, Glogow I, and Glogow II copper plants (smelters) were also included in the complex. Target capacity of Glogow I was 160,000 tons of electrolytic copper per year, and of Glogow II 150,000 tons per year.

Iron and Steel.—There were 27 steel plants in Poland, with employment of about 170,000. Crude steel production increased by 1.4 million tons in 1983 over that of 1982, and production of rolled steel increased by 1.3 million tons. Crude steel output in 1982 was composed of 5.5 million tons of oxygen steel, 2.0 million tons of electric-furnace

steel, and 6.9 million tons of open-hearth steel. Domestic iron ore production was insignificant, since only one small mine was producing 10,000 tons of low-grade siderite ore. Imports of iron ore and concentrates were about 13.8 million tons, of which over 80% came from the U.S.S.R. Imports of pig iron were 1.2 million tons. The Katowice steel plant, which has been in operation for 7 years, was operating profitably. The plant's two 300-ton converters accounted for 30% of Polish production of steel.

The Polish Steamship Co. was to develop a new iron ore handling terminal in Swinoujscie at a cost of \$2.3 million.

A major investment in coking coal production was to increase capacity at the Katowice steel plant by 3.3 million tons per year, but a reported lack of equipment at the construction site significantly delayed completion. The first two coke oven batteries were to start in 1986. Another coking plant of 1.1-million-ton-capacity was under construction at Krakow, near Katowice. Two smaller coking coal installations were scheduled to be built also at Krakow. All three plants were to serve the Lenin steel plant at Krakow.

Lead and Zinc.—Deposits of lead-zinc ore occur in several regions, but main lead and zinc production came from the Olkusz region, which has the largest reserves. Ore was obtained from the large Boleslaw, Olkusz, and Pomorzany underground mines and four smaller mines. Zinc metal and zinc products were exported. Of total exports of 28,000 tons of zinc, about 8,000 tons was purchased by centrally planned economy countries and 20,000 tons by market economy countries. Prospecting in the region at Zawiercie and Tarnowskie Gory revealed new zinc and lead deposits.

Silver.—Silver, a byproduct of copper production, continued to be one of Poland's major hard currency earners. The value of silver exports amounted to Z13,601 million in 1983 compared with Z8,012 in 1982. However, production of silver increased only by 21 tons.

NONMETALS

Barite.—Poland's only barite mine, located at Boguszow in Walbrzych Province, increased its output and now fully meets domestic demand. The mine, which is self-financing, has also begun to utilize its waste products. A waste compound is extracted at the sediment ponds and sold to the Chelm cement works in Lubin Province for the

manufacture of a special water-resistant cement. Fluorspar was also mined, and was to be recovered from waste sludge, increasing total output to more than 3,000 tons per day.

Sulfur.—Production of sulfur in the Tarnobrzeg area slightly increased, compared with that of 1982. Production included extraction of sulfur ore at the Machow opencast mine, amounting to 1.7 million tons, from which about 400,000 tons of refined sulfur was obtained; the extraction of about 1.2 million tons by the Frasch process at the Jezierko Mine; about 1 million tons at Grzybow; and about 10,000 tons at the Bazina experimental mine. The export outlet was through the port of Gdansk, with crushed sulfur shipped to Morocco and Brazil, and liquid sulfur, to the United Kingdom, France, and the Netherlands. Delay in investment in the long-awaited Bazina Mine made it likely that Polish sulfur exports will drop substantially between 1985 and 1988. Exports to the Western World will suffer most of the decline.

Reserves at Grzybow, 25 kilometers west of Tarnobrzeg and the oldest producing mine, were approaching exhaustion and production was declining. Total remaining reserves at Grzybow were estimated at less than 10 million tons of sulfur. A decision was taken to prolong the life of the mine by reducing production to below 0.5 million tons per year from 1985. Jezierko was the largest Frasch operation mine and had sufficient reserves to produce about 3.5 million tons per year for the next 60 years.

A further Frasch-minable sulfur deposit, comparable in size and quality with the Jezierko Mine, was found at Osiek, about 20 kilometers to the south of Tarnobrzeg. A project at this mine was approved and was awaiting an investment of about \$200 million. Output at Osiek was projected at 1.2 to 1.5 million tons per year.

MINERAL FUELS

Coal.—Domestic consumption of coal and the requirements of stockpiling were met in full. About 35 million tons of coal were exported of 191 million tons of bituminous coal produced in 1983. In 1982, Poland had exported a total of 28 million tons of bituminous coal, including 20 million to the West, and earned \$749 million from CMEA countries and the West. In the next few years, a stabilization of coal production was envisaged at 190 million tons per year, with lignite production at 60 million tons per

year, to be maintained by substantial capital investment.

The official price of coal was lower than the cost of extraction. Subsidies therefore amounted to about Z66 billion in 1982 and about Z88 billion in 1983 and were to go up to Z137 billion in 1984. In 1983, there were 67 bituminous mines in operation. Six new mines were under development, and the extension of three existing mines was underway. A new coal mine in Rybnic, the ninth in the Rybnic Coalfield, was put into preliminary operation in December. Reserves amounted to 240 million tons of bituminous and coking coal, enough for 60 years of exploitation.

Natural Gas.—Production of natural gas, mostly from the Lubaszow Field, was approximately the same as in 1982 and amounted to about 200 billion cubic feet. Several gas wells started production in the Zelona Gova area, including the Jorocin well. Oil and gas prospecting continued in this area. Poland will obtain a sharp increase of 2.5 trillion cubic feet per year in Soviet natural gas deliveries, now about 160 billion cubic feet per year, in payment for Polish labor on the U.S.S.R.'s gas pipeline network. During 1983-85, Polish workers will lay 265 miles of gas pipeline in the Soviet Union, build compressor stations, and provide housing and other infrastruc-

ture at a total cost of \$237 million.

Petroleum.—Production of crude oil in Poland was relatively insignificant, less than 2% of consumption, and continued to decrease. Prospecting was also reduced. About 100 million barrels of crude oil was imported, mainly from the U.S.S.R., an increase of almost 10 million barrels compared with 1982 imports. About 3.7 million barrels was imported from Iran. In 1983, Poland exported 10 million barrels of petroleum products and synthetic fuels, which was 50% more than that of 1982. There were seven refineries in Poland with total capacity of about 140 million barrels per year.

A Polish, Soviet, and East German consortium continued the exploration of the Baltic Sea. Three wells were drilled into a mid-Cambrian sandstone. One of the wells was completed in 1982 as a gas discovery. In 1983, another well was reported to have found promising shows of oil after reaching about 10,000 feet. Some new fields were discovered in the Carpathian piedmont.

¹Foreign mineral specialist, Division of Foreign Data.

²Tribuna Ludu (Warsaw). Feb. 3, 1984, pp. 1-4.

³Moly Rocznik Statystyczny (Concise Statistical Yearbook of Poland) (Warsaw). 1984, p. 140.

⁴The Polish zloty (Z) is not convertible, and the official exchange rate cannot be used as a measure of relative value. Values given in this chapter are therefore not converted to dollars. The average official exchange rate in 1983 was Z110=US\$1.00.

