

THE MINERAL INDUSTRY OF CZECH REPUBLIC

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The Czech Republic again reported positive economic performance for 1995. The country's gross domestic product (GDP) grew by about 4.8% compared with that of 1994 and industrial output rose by almost 6.0% during the same period. The steep decline in industrial output that occurred from 1991 through 1993, owing to structural changes in the economy during the country's transition from central economic planning to a market-based economic system, appeared to have stopped by early 1994, and recovery continued throughout 1995. The Czech Republic's minerals industry showed stabilization of production, largely in the industrial minerals sector and in the steel industry. On the other hand, metal mining, except that for gold and uranium, had ceased because of unfavorable markets. In the mineral fuels sector, the decline in the output of coal was balanced somewhat during the year by an increase in the production of natural gas and petroleum. The Czech Republic remained an important regional producer of steel, industrial minerals, and building materials. Foreign commercial agreements on gold prospecting and the addition of new capacities in the steel industry were among the noteworthy activities in the minerals industry in 1995.

Taking into account the new economic climate that was emerging in the Czech Republic, the Government began to develop pragmatic programs to bring about the rapid denationalization of the country's economy and, where necessary, the modernization of industrial processes. Realizing that foreign investment could be an appropriate vehicle to help achieve both ends, the Government started to widen the dissemination of public information, much of which was unavailable during the Communist regime. To help address the needs of the country's minerals industries, the Ministry of Industry of the Czech Republic, under advisement from its Department of Minerals Resources and Geological Survey, in 1995 continued to issue the "Mineral Commodity Summaries of the Czech Republic." This document was patterned on similar publications by the U.S. Bureau of Mines and those of several other major market economy countries. Additionally, this report also was published in English and included information on mineral characteristics, domestic ore production and use, mineral deposits and reserves, outlook, the world's main mineral producers, industrial minerals and rocks, building materials, and fossil fuels.¹

The mining code of the Czech Republic (consolidated text

of 1992, Law No. 439/1992) and the decree of the Ministry of Environmental Protection of May 1992, No. 364 on protected areas of mineral deposits, respectively, addressed issues pertaining to the exploitation of the country's mineral deposits and the protection of the environment in the vicinity of the deposits.² Reportedly, a new mining law was to have been drafted jointly by the Ministries of the Economy and Environmental Protection. In April, it was announced that separate bills drafted by each agency were joined, but that a number of differences of interpretation of various provisions and definitions still had to be resolved.

The interdependence between the future of the minerals industry of the Czech Republic and the abatement of industrial point sources of pollution continued to be an important issue in the country in 1995. As in other former member countries of the CMEA, the development of heavy industries in the Czech Republic, including those for steel production and the mining and processing of metals, fossil fuels, and industrial minerals, was carried out largely without reference to market economy or environmental considerations from 1946 to 1989. The Czech Republic's industry, compared with those of market economy countries, became relatively inefficient and polluting. Industrial pollution in the Czech Republic had been severe, largely from point sources associated with steelmaking and with low-grade, coal-burning electric powerplants, as well as with the country's cement and chemical industries.

Operative environmental legislation for the Czech Republic was Law No. 17/1992, which set basic definitions and principles regarding environmental protection as well as the obligations of "legal and physical persons (bodies)" for protecting the environment during the use of natural resources. In December 1993, the Ministry of the Environment drafted a report, titled, "The Environmental Policy of the Czech Republic."³ The report established priorities for the Government's environment policies that accorded with those described in "An Environment for Europe" by the United Nation's Economic Commission for Europe. It was based on the requirement to "limit risks to human health and risks which threaten to create irreversible changes and damage to the environment."

Policy proposals specific to mining were covered under the geologic environment component of the report. The given aims were to promote the efficient use of nonrenewable natural resources; limit the contamination of the geologic

environment; protect rare natural occurrences, such as geologic outcrops, rare minerals, and palaeontological sites. Proposed measures in pursuit of these goals included restrictions on mining as a basis of the country's source of raw materials; the integration of cutbacks in the mining industry with the establishment of funds for land reclamation; the construction of hazardous waste dumps, including those for radioactive materials; and the enforcement of environmental auditing of mining operations. Additionally, recommendations were made to require a reduction in the consumption of raw materials and energy, increase the use of local secondary raw materials and renewable material resources, and limit exports of primary raw materials.

However, in 1995, Czech sources reported that environmental accession standards established by the European Union (EU) were placing an increasingly heavy strain on the country's industry.⁴ In many cases, the investment of foreign capital in the Czech Republic's industry had been discouraged and/or prevented when the scope of funds needed for environmental remediation had been revealed. Reportedly, fees for waste removal in many cases have been growing beyond the means of many industries, thereby affecting both production and investor confidence. Reportedly, some enterprises involved in processing industrial minerals would have to allocate more money to clean up a property than the value of the facilities on the land.

The production results for metals in 1995 showed overall stabilization and some growth. The output of pig iron and crude steel in 1995 appeared to have stabilized at approximately the same level of output that was achieved in 1994. The mine output of most nonferrous metals, however, had ceased or showed only minimum production. Such was the case of mined uranium and zinc ores. (*See table 1.*) The Czech Republic no longer would exploit uneconomic mineral resources, as often was the case when the country's minerals industries were operating under a system of central economic planning. The relatively improved showing of the country's steel and industrial minerals sectors was consonant with emerging market priorities that addressed issues of infrastructural modernization and the export of marketable high value steel-based durable goods. (*See table 1.*) Table 2 lists the administrative bodies as well as subordinate production units of the main branches of the country's mineral industry in 1994. (*See table 2.*)

By yearend 1994, the value of total exports of the Czech Republic increased by about 7% compared with that of 1993 and the value of imports by slightly more than 13%. The member countries of the EU collectively were the Czech Republic's largest trading partner in terms of total exports and imports.⁵ However, Russia and other Republics of the former Soviet Union (FSU) maintained their position as a major supplier of mineral and mineral fuel commodities. Major mineral imports by the Czech Republic in 1994 included 6.5 Mt of crude petroleum, which was an increase

of 16% compared with that of 1993; 7.3 million cubic meters (Mm³) of natural gas, an increase of about 8% compared with those of 1993; and about 7.3 Mt of iron ore, or a decrease of slightly more than 3% for the same period. Mineral exports for 1994, selectively published in official trade statistics, included cement, 2,069 Mt; kaolin, 345,000 t; and limestone, 53,000 t, which showed declines of 1%, 19%, and 72%, respectively, compared with those of 1993.⁶

In 1995, Canadian companies continued to play a prominent role in the Czech Republic's gold mining sector. In early 1995, Menora Resources, a Canadian firm based in Toronto, planned to acquire milling royalties and a package of other options at five gold mines in the Czech Republic. Menora was to receive US\$0.25 per ton of ore for the first 10 million tons of ore processed, and afterwards US\$0.10 per ton of ore treated to a maximum of 11 million tons. The option package involved the trade of 4 million shares by Menora for a 10% working interest in the five mines.⁷

Greenwich Resources Plc. of the United Kingdom reported that its analysis has indicated the existence of a large, low-grade gold deposit at Vacikov-Petrackova Hora in the Czech Republic.⁸ The data for this study was derived from Greenwich's wholly owned exploration area at Rozmítal in the Czech Republic. Reportedly, on the basis of Greenwich's data, it was estimated that the deposit contained 27 Mt of ore grading 1 g/t gold, or about 907,000 troy ounces of contained gold. Gold mineralization occurred in a series of quartz veins within a grandioritic intrusive. It was believed that additional similar intrusives in the area may extend the resource of gold in the region. Area studies conducted by the Czech Government have determined the gold resources to be near or at the surface, which would make them amenable to surface mining. However, Czech Government's assaying of the deposit apparently has understated the gold value by about 8% and a reevaluation of the Czech estimates was conducted during the year.

According to the Ministry of the Economy of the Czech Republic, the Government had spent US\$3.8 million on gold exploration by 1995. Of the 27 sites where gold has been identified, 16 deposits were selected for additional study.⁹

In 1995, Poldi Ocel, one of the country's main steel producers, reported that domestic demand for steel was showing recovery with the number of contracts from the the Czech Republic's industrial consumers increasing by between 15% and 20% compared with those of 1994.¹⁰ At the same time, Poldi Ocel reported operations to have been at full capacity.

Foreign investment in the steel industry during the year included an agreement between Zelezarny a Dratovny Bohumin (ZDB) steelworks and Bekaert, a Belgian producer of drawn wire and cable, to build a new wire drawing facility at Bohumin.¹¹ Reportedly, Bekaert was to own 55% of the new factory, 45% would be owned by ZDB. Total investment would amount to about \$US33 million and the plant would produce high- and low-carbon steel wires beginning a t

yearend 1996. Full capacity would be reached by the year 2000 to produce 80,000 t/yr of steel wire.

The two major uranium deposits in the Czech Republic are at Rozna in Western Moravia (hydrothermal mineralization), and at Hamr, near Straz pod Ralskem in Northern Bohemia (uranium-bearing sandstones bounded by chalks). There are also resources of uranium near the Krusne Hory range associated with tertiary sediments. About 60% of the uranium was extracted through underground mining and the balance, at Hamr, by in situ underground chemical leaching. Total commercial resources were estimated at about 139,000 t of uranium metal contained in the ore.

In view of the transition of the Czech economy to a market economy system, the cessation of Russian purchases of Czech uranium for processing, low world market prices for uranium, as well as Slovakia's decision to buy the abundant and less expensive Russian material, the future of this sector would depend on the continued operation of the Dukovany nuclear electric power station and the completion of construction of the Temelin nuclear power station in 1995. In 1995, Government sources indicated that with the completion of the Temelin nuclear powerplant, the country's consumption of uranium would reach almost 700 t. The rated consumption of uranium at the Dukovany nuclear powerplant was 330 t/yr, while that at the two blocks of the Temelin facility would be 360 t/yr.¹² Because of the low international prices for uranium, Czech material has not been competitive in the market, but current stocks reportedly were sufficient for 5 years of operation at the two nuclear electric power facilities.¹³ Proposals by the power industry during the year discussed the possibility of temporarily closing mining and processing operations at Bystrice nad Pernstejnem as well as the purchase of a portion of the power industry's uranium requirement in the market, from domestic stocks, as well as imports.¹⁴

The Czech Republic continued to be a major producer of industrial minerals in the Central European region with resources sufficient to meet both domestic and export needs. Major activities in the country's cement industry in 1995 involved the modernization at two cement plants with the participation of IKN GmbH of Germany. Cementarna a vapenky Prochovice announced plans to install a 3,400-metric tons-per-day (t/d) cooling unit supplied by IKN GmbH. IKN GmbH also was involved in the modernization process at Cizkoviccka Cementarna where an existing cooler was modified with the installation of a pendulum cooler with a roller crusher (2,100 t/d).¹⁵

In the Czech Republic, the brown coal-lignite-producing areas were at Brno, Kladno, Most, Plzen, Skokolov, and Trutnov. Reportedly, 90% of the brown coal-lignite was extracted by surface mining and is typically a high ash and sulfur product ranging from 6.6% to 41.1% in ash content (30% average). The coal's sulfur content ranged from 0.7% to 6.0% (1.8% average). Most of the brown coal and lignite was consumed by the country's electric power generating

industry, causing a significant SO₂ emission problem. Bituminous coal was mined entirely underground by the longwall method at the East Bohemia, West Bohemia, Kladno, and Ostrava-Karvina Doly (OKD) coalfields. The Kladno and OKD coalfields were the largest producers of bituminous coal, respectively accounting for about 6% and 88% of the country's total bituminous coal output. About 73% of the coal produced at OKD has been suitable as coking coal. Kladno's entire output consisted of steam coal.

In 1995, owing to a decline in the domestic demand for bituminous coal as well as to imports of cheaper coal from nearby countries, OKD has been forced in recent years to close several mines. However, mining operations in the Karvina region were to continue and the profitability of OKD's overall operations were expected to be supported largely by noncoal mining subsidiaries, such as the coke, chemical, construction, and engineering businesses.¹⁶

The near-term outlook for the Czech Republic's economy and mineral industry appears to be good, especially in comparison with most other former centrally planned economy countries of Eastern Europe. The country's highly focused and vigorous economic restructuring program apparently has stimulated substantial foreign investment in the country's minerals industries—a trend that is likely to continue for the foreseeable future. With scientific and technical excellence as one of the main components of the country's cultural tradition, the Czech Republic can be expected to extend its influence throughout the region known as Eastern Europe as well as the Republics of the FSU. Industries such as steel, ceramics, and construction materials should continue to meet the needs of both the country's domestic and foreign customers.

¹Mineral Commodity Summaries of the Czech Republic. Geofond, Prague, May 1995.

²Rocnik 1992, Sbirka zakonu Ceske a Slovenske Federativni Republik. Nos. 74 and 87.

³The Environmental Policy of the Czech Republic (Draft by the Minister of the Environment). Prague, Dec. 1993.

⁴FBIS-EEU-95-204-A. Oct. 23, 1995, p. 22; from CTK, 1402 GMT, Oct. 13, 1995.

⁵External Trade, Jan.-Dec. 1994. No. 19, Czech Statistical Office, Prague, Feb. 1995, pp. 12-22.

⁶Economic and Social Indicators of Czech Republic. Czech Statistical Office, No. 4, 1994, pp. A-20-A-21.

⁷The Northern Miner. Feb. 20, 1995, p. 19.

⁸Mining Journal (London). Mar. 24, 1995, p. 213.

⁹_____. Aug., 18, 1995, p. 115.

¹⁰FBIS-EEU-95-083-S. May 1, 1995, p. 13; from CTA, 0708 GMT, Mar. 18, 1995.

¹¹FBIS-EEU-95-209-S. Oct. 30, 1995, p. 5; from CTK, 0806 GMT, Sept. 19, 1995.

¹²Mining Journal (London). June 30, 1995, p. 482.

¹³Work cited in footnote 12.

¹⁴FBIS-EEU-95-083-S. May 1, 1995, p. 17; from CTA, 0612 GMT, Mar. 26, 1995. And, FBIS-EEU-95-071, Apr. 13, 1995, p. 9; from Hospodarske Noviny Apr. 10, 1995, p. 3.

¹⁵Rock Products—Cement Edition. May 1995, p. 42.

¹⁶Mining Magazine. V. 172 No. 5, May 1995, p. 308.

TABLE 1
CZECH REPUBLIC: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity		1991	1992	1993	1994	1995 e/
METALS						
Aluminum, secondary		--	--	30,000 e/	48,339 r/	48,000
Antimony, mine output, Sb content		384 r/	224 r/	--	--	--
Antimony, metal		324	223	--	--	--
Copper:						
Metal:						
Refined, primary 2/		600	500	200	--	--
Refined, secondary		20,000 e/	20,000 e/	20,000 e/	23,323 r/	20,000
Gold metal	kilograms	564	521	512 r/	75	-- 3/
Iron and steel:						
Iron ore:						
Gross weight	thousand tons	102	64	-- 3/	--	--
Fe content		32,844 r/	20,608 r/	-- r/	--	--
Metal:						
Pig iron	thousand tons	5,810	5,082 r/	4,668 r/	5,287 r/	5,289 3/
Ferrous alloys, total electric furnace e/	do.	1	1	1	1	1
Steel, crude	do.	7,972 r/	7,340	6,732 r/	7,075 r/	7,000
Semimanufactures	do.	7,167 r/	7,000	7,000	6,445 r/	6,400
Lead:						
Mine output, Pb content		2,100	1,100	100	--	--
Concentrate, gross weight		2,011 r/	2,000	2,000	-- r/	--
Pb content of concentrate		1,030 e/	1,000	1,000	500	--
Metal, secondary		17,800	24,000	20,000	20,000	20,000
Silver	kilograms	8,900	6,200	500	100	-- 3/
Tin:						
Mine output, Sn content		15	--	--	--	-- 3/
Metal, primary and secondary		118 e/	115	115	100	100
Tungsten, mine output, W content		12	--	--	--	-- 3/
Uranium, mine output, U content		1,827 r/	1,631 r/	1,018 r/	537	611 3/
Zinc: e/						
Mine output:						
Ore (Pb-Zn), gross weight		353,000 3/	220,000	250,000	15,000	-- 3/
Zn content of ore		8,500 3/	4,400 3/	1,500 3/	100	-- 3/
Concentrate, gross weight		9,760 3/	9,000	9,000	9,000	--
Zn content		4,800	4,400	4,000	4,000	--
Metal, secondary		811 3/	1,070 3/	1,000	1,000	1,000
INDUSTRIAL MINERALS						
Barite		1,000	--	--	--	-- 3/
Cement, hydraulic	thousand tons	5,610	6,145 r/	5,393 r/	5,303 r/	4,825 3/
Clays:						
Bentonite	do.	125	135	63	65	54 3/
Kaolin	do.	2,913 r/	2,530	2,336 r/	2,706 r/	2,800 3/
Other	do.	947	903	1,018	823	915 3/
Diatomite		68,000	57,000	39,000	40,000	29,000 3/
Diamond, synthetic e/	carats	5,000	5,000	5,000	5,000	5,000
Fertilizer, manufactured:						
Nitrogenous, N content		182,000	180,000 e/	180,000 e/	247,000 r/	264,000 3/
Phosphatic, P2O5 content		46,300	40,000 e/	40,000 e/	13,700	14,000
Potassic, K2O content		23,100	20,000 e/	20,000 e/	21,900	22,000
Mixed		55,300	50,000 e/	50,000 e/	156,700 r/	117,000 3/
Feldspar		130,000	152,000	203,000	170,000	183,000 3/
Fluorspar		82,000	22,000	22,000	10,000	-- 3/
Gemstones, crude, pyrope-bearing rock		31,000	45,000	34,000	33,000	35,000
Graphite		47,000	20,000	27,000	25,000	27,000 3/
Gypsum and anhydrite, crude		569,000	660,000	560,000	591,000	542,000 3/
Lime, hydrated and quicklime	thousand tons	1,391 r/	1,337 r/	1,147 r/	1,206 r/	1,186 3/
Mica		--	--	--	--	3,803 3/
Nitrogen, N content of ammonia e/		200,000	200,000	200,000	287,000	250,000
Quartz		65,000	46,000	23,000	2,000	3,000 3/
Salt		183,597 r/	180,000	180,000	180,000	180,000
Sand and gravel:						
Common sand and gravel	thousand cubic meters	12,778 r/	12,772 r/	12,245 r/	11,465 r/	10,525 3/
Foundry sand	thousand tons	919	1,075 r/	954	1,093 r/	964 3/
Glass sand	do.	918	888	781	862	1,026 3/

See footnotes at end of table.

TABLE 1--Continued
CZECH REPUBLIC: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity		1991	1992	1993	1994	1995 e/
INDUSTRIAL MINERALS--Continued						
Stone:						
Basalt (for casting)		72,000	107,000	134,000	85,000	108,000 3/
Dimension stone	thousand cubic meters	198,000	176,000	177,000	223,000	200,000
Limestone and other calcareous stones	thousand tons	11,461 r/	11,134 r/	10,491 r/	10,205 r/	10,092 3/
Building Stone	thousand cubic meters	9,517 r/	8,412 r/	7,488 r/	8,224 r/	9,000
Sulfur, byproducts, all sources e/		20,000	20,000	20,000	20,000	20,000
Sulfuric acid e/		300,000	300,000	300,000	350,000	350,000
Wollastonite		--	--	--	--	800 3/
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand tons	25,769 r/	24,691 r/	23,862 r/	20,910 r/	21,309 3/
Brown and lignite	do.	77,488 r/	69,519 r/	68,154 r/	60,728 r/	58,773 3/
Coke	do.	6,467 r/	5,721 r/	5,236 r/	5,144 r/	4,945 3/
Fuel briquets from brown coal	do.	892	800	800	499 r/	470
Gas:						
Manufactured, all types	million cubic meters	5,380	5,000 e/	5,000 e/	1,136	1,100
Natural, marketed 4/	do.	125	132	106	154	165 3/
Petroleum:						
Crude:						
As reported	thousand tons	61	80	107	131	149 3/
Converted	thousand 42-gallon barrels	414	542	550	889	1,010
Refinery products e/	do.	90,000	90,000	70,000 r/	40,000 r/	40,000

e/ Estimated. r/Revised.

1/ Table includes data available through June 1996. In addition to the commodities listed, arsenic, diatomite, dolomite, illite, sodium compounds, sulfuric acid, talc, and zeolite are produced, but information is inadequate to make reliable estimates of output levels.

2/ Produced as a byproduct from noncopper ores.

3/ Reported figure.

4/ Includes gas produced from coal mines. Gross output of natural gas is not reported, but it is believed to exceed reported marketed output by a relatively inconsequential amount.

TABLE 2
CZECH REPUBLIC: STRUCTURE OF THE MINERAL INDUSTRY FOR 1995

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies 1/	Location of main facilities 2/	Annual capacity
Antimony ore	Krasna Hora	Central Bohemia	NA
Cement	Cizkovice, Hranice, Karlov Dvor, Lochkov, Pracovice, and Velary	Bohemia	3,500
Do.	Bystre, Malomerice, Mokra, Ostrava-Kunice, and Zahorie	Moravia	2,800
Clay, kaolin	Mines in Karlove vary area	West Bohemia	450
Do.	Mines in Plzen area	Central Bohemia	150
Coal:			
Bituminous	Mines in OKD coal basin	Ostrava-Karvina, north Moravia	22,100
Do.	Mines in KD coal basin	Kladno, central Bohemia	3,000
Brown	SHD administration	Most, northwest Bohemia	61,000
Do.	HDB administration	Sokolov, west Bohemia	17,000
Lignite	JLD administration	Hodonin, south Moravia	5,000
Copper, Ore	Zlate Hory	North Moravia	300
Lead-zinc, ore	Horni Benesov and Zlate Hory	do.	400
Lead, metal, secondary, Refined	Kovohute Pribram	Pribram	26
Natural gas	billion cubic meters Gasfields around Hodonin	South Moravia	25
Petroleum:			
Crude	Oilfields around Hodonin	do.	140
Refinery	Kolin, Kralupy, Pardubice, and Zaluzi	Bohemia	NA
Steel, crude	Nova Hut sp (Ostrava)	Kunice-Ostrava	3,800
Do.	Zelezarne Vitkovice	Vitkovice-Ostrava	1,900
Do.	Trinecke Zelezarny (Trinecke Iron and Steel Works)	Trinec	3,000
Do.	Poldi United Steel Works	Kladno-Prague	1,700
Do.	Zelezarny Bila Cerkev	Hradek-Rokycany	300
Do.	Zelezarny Veseli	Veseli and Moravou	300
Do.	Zelezarny Chomutov sp	Chomutov	350
Do.	Bohumin Iron and Steel Works	Bohumin	400
Tin, ore	Krasno (Stannum) and Cinovec	Northwest Bohemia	300

NA Not available.

1/ All mining companies are Government owned.

2/ Names and locations of mines and crude oil refineries are identical.