THE MINERAL INDUSTRIES OF

BOSNIA AND HERZEGOVINA

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Bauxite, copper, iron, lead and zinc, and lignite were among the major mineral resources exploited in Bosnia and Herzegovina. Additionally, the country produced a variety of industrial minerals for local use that included asbestos, gypsum, kaolin, and limestone and construction stone. The country's metals, chemicals, and petroleum refining industries are centered at such urban areas as Banja Luka, Mostar, Sarajevo, and Tuzla. Bosnia and Herzegovina also was an important manufacturing region for the defense industry of the former Yugoslavia.

In 1998, Bosnia and Herzegovina remained a country divided into two zones. Although, technically a single multiethnic state, Bosnia and Herzegovina actually comprised two roughly equal territories in which the Federation of Bosnian Moslems and Croatians (FBC) formed one entity (about 51% of Bosnia and Herzegovina), and Republika Srpska (RS), with a predominantly Serbian population, formed the other.

The cessation of hostilities at yearend 1995 allowed a measure of peaceful development and reconstruction of damaged industrial and social infrastructure through 1998. The social and economic devastation from the civil war (1992-95) created an economy whose gross domestic product (GDP) in 1998 was about one-fourth that of its prewar status; the value of industrial output was 10% to 20% of the immediate prewar period (Financial Times, 1998). Consequently, starting from a low base, economic growth rates for 1996-1998 are high. In 1998, the GDP of Bosnia and Herzegovina grew by about 18% compared with that of 1997. Extensive damage to infrastructure and industry was estimated at nearly $20 billion, which called for a $5.1 billion international reconstruction program for the period from 1996 to 2000. This effort would spotlight such basic material inputs, as sand and gravel, cement, steel, etc. Bosnia and Herzegovina's inland system of transportation comprises railroads and highways and waterways. Although complete data with respect to the total lengths of the railroad and navigable inland waterway systems were not available, the highway and road system reportedly consisted of about 21,000 kilometers (km) of paved, gravel, and earth-surfaced roads, of which 11,000 km was paved, 8,000 km was gravel, and 1,600 km was earth surfaced. The country was almost entirely landlocked and did not possess a merchant marine fleet. Pipelines for the carriage of petroleum were 174 km in length; however, data for those carrying natural gas were not available. A major portion of this infrastructure, however, was severely damaged during the war, and reconstruction was being handled largely by such international financial organizations as the European Bank for Reconstruction and Development and the World Bank. The extensive renovation of the country's infrastructure will require major inputs of industrial minerals and steel.

The Government of Bosnia and Herzegovina has begun a slow process of denationalizing state-owned industries. A voucher system, similar to that used in the Czech Republic and in other countries of Central Europe, has been under review. Small-scale businesses would be initial targets of privatization; larger state-owned enterprises—steel mills, cement plants, etc.—would be privatized later (Financial Times, 1998).

Before 1992, Energoinvest administered the production of bauxite, alumina, and aluminum in Bosnia and Herzegovina. Major bauxite mines operated in the Banska Krupa, Jajce, Vlasenica, Banja Luka, Stolac, and Zvornik regions. Mines at the latter three locations with capacities to produce more than 1.8 million metric tons per year (Mt/yr) of bauxite were in the RS. However, the alumina refining, aluminum smelting and fabricating industries are almost entirely in Mostar and Tuzla, which are under the jurisdiction of the FBC. The aluminum sector—mining, processing, and fabricating—sustained major damage during the war and was in need of capital investment to reestablish operations on something like the former scale. Apart from capital investment requirements, the rehabilitation of the aluminum sector will depend on the ability of both parts of Bosnia and Herzegovina to reestablish commercial relations.

Before 1992, Bosnia and Herzegovina provided the former Federal Republic of Yugoslavia with about 99% of its mined iron ore. About 70% of the country's iron ore mining capacity is within the RS. Ljubija, the principal iron ore mine, near Prijedor (RS), has a design capacity to produce 3.6 Mt/yr of ore and resources assessed at 500 million metric tons (Mt). Other iron ore mines in the Prijedor region include the Omarska and Tomasica mines, working deposits similar to that of Ljubija. The Ljubija Mine was not affected by war, other than by the disruption of its markets in the former Yugoslavia, and reportedly was equipped and fully staffed. However, Bosnia and Herzegovina's steel mill at Zenica is in the region administered by the FBC and the situation here is similar to that of the bauxite-alumina-aluminum industry, where mining and processing are in separate jurisdictions and where commercial transactions between them have not been reestablished. The Zenica steel mill was a major steel producer in the former Yugoslavia, accounting for about 40% of total output in 1990. Following the initiation of hostilities in 1992, production fell to about 100,000 metric tons per year (t/yr), where it is today (Buchan, 1998). According to the plant's management, employment was cut from 25,000 workers to 4,700 workers during this period. The plant's on- line capacity was reconfigured as well, with 4 out of 5 coke furnaces, 3 out of 4 blast furnaces, and 6 of 10 rolling mills being taken off-line. The plant's management also planned to raise production to about 1.2 Mt/yr, of which about 400,000 t/yr would be consumed by Bosnia and Herzegovina, about 600,000 t/yr by the newly emerged countries of the former Yugoslavia, and the balance by consumers in the Mediterranean area. Investment in

the project was anticipated from the Kuwaiti Investment Authority.

Virtually all of Bosnia and Herzegovina's lead and zinc mining operations are in the RS part of the country. The Sase Mine, in Skelani in the Srebrenica region, was reported to have maintained a low level of operation given the heavy damage to the facility and its equipment incurred during the civil war. In 1998 mine production capacity was put at 6,500 t/yr of lead and 4,000 t/yr of zinc.

Bosnia and Herzegovina produced a variety of industrial minerals for domestic use. Asbestos was being mined in the Petovo region for use in the production of fireproof concrete structures. Gypsum was produced at at least two mines: in Sipovo and Novi Grad (RS). Kaolin was produced at the Crna Dolina Mine near Prijedor, with the capacity to produce about 100,000 t/yr. Other kaolin mines that remained operational were at Bosanska Dubica, Kobas (RS) and Bratunac (RS). Bentonite deposits are worked at Gracanica, Sipovo (RS), Tesanj, and Zvornik. Construction stone, including dimension stone were both produced. In RS alone, there are 20 plants processed limestone for the construction materials and construction sectors of the economy. Barite was mined in Kresevo, Vares, and Velika Kladusa.

Before 1992, Bosnia and Herzegovina supplied the former Yugoslavia with about 85% of its brown coal and about 15% of its lignite. Coal mining and electric power generation were conducted under the auspices of SOUR Titov Rudnici Uglja, a vertically integrated, state-owned power company. Following the cessation of hostilities, three electric power companies came into existence, two in the FBC and one in RS—Elektroprivreda Republika Srpska, fully integrated with company-owned coal mines, in the RS, and Elektroprivreda Bosnia and Herzegovina and Elektroprivreda Mostar in the FBC. The prewar electric-power generating capacity amounted to 2,034 megawatts (Mw) from 13 hydroelectric plants and 1,957 Mw from 4 thermal electric power stations, but about 56% of Bosnia and Herzegovina's total electric power generating capacity was severely damaged or destroyed, with damage estimated to be 1.34 billion.

In 1998, coal mining in Bosnia and Herzegovina was organized into two separate operations. In the FBC, the Tuzla Coal Mines and the Middle Bosnia Coal Mines supplied the Tuzla and Kakanj powerplants with more than 80% of their total coal production. In RS, the brown coal surface mine at Ugljevik and the lignite surface mine at Gacko were fully integrated with the respective Ugljevik and Gacjo powerplants. Coal reserves for the entire country were estimated at 3.8 billion tons, comprising brown coal, 40%, and lignite, 60%. About 20% of Bosnia and Herzegovina's resources of brown coal were in the RS; similarly, about 40% of the lignite resources are in the RS. The mining operations in the RS were reported to have suffered only slight damage; however, repair and maintenance difficulties were reported during the war and only 60% of the 1990 output of 3.5 Mt has been achieved so far. The RS's electric power sector was currently a net exporter of electricity to Croatia, Italy and Slovenia.

The World Bank forecasted a net sales growth for the entire energy sector (electric power generation, including coal mining) to grow 12.3% annually through the end of 2003. However, a large measure of this growth will depend on the reestablishment of electric power consumption in the aluminum and iron and steel (including ferroalloys) industries.

The future of Bosnia and Herzegovina's minerals industry may serve as a litmus test of the country's ultimate status as a unified state. The commercial disposition of the country's resources of bauxite and iron ore could serve as indicators of that future.

References Cited

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TABLE 1
BOSNIA AND HERZEGOVINA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/		1994	1995	1996	1997	1998
METALS						
Aluminum:						
Bauxite		75,000	75,000	75,000	75,000	75,000
Alumina		50,000	50,000	50,000	40,000	40,000
Metal, ingot, primary and secondary		15,000	15,000	15,000	15,000	10,000
Iron and steel:						
Ore and concentrate:						
Ore, gross weight		200,000	150,000	100,000	100,000	100,000
Ore, Fe content		70,000	52,000	35,000	35,000	35,000
Agglomerate		50,000	50,000	40,000	40,000	40,000
Metal:						
Ferroalloys:						
Ferrosilicon		1,000	1,000	1,000	1,000	1,000
Silicon		200	200	100	100	100
Pig iron		100,000	100,000	100,000	100,000	100,000
Crude steel:		115,000	115,000	115,000	110,000	110,000
Semimanufactures		100,000	100,000	100,000	100,000	90,000
Lead:						
Mineral concentrator output:						
Ore, gross weight (Pb-Zn ore)		10,000	10,000	10,000	10,000	10,000
Pb content of ores		200	200	200	200	200
Pb concentrate		400	400	400	400	400
Metal, smelter, primary and secondary		100	100	100	100	100
Manganese ore:						
Gross weight		2,000	2,000	2,000	2,000	2,000
Mn content		600	600	500	500	500
Zinc:						
Zinc content of Pb-Zn ore		300	300	300	300	300
Concentrate output, gross weight		600	600	600	600	600
INDUSTRIAL MINERALS						
Asbestos, all kinds		500	500	500	500	500
Barite concentrate		2,000	2,000	2,000	2,000	2,000
Cement	thousand tons	244 r/	226 r/	150	200	300
Clays:						
Bentonite		800	800	800	800	800
Ceramic clay, crude		20,000	20,000	20,000	20,000	20,000
Kaolin:						
Crude		3,000	3,000	3,000	3,000	3,000
Calcined		1,500	1,500	1,500	1,500	1,500
Gypsum:						
Crude		30,000	30,000	30,000	30,000	30,000
Calcined		3,000	3,000	3,000	3,000	3,000
Lime	thousand tons	50	50	50	50	50
Magnesite, crude		2,000	2,000	2,000	2,000	2,000
Nitrogen, N content of ammonia		2,000	2,000	500	500	500
Glass sand		50,000	50,000	50,000	50,000	50,000
Salt, all sources		50,000	50,000	50,000	50,000	50,000
Sand and gravel, excluding glass sand	thousand cubic meters	500	500	500	500	500
Sodium compounds:						
Soda ash		20,000	10,000	10,000	5,000	5,000
Caustic soda		10,000	10,000	10,000	5,000	5,000
Sodium bicarbonate		1,000	1,000	1,000	500	500
Stone, excluding quartz and quartzite, dimension, crude:						
Ornamental	square meters	20,000	20,000	20,000	20,000	20,000
Other	cubic meters	2,000	2,000	2,000	2,000	2,000
Crushed and brown, n.e.s.	thousand cubic meters	500	500	500	500	500
Sulfur, byproduct of metallurgy		1	1	1	1	1
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Brown coal	thousand tons	1,000	1,000	1,000	1,000	1,000
Lignite	do.	1,500	1,500	1,000	1,000	1,000

See footnotes at end of table.

TABLE 1--Continued
BOSNIA AND HERZEGOVINA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/		1994	1995	1996	1997	1998
MINERAL FUELS AND RELATED MATERIALS--Continued						
Coke		100	100	--	--	--
Petroleum refinery products	thousand 42-gallon barrels	--	--	--	500	500

r/ Revised.

1/ Table includes data available through September 1999.

2/ In addition to commodities listed, common clay was also produced, but available information was inadequate to make reliable estimates of output.

TABLE 2
BOSNIA AND HERZEGOVINA: STRUCTURE OF THE MINERAL INDUSTRY IN 1998

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Alumina		Energoinvest	Plants at Birac-Zvornik	600
Do.		do.	Plant at Mostar	280
Aluminum		do.	Smelter at Mostar	92
Bauxite		do.	Mines at Vlasenica, Jajce, Bosanska Krupa, Posusje, Listica, Citluk, and other locations	2,000
Coal:				
Brown		SOUR Titovi Rudnici Uglja, Tuzla	Mines in BiH	12,000
Lignite		do.	do.	7,000
Cement		Gik Hidrogradnja, Tvornica Cementa BiH	Plant at Kakanj	650
Ferroalloys		Elktrobosna, Elektrohemijska i Eletrotermijska Industrija	Plant at Jajce	80
Iron ore		Rudarsko Metalurski Kombinat Zenica	Mines at Vares, Ljubija, and Radovan	5,000
Lead-zinc ore		Energoinvest	Mine and mill at Srebrenica	300
Manganese ore		Mangan-Energoinvest	Mine and concentrator at Buzim	100
Petroleum, refined	thousand barrels per day	Energoinvest: Rafinerija Nafte Bosanski Brod	Refinery at Bosanski Brod	100
Pig iron		Rudarsko metalurski Kombinat Zenica (RMK Zenica)	4 blast furnaces at Zenica	2,250
			2 blast furnaces at Vares	100
Do.		do.	Electric reduction furnaces at Iljas	100
Salt	cubic meters per year	Hemijski Kombinat "Sodaso," Rudnik Soli i Solni Bunari	Rock salt: Mines at Tusanj	120,000
Do.	do.	do.	Production from brine at Tuzla, BiH	2,000,000
Steel, crude		Rudarsko Metalurski Kombinat Zenica	Plant at Zenica	2,060