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The Mineral Industry of Ukraine

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Ukraine was among the world's leading producers of a number of minerals. It was one of the world's top four producers of gallium, the fourth ranked producer of rutile (accounting for 8% of world output), the fifth ranked producer of titanium sponge (5% of world output), the sixth ranked producer of iron ore (3% of world output), the seventh ranked producer of manganese ore (2.4% of world output), and the eighth ranked producer of ilmenite (5% of world output) and steel (2.3% of world output). The country had significant coal reserves but was dependent on imports to satisfy most of its petroleum and natural gas demand. Ukraine was also an important transit country for natural gas and petroleum from Central Asia and Russia to Europe (Corathers, 2012; Gambogi, 2012a, b; Jaskula, 2012; Jorgenson, 2012; World Steel Association, 2012, p. 9).

Mining and metals production were an important part of Ukraine's economy, but the mineral industry was facing a number of challenges owing to the general nature of doing business in Ukraine and to issues specific to the mineral industry. According to the Doing Business rankings assembled by the International Bank for Reconstruction and Development and The World Bank, Ukraine was ranked 152d out of 183 countries based on the efficiency of the country's business regulations. Among various categories that made up the rankings, Ukraine ranked 180th in dealing with construction permits, 169th in access to electricity, 166th in registering property, 140th in trading across borders, and 111th in protecting investors. On the positive side, Ukraine was ranked 24th in access to credit and 44th in enforcing contracts. The mineral industry itself faces specific problems, such as energy inefficiency owing to a lack of sufficient investment, relatively low ore grades for some important minerals, dependence on foreign markets for sales of important mineral commodities, and restrictions by some countries on imports from Ukraine (Metall Ukrainy, 2011b; International Bank for Reconstruction and Development and The World Bank, 2012, p. 5, 8).

Minerals in the National Economy

In 2011, Ukraine's real gross domestic product (GDP) increased by 5.2% compared with that of 2010. The State Statistics Committee of Ukraine reported that, in 2011, mining and quarrying activities accounted for about 7% of the GDP, and manufacturing, for 14%. The value added to manufacturing from metals processing was not reported. In 2010 (the latest year for which data were available), an average of 446,000 people were employed in the mining industry, 339,000 were employed in metallurgy and production of finished metal products, 114,000 were employed in the manufacturing of nonmetallic mineral products, and 39,000 were employed in the manufacturing of coke and refined petroleum products. Total industrial employment was about 2.8 million. A significant portion of those employed in the mineral industry were part of the coal industry, and the Coal Industry Workers' Union of Ukraine reported that as of January 1, 2011, about 300,000 of its members were listed as "working" members (Coal Industry Workers' Union of Ukraine, 2011; State Statistics Service of Ukraine, 2011c, p. 372; 2012b, c).

Production

In 2011, production of kaolinitic clays increased by 88%; nitrogen, by 26%; feldspar and peat, by 23% each; titanium sponge, by 22%; salt and kaolin, by 21% each; sulfuric acid, by 19%; marketable coal, by 15%; bentonite, by 14%; and cement and limestone, by 11% each. Production of primary aluminum decreased by 72%; manganese marketable ore and concentrate, by 39%; ferromanganese, by 36%; ferrosilicon, by 23%; petroleum refinery products, by 14%; zirconium concentrates, by 13%; and silicomanganese, by 10% (table 1).

Mineral Trade

The total value of Ukraine's exports increased to about $68 billion in 2011 from $51 billion in 2010. The value of exports was equal to about 54% of Ukraine's GDP in 2011 compared with about 50% in 2010. Ukraine's leading export category in terms of value was ferrous metals, and in 2011, exports of ferrous metals were valued at $18.5 billion and made up 27% of the total value of exports; exports of mineral fuels and petroleum products were valued at $5.7 billion and made up 8.3% of the total value of exports. The value of exports of mineral products and metals made up about 47% of the value of total exports (State Statistics Service of Ukraine, 2011a, b; 2012a, b).

The total value of Ukraine's imports was about $83 billion in 2011 and $61 billion in 2010. The leading import commodities were mineral fuels and refined petroleum products, which made up about 34.6% of the value of total imports in 2011. Natural gas was the leading individual import product in terms of value and accounted for 17% of the value of total imports. Ukraine consumed 59.3 billion cubic meters of natural gas in 2011 and 57.6 billion cubic meters in 2010, of which Ukraine purchased from Russia 44.8 billion cubic meters in 2011 and 36.5 billion cubic meters in 2010 (State Statistics Service of Ukraine, 2011a; 2012a, b; JSC Naftogaz of Ukraine, 2012; OAO Gazprom, 2012, p. 78).

Structure of the Mineral Industry

Ownership and control of mineral production facilities in Ukraine were not always completely transparent, but understanding the ownership issues is important for understanding the actions of industry participants. According to news reports, Ukrainian companies or their owners often

established holding companies outside of Ukraine in order to purchase mineral production facilities and control their activities through indirect ownership. Therefore, when discussing particular companies, it was common to refer to the companies as being "controlled by" instead of "owned by" another entity to avoid an unnecessarily detailed explanation of the ownership structure. This report and table 2 use this method to show the companies that actually control various facilities without showing specific shareholding entities.

A good example of this indirect method used to control mineral production facilities was the PrivatBank Group's control of Ukraine's manganese production and of virtually all Ukraine's ferroalloys production. The PrivatBank Group's control of Ukraine's two manganese mining companies at Marganets and Ordzhonikidze and three ferroalloys plants at Nikopol, Stakhanov, and Zaporozhye was widely reported, but the exact nature of ownership was difficult to determine. The shares of most of these facilities were owned by a number of privately held companies based in Cyprus that were reported to have been owned by the principal shareholders of PrivatBank, which gave the PrivatBank Group effective control over the facilities without having direct ownership of them (table 2; Ignatenko, 2009).

Another important aspect of the structure of the Ukrainian mineral industry was that major production facilities were often controlled by Ukrainian conglomerates with financial and industrial assets (known as financial-industrial groups). The leading Ukrainian financial-industrial group in terms of production of mineral commodities was System Capital Management Group (SCM Group), which controlled assets in a number of industries in Ukraine, including the finance, media, power generation and distribution, real estate, and telecommunications industries. Through Metinvest B.V. (based in the Netherlands) and Donbass Fuel and Energy Co. (DTEK), SCM Group also held interests in leading mining and metals production facilities. In 2011, Metinvest controlled 44% of iron ore production in Ukraine (computed by dividing Metinvest's total concentrate production of 35.7 metric tons (Mt) by Ukraine's reported total production of 80.6 Mt of marketable ore and concentrate), 41% of crude steel production, and about 35% of coke production (not including any production associated with JSC Donetskkoks or OAO Zaporozhkoks in which Metinvest had partial ownership). Metinvest and DTEK combined accounted for about about 52% of coal production in Ukraine (SCM Group, 2011, p. 24–25, 28; Donbass Fuel and Energy Co., 2012, p. 46; Metall Ukrainy, 2012d, p. 57; Metinvest B.V., 2012, p. 36, 38, 57).

Steel producers that did not have their own supply of raw materials found it difficult to remain independent, and vertical integration in the iron and steel industry was common. In July, Metinvest and unnamed investors together bought 50% of the Industrial Group's mining and metals business, which included ownership of just over 50% of JSC Zaporizhstal. The agreement also contained an option for Metinvest and the other investors to purchase the remaining 50% stake in the Industrial Group's mining and metals business. Zaporizhstal and OJSC Ilyich Iron and Steel Works, which was purchased by Metinvest in 2010, had each lacked its own supply of iron ore. In December, Mechel OAO of Russia purchased 100% of the shares of the Donetsk Electrometallurgical Plant for $537 million. The Donetsk Electrometallurgical Plant produced crude steel in an electric arc furnace (EAF) and used continuous casting to produce billets. PJSC Azovelectrostal was added to the list of steel producers in table 2. The plant had actually existed since Soviet times but was not added to table 2 owing to a lack of information (Metinvest B.V., 2011c; Mechel OAO, 2012, p. 163).

Commodity Review

Metals

Aluminum.—On April 26, United Company RUSAL (RUSAL) halted primary aluminum production at the Zaporozhye smelter, which was Ukraine's only producer of primary aluminum. According to RUSAL, the main reason for halting production at the smelter was high electricity costs. Since 2006, the company had unsuccessfully lobbied the Government of Ukraine to reduce the smelter's electricity tariffs, which made up about 45% of the cost of primary aluminum production. In 2010, the plant reportedly operated at a financial loss of $140 million (Kommersant Ukraina, 2011).

Ferroalloys.—Production of ferromanganese, ferrosilicon, and silicomanganese significantly decreased in 2011 as Ukrainian producers experienced high production costs and reduced demand for their products. The Nikopol ferroalloys plant produced 126,600 metric tons (t) of ferromanganese and 643,900 t of silicomanganese. The Stakhanov ferroalloys plant produced 145,300 t of ferrosilicon and 63,000 t of silicomanganese. The Zaporozhye ferroalloys plant produced 53,900 t of ferromanganese; 5,600 t of ferrosilicon; and 136,600 t of silicomanganese. In January, the Zaporozhye plant began to reduce its ferroalloys production after the plant's electricity tariff increased; in February, the plant announced that it was producing at only 30% of capacity. In 2010, owing to reduced production, the Zaporozhye plant did not consume the minimum 150 million kilowatthours of electricity necessary to qualify for a lower electricity tariff in 2011 (Metall Ukrainy, 2011a, p. 61; Ukrrudprom, 2012d, e, g).

The Ukrainian Association of Ferroalloys Producers (UkrFA) (a business group that represented all the major ferroalloys and manganese ore producers in Ukraine) claimed that increased imports of ferroalloys was substituting for domestic production and asked for protections against imports. The Government of Ukraine rejected a similar claim in 2010, and in November 2011, the Ministry of Economic Development and Trade denied UkrFA's requests for another investigation into ferroalloy imports. Some analysts felt that import restrictions would be inappropriate because they could give the Privat Group a monopoly over the domestic market and domestic consumers of ferroalloys would be harmed because prices would significantly increase. In 2011, Ukraine's imports of ferroalloys increased 2.4 times to 256,500 t, and exports of ferroalloys decreased by 15.8% to 931,000 t (UGMK.info, 2011; Unian Economica, 2011b; Yanverev, 2011).

Iron and Steel.—According to the World Steel Association, in 2011, Ukraine was the world's 8th ranked producer of steel and the 6th ranked exporter. Ukraine exported about 26 Mt

of steel, which was about 74% of the country's total steel production. The relatively low domestic demand for steel products left Ukrainian steel producers dependent on selling their products in other countries. During the world financial crisis that began in 2007, foreign demand for steel products decreased, and from 2007 to 2009, Ukraine's production of crude steel dropped by about 30% as Ukraine's steel exports decreased by about 21% (table 1; World Steel Association, 2009, p. 25; 2011, p. 25; 2012, p. 9, 25; Metall Ukrainy, 2011b).

Metinvest was the country's leading producer of crude steel and accounted for 41% of total output in Ukraine in 2011. Metinvest focused on integrating coal, iron ore, and steel production to control production costs, and the company saw further integration as a primary objective for future development. In 2011, Metinvest internally consumed 47% of its iron ore output, but hoped to eventually consume 100% of output. The increased internal consumption of iron ore would come mainly from acquisitions of new steel production facilities, such as OJSC Ilyich Iron and Steel Works, which was purchased in 2010; and JSC Zaporizhstal, of which Metinvest acquired a significant ownership share in 2011. In recent years, crude steel producers in Ukraine that did not possess their own source of iron ore found it difficult to remain independent because most domestically produced iron ore was either consumed by vertically integrated companies or exported, and imports of iron ore were relatively expensive to obtain (table 1; Metinvest B.V., 2011a, p. 17; 2011c; 2012, p. 14, 34–35, 38).

In 2011, Ukraine produced 69.3% of its steel in oxygen converter furnaces, 26.2% in open hearth furnaces, and 4.5% in EAFs. Production of steel using open hearth furnaces is not energy efficient compared with oxygen converter or EAF production and takes place only in a few other countries, including Russia and India, which produced only 9.7% and 1.4%, respectively, of their steel in open hearth furnaces. In Ukraine, only 54% of steel was produced through continuous casting, which was the lowest percentage of any country in the world (World Steel Association, 2012, p. 10–11).

Companies were aware of their need for investment, and in 2011, several significant investment programs were in place that were likely to improve efficiency in the industry. Continuous casting machines were being installed at two major producers. OJSC ArcelorMittal Kryviy Rih was constructing a continuous casting machine with a production capacity of 1.2 million metric tons per year (Mt/yr) and Dneprovskiy Metallurgical Plant "Dzerzhinsky" was installing a continuous casting machine with a production capacity of 1.4 Mt/yr. JSC Zaporizhstal and OJSC Ilyich Iron and Steel Works (Ilyich) were installing pulverized coal injection systems that would reduce their consumption of coke. In May, JSC Azovstal Iron and Steel Works decommissioned its open hearth furnace and announced that the company would quickly complete investments that would allow the plant to convert all its production capacity to converter furnaces. The Interpipe Group was constructing an EAF with designed production capacity of 1.32 Mt/yr of semimanufactures in Dnipropetrovsk. Production of steel at Dnipropetrovsk was expected to begin in 2012, and full production capacity was expected by 2014 (Metinvest B.V., 2011b; Interpipe Group, 2012; Metall Ukrainy, 2012b, p. 27–29).

Iron Ore.—In 2011, production of marketable iron ore and concentrate increased by 3% compared with that of 2010 as foreign and domestic demand for iron ore increased. Exports of iron ore products increased by about 4% to 34.1 Mt, and imports of iron ore products decreased by about 33% to 1.8 Mt. China was Ukraine's leading export market for iron ore products in 2010 (the latest year for which data were available) and accounted for about 40% of total exports. The decrease in imports was largely owing to Metinvest's acquisition of Ilyich in November 2010. Ilyich had been a significant importer of iron ore products, but after November 2010, it was supplied by Metinvest's domestic sources of raw material. Almost all Ukraine's imports of iron ore products came from Russia (Metall Ukrainy, 2012a, p. 47; 2012f, p. 44; Ukrrudprom, 2012a, c).

Metinvest was the leading producer of iron ore in Ukraine and accounted for 44% of iron ore production. The company may have controlled an even higher percentage of domestic production because the reported figure presumably does not include Metinvest's share of production at the Krivorozhskiy Iron Ore Complex. Metinvest increased internal consumption of iron ore to 47.4% in 2011 because it was the first full year that the company owned OJSC Ilyich Iron and Steel Works and supplied it with its own iron ore (Metinvest B.V., 2012, p. 14, 34–35).

Manganese.—The Marganets mining and beneficiation complex (GOK) produced 748,869 t of manganese concentrates and marketable ore in 2011, and the Ordzhonikidze GOK produced 222,631 t. Total manganese output decreased by 39% compared with that of 2010 owing to a 74% decrease in production at the Ordzhonikidze GOK. Apparently, a dispute with local authorities resulted in the Ordzhonikidze GOK halting production for much of the year after it was accused of illegally using certain lands for the production of manganese ore. The circumstances surrounding the case were not entirely clear and it was unknown when production could restart. In 2011, imports of manganese ores and concentrates decreased by 7% to 1.2 Mt and were valued at $497 million. The majority of domestically produced and imported manganese ores and concentrates was used to produce ferroalloys, and only about 136,700 t of manganese ores and concentrates (valued at $18.05 million) was exported from Ukraine in 2011 (Unian Economica, 2011a; Metall Ukrainy, 2012c, p. 41; 2012e, p. 46; Ukrrudprom, 2012b, f).

Titanium.—The titanium industry in Ukraine consisted of ilmenite and rutile concentrate production, titanium sponge production at the Government-owned Zaporozhye Titanium & Magnesium Combine (ZTMK), and titanium ingot production by a small number of producers, including OOO Antares, OOO Fiko, and ZTMK, which had a combined capacity to produce about 12,000 t/yr of titanium ingots. Titanium dioxide pigment was produced by Crimea Titan CJSC and OAO Sumykhimprom. Ukraine did not have the ability to produce titanium metal products used in the aerospace industry and other industries that require more technically advanced titanium metal products (Metall Ukrainy, 2010, p. 61).

The dominant producers of ilmenite and rutile ores and concentrate were the Irshansk GOK and the Volnogorsk

state mining-metals complex; OOO Valki-Ilmenit, and the Mezhdurechensk GOK also were thought to have produced ilmenite concentrate, but production data were not available; consequently table 1 shows estimated production only from the Irshansk and the Volnogorsk operations. In February 2012, the Government of Ukraine renewed Crimea Titan CJSC's lease to operate the Irshansk GOK and the Volnogorsk state mining-metals complex. The new lease allowed Crimea Titan to operate the two facilities until 2014. In September 2009, the Government refused to extend Crimea Titan's lease on the Irshansk and Volnogorsk mining facilities, and Crimea Titan took the case to court. During the time the case remained in the courts, Crimea Titan continued to produce ilmenite and rutile at Irshansk and Volnogorsk but did not pay the Government for the use of the properties. As part of the new lease deal, Crimea Titan agreed to pay the Government $19.2 million[1] in rent owned for the period that Crimea Titan operated the Irshansk and the Volnogorsk facilities after the previous lease ended in 2009. The Irshansk and the Volnogorsk mining facilities provided Crimea Titan with an inexpensive source of titanium raw materials for titanium dioxide pigment production (Ukrrudprom, 2011; RBK-Ukraine, 2012).

In 2011, there was considerable activity in new projects for the production of titanium raw materials in Ukraine. The Mezhdurechensk GOK, which was part of OstChem GmbH, started production in January 2011 and had an annual production capacity of 84,000 t/yr of ilmenite concentrate. Velta LLC began production of ilmenite from the Birzulovo deposit in Kirovograd Oblast in December 2011, but commercial deliveries of ilmenite concentrate did not begin until 2012. The production capacity at the plant was 185,000 t/yr of ilmenite concentrate, but the company planned to expand production to 300,000 t/yr during 2012 (Kabash, 2011; Velta LLC, 2012; Watts, 2012).

In September, the Zhytomyr Regional State Administration announced that it would sign a memorandum of understanding with CHPP Sirius for the development of the Kropivenskoe apatite-ilmenite-titanomagnetite deposit. The head of the Zhytomyr Regional State Administration said that the development of the deposit would require an investment of $2.2 billion. A few other exploration and development projects were reportedly ongoing in Ukraine (such as CJSC Titanium-Apatite Co., Limpieza Ltd., and TioFab Ltd.), but it was not known if or when production could be expected from any of these projects (Interfax-Ukraine, 2011).

Mineral Fuels and Related Materials

Coal.—Donbass Fuel and Energy Co. (DTEK) was the leading producer of coal in Ukraine, and in 2011, the company had output of 36.8 Mt. This production figure included output at Sverdlovanthracite and at Rovenkyanthracite, although both were obtained by DTEK only in December 2011. DTEK obtained a 49-year lease for Dobropolyeugol in January, and in December, DTEK obtained 49-year concession agreements for Rovenkyanthracite and Sverdlovanthracite. At the end of 2011, DTEK controlled five of the seven leading coal producing companies in Ukraine. Pavlogradugol was the leading coal producing company in Ukraine with 15.41 Mt of output; Rovenkyanthracite was the second ranked producer (7.32 Mt); Sverdlovanthracite was the fourth ranked producer (6.56 Mt); Komsomolets Donbassa was the sixth ranked producer (4.26 Mt); and Dobropolyeugol was the seventh ranked producer (3.27 Mt) (Donbass Fuel and Energy Co., 2012, p. 22, 25, 31, 46)

Petroleum.—Production of petroleum refinery products decreased by 14% in 2011 mainly owing to the shutdown of the Odessa refinery. OAO Lukoil of Russia, which owned the refinery, reported that it was shut down in late 2010 owing to poor market conditions for refined petroleum products in Ukraine and because of the difficulty in obtaining crude oil supplies after the Odessa-Brody pipeline changed the direction in which it transported oil. Previously the pipeline had been shipping Russian oil from Brody to Odessa, but beginning in 2011, it began shipping Caspian Sea oil from Odessa to Brody. According to Lukoil, the refinery could restart production in 2012 (Taylor and Zhdannikov, 2011; OAO Lukoil, 2012, p. 58).

Uranium.—Ukraine's uranium reserves (U content) were estimated to be between 130,000 and 200,000 t, and the country was the 10th ranked producer of uranium in the world. In 2010 (the latest year for which data were available), nuclear powerplants in Ukraine accounted for 48% of all the electricity produced in the country, and domestic uranium production accounted for about 30% of all uranium used in Ukraine's nuclear powerplants. Uranium ore was produced in Ukraine by the state-owned company Vostochny GOK at underground mines and was processed into concentrate at the company's hydrometallurgical plant at Zheltye Vody. The concentrate was then sent to Russia to be processed by JSC TVEL of Russia into nuclear fuel for use in Ukraine; the remaining nuclear fuel required for Ukraine's nuclear powerplants was purchased from TVEL. In September 2010, TVEL was awarded a contract for the construction of a nuclear fuel assembly plant in Ukraine. The fuel assembly plant would allow Ukraine to execute the final stage of nuclear fuel preparation, but it would still be necessary for Ukraine to ship its uranium concentrate out of the country for the intermediate process of uranium conversion and enrichment (JSC TVEL, 2010; NNEGC Energoatom, 2011; World Nuclear Association, 2012a, b).

In July, Vostochny GOK began uranium ore production from the Novokonstantinovskoye deposit in Kirovohrad Oblast. Vostochny GOK had planned to produce 75,000 t of ore containing 99 t of uranium from the deposit in 2011, but this project was not fully funded, and it was not known if that level of production was actually reached. The Vostochny GOK expected the development of the Safonovskoye deposit in Mykolaiv Oblast to result in uranium output in 2012. Production was expected to be 5 t in 2012 and 50 t in 2013 and to reach production capacity of 150 t/yr in 2014. As with the Novokonstantinovskoye deposit, however, finding funding for the project proved difficult, and it seemed unlikely that this production schedule would be adhered to (RBK-Ukraine, 2011; Zerkalo Nedeli, 2012).

In September 2010, the General Manager of Vostochny GOK stated that the company expected total production of uranium in Ukraine to be about 1,000 t in 2011; slightly less in 2012 and

[1]Where necessary, values have been converted from Ukrainian hryvnias (UAH) to U.S. dollars (US$) at the rate of UAH7.89=US$1.00.

2013 owing to reduced production from the Ingulskaya and the Smolinskaya Mines; 2,100 t in 2014 owing to increased production at the Novokonstantinovskoye deposit; and from 2017 onward, about 3,500 t/yr. The level of production planned for 2017 would allow Ukraine to supply 100% of the uranium needs of the domestic nuclear powerplants. Difficulty in obtaining the funding to develop new projects, however, resulted in missing the production target for 2011 and made the future output schedule seem doubtful (RBK-Ukraine, 2010).

Outlook

Ferrous metallurgy will most likely continue to be the most significant sector of Ukraine's mineral industry. Investment in the metallurgy sector could improve the competitiveness of Ukrainian production (especially in the iron and steel industry) and efforts to reduce energy consumption will be especially important. Exports will in all likelihood remain important for sales of Ukraine's ferrous metallurgy products, and demand in foreign markets could be the most important determinant of domestic production. It also remains to be seen whether Ukraine will be able to increase its production of coal and uranium to increase the security of its resources for electricity production, given that past efforts to increase the production of mineral fuels have suffered from a lack of funding or faced other problems that have impeded resource development.

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TABLE 1
UKRAINE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2007	2008	2009	2010	2011
METALS						
Alumina		1,700,000 e	1,673,000	1,524,000	1,534,000	1,601,000
Aluminum:						
Primary		113,437	113,000	50,000	25,000	7,000
Secondary[e]		130,000	130,000	130,000	130,000	130,000
Total[e]		243,000	243,000	180,000	155,000	137,000
Cadmium, metal[e]		-- r	-- r	-- r	-- r	--
Copper, metal, secondary[e]		20,000	20,000	20,000	20,000	20,000
Gallium[e]		13	13	13	13	13
Germanium[e]	kilograms	1,000	1,032 3	690 3	700	700
Iron and steel:						
Iron ore, marketable ore and concentrate:						
Gross weight		77,900,000	72,688,000	66,476,000	78,170,700	80,580,800
Fe content[e]		42,800,000	40,000,000	36,600,000	43,000,000	44,300,000
Metal:						
Pig iron		35,647,000	30,982,000	25,682,900	27,361,000	28,881,100
Ferroalloys:						
Blast furnace:[e]						
Ferromanganese		28,400	16,000	--	--	--
Spiegeleisen		4,730	2,000	--	--	--
Electric furnace:						
Ferromanganese		368,000	362,400 3	129,400 3	280,100 3	180,500 3
Ferronickel		79,530	89,825	61,449	62,000 e	62,000
Ferrosilicon		218,000	152,800 3	150,300 3	195,500 3	150,900
Silicomanganese		1,281,000	894,900 3	741,900 3	940,400 3	843,500
Other[e]		23,700	23,000	23,900	28,500	28,500
Total, blast and electric furnaces[e]		2,000,000	1,540,000	1,110,000	1,510,000	1,270,000
Steel:						
Crude		42,830,000	37,279,000	29,855,000	33,559,000	35,332,000
Finished products:						
Rolled		24,510,000	20,493,000	16,097,600	17,549,300	19,511,000
Pipe		2,811,000	2,542,000	1,742,000	1,928,400	2,371,800
Lead, refined, secondary[e]		7,000	7,000	7,000	7,000	7,000
Magnesium metal[e, 4]		2,500	2,000	2,000	2,000	2,000
Manganese, marketable ore and concentrate:						
Gross weight		1,719,600	1,446,600 4	932,000 4	1,589,300 4	971,500
Mn content[e]		580,000	492,000	317,000 r	540,000	330,000
Manganese, metal[5]		14,578	8,585	14,330	16,137	16,100 e
Nickel:						
Mine output, Ni content of laterite ore[e]		12,000	8,000	--	--	--
Ni content of ferronickel		14,211	16,224	12,392	12,400 e	12,400 e
Titanium:						
Ilmenite concentrate:[e, 6]						
Gross weight		500,000	520,000	500,000	500,000	500,000
TiO_2 content, 59%		294,000	306,000	295,000	295,000	295,000
Rutile concentrate, 95% TiO_2[e]		60,000	60,000	60,000	60,000	60,000
Metal, sponge[e]		9,740 r	9,930	6,830 r	7,400	9,000 e
Zirconium concentrates[e, 7]		37,000 r	36,000 r	31,000 r	30,000	26,000
INDUSTRIAL MINERALS						
Bromine		7,824	4,416	4,121	4,100 e	4,100 e
Cement		15,000,000	14,918,400	9,495,700	9,456,500	10,515,300
Clays:						
Ball clay[e]		652,000 3	650,000	600,000	600,000	600,000
Bentonite[e]		300,000	200,000	195,000	185,000	211,000
Kaolin	thousand metric tons	1,735	1,457	764	1,085	1,317
Kaolinitic clays	do.	437	318	354	306	575

See footnotes at end of table.

TABLE 1—Continued
UKRAINE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2007	2008	2009	2010	2011
INDUSTRIAL MINERALS—Continued						
Diamond, synthetic[e]	carats	8,000,000 [r]	4,000,000 [r]	NA	NA	NA
Feldspar		76,305	83,420	84,757	146,000	179,000
Graphite[e]		5,800	5,800	5,500	6,000	6,000
Gypsum		741,580	1,158,000	711,000	679,000	676,000
Lime	thousand metric tons	5,688	5,128	4,101	4,220	4,487
Limestone	do.	30,000	26,700	18,000	20,600	22,800
Nitrogen, N content of ammonia[e]	do.	4,200	4,000	2,500	3,400	4,300
Salt		5,548,000	4,425,000	5,395,000	4,908,000	5,938,000
Soda ash		950,000 [e]	977,800	680,000	706,700	700,000 [e]
Sulfur, native[e]		135,000	135,000	120,000	130,000	130,000
Sulfuric acid	thousand metric tons	1,657	1,479	890	1,296	1,537
Vermiculite[e]		65,000	65,000	55,000	60,000	60,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, raw:[e]						
Anthracite	thousand metric tons	13,000	14,000	13,000	14,000	16,000
Bituminous	do.	62,255 [3]	63,400	59,000	61,000	66,000
Lignite	do.	182 [3]	200	200	200	200
Total	do.	75,400	77,600	72,200	75,200	82,200
Marketable[3]	do.	58,739	59,312	54,820	54,444	62,700
Coke		20,143,000	19,543,000	17,424,000	18,599,700	19,599,100
Natural gas[8]	thousand cubic meters	21,150,000	21,467,000	21,545,000	20,458,000	19,934,900
Peat:						
Fuel use		395,000	358,000	449,000	430,000	515,000
Horticultural use		200,000 [e]	200,000 [e]	242,000	167,000	221,000
Total		595,000 [e]	558,000 [e]	691,000	597,000	736,000
Petroleum:[e]						
Crude and gas condensate[9]	42-gallon barrels	32,400,000	30,300,000	28,500,000	25,400,000	24,000,000
Refinery products[10]	do.	103,000,000	83,700,000	85,700,000	80,300,000	69,000,000
Uranium:[e]						
U content		800	830	830	850	890
U_3O_8 content		940	980	980	1,000	1,050

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. NA Not available. -- Zero.
[1]Table includes data available through November 2, 2012.
[2]In addition to the commodities listed, other mineral commodities may be produced, but available information was inadequate to make reliable estimates of output.
[3]Reported figure.
[4]Includes secondary production.
[5]Data provided by the Ukrainian Association of Ferroalloy Producers (UkrFA).
[6]Ilmenite production statistics include information from only the Irshansk GOK and Volnogorsk State Mining-Metals Complex. Production data for OOO Valki-Ilmenit and the Mezhdurechensk GOK were not available, but they may produce about an additional 130,000 metric tons per year (t/yr) of ilmenite concentrate (50,000 t/yr at Valki-Ilmenit and 80,000 t/yr at the Mezhdurechensk GOK).
[7]Zirconium concentrates production estimates are based on reported exports.
[8]The data series for natural gas production is based on natural gas production as reported by the State Statistics Service of Ukraine and includes associated petroleum gas production.
[9]Figures were converted to barrels from metric tons (t), which were reported as follows: 2007—4,459,000; 2008—4,168,300; 2009—3,916,600; 2010—3,493,400; and 2011—3,297,800.
[10]Figures were converted to barrels from metric tons (t), which were reported as follows: 2007—13,283,000; 2008—10,717,000; 2009—10,947,000; 2010—10,333,000; and 2011—8,787,000.

TABLE 2
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1, 2]	Location or deposit names	Annual capacity[e]
Alumina and aluminum:			
Alumina	Nikolaev alumina refinery [United Company RUSAL (RUSAL)]	20 kilometers south of Mykolaiv	1,601,000
Do.	Zaporozhye refinery [United Company RUSAL (RUSAL)]	Zaporizhia	275,000
Aluminum, primary	Zaporozhye smelter [United Company RUSAL (RUSAL)]	do.	114,000
Coal	About 150 active surface and underground mines, including:	About 95% of coal produced in Donetsk, Dnipropetrovsk, and Luhansk Oblasts	90,000,000 [3]
	Donbass Fuel and Energy Co. (DTEK) (System Capital Management, 100%):		
	DTEK Pavlogradugol	10 mines in Dnipropetrovsk and Donetsk Oblasts	
	DTEK Komsomolets Donbasa Mine	Kirovskoe, Donetsk Oblast	
	DTEK Dobropolyeugol	5 mines near Dobropillya, Donetsk Oblasts	
	DTEK Sverdlovanthracite	5 coal mines and 3 processing plants in Luhansk Oblast	
	DTEK Rovenkyanthracite	6 mines and 3 processing plants in Luhansk Oblast	
	Krasnoarmeiskaya-Zapadnaya No. 1	1 mine at Krasnoarmeisk, Donetsk Oblast	
	JSC Krasnodon Coal Co. (Metinvest B.V.)	7 mines and 2 processing plants in Luhansk Oblast	
	Smaller producers	Donetsk, Dnipropetrovsk, Luhansk, Lviv, and Volynsk Oblasts	
Coke	Evraz Group:	Dnipropetrovsk Oblast:	3,000,000
	OAO Dneprkoks coke plant	Dnipropetrovsk	
	OAO Bagliykoks coke plant	Dniprodzerzhinsk	
	OAO Dneprodzerzhinsk coke plant	Dniprodzerzhinsk	
Do.	Metinvest B.V.:		
	JSC Avdiivka Coke Plant	Avdeyevka, Donetsk Oblast	4,000,000
Do.	JSC Azovstal Iron and Steel Works	Mariupol, Donetsk Oblast	3,182,000
Do.	OJSC ArcelorMittal Kryviy Rih	Kryviy Rih, Dnipropetrovsk Oblast	3,300,000
Do.	JSC Donetskkoks (Metinvest B.V., 24.5%, and OJSC Ilyich Iron and Steel Works, 12.96%)	Donetsk, Donetsk Oblast	390,000
Do.	Yenakievo coke plant	Yenakievo, Donetsk Oblast	NA
Do.	OAO Zaporozhkoks (JSC Zaporizhstal, 42%, and Metinvest B.V., 25%)	Zaporizhia	NA
Do.	Makeevka coke plant	Makeevka, Donetsk Oblast	NA
Do.	OAO Yasinovskiy coke plant	do.	NA
Do.	OAO Alchevsk coke plant [Industrial Union of Donbass (ISD Corp.)]	Alchevsk, Luhansk Oblast	3,700,000
Do.	Horlivka coke plant	Horlivka, Donetsk Oblast	440,000
Do.	Kharkov coke plant	Kharkov	225,000
Ferroalloys:			
Ferromanganese	Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	100,000
Do.	Nikopol ferroalloys plant (PrivatBank Group and EastOne Group)	Nikopol	300,000
Do.	Stakhanov ferroalloys plant (PrivatBank Group)	Luhansk Oblast	NA
Ferromanganese, blast furnace	Konstantinovka Iron and Steel Works	Konstyantynivka, Donetsk Oblast	NA [4]
Do.	Kramatorskiy ferroalloys plant	Kramatorsk, Donetsk Oblast	NA [5]
Ferronickel	Pobuzhskiy ferronickel plant	Pobuzhke, Kirovohrad Oblast	100,000

See footnotes at end of table.

TABLE 2—Continued
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1, 2]	Location or deposit names	Annual capacity[e]
Ferroalloys—Continued:			
Ferrosilicon	Stakhanov ferroalloys plant (PrivatBank Group)	Luhansk Oblast	NA
Do.	Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	100,000
Silicomanganese	Stakhanov ferroalloys plant (PrivatBank Group)	Luhansk Oblast	NA
Do.	Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	250,000
Do.	Nikopol ferroalloys plant (PrivatBank Group and EastOne Group)	Nikopol	900,000
Gallium	Nikolaev alumina refinery [United Company RUSAL (RUSAL)]	20 kilometers south of Mykolaiv	13
Germanium	Zaporozhye titanium-magnesium plant	Zaporizhia	19,000
Graphite	Zavalyevskiy graphite complex	Zavalyevskiy deposit	NA
Iron ore:			
Underground mining	Krivorozhskiy Iron Ore Complex (Metinvest B.V., 50%, and PrivatBank Group, 50%)	4 mines, in Kryvorizkiy iron ore basin	7,000,000
Do.	Sukha Balka (Evraz Group)	2 mines in Dnipropetrovsk Oblast	3,100,000
Do.	PJSC ArcelorMittal Kryviy Rih	2 mines at Kryviy Rih	1,500,000
Do.	Zaporozhye Iron Ore Complex	Eksplutatsionnay Mine in Zaporizhia Oblast	4,500,000
Do.	JSC Central Iron Ore Enrichment Works (Metinvest B.V.)	1 mine in Dnipropetrovsk Oblast	2,200,000
Open pit mining	do.	3 mines in Dnipropetrovsk Oblast	12,000,000
Do.	JSC Northern Iron Ore Enrichment Works (Metinvest B.V.)	2 mines in Dnipropetrovsk Oblast	30,000,000
Do.	JSC Ingulets Iron Ore Enrichment Works (Metinvest B.V.)	Ingulets mine south of Kryviy Rih	35,000,000
Do.	Yuzhniy GOK (Evraz Holding, 50%, and Smart Holding, 50%)	Mine at Kryviy Rih	22,000,000
Do.	PJSC ArcelorMittal Kryviy Rih	2 mines at Kryviy Rih	26,550,000
Do.	Poltava GOK (Ferrexpo Plc.)	Gorishne-Plavninskoye and Lavrikovskoye (GPL) Mine 15 kilometers east of Kremenchug	30,000,000
Lead, secondary	CJSC Svinets	Kostyantynivka	20,000
Magnesium metal	Magnii concern	Kalush	22,000
Manganese:			
Ore, marketable	Ordzhonikidze GOK (PrivatBank Group)	Ordzhonikidze	NA
Do.	Marganets GOK (PrivatBank Group)	Marhanets	NA
Metal	Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	NA
Mercury	OOO Nikitrtyt	Horlivka, Donetsk Oblast	300
Nickel, Ni content in FeNi	Pobuzhskiy GOK (comprises three open pit mines and the Pobuzhskiy Ferronickel Plant)	Pobuzhke, Kirovohrad Oblast	20,000
Petroleum, refined 42-gallon barrels	Kherson oil refining plant	Kherson	NA
Do. do.	Odessa refinery (OAO Lukoil)	Odessa	23,000,000 [6]
Do. do.	Lisichansk refinery (TNK-BP)	Lisichansk	52,600,000
Do. do.	Halychyna refinery (Ukraine Oil Co.)	Drohobych, Lviv Oblast	28,600,000
Do. do.	Kremenchug refinery (CJSC Ukrtatnafta)	Kremenchug	150,000,000
Do. do.	JSC Naftokhimik Prykarpattya	Nadvirna, Ivano-Frankivsk Oblast	18,400,000
Steel, crude	Industrial Union of Donbass Corp. (ISD Corp.): OJSC Alchevsk Iron and Steel Works	Alchevsk, Lugansk Oblast	5,200,000
Do.	Dneprovskiy Metallurgical Plant “Dzerzhinsky”	Dniprodzerzhinsk	3,850,000
Do.	Metinvest B.V.: JSC Azovstal Iron and Steel Works	Mariupol, Donetsk Oblast	6,200,000
Do.	JSC Yenakiieve Iron and Steel Works	Yenakievo, Donetsk Oblast	2,700,000
Do.	OJSC Ilyich Iron and Steel Works	Mariupol, Donetsk Oblast	6,000,000

See footnotes at end of table.

TABLE 2—Continued
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners[1, 2]	Location or deposit names	Annual capacity[e]
Steel, crude—Continued		OJSC ArcelorMittal Kryviy Rih	Kryviy Rih, Dnipropetrovsk Oblast	7,400,000
Do.		Dnepropetrovsk Metals Plant "Petrovskovo" (DMZP) (Evraz Group S.A., 96.77%)	Dnipropetrovsk	1,360,000
Do.		JSC Zaporizhstal (Metinvest, 24.9%)	Zaporizhia	4,350,000
Do.		Kramatorskiy Metal Plant "Kuibiysheva"	Kramatorsk, Donetsk Oblast	NA
Do.		Donetskstal	Donetsk	NA
Do.		Donetsk electrometallurgical plant (Mechel OAO)[7]	do.	1,000,000
Do.		Dneprospetsstal	Zaporizhia	918,000
Do.		OOO Elektrostal	Kurakhovo, Donetsk Oblast	NA
Do.		JSC Energomashspetsstal (OJSC Atomenergomash)	Kramatorsk, Donetsk Oblast	NA
Do.		PJSC Azovelectrostal (JSC Azovmash)	Mariupol, Donetsk Oblast	500,000
Titanium:				
Concentrate:				
Ilmenite		Irshansk GOK [Leased from the Government by Crimea Titan CJSC (Government, 50% plus one share, and OstChem GmbH, 50% minus one share)]	Irshansk, 50 kilometers north of Zhytomyr	400
Do.		OOO Valki-Ilmenit (OstChem GmbH, 75%)	do.	70
Do.		Mezhdurechensk GOK (OstChem GmbH, 75%)	Zhytomyr Oblast	84
Do.		Velta LLC	Korobchino, Novomirgorod district, Kirovograd Oblast	185 [8]
Do.		Volnogorsk state mining-metals complex [Leased from the Government by Crimea Titan CJSC (Ukraine Government, 50% plus one share, OstChem GmbH, 50% minus one share)]	Volnogorsk, 70 kilometers west of Dnipropetrovsk	200
Rutile		do.	do.	65
Sponge		Zaporozhye Titanium & Magnesium Combine (ZTMK) (Government)	Zaporizhia	NA
Uranium:				
Ore	thousand metric tons	Vostochny GOK (Government)	Ingulskaya Mine at Kirovohrad	450
Do.	do.	do.	Smolinskaya Mine at Smolino	600
Do.	do.	do.	Novokonstantinovskoye deposit in Kirovohrad Oblast	100
Concentrate		do.	Hydrometallurgical concentration plant at Zheltye Vody	1,000
Zinc, secondary		Ukrzinc plant	Kostyantynivka	25,000
Do.		CJSC Svinets	do.	30,000
Zirconium:				
Concentrate		Volnogorsk state mining-metals complex [Leased from the Government by Crimea Titan CJSC (Ukraine Government, 50% plus one share, and OstChem Gmbh, 50% minus one share)]	Volnogorsk, 70 kilometers west of Dnipropetrovsk	35
Metal and compounds		State Research and Production Enterprise "Zirconium"	Dniprodzerzhinsk	NA

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.
[1]Inconsistencies in enterprise and location names may appear in this table because both Ukrainian and Russian spellings were used for transliterations. English versions of company names are used as given by official company sources (Web sites, press releases, and so forth). Ukrainian versions of location names are used wherever possible.
[2]GOK is the abbreviation for gorno-obogotitelniy kombinat, which translates as "mining and beneficiation complex."

TABLE 2—Continued
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

[3]Capacity estimates are totals for all enterprises that produce that commodity.
[4]Konstantinovka Iron and Steel Works stopped production of blast furnace ferromanganese in 2008.
[5]Kramatorskiy Metal Plant "Kuibiysheva" stopped production of blast furnace ferromanganese in 2006.
[6]The Odessa refinery stopped production in the 4th quarter of 2010. Production could restart in the future if business conditions improve.
[7]In December 2011, Mechel OAO of Russia purchased 100% of the shares of the Donetsk electrometallurgical plant.
[8]Velta LLC began production of ilmenite concentrate in December 2011, but its first deliveries of commercial concentrate were not made until April 2012.