

THE MINERAL INDUSTRY OF HUNGARY

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In 1996, Hungary produced modest amounts of fossil fuels, industrial minerals, and metals. Bauxite was the only major nonfuel mineral produced in Hungary that was significant in terms of European mineral production. However, the country's production of primary aluminum had almost ceased owing to Hungary's energy shortages. The production of coal, natural gas, and petroleum was sufficient to satisfy only about one-half of the country's annual energy needs. Hungary's continuing development of a market economy involved major structural economic changes, such as denationalization of state-owned enterprises in the industrial, agricultural, and service sectors. A major element in this process was the gradual severance of state subsidies to these sectors, mostly from 1991 to 1994. By yearend, the process of denationalization in the minerals industry was nearing completion.

The country's economic performance continued to show overall improvement, given the economy's dislocations and production downturns that took place in the early stages of transition to a market economy system from 1990 to 1993. Compared with those of 1995, Hungary's gross domestic product (GDP) and industrial production in 1996 were expected to grow by 1.5% and 3%, respectively (Marsh, 1996). In terms of physical units, the output of metals, as a whole, was close to the production levels of 1995, but showed a substantial increase in the production of aluminum metal. Mineral fuels output, too, was stable, with the exception of crude petroleum output, which declined by about 13% compared with that of 1995 (Molnar, 1997). The chief events in Hungary's minerals industry included further privatization efforts in the aluminum, copper, and steel industries.

The Government of Hungary maintained its commitment to restructure and denationalize state-owned enterprises, which, by 1996, resulted in more than 60% of Hungary's GDP being generated by private sector activity. Moreover, the Government planned to accelerate the privatization of the country's state-owned enterprises (Federal Broadcast Information Service 1995). Also, the Government of based its regulatory policies for mining and geological survey work on provisions in the Mining Law of 1993 (Act XLVIII). Section 50 of the Mining Law was the basis for Governmental Decree No.132/1993, which, in turn, comprises the legislative basis for the Hungarian Geological Survey. The Mining Law and related decrees and codes established the legislative bases for estimating reserves, determining environmental risks associated with mining, and providing the geological and technical information needed to outline tender conditions (Government of Hungary, 1993).

Government agencies that were responsible for enforcing

existing environmental protection laws and regulations included the Ministry of the Environment and Regional Planning (KTM) and the Hungarian Mining Office (MBH). KTM was authorized to help only in the enforcement of existing environmental legislation prescribed by other ministries of the Government. With respect to mining and minerals, Hungary's Ministry of Industry and Commerce had the primary responsibility for establishing environmental regulatory standards. The chief responsibility of MBH was that of a certifying agency, which could review only technical developmental and operational plans. These plans were required to include provisions pertaining to environmental protection and land restoration by responsible entities.

From 1993 to 1996, Hungary's mineral-commodity production trends have been showing increasing correspondence to market demands as opposed to those of central economic planning norms, which were required before 1990. (*See table 1.*) Table 2 lists the names of the major operating companies in Hungary's minerals industry and provides their general location. (*See table 2.*)

Following the decision by the Government to denationalize heavy industrial enterprises, a process of privatization was undertaken in the country's alumina, aluminum, and bauxite sector in early 1996. Three subsidiaries of HUNGALU (the Hungarian Aluminum Corporation) that were privatized were Magyarovar Alumina and Electrocorundum Ltd. (MOTIM), a refinery with the capacity to produce 75,000 metric tons per year (t/yr) of refractory-grade calcined alumina; Inota Aluminium Works Ltd. (Inota), with a capacity to produce 34,000 t/yr of aluminum; and Metalucon Metal Structure Manufacturing & Trading Ltd., a fabricator of aluminum products. The sale of shares was handled by APV Rt., the privatization agency of Hungary. Bid invitations for MOTIM and Inota were issued in November 1995 (Metal Bulletin, 1996d). Altus GPS, a Hungarian consortium, successfully bid for the State's share in MOTIM. Magyar Aluminium of Hungary successfully bid for Inota (Metal Bulletin, 1996d).

The final sale agreement concerning MOTIM, which was reached in March 1997, it into a share-based public company. Also, MOTIM reported strong demand for its products from the country's glass- and steel-producing sectors with orders engaging the company's full capacities well into 1997 (Industrial Minerals, 1996).

At yearend Ajka Aluminium Industrial Ltd. (Ajka), also a subsidiary of HUNGALU, was offered for sale. The privatization of Ajka, a refinery with a capacity to produce 400,000 t/yr of alumina, involved the sale of 90% of the

enterprise's shares; 10% of the stock reserved for Ajka employees, who were to be allowed to purchase shares at 50% of the final bid price (Metal Bulletin, 1996c).

A number of prospective buyers offered bids at yearend. Conditions for the sale of Ajka stock included commitment to maintaining its existing contracts with Hungary's bauxite mines and its shareholdings in the bauxite mining sector of Hungary. Prospective bidders had to guarantee the plant's operation for at least 10 years and to agree to provide alumina to the Inota primary aluminum smelter (Metal Bulletin, 1996c). Additionally, the new majority stockholder would have to agree to maintain current employment levels (1,200) and to abate levels of environmental pollution.

The sale of Hungary's other alumina producer, Almasfuzito, to the Hungarian consortium, Hungaralumina (Alucan, 50%; Alfer and Metalservice, each 25%), was finalized at yearend 1996. The company had been managed by Hungaralumina for about 3 years (Metal Bulletin, 1996c).

In 1996, Alcoa of the United States reportedly negotiated with its Alcoa-Kofem joint-venture partner HUNGALU to acquire Hungalu's 49.9% interest in the Szekesfehervar aluminum fabricating plant, which will give Alcoa 100% ownership of the enterprise. The original Alcoa-HUNGALU (Alcoa-Kofem) joint venture in Szekefehervar, established in January 1993, gave Alcoa 50.1% of the shares and the balance to Hungalu. Alcoa plans to integrate operations of the Hungarian aluminum extrusion, sheet, plate, and construction materials-producing facility with those of three similar plants it operates in the European market. Alcoa also had begun the construction of a new US\$32 million plant at Szekesfehervar designed to produce forged aluminum wheels (Metal Bulletin, 1996a).

Although Hungary no longer mined copper in the Recsk area, in the northern part of the country, the 900 to 1,100 meters (m) deep Recsk ore body in the Matra mountains contained between 172 and 175 million metric tons (Mt) of copper ore, grading 1.12% copper, and about 20 Mt of polymetallic ore, grading 4.22% lead and 0.92% zinc along with smaller quantities of gold, molybdenum, and silver. Geological investigations conducted by the Government determined the area of mineralization to be about 10 square kilometers. The Recsk copper mining enterprise (Recski Erbanyak Vallalar) was scheduled for privatization by the end of March 1996. During the preceding 2 years, APV Rt, reportedly had been negotiating the sale of the Recsk copper deposit with MCC-OCL, a U.S.-Chinese consortium (Mining Journal, 1996b). A spokesperson for APV Rt reported the tender for the sale of Hungary's Csepeli Femmu Rt (Csepeli) copper refinery to have been unsuccessful. The copper refinery, which produces copper semimanufactures, had been valued at about US\$10.4 million. APV Rt's original tender offered 70% of the enterprise's shares for sale. The sole bidder (unnamed) apparently had failed some of the terms and conditions of the sale. APV Rt subsequently planned to revise its privatization program for Csepeli (Mining Journal, 1996a).

In 1996, CAMECO conducted the engineering study to determine the best mining methods for the Lahoca copper-gold deposit. If the results of the feasibility study are positive, then

mining could begin in mid-1997 (Mining Magazine, 1996a). Additionally, Rio Tinto Corp. of the United Kingdom and Humex-Illit of Hungary each received a 35-year gold exploration and mining concession in the northern part of the country from the Government of Hungary (Mining Magazine, 1996b).

In 1996, the combined output of Hungary's principal steel producers, Dunafer (Dunai Vasmu), Ostag-Ozdi Acelmu Rt, and Dimag-Diosgyoer Stock Corp., amounted to about 2 Mt of crude steel. APV Rt announced plans to tender a 5-year management contract to operate Dunafer. To privatize Dunafer fully between 2002 and 2005, APV Rt would be seeking a potential owner/investor with sufficient resources to modernize the enterprise's aging plant and equipment. APV Rt estimated that the renovation of Dunafer could cost between US\$400 million and US\$530 million. Exports of steel have accounted for about 50% of Dunafer's total sales in 1995 (Metal Bulletin, 1996b).

Hungary's only deposit of high-quality glass sand was mined at Fehervarcsurgo. The deposit, containing quartz sand of Pannonian age, has been mined since 1962. Before 1990, the operation was state owned and operated. In 1990, it became a joint stock company with shares owned by the enterprise's employees and the Government of Hungary. In 1992, Üveg-Ásvány Kft. (Glass-Mineral Mining Industrial Ltd.), the operator of the deposit, was acquired by NAVAN Plc. of Ireland, which had acquired a controlling 49% share of Üveg-Ásvány Kft. stock (Üveg-Ásvány Kft., 1992; Károly KÖvári, Chief Engineer, Üveg-Ásvány Kft., oral commun. September 3, 1997). Currently, the company produces from 250,000 to 300,000 t/yr of glass sand. The product is shipped to customers either bagged or in bulk form. The output of this enterprise meets about 20% of Hungary's total industrial requirement for silica sand. The major consumers are glass factories and electric light manufacturers, as well as the ceramics industry.

Hungary was a major European producer of high-quality perlite. The country's only deposit was exploited in Pálháza, in the northeastern part of Hungary, by Perlit-92 Kft., a company jointly owned by NAVAN and Hungarian investors. Perlite is a volcanic glass, having numerous concentric cracks and generally a higher water content than obsidian. The deposit overlays upper Miocene sediments and is, in turn, overlain by perlitic rhyolites; the footwall is andesite.

Hungarian perlite is a primary volcanic material and is, therefore, stronger than the sedimentary type of material that is mined on the island of Milos in Greece, which is the second important European source of the mineral. According to company officials, Palhaza's reserves of perlite amounted to about 3 million tons and were sufficient for about 20 years of exploitation. Perlite in Pálháza was discovered in 1956, and the first production by open-pit mining started in 1959. From 1959 to 1991 the average annual output was about 50,000 t/yr. In addition to this deposit two nearby deposits recently were discovered about 20 km from Pálháza. They contain mainly sedimentary Milos-type material, although some primary volcanic perlite is also present. The resources at these deposits were believed to be sufficient for about 8 to 10 years of mining

(Perlit-92 Kft., 1992; Dr. Farkas Géza, Managing Director, Perlit-92 Kft., oral commun., September 2, 1997).

In 1996, the Pálháza operation had the capacity to produce about 120,000 tons per year of perlite. The labor force amounted to 100 employees, operating the mine and processing (milling) plant in three shifts. After processing, the swelled or expanded perlite is shipped to customers for use in the production of construction materials and as a filtering agent in agricultural and environmental protection applications as well as in the food and pharmaceutical industries (Perlit-92 Kft., 1992; Dr. Farkas Géza, Managing Director, Perlit-92 Kft., oral commun., September 2, 1997).

About 20% of the country's annual output of perlite is consumed domestically, and the balance, exported. Major importers of Hungarian perlite were Germany and Austria, accounting for about 70% of total exports in recent years. Other importers of Pálháza perlite were the republics of former Yugoslavia, the Czech Republic, the Republic of Korea, Russia, and Slovakia.

Renaissance Stone Masonry Rt, a major Hungarian producer of dimension stone, was acquired by the Cononish Corporation of Scotland (50.6%) in 1995. The corporation focused on improving its quarrying and stone processing divisions, with the majority of capital expenditure aimed at the Tardos and Sutto quarries and the Sutto processing plant. At the same time, the company divested itself of its uneconomic construction division (Caledonia, 1995). Production of cut block in 1995 rose from 4,444 cubic meters (m³) to 5,644 m³ in 1994. To further raise profitability, waste rock would be processed to a final marketable product with the addition of a new processing line in 1996.

Domestically produced coal, natural gas, and petroleum have accounted for about one-half of Hungary's energy needs. In 1996, most of the country imports of natural gas and petroleum came from the republics of the former Soviet Union. Major changes in the natural gas sector in 1995-96 involved the privatization of the country's gas distribution system. Foreign buyers acquired majority shares of stock in Hungary's five gas distribution companies. Additionally, the shares of stock owned by the Government of Hungary in MOL, the country's vertically integrated oil and gas producing company, decreased from 88% to 55% in 1996 with the sale of stock to domestic and foreign investors (Petroleum Economist, 1996). Among the foreign buyers of Hungarian natural gas distribution companies was Gaz de France, which acquired 51% of the shares in EGAZ and DEGAZ in Győr and Szeged, respectively (Gaz de France, 1996).

Railways carried a substantial amount of Hungary's mineral freight. The railroad network consisted of about 7,800 km of track, of which about 7,500 km was 1.435 m standard-gauge track. Of the total volume of mineral freight carried in Hungary, railroads carried 45% of the fuels, 19% of ores and other mining products, 26% of the construction materials, and 74% of the total amount of iron and steel and nonferrous metal products.

Hungary also had access to maritime ports on the Baltic Sea in Poland at Gdansk and Gdynia, as well as at Rostock in the former German Democratic Republic. Major ports on the Danube River were at Budapest and Dunaujvaros. Marine transport carried 0.7% of the fuels, about 3% of the ores and mining-related products, 0.7% of the construction industry's products, and about 6% of the iron and steel and nonferrous metals.

Hungary's highways had a total length of 130,000 km, of which about 28,700 km was part of the national highway system. This system carried about 14% of the fuels, 78% of the ores and mining-related products, 73% of the construction industry's products, and 20% of the iron and steel and nonferrous metals.

The country's pipeline network consisted of a 1,204-km line for crude oil, a 600-km line for refinery products, and a 3,800-km pipeline for natural gas. The pipelines carried about 40% of the total fuel transport.

The total net installed electric-generating capacity amounted to about 7,000,000 kilowatts (kW), of which 4,750,000 kW was rated by thermal electric generating plants; 1,760,000 kW, by nuclear powerplants; and 46,000 kW, by hydroelectric power facilities.

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TABLE 1
HUNGARY: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/ METALS	1992	1993	1994	1995	1996 e/
Aluminum:					
Bauxite, gross weight thousand tons	1,720	1,561 r/	836 r/	1,015 r/	1,043 3/
Alumina, gross weight, calcined basis do.	548	421	177	184 r/	208 3/
Metal:					
Primary	26,865	27,879	30,740	25,000 e/	--
Secondary e/	20,000	25,000	3,000	4,000	82,748 3/
Total e/	46,865	52,879	33,740	29,000	82,748
Copper, metal: e/					
Smelter, secondary	100	100	100	100	100
Refined including secondary	12,000	11,000	11,000	11,000	11,000
Gallium, mine output metal content kilograms	7,000 r/	7,000 r/	5,577 r/	4,187 r/	5,000
Iron and steel, metal:					
Pig iron thousand tons	1,176	1,407	1,590	1,515 r/	1,496 3/
Ferroalloys e/ 4/	8,500	8,500	8,000	8,000	8,000
Steel:					
Crude thousand tons	1,559	1,752	1,945	1,865 r/	1,969 3/
Semimanufactures, rolled only do.	1,670	1,835	2,074 r/	2,117 r/	2,133 3/
Manganese ore:					
Run of mine:					
Gross weight	32,000	38,000	40,000	37,000 r/	33,813 3/
Mn content e/	6,900 r/	9,200 r/	13,000 r/	9,600 r/	8,800
Concentrate:					
Gross weight	18,000	59,000	25,000	25,000 e/	20,000
Mn content e/	5,400	17,500	7,500	7,500	6,000
Zinc, metal, smelter, secondary e/	1,000	1,000	-- 3/	--	--
Uranium, U3O8 content	489	499	503	277	250
INDUSTRIAL MINERALS					
Cement, hydraulic thousand tons	2,240	2,530	2,810	2,875 r/	2,776 3/
Clays:					
Bentonite:					
Raw	23,000	9,404	14,700	22,792 r/	15,376 3/
Processed	15,000	8,000 e/	12,000	12,000 e/	9,000
Kaolin, raw and washed	7,000	15,000	15,000	10,959 r/	9,854 3/
Gypsum and anhydrite	50,000 e/	125,000 r/	151,000 r/	198,000 r/	190,000
Lime, calcined thousand tons	507	476	464	538 r/	489 3/
Nitrogen, N content of ammonia do.	152	237	250	250 e/	250
Perlite	83,000	80,000	85,000	151,000 r/	150,000
Refractory materials, n.e.s.:					
Chamotte products thousand tons	19	20	20	19 r/	20
Chrome magnesite products do.	41	3	5	4 r/	5
Sand and gravel:					
Gravel do.	8,000 e/	8,000 e/	8,103 r/	10,906 r/	4,399 3/
Sand:					
Common do.	200 e/	200 e/	104 r/	206 r/	275 3/
Foundry do.	184	15	12	159 r/	9 3/
Glass do.	660	260	308	523 r/	325 3/
Sodium compounds:					
Hydroxide (caustic soda)	139,000	130,000	132,000	159,215 r/	160,167 3/
Sulfate e/	6,000	6,000	-- r/ 3/	-- r/ 3/	-- 3/
Stone:					
Dimension, all types thousand tons	3,650	4,030	5,206 r/	4,967 r/	5,000
Dolomite do.	298	644	933 r/	1,001 r/	582 3/
Limestone do.	3,700	3,920	4,273 r/	4,340 r/	4,771 3/
Sulfur: e/					
From pyrite	900	800	-- r/	-- r/	-- 3/
Byproduct, elemental, all sources	8,000	8,000	30,890 r/ 3/	28,802 r/ 3/	28,000
Total	8,900	8,800	30,890 r/	28,802 r/	28,000
Sulfuric acid	94,900	71,300	83,700	106,737 r/	89,955 3/
Talc	2,000 r/ e/	1,800 r/	1,500 r/ e/	1,150 r/	1,200

See footnotes at end of table.

TABLE 1--Continued
HUNGARY: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity 2/	1992	1993	1994	1995	1996 e/	
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand tons	1,274	942	1,024	844 r/	962 3/
Brown	do.	7,630	6,600	5,710	6,458 r/	6,517 3/
Lignite	do.	7,020	5,050	6,760	7,151 r/	7,575 3/
Total	do.	15,924	12,592	13,494	14,453 r/	15,054
Coke, metallurgical		719	643	650	650 e/	650
Fuel briquets	thousand tons	682	605	410	362 r/	325 3/
Gas, natural, marketed	million cubic meters	5,060	5,010	5,900	5,451 r/	5,134 3/
Peat, agricultural use e/	thousand tons	65	65	65	48 r/ 3/	50
Petroleum:						
Crude:						
As reported	do.	1,830	1,710	1,600	1,669 r/	1,477 3/
Converted	thousand 42-gallon barrels	12,200	11,400	10,700	10,800	9,800
Refinery products 5/	do.	45,700	41,200	41,000	41,000	40,000

e/ Estimated. r/ Revised.

1/ Table includes data available through Nov. 1997.

2/ In addition to the commodities listed, diatomite and a variety of other crude construction materials, such as, common clays are produced, but available information is inadequate to make reliable estimates of output levels.

3/ Reported figure.

4/ Hungary is believed to produce some blast furnace ferromanganese.

5/ Excludes refinery fuel and losses.

TABLE 2
HUNGARY: STRUCTURE OF THE MINERAL INDUSTRY FOR 1996

(Thousand of metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Alumina	HUNGALU (Hungarian Aluminum Corp.)	Ajka Timfoldgyar plant, about 120 kilometers southwest of Budapest, near Lake Balaton	400
Do.	do.	Almasfuzito Timfoldgyar plant near the Czech Republic border, 63 kilometers northwest of Budapest	350
Do.	do.	Moson-Magyarovar plant, in northwest corner of Hungary, about 12 kilometers from Austrian and Czechoslovak border	75
Aluminum, primary	do.	Inota plant, near Varpalota, 75 kilometers southwest of Budapest	46
Bauxite	do.	Bakony District, extending roughly 100 kilometers northeast along Lake Balaton	1,500
Do.	Fejer County Mining Enterprise	Fejer County, Vertes District, about 60 kilometers south of Budapest	1,060
Cement	Cement es Meszmuvek	Belapatfalva, near Miskolc, 125 kilometers northeast of Budapest	1,200
Do.	do.	Beremend, 45 kilometers south of Pecs	1,100
Do.	do.	Hejocsaba, 150 kilometers northeast of Budapest	1,600
Do.	do.	Labatlan, 20 kilometers north of Tatabanya	500
Do.	do.	Selyp, 50 kilometers north of Budapest	60
Do.	do.	Tatabanya, 80 kilometers west of Budapest	500
Do.	do.	Vac, 50 kilometers north of Budapest	1,200
Coal:			
Bituminous and lignite	Magyar Szenbanyaszati Troszt (MSZT) (Hungarian Coal Mining Trust)	Tatabanya and Oroszlany coal mining region, 45 kilometers west of Budapest	8,900
Do.	do.	Mecsek coal mining region, near Pecs and Komlo, north of the Yugoslav border	3,100
Do.	do.	Borsod coal mining region, 130 kilometers northeast of Budapest	5,200
Lignite	do.	Thorez opencast mine at Visonta, 80 kilometers northeast of Budapest	7,000

TABLE 2--Continued
HUNGARY: STRUCTURE OF THE MINERAL INDUSTRY FOR 1996

(Thousand of metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Manganese		Orszagos Erc-es Asvanybanyak (National Ore and Mineral Mines)	Urkut manganese ore mines, 120 kilometers southwest of Budapest	160
Natural gas	million cubic feet	Hungarian Oil and Gas Co. (MOL)	Szeged and Algyo gasfields, southern Hungary	152,000
Do.		do.	Hajduszoboszo gasfields, 180 kilometers east of Budapest	50,000
Do.		do.	Smaller gasfields: Szank, Kardoskut, Bekes, Berefurdo, and others	39,000
Petroleum:				
Crude	million barrels	do.	Szeged-Algyo field, near Romanian-Yugoslav border; 50% of total capacity	7
Refined:		Subsidiaries of MOL:		
Do.	do.	Danube Petroleum Refining Co.	Szazhalombatta	55
Do.	do.	Tisza Petroleum Refining Co.	Leninaváros	22
Do.	do.	Zala Petroleum Refining Co.	Zalaegerszeg	4
Steel		Dunai Vasmu (Danube Steel Works)	60 kilometers south of Budapest	1,400
Do.		Ostag-Ozdi Acelmu Rt	120 kilometers northeast of Budapest	700
Do.		Dimag-Diosgyoer Stock Corp.	Diosgyoer, 145 kilometers northeast of Budapest	954
Do.		Cepel Iron and Steel Works	Budapest	171