

BULGARIA AND ROMANIA

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The northeastern region of the Balkan Peninsula, comprising Bulgaria and Romania, borders the Black Sea to the east, Ukraine and Moldova to the north, Greece and Turkey to the south and southeast, Macedonia and Serbia and Montenegro to the west, and Hungary to the northwest. The Danube River forms a natural boundary between Bulgaria in the south and Romania in the north. Bulgaria is encompassed within the Mediterranean Alpine folded zone, which comprises the Carpatho-Balkan branch to the north and the Dinaric-Hellenic branch to the south (Bogdanov, 1982). The Carpatho-Balkan branch also constitutes the primary folded zone in Romania, incorporating the eastern and southern Carpathian Mountains as well as the Apuseni Mountains within the Carpathian arc to the west of the Transylvanian Plateau (Ianovici and Borcoş, 1982).

Mining and metalworking in this region has a long history that was well documented by Roman times, when Bulgaria and Romania, respectively known as Thrace and Dacia, were important sources of base and precious metals. Gold and nonferrous metals mined in this region remain attractive investment opportunities to foreign investors.

BULGARIA

Bulgaria's minerals industry comprised the mine output of ferrous and nonferrous metals, mineral fuels (mainly coal), and such industrial minerals as clays, gypsum, and rock salt. Additionally, the metallurgical branch smelted and refined copper, gold, iron and steel, lead, silver, and zinc. Cement, dimension stone, and other construction materials also were produced. On a world scale, however, Bulgaria's minerals industry was small and only of regional importance. Although most of the country's minerals requirements were met through domestic production, the country continued to depend on imports of iron ore, steel, and mineral fuels.

The Government remained committed to transforming the economy to a market-based economic system. The Law on Transformation and Privatization of State and Municipal-Owned Enterprises was enacted by Parliament in 1992 and the Underground Resources Act was enacted in 1998 to promote private enterprise and foreign investment. Although the act stipulates that underground mineral wealth is the property of the state, it provides for claims by domestic and foreign companies for the development and operation of mineral deposits for up to 35 years with additional 15-year extensions to be approved. Exploration rights to private companies could be granted for up to 3 years (Kousseff, 1999). In addition, the National Program for Sustainable Development of Mining in Bulgaria was drafted and approved in 1998. The Government continued to work to improve the country's environmental condition. In 2000, this included obtaining a loan from the World Bank amounting to \$47 million¹ earmarked for environmental cleanup. Targeted

enterprises included the Burgas-based Neftochim petroleum refinery. The funds were to be distributed over a 3-year period (Oil and Gas Journal, 2000).

Bulgaria's economy in 2000 showed gains as the gross domestic product (GDP) registered a growth rate of 5% compared with that of 1999. Industrial production, which accounted for 29% of the GDP, registered a marked growth rate of about 10.8% (U.S. Central Intelligence Agency, 2001a). According to the European Bank for Reconstruction and Development (2001, p. 23), industry also contributed about 10% of the country's total value of exported goods in 2000. Improvement in Bulgaria's economic performance at the end of the 1990s—which saw a significant shift away from economic uncertainties during the transition from central economic planning—and the improving political stability in the Balkans generated net foreign investment in 2000 of about \$1 billion, which was about one-third greater than that of 1999. Foreign investor confidence in the legal underpinnings of the country's growing privatization process was another important factor that contributed to the increase in direct foreign investment.

Metals

Metals have been a substantial component of the mineral industry's production. Bulgaria's mine output includes copper, iron, lead and zinc, and manganese. Additionally, byproduct gold, silver, molybdenum, and other metals have been produced, chiefly from the processing of copper and lead and zinc ores.

In early 2000, Navan Resources plc of Ireland obtained a new exploration license for gold in southeastern Bulgaria. This area was considered "highly prospective" and would add to Navan's other interests in Bulgaria that included a 92% interest in the Chelopech gold and copper mine. The new Krumovgrad exploration license extends over a 130-square-kilometer (km²) area near the Greek border. The region was already known for the presence of epithermal gold mineralization. Surnak Central, one of the prospects in this region drilled earlier by the Government of Bulgaria, showed 5.2 grams per metric ton (g/t) gold at a depth of 89.9 meters (m). Overall, the deposit showed 110 million metric tons (Mt) of ore grading 2.2 g/t gold and 8.8 g/t silver.

Navan's other activities in Bulgaria were in western Srednegoria where exploration revealed promising copper mineralization at Pozharevo. Malachite/azurite/chalcopyrite deposition was discovered in veins and fractures in altered volcanics during trenching of outcrops in 1999. Drill core analysis revealed copper values varying from 1% to 3.2%. There also was substantial evidence of gold mineralization near the surface that might allow open pit copper and gold mining (Skillings Mining Review, 2000).

Other important events concerning gold exploration in Bulgaria included the winning of a tender for an exploration license by Hereward Ventures plc of the United Kingdom.

¹Where necessary, values have been converted from euros (€) to U.S. dollars at the rate of €0.94=US\$1.00.

About 30 kilometers (km) south of Sofia in the Pernik area, the Dikanyite license extends over a 117-km² area, which also was a gold-producing area in antiquity. Gold mineralization is believed to be associated with shear zones (Mining Journal, 2000d).

In midyear, Union Minière Pirdop Copper (Pirdop) contracted Lurgi Metallurgie of Germany to provide Pirdop with upgraded equipment that would meet the environmental standards of the European Union (EU). The overhaul would take place over a 24-month period and would be the last stage of the plant's investment program to achieve an output of 185,000 metric tons per year (t/yr) of copper anode and 45,000 t/yr of cathode. Lurgi Metallurgie would supply new steam-heated dryers with dust abatement capability, upgrade existing electrostatic precipitators, provide new primary and secondary hoods at the converters, and modernize existing wet gas cleaning systems. A new tailings pond also was to be provided along with upgraded slag flotation units. The completion of this work was planned for 2002 (Union Minière S.A., 2000). In 2000, Pirdop posted a 74% increase in the production of anode and a 55% increase in the output of cathode. Almost 75% of the anode (containing associated precious metals) was exported to Belgium; the balance was earmarked for domestic use. The Asarel-Medet mining and beneficiation complex, which was privatized in 1999 through a management-employee buyout, supplied most of the copper ore and concentrate for Pirdop (European Bank for Reconstruction and Development, 2001, p. 23).

Other developments in Bulgaria's copper industry in 2000 included plans by Halkor S.A., a Greek copper processing concern, to upgrade idle capacity at KOCM AD, a Sofia-based enterprise for manufacturing rolled copper products and alloys. Halkor acquired KOCM through its Bulgarian subsidiary Sofia Copper AD for \$64 million. Halkor further announced plans to close down one of its facilities in Greece and transfer production to Bulgaria (Mining Journal, 2000e).

In early 2000, the Privatization Agency of Bulgaria continued its offering for sale 80% of KCM SA, the country's producer of lead and zinc. Although the offering was considered by a number of bidders, the only actual bid was made by KCM's own management (Metal Bulletin, 2000g). An earlier bid in 1999 by Mes Metals of Turkey failed because of the inability of Mes to meet sale conditions (Mining Journal, 1999a, b). According to the Privatization Agency of Bulgaria, the sale of KCM to the management-operated commercial entity went into effect in July. The company was renamed KTZM 2000. The terms of the transaction specified an initial payment amounting to 10% of the total \$14.6 million sale price; the balance would be spread over the subsequent 10 years. Additionally, KTZM agreed to invest about \$10 million by 2003 (Mining Journal, 2000c).

Additional developments in Bulgaria's nonferrous metals sector included the establishment of Steelmet (an aluminum section plant) as a joint venture between Viohalco S.A. of Greece and Metalsnab Holding of Bulgaria. Viohalco further acquired nonferrous metal producer Sofia Met with a production capacity of 7,000 t/yr of fabricated nonferrous metals. Viohalco planned to sell 30% of Sofia Met's output on the domestic market; the balance would be exported to the EU, member countries of the Commonwealth of Independent States, as well as to other Balkan countries (European Bank for Reconstruction and Development, 2001, p. 23).

Bulgaria's production of crude steel, which amounted to slightly more than 2 Mt, increased by about 6.9% in comparison

with that of 1999. The country's steel output was centered at two plants—Kremikovtzi in the Sofia region and Stomana at Pernik. The chief event in the iron and steel sector in 2000 was the Government's approval of a bid on a 6-month contract to manage Stomana AD by a consortium comprising Eurometal of Bulgaria and Metal Traders of Germany. A \$35 million plan by the consortium to modernize and restructure Stomana in exchange for a buyout for \$13 million at the end of the management contract period reportedly was proposed (Metal Bulletin, 2000h).

Bulgaria, which like Romania had enjoyed a burgeoning scrap steel export market, experienced a sharp export decline in 2000, mainly owing to an inability to compete with very large quantities of similar quality steel exported from Russia. Much of the slack in Bulgaria's scrap steel exports, however, was taken up by growing domestic demand (Metal Bulletin, 2000j).

Industrial Minerals

The growth of foreign investment at the end of the 1990s resulted in substantial foreign ownership in Bulgaria's cement industry. Major investment came from the EU and included Italcementi (Devnya Cement), Heidelberg Zement AG (Zlatna Panega Cement), and Holderbank (Beloizvorski Cement). To facilitate exports to the EU, in October, the Government adopted legislation to establish EU standards for the construction materials and cement sector (European Bank for Reconstruction and Development, 2001, p. 23).

Mineral Fuels

Bulgaria is endowed with large, albeit low-rank, resources of coal. The country's reserves of lignite amount to 2.5 billion metric tons (Gt); those of subbituminous coal, to 200 Mt. In 1998, the "Action Plan for Coal Mining Companies" for the 1998-2001 period was published by the Government of Bulgaria. The plan called for the closure of inefficient mines, followed by free-market pricing of coal and the denationalization of the coal mining industry. The plan also called for the investment of \$437 million to improve the coal mining sector, which would include the introduction of new technology to the industry, facility modernization, and mined-out land reclamation (U.S. Department of Energy, 1999, p. 3-4). A substantial portion of the country's thermal electric powerplants, which produce more than one-half of the country's total production of about 45 billion kilowatts, operate on domestic coal.

Bulgaria also produced small quantities of crude petroleum from nine oil wells. Output in 2000 amounted to about 41,000 metric tons (t). Virtually all of Bulgaria's crude oil needs are met through imports. More recently, however, Bulgaria sought the participation of foreign companies to jointly explore for oil and gas in the Black Sea and in the Black Sea coastal areas; Austrian, British, and United States companies have been participating in this effort (U.S. Department of Energy, 1999, p. 1).

ROMANIA

Romania's production of metals (aluminum, copper, lead and zinc, manganese, and steel and ferroalloys), industrial minerals, and mineral fuels was mainly of regional importance. In the metals sector, production results for 2000 continued to show

production losses for primary copper metal; mine production of lead and zinc as well as crude steel output, however, showed some recovery during the year (table 1). In 2000, the country's economy appeared to rebound from its decline in 1999. The GDP rose by 2.2%, and industrial production increased by 8% (U.S. Central Intelligence Agency, 2001b.).

Metals

Production of primary aluminum at Alro SA rose by about 3% compared with the 1999 level of output. Domestic sales were expected to amount to about 43,000 t; exports would amount to more than 130,000 t. In addition to continuing capital projects valued at \$5.49 million, new investment for facility modernization for 2000 amounted to \$14.85 million. Privatization plans continued to advance in part because of a contract that was signed by the State Ownership Fund (majority shareholder of Alro) and Paribas Corporate Finance Co. of France, which designated the latter as consultant for the planned privatization process (American Metals Market 2000). The privatization of the aluminum industry was to entail the issuance of international tenders for a 59.7% stake in Alro and a 69.9% stake in Romania's aluminum rolling mill ALPROM SA (Metal Bulletin, 20001).

Romania mined copper largely in two districts—the northeastern part of the country that included mines at Baia Sprie, Cavnic, and Lesul Ursului, and in the southwestern part of the country with major mines at Moldova Noua, Rosia Poieni, and Rosia Montana. Generally, the grade of ore has been low, with major producing mines (Moldova Noua and Rosia Poieni) hoisting ore grading about 0.35% copper or less. Concentrates from these areas have been smelted and refined at Baia Mare and Zlatna. Compania Nationala REMIN S.A. operated an Outokumpu flash smelter, an electrolytic copper refinery, and a continuous caster at Baia Mare and an Outokumpu flash smelter and an electrolytic refinery at Zlatna to process copper concentrates (Serjeantson, 1995).

Relatively low-grade lead and zinc ore was produced at underground mines in the Baia Mare, Borsa, Certej, and Rodna Districts, grading from 0.4% lead and 0.6% zinc to 1.0% lead and 1.2% zinc. Moreover, Romania's lead and zinc ores also contained copper (0.35%) as well as associated antimony, bismuth, cadmium, gold, and silver. Metal recovery in concentrate reportedly has ranged between 50% and 75% for lead and zinc. Smelting and refining of lead and zinc from domestic and imported ores and concentrates was carried out at Sometra S.A.'s (formerly Intreprinderea Metalurgica de Metale Neferoase) Imperial Smelter at Copsa Mica, which had capacity to produce about 42,000 t/yr lead and 66,000 t/yr zinc.

Aurul S.A. [owned by Esmeralda Exploration Ltd. (50%) and REMIN S.A. (44.8%)], which was a joint stock company registered in Romania to process gold-bearing tailings, experienced considerable difficulties in early 2000 on the environmental front. Spillage of about 100,000 cubic meters of waste liquid from a tailings pond in the Baia Mare region was recorded on January 30 of an undetermined level of toxins (cyanide and heavy metals). Company officials indicated that the spillage was the result of unusually high rain and snow fall and not because of any structural defects in the dam (Metal Bulletin, 2000d). A United Nations inspection team found a number of critical points concerning the construction of the dam including the retransmission of decant water from the new pond back to the old Meda pond with elevated cyanide levels and

insufficient capacity at the new pond itself to store safely processed limes and unexpected large quantities of water (Mining Journal, 2000a).

In June, the Government of Romania approved the resumption of Aurul's tailings processing operation at Baia Mare. Aurul indicated that modifications were made to installations and equipment to handle potential future overflows. These included pumps to entrain excess water from the tailings dam to a separate dam during emergencies. Plans also called for the future installation of a cyanide detoxification plant (Mining Journal, 2000b). The resumption of the tailings processing operation was to undergo an initial testing period; a new environmental impact statement would be issued and final assessment made. Aurul was expected to make an application for a full operating permit in September (Metal Bulletin, 2000c). The recovery of gold was expected to amount to about 1.6 t/yr; silver, about 9 t/yr.

In early 2000, Euro Gold S.A. (a joint venture of Gabriel Resources Ltd. and Minvest S.A.) announced the result of a prefeasibility study received in late 1999 from Pincock Allen and Holt of the United States concerning the joint venture's Rosia Montana gold properties. The study was based on \$300 per troy ounce gold and \$5 per troy ounce silver prices. The study suggested a 10-million-metric-ton-per-year (Mt/yr) open pit mining operation that would produce about 12.8 t/yr gold (reported as 411,000 troy ounces per year) at a \$113 per troy ounce production cost. Total exploitable resources were estimated to contain about 250,000 kilograms (8 million troy ounces) of gold and about 1.5 million kilograms (49 million troy ounces) of silver (Mining Magazine, 2000). Having received a completed prefeasibility study, Gabriel was allowed to increase its stake in Euro Gold to 80% from 65%, per the joint-venture agreement, which it did. By yearend, Rosia Montana's resources showed an overall increase of gold to 12.2 million troy ounces from 8.65 million troy ounces (Northern Miner, 2000b). Among related issues, the Government of Hungary sought compensation for damages for alleged environmental degradation to rivers and streams extending to its territory amounting to \$180 million. The sought-for funds would be used for reclamation of affected areas (Metal Bulletin, 2000f).

Romania's Barza Brad gold mine was the focus of interest by Exall Resources Ltd. of Canada, which undertook a due diligence review of the facility. Minvest (a major state-owned mining entity) operated the mine in 2000. A prefeasibility study would entitle Exall to acquire 80% of the Barza Brad Mine, in which case Minvest would share the balance (20%) with minority Romanian shareholders. The due diligence review included airborne electromagnetic and radiometric surveys covering a 12 km² area conducted on 150-m line spacings. Independent mine review work by Watts Griffis & McQuat was to follow (Northern Miner, 2000a).

In early 2000, the Government of Romania announced plans to conduct discussions with authorities in India about increasing India's exports of iron ore and flat rolled steel products to Romania. India reportedly supplied about 300,000 t of Romania's consumption of 6.5 to 7.5 Mt/yr of iron ore; the amount India supplied could be increased to 1.5 Mt. Most iron ore exports to Romania derive from Russia, South Africa, and Ukraine (Metal Bulletin, 2000a).

Sidex S.A., reportedly the largest producer of steel in Romania, reported a substantial drop in crude steel production in 1999 compared with 1998 output (to 3.2 Mt from 4.71 Mt).

A drop in domestic demand during the latter part of the year and a shortage of working capital needed for raw material purchases were among the factors that were attributed to the production decline. Another factor was the continuing blockage of the Danube in the aftermath of the Kosovo conflict, which added an additional charge of \$8 to \$12 per ton on a cost, insurance, freight basis, as well as the European Commission's increased duties on Romanian steel plate (Metal Bulletin, 2000n). In midyear, in an effort to boost steel production, Sidex restarted its fourth blast furnace. As a result, the output of steel would be raised by about 3,000 metric tons per day (t/d) to about 13,000 t/d. A fifth blast furnace was scheduled to restart at yearend 2000 (Metal Bulletin, 2000m).

The Max Aicher steel group of Germany (Max Aicher Bau GmbH & Co. Kg) announced the acquisition of Lamdro SA, a bar mill in Drobeta Turnu, by purchasing 99.57% of the shares of stock. The mill, which had capacity of 400,000 t/yr, would be part of Aicher's assets and would enable the company to engage in major postwar reconstruction efforts in the Balkans (Metal Bulletin, 2000a). Additionally, the Max Aicher group expressed interest in CSR SA Reșița in Caras-Severin County, following the State Privatization Agency's (SOF) offering of 94.5% of Reșița's shares for sale. Noble Ventures (a consortium of U.S. interests based in South Carolina) also expressed interest in the offering (Metal Bulletin, 2000b). Reșița, an open hearth steelmaker, had a 500,000 t/yr rolling capacity. The SOF also offered a 99.1% share of Republica SA, a pipe and tube mill with a capacity of 90,000 t/yr, for sale. In preparation for the sale, Republica reported having reduced its work force to 1,800 employees from 3,000 employees during the previous 18-month period (Metal Bulletin, 2000k).

Another issue during the year involved a dispute between the owners/managers of Gavazzi Steel SA (formerly, the Otelul Rosu steelworks; then, Societ Com Socomet SA; later, Easteel Siderurgica Romana SA Otel Rosu) and the SOF concerning the payment schedule drafted in the sale agreement. Differences of interpretation on the payments provisions were at issue, especially in regard to surcharges for inflation allegedly added by the SOF. Gavazzi management, however, indicated that its planned \$17 million initial investment to modernize the facility was to continue. The total investment was to amount to about \$60 million (with financial assistance from the European Bank for Reconstruction and Development) to be spent during the 2000-2005 period. The initial investment would include the addition of a new 300,000 t/yr electric arc furnace (EAF) supplied by Tehint of Italy, which would replace three older EAFs. The subsequent planned investment phase would see the addition of two new rolling mills (Metal Bulletin, 2000e).

Mineral Fuels

The petroleum extraction, production, and refining industry historically has been among Romania's leading industrial sectors. Although small by world standards, the petroleum industry continued to be an important component of the country's energy balance. Estimates of petroleum resources have ranged from 1.0 to 1.6 Gt. The extraction of crude petroleum in recent years, however, has exhibited a declining trend. In 1996, 1997, 1998, and 1999, petroleum output declined by 3%, 2%, 3%, and 2%, respectively, compared with the preceding year (table 1). In 2000, petroleum production decreased by about 2% compared with that of 1999; however, a small increase in petroleum production in the near future was

anticipated owing to the opening of 15 petroleum and natural gas blocks in 1996 for exploration by such foreign oil companies as Amoco of the United States, Royal Dutch Shell of the Netherlands, and Enterprise Oil of the United Kingdom (Lynch, 1999, p. 2). The country's refined petroleum products capacity amounted to about 25 Mt/yr. Major events in the petroleum and natural gas sector in late 1999 included the linkage of Romania's natural gas transportation system with that of Ukraine. The state-owned gas company Romgaz would receive Russian gas through the linkage to increase energy supplies to the northern part of the country.

A feasibility study undertaken by experts from Romania and the United States reached a conclusion that a 1,400-km petroleum pipeline linking Constanta and Trieste was feasible. The proposed pipeline's designed carrying capacity would be 47.1 Mt/yr. The projected completion date of the pipeline would be in the third quarter of 2002 at a cost of \$1 billion with an additional sum of \$300 million projected for improvements during the initial 10 years of the pipeline's operation. The pipeline would be in the position to carry crude petroleum originating in the Caspian Sea producing area to Trieste where linkage with the Trans-Alpine Pipeline would be possible (Petroleum Economist, 2000).

Coal was produced at 34 mines from resources amounting to 3.5 Gt, of which 75% was lignite; 22%, bituminous coal; and 3%, brown coal. Coal accounted for about 60% of the primary fuel for the country's principal electric power stations (Lynch, 1999, p. 7).

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TABLE 1
BULGARIA AND ROMANIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1996	1997	1998	1999	2000	
BULGARIA 2/						
Metals:						
Aluminum, metal, secondary	4,417	3,127	3,500 e/	3,500 e/	3,500 e/	
Bismuth, metal e/	40	40	40	40	40 e/	
Cadmium, metal, smelter	250	280	250 e/	150 e/	150 e/	
Copper:						
Ore:						
Gross weight	thousand tons	21,123	21,836	20,726	22,346	22,829 3/
Cu content e/	do.	106	109	105	113 r/	107 e/
Concentrate:						
Gross weight	do.	444	463	438	482 r/	462 3/
Cu content	do.	89	93	88	96 r/	92 e/
Metal, primary and secondary:						
Smelter		104,398	114,630	119,500	112,000	115,000 e/
Refined, electrolytically		22,301	34,530	36,400 r/	21,000 r/	32,500 3/
Gold, metal	kilograms	3,390	1,020	1,253 r/	2,743 r/	2,347 3/
Iron and steel:						
Iron ore:						
Gross weight	thousand tons	1,000 e/	858	895	699	559 3/
Fe content	do.	282	242	250 e/	223 r/	178 3/
Iron concentrates	do.	497	479	463 r/	361	304 3/
Metal:						
Pig iron for steelmaking	do.	1,481	1,610	1,400	1,100	1,200 e/
Ferroalloys, ferrosilicon e/	do.	8	10	10	10	10 e/
Steel, crude	do.	2,457	2,628	2,240 r/	1,890 r/	2,020 3/
Semimanufactures, rolled	do.	1,901	2,242	1,800 e/	1,800 e/	1,900 e/
Lead:						
Mine output, Pb content		33,000	32,000 r/	22,000 r/	14,000 r/	14,000 3/
Concentrate:						
Gross weight		40,681	39,800	34,595	25,208 r/	15,019 3/
Pb content e/		28,500	27,900	24,200	17,000 r/	10,500 3/
Metal, refined, primary and secondary		74,690	73,000 r/	77,100 r/	81,600 r/	84,100 3/
Manganese ore:						
Gross weight		44,270	47,430	55,600	--	-- 3/
Mn content e/		13,100	14,000	17,000	--	--
Silver, mine output, Ag content		49	32	68 r/	59 r/	60 e/
Tin, metal		8	8	10 e/	10 e/	10 e/
Uranium, oxide, U content e/		600	600	600	600	600 e/
Zinc:						
Mine output, Zn content e/		25,700	21,000	18,000 r/	12,000	10,000 e/
Concentrate:						
Gross weight		38,000	38,420	33,600	19,560 r/	18,096 3/
Zn content e/		19,800	20,000	17,000	10,200	9,400 e/
Metal, smelter, primary and secondary		68,018	82,000 r/	86,100 r/	83,700 r/	84,200 3/
Industrial minerals:						
Asbestos fiber, all grades		300	300	300 e/	300 e/	300 e/
Barite ore, run of mine		976,700	285,000	452,197	1,124,000 r/	8,747,000 3/
Cement, hydraulic	thousand tons	2,137	1,656	1,700 e/	1,700 e/	1,700 e/
Clays:						
Bentonite	do.	202	171	176	232	296 3/
Kaolin, washed	do.	189	150	150 e/	140 e/	150 e/
Refractory	do.	67	62	56	48	34 3/
Feldspar	do.	30	36	36 r/	28	22 3/
Fluorspar e/	do.	2 3/	2	2	2	2 e/
Gypsum and anhydrite:						
Crude	do.	169	156	184	149	170 3/
Calcined	do.	64	60	75 r/ e/	55 e/	65 e/
Lime, industrial	do.	991	849 r/	1,000 e/	1,068 r/	1,388 3/
Limestone and dolomite	do.	10,443	10,842	11,000 e/	11,000 e/	11,000 e/
Nitrogen, N content of ammonia	do.	1,194	982 r/	1,000 e/	1,000 e/	1,000 e/
Perlite	do.	26	20	12 r/	13	17 3/
Pyrites, gross weight e/	do.	150	150	150	150	150 e/
Salt, all types	do.	1,600	1,600	2,400	1,300	1,700 3/

See footnotes at end of table.

TABLE 1--Continued
BULGARIA AND ROMANIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1996	1997	1998	1999	2000	
BULGARIA--Continued 2/						
Industrial minerals--Continued:						
Sand and gravel	thousand cubic meters	3,075	2,140	2,000 e/	2,000 e/	2,200 e/
Silica (quartz sand)	thousand tons	832	557	593	533	690 e/
Sodium carbonate, calcined	do.	800	800	800	800	800 e/
Sulfur: e/						
Sulfur content of pyrite		50,000	50,000	50,000	50,000	50,000 e/
Byproduct		50,000	50,000	50,000	50,000	50,000 e/
Total		100,000	100,000	100,000	100,000	100,000 e/
Sulfuric acid		524,714	550,700	500,000 e/	500,000 e/	500,000 e/
Mineral fuels and related materials:						
Coal, marketable:						
Anthracite	thousand tons	23	16	16	17	18 e/ 4/
Bituminous	do.	172	130	105	106	100 e/ 4/
Brown	do.	3,961	3,491	3,692	3,074	3,211 e/ 4/
Lignite	do.	28,101	26,929	27,435	22,696 r/	23,765 e/ 4/
Total	do.	32,257	30,566	31,248	25,893	27,094 e/
Coke	do.	1,157	1,239	1,200 e/	1,200 e/	1,200 e/
Natural gas, marketed	million cubic meters	42	38	33	27	15 e/ 4/
Petroleum:						
Crude, reported	thousand tons	34	28	32	39	41 e/ 4/
Refinery products e/	thousand 42-gallon barrels	25,000	25,000	25,000	25,000	25,000 e/
ROMANIA 4/						
Metals:						
Aluminum:						
Bauxite, gross weight		174,500	127,450	161,865	136,000 r/	135,000 e/
Alumina, calcined, gross weight		260,637	281,636	250,226	277,388	416,575
Ingot including alloys:						
Primary		140,874	162,987	174,038	174,100 r/	179,039
Secondary		3,678	2,042	1,110	205 r/	32
Total		144,552	165,029	175,148	174,305 r/	179,071
Bismuth, mine output, Bi content e/		40	40	40	40	40
Cadmium metal, smelter		5	5	--	--	--
Copper:						
Mine output, Cu content of concentrate		24,434	23,190	19,065	16,455 r/	16,079
Metal:						
Smelter:						
Primary		32,622	25,024	18,708	24,010	16,495
Secondary e/		1,000	1,000	1,000	2,000 3/	2,000
Total		33,622	26,024	19,708	26,010	18,495
Refined:						
Primary		29,305	22,912	21,008	20,893 r/	13,803
Secondary e/		5,000	4,000	2,000	4,000 4/	4,000
Total		34,305	26,912	23,008	24,893 r/	17,803
Gold, mine output, Au content e/	kilograms	500 r/	500 r/	500 r/	475 r/ 3/	500
Iron and steel:						
Iron ore:						
Gross weight	thousand tons	860	756 r/	459 r/	365 r/ e/	290 e/
Metal content	do.	140	147	85	69 r/	55
Metal:						
Pig iron	do.	4,025	4,557	4,541	2,969 r/	3,069
Ferroalloys:						
Ferrochromium		9,650	950	873	--	--
Ferrosilicon		23,827	9,620	5,553	-- r/	2,542
Ferromanganese		20,150	11,505	4,170	25	1,044
Ferrosilicomanganese		78,590	62,570	83,617	550	21,158
Silicon metal e/		300	300	150	100 r/	100 e/
Steel, crude	thousand tons	6,082	6,674	6,336	4,392 r/	4,770
Semimanufactures:						
Pipes and tubes	do.	591	633	661	351 r/	462
Rolled products	do.	4,479	4,804	4,391	3,379 r/	3,685

See footnotes at end of table.

TABLE 1--Continued
BULGARIA AND ROMANIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1996	1997	1998	1999	2000	
ROMANIA--Continued 4/						
Metals--Continued:						
Lead:						
Mine output, Pb content of concentrate	21,356	19,447	15,128 r/	17,489 r/	18,744	
Smelter, primary e/	12,000	10,000	10,000	15,000	15,000	
Refined: e/						
Primary	20,000	18,000	20,000	18,000 r/	27,000	
Secondary	4,000	4,000	4,000	3,000	3,000	
Total	24,000	22,000	24,000	21,000 r/	30,000	
Manganese:						
Ore, gross weight e/	thousand tons	150	100	100	60	35
Concentrate: 5/						
Gross weight	do.	104	68	73 e/	42 e/	20 e/
Mn content	do.	26	17	19	11	5
Silver, mine output, Ag content e/		20 r/	20 r/	20 r/	18 r/ 3/	20
Zinc:						
Mine output, Zn content of concentrate		32,082	31,737	25,650 r/	26,536 r/	27,455
Metal, primary and secondary:						
Smelter		28,162	30,226	29,427	25,000	25,000 e/
Refined		80,000 e/	82,000	86,000	84,000	84,000 e/
Industrial minerals:						
Barite, processed		12,541	12,729	10,327	4,632 r/	4,266
Cement, hydraulic	thousand tons	6,956	6,553 r/	7,300	6,252	8,264
Clays:						
Bentonite:						
Run of mine e/		100,000	60,000	60,000	45,000	80,000
Marketable		43,543	27,133	25,434	20,577 r/	35,789
Kaolin:						
Run of mine e/		145,000	90,000	75,000	75,000 r/	65,000
Marketable		45,200	29,169	24,742	25,456 r/	19,007
Diatomite		56,906	23,880	34,600	11,592	9,712
Feldspar		34,975	25,962	37,010	36,627 r/	38,361
Fluorspar e/		15,000	15,000	15,000	15,000	15,000
Graphite		2,931	2,563	1,951	1,041	1,251
Gypsum	thousand tons	91	79	297	308 r/	229
Lime	do.	1,748	1,599	1,813	1,623 r/	1,480
Nitrogen, N content of ammonia	do.	1,513	781	378	686	700 e/
Pyrites, gross weight	do.	168	208	200	195 r/	35
Salt:						
Rock salt	do.	808	254	68	64 r/	52
Other	do.	1,881	2,369	2,220	2,133 r/	2,215
Total	do.	2,689	2,623	2,288	2,197 r/	2,267
Sand and gravel	do.	907	711	1,049	763 r/	653
Sodium compounds, n.e.s.:						
Caustic soda	do.	326	322	310	297 r/	355
Soda ash, manufactured, 100% Na ₂ CO ₂ basis	do.	537	548	482	414 r/	405
Sulfur:						
S content of pyrites	do.	42	52	50	48 r/	9
Byproduct, all sources	do.	68	43	46	45	45
Total	do.	110	95	96	93 r/	54
Sulfuric acid	do.	422	330	229	234	166
Talc		10,248	7,578	8,134	8,289	7,850
Mineral fuels and related materials:						
Carbon black		26,023	21,400	18,450	12,488 r/	14,756
Coal, washed:						
Anthracite and bituminous:						
For coke and semicoke production	thousand tons	312	324	192	110	13
For other uses	do.	10	10	2	1	1
Brown	do.	1,000	692	--	--	--
Lignite	do.	40,546	32,281	26,037	22,881 r/	29,279
Total	do.	41,868	33,307	26,231	22,992 r/	29,293

See footnotes at end of table.

TABLE 1--Continued
BULGARIA AND ROMANIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity		1996	1997	1998	1999	2000
ROMANIA--Continued 4/						
Mineral fuels and related materials--Continued:						
Coke:						
Metallurgical	thousand tons	2,948	3,110	2,929	1,593	1,536
Other	do.	1	1	--	--	--
Total	do.	2,949	3,111	2,929	1,593	1,536
Gas, natural, gross:						
Associated	million cubic meters	1,361	1,245	1,210	1,164	1,164
Nonassociated	do.	16,801	14,671	13,231	13,413	13,413
Total	do.	18,162	15,916	14,441	14,577	14,577
Petroleum:						
Crude:						
As reported	thousand tons	6,626	6,515	6,309	6,154	6,038
Converted	thousand 42-gallon barrels	49,400	48,760	47,020	45,866	45,000
Refinery products e/	do.	132,000	125,000	95,000	77,265 3/	78,000

e/ Estimated; estimated data are rounded to no more than three significant digits and may not add to totals shown. r/ Revised. -- Zero.

1/ Table includes data available through October 2001.

2/ In addition to commodities listed, chromite, magnesite, palladium, platinum, tellurium, and uranium and a variety of crude construction materials (common clays, dimension stone, and crushed stone) are produced, but available information is inadequate to make reliable estimates of output level.

3/ Reported figure.

4/ In addition to the commodities listed, antimony, asbestos, and a variety of crude construction materials are produced, and molybdenum may have been produced as a byproduct of copper from 1988 on; output is not reported quantitatively and available information is inadequate to make reliable estimates of output levels.

5/ Estimated series were based on published data on concentrate production.

TABLE 2
BULGARIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Cement	Reka Devnia	Devnia	1,825.
Do.	Zlatna Panega	Panega	1,300.
Do.	Others	Temelkovo, Dimitrovgrad, Plevna, and Beli Izvor	1,590.
Coal:			
Bituminous	Economic Mining and Power Combine (Smek) Balkanbass	Balkan Coal Basin in central Bulgaria, northwest of Silven	445.
Brown	G. Dimitrov	Pernik coal basin, southwest of Sofia	4,000.
Do.	Others	Bobov Dol and Pirin in western Bulgaria	3,100.
Lignite	SMEK East Maritsa	East Maritsa coal basin near Zagora	25,000.
Do.	Others	Marbas, Pernik, and Bobov Dol coal basins	5,300.
Copper (Cu):			
Concentrate, Cu content	Asarel-Medet AD	Panagurishte, Pazardzhik District	25.
Do.	Chelopech Ltd.	Srednogorie, Sofia District	5.
Do.	Bradtze	Malko Turnovo	2.
Do.	Elatzite-Med Ltd.	Srednogorie, Sofia District	15.
Do.	Rosen	Burgas, near the Black Sea	1.
Do.	Tsar Asen	Srednogorie, Sofia District	2.
Do.	Burgaskii Mines Ltd., Zidorovo	Burgas, near the Black Sea	0.5
Metal, refined	Union Miniere Pirdop Copper Smelter & Refinery	Srednogorie, Sofia District	120.
Iron ore	Kremikovtsi Iron and Steel Combine	Kremikovtsi	2,000.
Lead-zinc (Pb-Zn):			
Concentrate, Pb-Zn content	Gorubso Co.	Erma Reka, Kurdjali, Laki, and Rudozem, all in Madan area near Greek border	59 Pb, 47 Zn.
Do.	Madzharovo Ltd.	Near Plovdiv	3 Pb, 2 Zn.
Do.	Ossogovo Ltd.	Ossogovo Mountains, western Bulgaria	3 Pb, 2 Zn.
Do.	Ustrem Ltd.	Near Thundza River, eastern Bulgaria	3.5 Pb, 0.8 Zn.
Metal:			
Pb, refined	KCM SA, formerly Dimitur Blagoev	Plovdiv	44.
Do.	Lead and Zinc Complex Ltd.	Kurdjali	60.

See footnotes at end of table.

TABLE 2--Continued
BULGARIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Lead-zinc (Pb-Zn)--Continued:			
Metal--Continued:			
Zn, smelter	KCM SA, formerly Dimitur Blagoev	Plovdiv	60.
Do.	Lead and Zinc Complex, Ltd.	Kurdjali	30.
Manganese ore	Mangan Ltd. (Obrotchishte)	Varna District	50.
Natural gas	Ministry of Power Supply	Chiren field, in northwest Bulgaria	(1/).
Petroleum:			
Crude	do.	do.	(1/).
Refined barrels per day	Economic Trust for Petroleum Products	Refineries in Burgas, Plevan, and Ruse	260,000.
Steel, crude:	Kremikovtsi Iron and Steel Works	Near Sofia	2,300.
Do.	Stomana Iron and Steel Works	Pernik	1,300.

1/ Insignificant capacity.

TABLE 3
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies (Government-owned unless otherwise specified)	Location of main facilities	Annual capacity
Alumina	Soc Com Alor SA [Balli Group (United Kingdom), and Bayrakter Co. (Turkey) own 51%]	Plant at Oradea, near Hungarian border	250.
Do.	do.	Plant at Tulcea, Danube Delta	400.
Aluminum, primary	Alro SA (Slatina Aluminium Enterprise)	120 kilometers west of Bucharest	270.
Barite	Ministry of Industry	Ortra mine, Rosia Montana, southwest of Cluj	100.
Bauxite	do.	Oradea-Dobresti Mining Complex, near Hungarian border	250.
Cement	Cimentul SA Turda	Plant at Turda, 600 kilometers from port of Constanta	cement: 1,360; clinker: 850.
Do.	Cimentul SA Cimus	Plant at Cimpulung, about 499 kilometers from port of Constanta	cement: 2,200; clinker: 1,360.
Do.	Moldocim SA Bicaz	Plant at Bicaz, about 450 kilometers from port of Constanta	cement: 3,100; clinker: 1,520.
Do.	Romeif SA Fieni	Plant at Fieni, about 420 kilometers from port of Constanta	cement: 1,600; clinker: 960.
Do.	Romcim SA	Plant at Alesd, 812 kilometers from port of Constanta	cement: 3,500; clinker: 2,120.
Do.	do.	Plant at Hoghiz, 437 kilometers from port of Constanta	cement: 2,200; clinker: 1,520.
Do.	do.	Medgidia plant, about 35 kilometers west of Constanta	cement: 3,500; clinker: 1,980.
Do.	do.	Plant at Jiu, about 533 kilometers from the port of Constanta	cement: 3,000; clinker: 2,045.

TABLE 3--Continued
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2000

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies (Government-owned unless otherwise specified)	Location of main facilities	Annual capacity	
Coal:				
Bituminous	Compania Nationala a Huilei-Petrosani	Valea Jiului Mining Complex, near Hunedoara	10,400.	
Lignite	Societatea Nationala a Lignitului Oltenia-Targu Jui	Jiu Valley, Oltenia County, north of Craiova	20,300.	
Do.	Societatea Nationala a Carbunelui-Ploiesti	About 50 kilometers north of Bucharest	8,700.	
Copper:				
Ore (concentrate)	Compania Nationala REMIN S.A. and Compania Nationala Minvest	Baia Mare, Baia-Sprie, and Cavnic mines, northwestern area near the Ukrainian border; Rosia Montana, Noud, Borsa Balan, and Lesul-Ursului Mines--in east-west arc along Carpathian range; Rosia Poieni Mine; and Moldova Noua Mine, southwest near Danubian border with Yugoslavia	180.	
Metal	Compania Nationala REMIN S.A.	Outokumpu flash smelter and electrolytic refinery at Baia Mare in the northwestern area, near the Ukrainian border	35.	
Do.	do.	Zlatna smelter and refinery, Apuseni, northwest Romania	13.	
Ferroalloys	Ferom-Joint Stock Co.	Complex at Tulcea	280.	
Iron ore	Compania Nationala Minvest	Mining complex at Hunedoara, in west-central Romania	1,320.	
Do.	do.	Resita Mining Complex, southwestern Romania, near Yugoslav border	660.	
Do.	do.	Napoca-Cluj Mining Complex, northwestern Romania on the Somesul River	990.	
Lead in ore	Compania Nationala REMIN S.A.	Baia Mare Mine, near Ukrainian and Hungarian borders	24.	
Do.	Compania Nationala Minvest	Balan Mine, 50 kilometers southwest of Piatra Neamt	10.	
Lead metal	Sometra S.A.	Imperial Smelter at Copsa Mica, central Romania, on the Tirnava Mare River	42.	
Natural gas	million cubic feet per year	Ministry of Industry, Department of Energy	Tirgu Mures Field at Tirgu Mures, north-central Romania	996,000.
Do.	do.	do.	Ploesti Field, 50 kilometers north of Bucharest	249,000.
Petroleum, crude	barrels per day	do.	Ploesti-Teleajen, Pitesti, and Tirogoviste Fields, in Prahova Valley around Bucharest; Bacau Field at Bacau, east-central Romania near the Siretul River; and West Carpathian Field, southeastern Carpathian Mountains, between the west bank of the Olt River and Tirgu Jiu	250,000.
Petroleum, refined	do.	do.	Refineries at Brazil, Pitesti, Onesti, Barcau, Borzesti, Brasov, Cimpina, Darmanesti, Oradea, Ploesti, Teleajen, and Navodari	664,000.
Steel	Gavazzi Steel SA (formerly Otel Rosu)	Caras-Severin, southeastern region, near Yugoslav border	400.	
Do.	SC Industrie Sarmei SA	Campia Turzii, Cluj, northwestern Romania	300.	
Do.	Sidex SA Galati	Danube River, north of Brail, near the Ukrainian border	10,000.	
Do.	Siderurgica SA Hunedoara	West-central Romania, near Calan	2,135.	
Do.	CSR SA Resita	Southwestern Romania, about 20 kilometers southwest of Caransebes	1,200.	
Do.	Siderica SA Calarasi	Near the Bulgarian border close to the Danube	2,200.	
Do.	COST SA Targoviste	Targoviste, Dimbovita, near Bucharest	1,100.	
Zinc in ore	Compania Nationala Minvest	Baia Mare, near Ukrainian and Hungarian borders	60.	
Zinc metal	Sometra S.A.	Imperial Smelter at Copsa Mica, Tirnava River, central Romania	66.	