

# THE MINERAL INDUSTRY OF

# UKRAINE

By Richard M. Levine

Ukraine continued to be a major producer of coal, ferroalloys, ilmenite, iron ore, manganese ore, and steel. Also, the country was a producer of a number of other mineral products, including alumina, aluminum, cadmium, germanium, secondary lead, mercury, nickel in ferronickel, magnesium, rutile, titanium dioxide, uranium ore, secondary zinc, zircon, and zirconium, and a large number of industrial minerals, including dolomite, graphite, kaolin, limestone fluxes, potash, quartz, salt, soda ash, and a variety of building materials. As has been the case with nickel where it appears that mining has ceased, it is possible that for certain other mineral products the country has ceased or sharply reduced production.

In 1997, Ukraine's gross domestic product decreased by 3.2% compared with that of 1996, and industrial output decreased by 1.8%. In value of output compared with that of 1996, production increased in the ferrous metals sector increased 7.5%, the fuel sector by 4.5%, and the nonferrous metals sector by 2.7%, and production decreased in the chemicals and petrochemicals sector by 0.6%, the construction materials sector by 7.9%, and the power sector by 2.6% (Interfax Statistical Report, 1998a). A large percentage of transactions in the industrial sectors, however, was in the form of barter trade (Interfax Statistical Report, 1998b).

In 1997, mineral products composed a major segment of foreign trade. According to trade data available for the first 5 months of the year, metallurgical products accounted for 43% of the country's exports, and mineral fuels and petroleum products, 46.3% of imports (Interfax Statistical Report, 1998c). Russia remained Ukraine's major supplier of mineral fuels.

Practically all Ukrainian enterprises for mining and processing mineral raw materials for ferrous metallurgy were part of the State firm Ukrudprom, which accounted for more than 95% of the country's production capacity for this sector. In 1997, Ukrudprom employed 120,000 workers and produced output valued at 2.9 billion hryvnas (as of January 1, 1998, one hryvna was worth \$0.535).

Despite some improvement in volume of production in 1997, the general situation in Ukraine's ferrous metals sector was described by Ukrainian specialists as very serious (Gornyy Zhurnal, 1998). The companies that were part of Ukrudprom were working under strained economic conditions that included scarcity of fuel, lack of operating capital, longstanding debts, unpaid receipts, and other difficulties that hindered normal operations. Problems were compounded by more difficult mining conditions. The majority of underground mines were operating at depths of more than 1,000 meters, and open pits, at depths of more than 300 meters (Gornyy Zhurnal, 1998).

Funds to replenish capacities that had been obtained from the Government during the Soviet era were no longer available,

which resulted in a sharp curtailment in investment. From 1990 to 1997, the decrease was more than fivefold in capital investment in the ferrous metals sector. It was predicted that if this situation was not corrected, then ferrous metals mining in Ukraine could cease within 3 to 5 years. The situation with tailings ponds was described as being catastrophic as many of the major mining concerns had less than 2 years of space remaining for tailings (Gornyy Zhurnal, 1998).

The situation regarding the condition of equipment and availability of spare parts was considered to be equally dire. Most of the needed equipment was manufactured abroad, but the industry lacked funds to purchase this equipment. Since the Soviet era, labor productivity had fallen in half. Also, with the end of Government subsidies and prices, enterprise production costs had more than doubled. Costs were increasing particularly for transporting output (Gornyy Zhurnal, 1998).

To address these severe problems, the Government formulated a plan for the development of the mining and metallurgical sectors that stressed the development of domestic and export markets and the closing of unprofitable enterprises. The thrust of the program is to increase enterprise profitability and the competitiveness of Ukrainian products (Gornyy Zhurnal, 1998).

In 1997, Ukraine's ferrous mining and metallurgical sector accounted for 27.2% of Ukraine's industrial output; output for a number of major products increased, reversing the downward trend of the past several years. Exports grew significantly, particularly to countries of Southeast Asia. Exports accounted for more than 70% of the output of the iron and steel sector (Interfax-M&CN, 1998).

Ukraine was a large alumina producer with production centered at the Mykolayiv alumina refinery and was also a major mining center for titanium raw materials. Mykolayaiv operated entirely on imported raw material. In 1997, the Mykolayiv refinery, with the capacity to produce more than 1 million metric tons per year of alumina, employed about 6,500 workers. It sold its output to aluminum smelters in Russia, as well as to the Tajik aluminum smelter in Tajikistan. The country exported all titanium ore intended for metal production as domestic sponge production at the Zaporizhzhya titanium-magnesium plant had ceased. In an effort to initiate gold mining, Ukraine was seeking investors to develop some identified deposits. The country had also identified a copper deposit in the Volyn' region for which it was seeking investment (Interfax-M&CN, 1998).

Although the country produced some oil and gas, Ukraine remained primarily a coal producer. The coal sector, however, was facing problems at least as serious as those faced by the ferrous metals sector, and its future would depend on it being fundamentally restructured to increase efficiency.

At the end of the Soviet period, Ukraine was the U.S.S.R.'s leading iron ore producer and second-ranking steel producer (after Russia). In 1997, Ukraine produced more than 25 million metric tons and ranked seventh among world steel producers, after China, Japan, the United States, Russia, Germany, and the Republic of Korea. It has the world's second largest manganese deposits and produced low-grade manganese ore at a rate that had made it a world leader in volume of output as recently as 1992. Since then, however, economic difficulties and the decline in demand in domestic and traditional markets in the former Soviet Union (FSU) and East Europe have cut output almost by one-half.

There also is in place in Ukraine a very large metal-consuming sector in the form of the FSU's second largest, after Russia's, machine manufacturing and metal working industry. Reflecting its former role in the Soviet machine-building industry, Ukraine specialized in heavy machine manufacturing, generally producing the equipment that requires the highest quantities of steel. The country was noted for the production of metallurgical and mining excavation equipment (Kramatorsk); machinery used in electricity generation, such as turbines and generators (Kharkiv), transportation equipment [e.g., automobiles (Zaporizhzhya and Lutsk), heavy transport trucks (Kremenchug), and locomotives (the largest locomotive plant in the FSU is in Luhansk)]; shipbuilding [Mykolayiv (three shipyards specializing in deep-sea vessels) and Kherson], agricultural machinery [e.g., tractor engine production in Kharkiv and plants (Kharkiv and Dnipropetrovsk)], machine tools, and machinery for the food-processing machinery.

In addition, about one-third of the U.S.S.R.'s defense industrial capacity, including tank production, naval shipbuilding (including aircraft carriers), electronics, aircraft components, and armaments was in Ukraine. Also, a wide range of metal-working activity, such as the ball-bearing plant in Lutsk, supplied automobile, truck, tractor, and bus plants in Ukraine, Belarus, and Russia with needed inputs. This metal-consuming sector was, by and large, spatially coincident with the ferrous metals industry, from which it derived most of its inputs.

Ukraine has many essential, already developed raw material sources and metallurgical facilities close to each other; a generally favorable location along the western border of the FSU, as well as frontage on the Black Sea; a trained and inexpensive labor force; and a large number of diverse metal-consuming industries with functional linkages to the iron and steel mills. However, it is still not clear, exactly where the country's industries comparative advantage will lie. Ukraine has developed its resources and processing and manufacturing facilities to a scale at which it could be an important producer of ferrous metals and machinery, provided that investment for modernization is forthcoming and is directed into activities that are economically rational.

This 1997 report on Ukraine's mineral industry is abbreviated. For more detailed textual coverage, please refer to the U.S. Geological Survey's 1996 report.

## References Cited

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TABLE 1  
UKRAINE: PRODUCTION OF MINERAL COMMODITIES 1/

(Metric tons unless otherwise specified)

Commodity	1993	1994	1995	1996	1997 e/
<b>METALS</b>					
Alumina e/	1,010,000 r/	1,070,000 r/	1,100,000 r/	1,000,000 r/	1,000,000
Aluminium: e/					
Primary	100,000	100,000	98,000 2/	90,000 r/	100,500 2/
Secondary	50,000	40,000	40,000	40,000	40,000
Total	150,000	140,000	138,000	130,000 r/	140,500
Cadmium, metal e/	7	10 2/	15	25 r/	25
Germanium e/	21	22 2/	22	22	22
Iron and steel:					
Iron ore, marketable	65,500,000 r/	51,300,000	50,400,000	47,600,000	53,000,000
Metal:					
Pig iron	26,999,000	21,200,000	20,000,000	18,143,000	20,561,000 2/
Ferroalloys: e/					
Blast furnace:					
Ferromanganese	40,000	30,000	25,000	25,000 r/	30,000
Spiegeleisen	4,000	3,000	2,500	2,500 r/	2,500
Electric furnace:					
Ferromanganese	140,000	170,000	170,000	170,000 r/	160,000
Ferronickel	50,000 r/	23,000 r/	23,000 r/	8,300 r/	--
Ferrosilicon	400,000	300,000 r/	300,000	300,000	300,000
Silicomanganese	735,000	600,000	600,000	600,000 r/	560,000
Other	30,000	25,000	25,000	25,000	25,000
Total	1,399,000 r/	1,151,000 r/	1,145,500 r/	1,130,800 r/	1,077,500
Steel:					
Crude	32,357,000 r/	23,798,000	22,309,000	22,100,000	25,600,000 2/
Finished	24,200,000	16,900,000	16,600,000	17,100,000	19,500,000 2/
Pipe e/	3,000,000	1,600,000 2/	1,500,000	2,000,000	1,800,000 2/
Lead, refined (secondary) e/	17,000 r/	9,000 r/	14,000 r/	21,000 r/	18,000
Magnesium e/	14,900 r/	12,000	10,000 r/	10,000 r/	10,000
Manganese:					
Marketable ore	3,800,000	2,979,000 r/	3,200,000	3,070,000 r/	3,040,000 2/
Mn content e/	1,350,000	1,050,000	1,100,000	1,040,000 r/	1,030,000
Mercury	50 r/	50 r/	40 r/ e/	30 r/ e/	25
Nickel, mine output, metal content e/	3,000 r/	1,400 2/	1,400	500 r/	--
Silicon e/	1,300	1,400 2/	1,400	1,000	1,000
Tin e/	3,000	2,000	2,000	2,000	2,000
Titanium:					
Ilmenite concentrate	450,000 e/	530,000	359,000	420,000 r/ e/	420,000
Rutile concentrate	60,000 e/	80,000	112,000	180,000 r/ e/	180,000
Metal, sponge	10,000 e/	5,000 e/	300	--	--
Zinc, metal e/	15,000	14,000 r/	5,000 r/	2,000 r/	2,000
Zirconium concentrates e/	70,000 r/	65,000 r/	60,000 r/	55,000 r/	65,000
<b>INDUSTRIAL MINERALS</b>					
Cement	15,000,000	11,400,000	7,600,000	5,000,000	5,100,000 2/
Graphite e/	40,000 r/	30,000 r/	30,000 r/	25,000 r/	25,000
Nitrogen, N content of ammonia e/	3,242,000 2/	3,000,000	3,100,000	3,300,000	3,400,000
Potash, K <sub>2</sub> O content	88,000 r/ e/	168,000	110,000	100,000	100,000
Salt e/	4,000,000 r/	3,500,000 r/	3,000,000 r/	2,800,000 r/	2,500,000
Soda ash e/	NA	NA	NA	375,000	367,000 2/
Sulfur, native	500,000 r/ e/	392,000	310,000	170,000	100,000
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Coal	115,700,000	95,300,000	83,600,000	75,500,000 r/ e/	76,300,000 2/
Coke e/	25,000,000	17,000,000	17,000,000 2/	28,650,000 r/	31,800,000 2/
Natural gas	thousand cubic meters	19,200,000	18,300,000	18,170,000	18,400,000
Petroleum:					
Crude	4,250,000	4,200,000	4,100,000	4,100,000	4,100,000 2/
Refined e/	NA	NA	NA	13,500,000	12,800,000 2/
Uranium concentrate, U content	500	500	500	500	500

e/ Estimated. r/ Revised. NA Not available.

1/ Table includes data available through April 4, 1999.

2/ Reported figure.

TABLE 2  
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 1997

(Metric tons unless otherwise specified)

Commodity	Major operating facilities	Location 1/	Annual capacity e/
Alumina	Mykolayiv refinery	Mykolayiv (Nikolayev)	1,200,000
Do.	Zaporizhzhya (Dneprovsk) refinery	Zaporizhzhya (Zaporozhye)	245,000.
Aluminum, primary	Zaporizhzhya (Dneprovsk) smelter	do.	110,000.
Coal:			
Hard	Donets coal basin with about 225 mines produces more than 90% of Ukraine's coal	Donetska (Donetskaya), Dnipropetrovska (Dnepropetrovskaya) and Luhanska (Luganskaya) oblasts	130,000,000.
Do.	Lviv-Volynskiy basin produces remainder from 18 mines	Western Ukraine	6,000,000.
Brown	Dneprovskoye basin	Central Ukraine	7,000,000.
Dolomite	Novotroitskoye, Severskoye mining administrations	Novotroitskoye deposit, Yamskoye deposit	3,000,000 (total).
Do.	Dokuchayevskiy Flux-dolomite complex	Yelenovskoye and Stylskoye deposits	
Ferrous alloys	Nikopol ferrous alloys plant	Nikopol	250,000 (ferromanganese). 1,200,000 (silicomanganese). 3,000,000 (manganese sinter).
Do.	Stakhanov plant	Luhansk	NA (ferrosilicon).
Do.	Zaporizhzhya plant	Zaporizhzhya	300,000 (ferrosilicon). 160,000 (silicomanganese). NA (ferrochrome). NA (ferromanganese). 40,000 (manganese metal).
Graphite	Zavalyevskiy graphite complex	Zavalyevskiy deposit	80,000.
Iron ore	Underground mining:		
Do.	Krivbassruda production association with 16 mines	Kryvyi Rih (Kryvyi Rog) basin	30,000,000.
Do.	Ekspluatatsionnaya Mine of the Zaporizhzhskiy iron ore complex	do.	3,500,000.
Do.	Open pit mining: Yuzhniy, Novokrivorozhskiy, Tsentralnyy, Severnyy, Inguletskiy, Poltaviskiy and Kamyshe-Burunskiy mining and beneficiation complexes	do.	90,000,000 (total).
Lead, secondary	Ukrainsk plant	Kostyantynivka (Konstantinovka)	70,000
Magnesium	Zaporizhzhya plant	Zaporizhzhya	10,000.
Do.	Khlorvinil concern	Kalush	20,000.
Manganese ore, marketable	Ordzhonikidze, Marganets mining and beneficiation complexes	Nikopol basin	7,000,000 (total).
Do.	Tavricheskiy mining and beneficiation complex (under development)	Bolshoy Tomak basin	
Mercury	Nikitovskiy mining and metallurgical complex	Donets basin	120.
Nickel	Pobuzhskiy mining and metallurgical complex, comprising three open pit mines and smelter	Pobuga region	7,000 (nickel in ferronickel).
Potash	Khlorvinil production association, Stebnik potash plant	Pricarpathian region	300,000 (K <sub>2</sub> O).
Steel, crude	Alchevsk plant	Alchevsk (Kommunarsk)	4,500,000.
Do.	Azovstal plant	Mariupol	4,000,000.
Do.	Dneprospetsstal	Zaporizhzhya	1,400,000.
Do.	Dneprovsk plant	Dniprodzerzhynsk (Dneprodzerzhinsk)	3,850,000.
Do.	do.	Dnipropetrovsk (Dnepropetrovsk)	1,900,000.
Do.	Donetsk plant	Donetsk	1,300,000.
Do.	Yenakiyev plant	Yenakiyev (Yenakiyev)	3,100,000.
Do.	Il'yich plant	Mariupol	7,300,000.
Do.	Kirov plant	Makeyevka	4,000,000.
Do.	Kryvyi Rih plant	Kryvyi Rih	10,650,000.
Do.	Zaporizhzhya plant	Zaporizhzhya	2,300,000.
Sulfur	Sera production association	Rozdol mining complex mines, Rozdol, Soroks, Zhidachev Deposits. Yavorov complex mines. Nemirov and Yazov deposits in (Lvivska) (Lvovskaya) and Kyivska (Kievskaya) oblasts	1,500,000 (total).

See footnotes at end of table.

TABLE 2--Continued  
 UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 1997

(Metric tons unless otherwise specified)

Commodity	Major operating facilities	Location 1/	Annual capacity e/
Titanium, ilmenite and zircon-rutile-ilmenite ores	Irshanskiy mining and beneficiation complex	Irsha River valley	600,000 (ilmenite concentrate). 2/
Do.	Verkhnedneprovskiy mining and metallurgical complex	Verkhnedneprovsk region	120,000 (rutile concentrate). 40,000 (zirconium concentrate).
Titanium, metal	Zaporizhzhya plant	Zaporizhzhya	20,000.
Uranium	Zheltye Vody complex	Northern part of Kryvyy Rih basin	NA.
Zinc, secondary	Ukrtsink plant	Kostyantynivka	25,000.

e/ Estimated NA Not available.

1/ Old name or spelling, if applicable, given in parenthesis.

2/ Total for both enterprises.

TABLE 3  
 UKRAINE: EXPORT OF MINERAL RAW MATERIALS FOR FERROUS METALLURGY  
 (Million metric tons)

Commodity	1990	1991	1992	1993	1994	1995	1996	1997
Agglomerate	11.75	7.51	6.92	7.33	7.36	6.08	7.08	7.96
Iron ore concentrate	5.47	3.87	4.48	4.81	4.77	5.72	5.5	6.2
Limestone, metallurgical	3.39	3.6	3.51	1.54	1.94	1.4	1.41	0.88
Manganese concentrate	0.11	0.17	0.13	0.1	0.2	0.08	0.1	0.23
Pellets	7.22	5.06	4.79	5.48	5.49	6.62	6.29	7.46

Source: Gornyy Zhurnal, no. 11-12, November-December 1998, p. 9.

TABLE 4  
UKRAINE: SELECTED LAWS PERTAINING TO THE MINERAL INDUSTRY

Law number	Title	Issuance date	Summary
188/98-BP	On main directions of the state policy of Ukraine in the sphere of environment protection, use of natural resources, and securing ecological safety	March 5, 1998	Enacts to approve main directions of the state policy of Ukraine in the sphere of environment protection, use of natural resources, and securing ecological safety; ordered the Cabinet of Ministers to secure implementing the said directions.
38/98-BP	On ratification of the agreement on cooperation in the area of studying, prospecting, and using mineral and raw material resources	January 16, 1998	Law 38/98-BP of January 16, 1998, on ratification of cooperation in the area of studying, prospecting, and using mineral and raw material resources; ratifies the said agreement, signed on March 27, 1997, in Moscow.
645/97-BP	On mining and processing uranium ores	November 19, 1997	Regulates special aspects of legal regulations while mining and processing uranium ores and using products of their processing as a raw material for getting a nuclear material. Establishes special features of uranium objects functioning; protection of personnel, population, and the environment from ionizing radiation; and special aspects of social protection of uranium objects personnel and population in connection with impact of ionizing radiation. Law includes 17 articles.
637/98-BP	On state regulation of mining, production, and use of precious metals and precious stones and control over operations with them	November 18, 1997	Regulates mining, production, use, and safe keeping of precious metals and stones, as well as carrying out control over operations with them. Law includes 6 sections and 22 articles.
638/96-BP	Ratifies agreement between Ukraine and International Bank for Reconstruction and Development	December 25, 1996	Ratified the agreement between Ukraine and International Bank for Reconstruction and Development on granting a loan for restructuring coal mining industry, signed on December 12, 1996, in Washington, DC.
385/95-BP	Approves concept of development of Ukraine mining and metallurgical industries complex until 2000	October 17, 1995	Approves concept of development of Ukraine mining and metallurgical complex until 2000. Text is included (two provisions).

This table was prepared with the assistance of Natalie Gawdiak, Research and Information Analyst, Law Library of Congress, and was based on information from the Global Legal Information Network (GLN).