

# THE MINERAL INDUSTRY OF ALBANIA

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The chief mineral commodities produced in Albania were chromite, copper, ferrochromium, nickeliferous iron ore, and petroleum refinery products, which until recently, constituted the dominant component of the country's foreign exchange earnings. During 1991-1995, Albania dismantled its central economic planning system and adopted the paradigm of a transitional economy country. One of the special features of this paradigm has been the reduction and/or abolition of state subsidies to industry and the consequent severe reduction of most industrial production, including mine output and minerals processing. To stimulate the development of a domestic market and to promote foreign investment, the Government also adopted a new mining code and new laws and regulations concerning foreign investment. Programs and plans by the Government to denationalize the country's economy, including the mining and minerals sectors, remained in effect in 1996. In 1995, the Government adopted the Privatization Law of the Mining Industry (No. 8026, November 9, 1995), which, taken together with ancillary resolutions, formed the basis for new policies concerning minerals and mining. This law specifically addressed procedures that must be followed to denationalize companies subject to the Mining Law No. 7769 of February 17, 1994 (World Trade Organization, 1996).

In essence, the new mining policy was market based and centered on private ownership (Ministry of Mines and Energy Resources, 1996). One of the objectives of the policy was to create conditions suitable for investment in the minerals industry from foreign, as well as domestic, sources of capital (Ministry of Mines and Energy Resources, 1996). The Government would continue to reduce subsidies to the minerals industries and would privatize economically viable mineral industry enterprises (Ministry of Mines and Energy Resources, 1996). These enterprises would be required to organize their business practices in accordance with provisions in the new mining law and have financial systems consonant with market practices. The Government would continue to finance the following studies: applications of new technologies to increase mining efficiency, new technologies for geological exploration for mineral deposits, and modernization of professional standards for scientific monitoring and management (Ministry of Mines and Energy Resources, 1996). In early 1996, Albania's National Privatization Agency began preparing lists of economically viable bauxite-, coal-, chromite-, and copper-mining enterprises (Metal Bulletin, 1996a).

Environmental problems in Albania are similar in kind, but not in degree, to those of other former centrally planned economy countries of Eastern Europe that were former members

of the Council for Mutual Economic Assistance (CMEA), an association of centrally planned economy countries that was disbanded in 1990. The most serious point sources of environmental pollution were industrial sites, such as mining, beneficiation, metallurgical, and refining complexes (chromite, copper, iron ore, steel, petroleum, etc.); lignite-fired thermal electric power stations; and chemical plants (World Bank, 1994). Because technology was more out of date at industrial facilities in Albania than at those in former CMEA countries of Eastern Europe, the facilities were less efficient and more polluting. The chief distinction between heavy industry in Albania and in other former Eastern European members of CMEA was that of scale—Albania's industrial development was significantly less extensive than that of the former CMEA countries. Consequently, the impact of environmental pollution generated by domestic industries in Albania from 1950 to 1992 has been relatively minor.

The decline in Albania's mineral production stemmed from several sources. From 1986 to 1990, total capital invested in the minerals industry amounted to less than 2% of the total invested in the entire economy (Foreign Broadcast Information Service, 1993). Between 1991 and 1996, the Government dismantled the rigid centrally planned economy, in which production norms were set without reference to internal or external market requirements. Technical difficulties, such as shortages of spare parts and the lack of modern mining equipment contributed to the decline in the mining sector. (*See table 1.*)

Despite the low percentage of capital investment, Albania's mineral industries remained the dominant sector of the country's overall industrial structure. Table 2 lists the administrative bodies, as well as subordinate units of production, of the main branches of the country's mineral industry as they appeared in 1991. (*See table 2.*) The economic viability of many of these facilities was under study in 1996, and the final organizational structure of the industry was still to be determined.

Metal ores have been Albania's chief source of mineral wealth. The bauxite deposits are mainly in the central part of the country, just east of Tirana, the capital, as well as in the Northern Alpine region near the border with the former Yugoslavia. Bauxite reserves were estimated to be about 12 Mt. The largest deposit was at Daijti, containing approximately 8 to 9 million metric tons (Mt) of reserves with an average grade of 39% to 40% aluminum oxide, 13% silica, 6% sulfur, 4% to 5% calcium oxide, and 18.3% iron oxide. Only 50,000 to 60,000 metric tons per year (t/yr) of bauxite, have been mined near Prenjas, in the Librazhd District.

Albania's chromite mining operations were the most important component of the mineral industry. From the late 1970's through the 1980's, Albania was a leading world producer and exporter of chromite, and was usually ranked second in terms of export and third in terms of production. Exports of chromite and ferrochromium have been vital earners of foreign exchange.

Although some chromite deposits and outcroppings can be found throughout Albania, the principal commercial chromite deposits are in ultrabasic massifs in the Midrita region, in the north-central and northern parts of the country. The mainly podiform ore was mined at seven mining districts, of which Bulquize and Batra, about 30 kilometers (km) northeast of Tirana, represented about two-thirds of Albania's total production capacity.

Albanian ore graded from 18% to 43% chromium oxide ( $\text{Cr}_2\text{O}_3$ ). Lumpy ores grading 39% to 42%  $\text{Cr}_2\text{O}_3$  and concentrates grading from 50% to 53%  $\text{Cr}_2\text{O}_3$  have been designated for export. About 25% of the ore was suitable for direct shipment; the balance was divided equally between beneficiation and shipment as feedstock for the Burrel ferrochromium plant. In recent years, chromite extraction has become more difficult because of the declining availability of ore suitable for open-pit mining; the increasingly complex mining environment at underground operations, especially at the Bulquize Mine; and the need for modern machinery and equipment.

In 1996, major activities in the chromite mining and processing sector involved negotiations with Preussag Stahl AG (Preussag) of Germany concerning the latter's purchase of an 80% equity in eight mines and five processing plants in the Midrita region. The value of the proposed acquisition was US\$50 million, which Preussag would invest during a 5-year period to modernize mining, processing, and ferrochromium smelting facilities. A consortium consisting of Preussag and other participants also would invest to modernize the infrastructure (telephones, railroads, roads, and hospitals) (Financial Times, 1996; Metal Bulletin 1996b). By yearend, however, no deal had been concluded between Albchrome SA and Preussag, despite letters of intent that had been signed earlier (Metal Bulletin, 1996c,d). Opposition from Albanian labor unions, fearing large-scale job losses, prompted the Government of Albania to reexamine the proposed business deal with Preussag (Mining Journal, 1997). At yearend, a new 1-meter (m)-thick seam of chromite was discovered at Shibenik by a consortium comprising of Gjeoalba (the State Geological Survey of Albania) and the Metal Mining Agency of Japan. This group was mandated to conduct geologic surveys to find new chromite deposits in Albania (Mining Journal, 1997).

During the late 1980's, Albania's output of copper ore, grading between 1.5% to 4% copper, had been about 1 million metric tons per year (Mt/yr). All copper ore was mined underground. With the exception of the Rehove Mine and beneficiation plant in southeastern Albania, copper was mined, processed, smelted, and refined largely in the northern part of the country. The largest copper mining and beneficiation complex was at Fushe Arrez, producing more than 320,000 t/yr

of ore during this period. As in other sectors of the economy, reduced production in the copper industry in the early 1990's was partly the result of a radical change in Government policy that allowed workers to determine their place of employment.

After beneficiation, copper concentrates were smelted at the Rubic, the Gjegjan (Kukes), and the Lac pyrometallurgical primary smelters. Refineries and rolling mills at Rubic and Lac produce copper wire, most of which was exported. Major exploration activity by Canadian mining companies in Albania's copper mining regions were underway in 1996, despite mass social unrest throughout the country and especially in these districts. In late 1995, Nebex Resources (Nebex) of Alberta, Canada, with the Institute of Geology (Gjeoalba) in Tirana, began a study of Albania's deposits of copper and other nonferrous metal ores. The study initially would focus on the Midrita and the Puka regions and would be completed by the end of 1997. Apart from copper, deposits containing gold, silver, iron, and zinc also were to be explored. In 1995, Nebex was reported to have invested US\$70,000 (Mining Journal, 1995b). For 1996, the company planned to invest between US\$500,000 and US\$1.5 million in 1997 for exploration (Mining Journal, 1995b). In early 1996, Nebex reported having increased its concessions in Albania to 1,050 square kilometers ( $\text{km}^2$ ) with the addition of the 200- $\text{km}^2$  Radomir concession, which borders Macedonia (Mining Journal, 1996; Northern Miner, 1996a). Preliminary tests at this concession have resulted in assays showing up to 11 grams per metric ton (g/t) of gold associated with mixed sulfides containing arsenopyrite, copper, mercury, and zinc, hosted in vertically dipping Paleozoic quartz-sericite-chlorite shear zones, ranging from 50 to 60 m in thickness. The terms of the agreement between Nebex and Gjeoalba would allow Nebex to acquire up to 80% interest at this concession in return for an exploration expenditure of US\$750,000 during a 4-year period. By March, Nebex had acquired four concessions for base and precious metals exploration. The Midrita concession covered an area of 400  $\text{km}^2$ , which extended over a belt of 14 copper deposits of Jurassic age and included 4 operating mines. Proven resources in this region amounted to 64 Mt (Mining Journal, 1995a; Northern Miner, 1996b). The potential for developing the copper, gold, and zinc deposits was believed to be very good. The copper ore in this area graded 1.5% Cu (average). The Kukes concession covered 250  $\text{km}^2$  and included ultrabasic massifs hosting deposits of chromite and copper. The current exploration plan was to focus on nickel-copper-platinum showings. Resources at Kukes, containing 1% Ni, have been estimated to be 50 Mt (The Northern Miner, 1996b). The Kacineri gold mining concession covered a 250- $\text{km}^2$  area and was believed to be very valuable with respect to gold. Preliminary resource estimates indicate 430,000 metric tons (t) grading 3 g/t of gold (Mining Journal, 1995a; Northern Miner, 1996b).

According to information released by Nebex in June, the drilling program to date had indicated a copper-rich massive sulfide zone (CNW/Canada NewsWire, 1996). Drill core intersecting 11 m in one bore hole reportedly graded as high as 8.8% Cu, 1.3% Zn, 2.3 g/t Au, and 21 g/t silver. One of the

holes was drilled through two massive sulfide horizons. The upper horizon, more than 2 m in thickness, averaged 1.6% Cu, 7.9% Zn, 1.9 g/t Au, and 35 g/t Ag. The second zone, 2.6 meters below the upper zone, was 3 m thick and averaged 1.8% Cu, 1.1% Zn, 1.4 g/t Au, and 3 g/t Ag. The 1-m-thick underlying sulfide stringer zone graded 3% Cu, 9.3% Zn, 3.8 g/t Au, and 329 g/t Ag (CNW/Canada NewsWire, 1996). A second hole indicated 16% Cu, 8.3% Zn, 5.9 g/t Au, and 80 g/t Ag in a 70 centimeter intersection. An underlying sulfide stringer zone showed a 4-m interval of 2.3% Cu (CNW/Canada NewsWire, 1996).

In September, Redbird Gold of Hamilton, Ontario, Canada, announced plans to acquire a stake in two Cyprus-based firms, Karma Albanian Mining and Skenderbeg Mining, which were granted exploration concessions in Albania. The concessions held by the two companies covered a 1,600-km<sup>2</sup> area, with massive sulfide and ophiolitic mineralizations, containing copper, gold, and zinc in central and northern Albania (Northern Miner, 1996d).

In 1996, a controversy stemming from the sinking of British naval vessels off the coast of Albania after World War II appeared to have been settled. According to the British Foreign Office, Albania's state gold reserves worth about US\$19 million was returned. A tripartite commission established by France, the United Kingdom, and the United States had been given control of the gold, which was held in the United Kingdom, until the matter could be satisfactorily resolved (Metal Bulletin, 1996c).

Albania's commercial resources of lateritic nickeliferous iron ore were estimated to be about 300 Mt. In the 1980's, yearly output ranged from 1 to 1.2 Mt of ore, of which about one-half was consumed at the Elbasan iron and steel works to produce pig iron, a small amount of steel, and salts of nickel and cobalt. The balance of the iron ore had been exported, mostly to Czechoslovakia, until 1993. During several decades, Czechoslovakia had been the largest consumer of Albanian nickeliferous iron ore, with annual imports ranging from 200,000 to 350,000 t/yr of ore. Czechoslovakia processed Albanian ore at its nickel and cobalt refinery at Sereď, where nickel and cobalt were extracted. This refinery, however, was closed in early 1993. Deposits of commercial-grade nickeliferous iron ore were exploited in ultrabasic massifs, near Pogradec, in east-central Albania. The principal mines were at Prenjas, Guri I Kuq, and Bitinska. In recent years (until 1991), the largest mining operation was at Prenjas, having produced about 600,000 t/yr of ore. The majority of Albanian ores are lateritic, grading about 35% to 45% Fe, 1.4% Ni, and 0.05% Co. The Bitinska deposit was believed to contain considerable resources of lateritic as well as silicate ores, but only the lateritic material has been mined. Production of ore in 1994 had ceased owing to both depressed international demand and dated and inefficient production technology. This resulted in the corresponding closure of the Elbasan nickel and cobalt refinery, as well as a large quayside stockpile of ore at the port of Durres (Metal Bulletin, 1992; Mining Journal, 1993).

Albania's industrial minerals sector remained in the early stages of development. In recent years, Albanian officials

indicated that future investments would be used to develop facilities to mine and process the country's asbestos, fluorite, kaolin, magnesite, phosphate, and quartz deposits. In September 1993, the Government reported that about US\$18 million and US\$8 million would be provided by the World Bank and Kuwait, respectively, for the renovation of 85 km of the country's automobile road system. The project was developed with the assistance of the World Bank and would involve many domestic, as well as some foreign, enterprises (British Broadcasting Corporation, 1993). Sufficient amounts of sand, gravel, and dressed stone also were produced to meet domestic needs.

In past years, the production of lignite, hydroelectric power, natural gas, and petroleum and the low consumption of fuel made Albania a net exporter of energy. However, because of reduced hydroelectric power output resulting from several years of drought, a general downturn in petroleum production, and increasing indigenous energy requirements, the status of Albania as net energy exporter has become less certain.

Albania's exploitable coal resources amounted to about 158 Mt of low-calorie lignite. Lignite had been mined from thin seams by using outdated mining methods and a low level of mechanization. The entire output was consumed domestically, mainly at thermal electric power stations.

Albania has about 17,300 km of highways, railroads, and waterways. The railroad system consisted of 509 km of 1.435-m standard-gauge track and 34 km of narrow-gauge single track. The road system consisted of 6,700 km of highways and main roads and 10,000 km of forest and rural roads. About 60% of all domestic cargo was transported by truck; 35%, by rail; and 2%, by coastal shipping along the Adriatic Sea and sections of Lakes Scutari, Ohrid, and Prespa. Nickeliferous iron ore mining areas at Prenjas and Guri I Kuq were linked by rail to processing centers at Elbasan. The copper mining district at Shkoder was also linked by rail to the copper smelter and refinery at Lac. Albania has a 1,630-megawatt generating capacity, mostly from hydroelectric sources. The country's petroleum and natural gas sector had about 145 km of crude oil pipeline, 55 km of refinery products pipeline, and 64 km of pipeline for natural gas. Seaports were at Durres, Sarande, and Vlore, but most bulk mineral cargoes were handled at Durres.

Albania's mineral industry was labor-intensive and in need of large infusions of capital to raise productivity. The future of the country's mineral industry in the context of market economics may depend on the Government's policies to revitalize the country's entire economy and whether or not these policies will maintain emphasis on the development of heavy industry.

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TABLE 1  
ALBANIA: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1992	1993	1994	1995	1996 e/	
<b>METALS</b>						
Bauxite e/	4,000	2,000	2,000	1,000	1,000	
Chromium:						
Chromite, gross weight e/	thousand tons	322	281	223	243	300
Marketable ore	do.	58	82	107	129	140
Concentrate	do.	15	33	11	31	30
Ferrochromium	do.	15	35	33	43	45
Cobalt: e/						
Mine output, Co content 3/		20	10	--	--	--
Plant production, Co content 4/		3	1	--	--	--
Copper:						
Ore:						
Gross weight	thousand tons	240	239	277	258	350
Concentrate		4,000 e/	14,000	9,000	17,000	25,000
Cu content e/		900	3,200	2,000	3,800	5,500
Metal, primary:						
Smelter		2,300	2,300	2,000	3,000	4,000
Refined e/		1,500	1,500	1,000	1,000	4,000
Iron and steel:						
Iron ore, nickeliferous:						
Gross weight	thousand tons	200	150	--	--	--
Fe content e/	do.	88	85	--	--	--
Metal: e/						
Pig iron		10,000	10,000	10,000	10,000	10,000
Crude steel		5,000	5,000	5,000	5,000	5,000
Rolled steel		1,000	1,000	1,000	1,000	1,000
Nickel: e/						
Mine output, Ni content		150	75	75	--	--
Plant production, Ni content		100	50	50	--	--
Metal, Ni cathode		50	20	20	--	--
<b>INDUSTRIAL MINERALS</b>						
Cement, hydraulic e/	thousand tons	200	200	200	200	200
Clay, kaolin e/		500	500	500	500	500
Dolomite e/		50,000	50,000	50,000	50,000	50,000
Fertilizer, manufactured: e/						
Phosphatic		10,000	10,000	10,000	10,000	5,000
Urea		4,000	4,000	4,000	4,000	3,000
Nitrogen, N content of ammonia e/		15,000	15,000	15,000	15,000	15,000
Olivinite		300	300	300	300	300
Phosphate rock (12%-15% P2O5) e/		1,500	1,500	1,500	1,000	1,000
Pyrite, unroasted e/		7,000	7,000	7,000	5,000	5,000
Salt e/		5,000	10,000	10,000	10,000	10,000
Sodium compounds n.e.s., soda ash, calcined e/		150	150	150	100	100
Sulfuric acid e/		1,000	1,000	1,000	1,000	1,000
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Asphalt and bitumen, natural 5/	thousand tons	50 r/ e/	19 r/	34 r/	33 r/	35
Coal, lignite	do.	200 r/ e/	135 r/	120 r/	81 r/	100
Gas, natural, gross production 6/	million cubic meters	100 e/	82 r/	52 r/	28 r/	50
Petroleum:						
Crude:						
Gross weight	thousand tons	500	586	535	521	500
Converted	thousand 42-gallon barrels	3,300	3,900	3,500	3,500	3,300
Refinery products e/	do.	1,000	1,000	1,000	1,000	1,000

e/ Estimated. r/ Revised.

1/ Table includes data available through June 1997.

2/ In addition to the commodities listed, a variety of industrial minerals and construction materials (common clay, quartz, titanomagnetite, stone, and sand and gravel) are produced, but output is not reported quantitatively, and available information is inadequate to make reliable estimates of output levels.

3/ Calculated from reported and estimated weight of nickeliferous ore; the amount of cobalt recovered, if any, is conjectural.

4/ Figures represent cobalt content of estimated production of commercially marketable cobalt salts produced within Albania from domestically mined nickeliferous iron ore.

5/ Includes asphalt and bitumen produced at petroleum refineries.

6/ Separate data on marketable production are not available, but gross and marketed output are regarded as being nearly equal.

TABLE 2  
ALBANIA: STRUCTURE OF THE MINERAL INDUSTRY FOR 1996

(Thousand metric tons unless otherwise specified)

Commodity	Location of main facilities (all state-owned)	Annual capacity
Cement	Elbasan, 32 kilometers southeast of Tirana; Kruje, 20 kilometers northwest of Tirana; Shkoder, 85 kilometers northwest of Tirana; and Vlore, southwest of Tirana	1,200
Chromite	Bater (including Bater I and II and Martanesh), 40 kilometers northwest of Tirana	450
Do.	Bulquize (including Bulquize south, Fush, Ternove, and Todo Maco), 35 kilometers northwest of Tirana	450
Do.	Kalimash, 60 kilometers north of Tirana	250
Do.	Kam, 70 kilometers north of Tirana	100
Do.	Klos, 20 kilometers northeast of Tirana	50
Do.	Pogradec (including Katjell, Memelisht, Pojske, Pishkash, and Prrrenjas), 50 kilometers east of Tirana	100
Ferrochromium	Burrel, 35 kilometers northeast of Tirana	40
Do.	Elbasan, 32 kilometers southeast of Tirana	36
Copper:		
Ore	Fushe-Arrez, 80 kilometers north of Tirana	350
Do.	Gjejan, 100 kilometers northeast of Tirana	150
Do.	Golaj (including Nikoliq and Pus), 120 kilometers northeast of Tirana	150
Do.	Kurbnesh-Perlat, 55 kilometers northeast of Tirana	100
Do.	Rehove, 110 kilometers southeast of Tirana	100
Do.	Reps (including Gurch, Lajo, Spac, and Thurr), 55 kilometers north of Tirana	350
Do.	Rreshen, 50 kilometers north of Tirana	50
Do.	Shkoder (including Palaj, Karma I and II), 85 kilometers northwest of Tirana	100
Smelter	Kukes, 110 kilometers northeast of Tirana	6
Do.	Lac, 35 kilometers northwest of Tirana	7
Do.	Rubik, 50 kilometers north of Tirana	4
Iron ore	Prrrenjas (Bushttrica, Prrrenjas, Skorska I and II), 70 kilometers southeast of Tirana	650
Do.	Guri i Kuq (including Cervenake, Grasishta, Guri i Kuq, Hudenisht and Guri Pergjrgjur), 25 kilometers east of Tirana	500
Steel	"Steel of the Party" Metallurgical Combine at Elbasan	150
Nickel, smelter	Elbasan	6
Coal, lignite	Maneze, Mezes, and Valias Mines in Tirana Durres area; Krabe Mine, 20 kilometers southeast of Tirana; Alarup and Cervnake Mines, in Pogradec area, 80 kilometers southeast of Tirana; Mborje-Drenove Mine in Korce area, 85 kilometers southwest of Tirana; and Memaliaj Mine in Tepelene area, 110 kilometers south of Tirana	2,500
Natural gas	million cubic feet Gasfields on southwest Albania between Ballsh and Fier	16,000
Petroleum:		
Crude	42-gallon barrels per day Oilfields at Marineze, Ballsh, Shqisht, Patos, Kucova, Gorrisht, and others	35,000
Refined	dRefineries: Ballsh, Cerrik, Fier, and Stalin	33,000