



2009 Minerals Yearbook

RUSSIA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF RUSSIA

By Richard M. Levine

Russia was one of the world's leading mineral producing countries. In 2009, Russia ranked among the leading world producers or was a leading regional producer of such mineral commodities as aluminum, arsenic, asbestos, bauxite, boron, cadmium, cement, coal, cobalt, copper, diamond, fluorspar, gold, iron ore, lime, magnesium compound and metals, mica flake and scrap and sheet, natural gas, nickel, nitrogen, oil shale, palladium, peat, petroleum, phosphate, pig iron, potash, rhenium, silicon, steel, sulfur, tin, titanium sponge, tungsten, and vanadium.

Minerals in the National Economy

The value of mineral output extracted in Russia had averaged about \$200 billion per year in recent years. According to official Russian data, in 2009, the mineral extraction sector accounted for about 8% of the gross domestic product (GDP). The mineral sector, however, which would include mining and processing, reportedly contributed 59% of the GDP (Vercheba, 2009; Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011d).

In 2009, the extraction of fuel minerals accounted for 89.9% of the value of output of the mineral extraction sector (Vercheba, 2009; Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011h). Reported capacity utilization was lower than in 2008 for selected mineral commodities; for example, the capacity utilization for cement was 57% compared with 70% in 2008; for coal, 76% compared with 81%; and for crude steel, 73% compared with 83% (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011f).

In 2009, the number of people employed in the mineral extraction sector decreased to 866,000 from 923,000 in 2008. Of this total, 567,000 were employed in mineral fuel extraction, including 399,000 who were employed in the extraction of oil and natural gas and 168,000 who were employed in the extraction of coal and peat. The metal mining sector employed 169,000 people, of which 107,000 were employed in the extraction of nonferrous metals and 62,000 were employed in the extraction of iron ore. Employment in all mineral extraction sectors was lower in 2009 than in 2008 (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011j).

In 2009, 78.4% of Russia's total investment in geologic prospecting went to exploration for oil and gas, 7.7% went to exploration for precious metals, and 2.4% went to exploration for diamond. For each of the other categories, investment was less than 2% of the country's total exploration expenditure (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011e).

Government Policies and Programs

Amendments to Russia's law on the use of subsurface resources, which were ratified on January 31, 2007, and further amended in 2008, set criteria for deposits containing strategic mineral commodities and limit the rights of foreigners to invest in a controlling stake in such deposits if the deposits have not yet been developed with foreign participation. Among the list

of strategic mineral deposits are deposits containing lithium, niobium, platinum-group metals (PGM), uranium, and the heavy rare earths (Interfax Russia & CIS Metals and Mining Weekly, 2008).

Production

The value of output in the mining and quarrying sector in constant prices in 2009 decreased by 0.6% compared with that of 2008. In 2009, the value of fuel mineral production increased by 0.4% compared with that of 2008 but that of nonfuel minerals decreased by 7.4% (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011c).

Structure of the Mineral Industry

At the end of 2009, Russia had 9,805 enterprises engaged in mining and quarrying, which was a 12.3% increase compared with the number of enterprises active in mining and quarrying in the previous year. Of these enterprises, 4,195 were engaged in extracting fuel minerals and the other 5,610 were engaged in mining nonfuel minerals (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011g, i). Russia had more than 100 large mining and beneficiation and mining and metallurgical enterprises that mined and processed ferrous and nonferrous metals (Chanturiya, 2007; Linyev and others, 2007).

Mineral Trade

In 2009, the total value of Russian exports decreased by 37% compared with that of 2008 (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b). Although the volume of many mineral commodity exports did not change significantly, the value of many mineral commodity exports did change owing to the decrease in world market prices for many mineral commodities in 2009. Reported trade data on selected mineral commodities are in table 3.

Russia was a major exporter of oil and natural gas, and these exports were a mainstay of the Russian economy. In recent years, Russia's economic growth had been based primarily upon oil and gas exports, and the country benefited greatly from high oil prices. In 2009, crude oil exports accounted for 33% of the total value of exports; petroleum refinery products, 16%; and natural gas, 14% (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b).

Commodity Review

Metals

Aluminum.—All Russian production of alumina, bauxite, and primary aluminum was controlled by United Company RUSAL, which was the world's leading producer of alumina

and aluminum. RUSAL operated 15 aluminum smelters, which were located in four countries: Russia (12 plants), Nigeria (1 plant), Sweden (1 plant), and Ukraine (1 plant). RUSAL's main facilities were located in Russia in Siberia and accounted for about 85% of the company's aluminum output. Together, the Bratsk smelter and the Krasnoyarsk smelter in Siberia accounted for almost one-half of RUSAL's aluminum production, and these smelters were among the leading aluminum smelters in the world. RUSAL's aluminum smelters in Siberia had the advantage of access to low-cost and renewable hydroelectric power as their principal source of electricity (United Company RUSAL, 2010a, p. 21).

RUSAL had plans to further expand its aluminum smelting operation in Siberia with two projects—the BEMO and the Tayshet smelter projects, which together would increase production capacity by an additional 1.3 million metric tons per year (Mt/yr). The BEMO project involved the construction of the 3,000-megawatt (MW)-capacity BEMO hydroelectric powerplant and the Boguchanskiy aluminum smelter in the Krasnoyarsk region; the smelter would have the capacity to produce 588,000 metric tons per year (t/yr) of aluminum. The project was to be completed in two stages. The first stage was scheduled for completion by 2013, and the second stage, by the end of 2015 (United Company RUSAL, 2010a, p. 22).

The Tayshet aluminium smelter, which was to be located in Irkutsk, was to have a design capacity to produce 750,000 t/yr of aluminum. Construction of the smelter had been temporarily suspended owing to financing issues, and RUSAL was in the process of negotiating with foreign investors for financing.

In 2009, RUSAL operated 12 alumina refineries, which were located in six countries—Russia (five plants), Jamaica (two plants), Ukraine (two plants), Guinea (one plant), Ireland (one plant), and Italy (one plant). RUSAL also operated eight bauxite mines throughout the world and one nepheline syenite mine in Russia. In Russia, RUSAL's bauxite mining operations included the North Urals and the Timan bauxite mines, which had the capacity to produce 3.4 Mt/yr and 2.5 Mt/yr of bauxite, respectively (United Company RUSAL, 2010a, p. 23-25).

In 2009, production decreased at all RUSAL's alumina refineries and aluminum smelters in Russia. In 2009, aluminum consumption in Russia decreased to 550,000 t from 700,000 t in 2008 (Podvishenskiy and others, 2010). RUSAL's reduction in aluminum output was the result of the temporary suspension of production at its least-cost-efficient smelters—the Bogoslovsk, the Novokuznetsk, and the Uralsk aluminum smelters (United Company RUSAL, 2010a, p. 33). In 2009, bauxite production at RUSAL's mines in the North Urals increased by 2% compared with that of 2008 to 3.4 million metric tons (Mt); production remained at the 2008 level of about 1.9 Mt at the Timan Mine in the Komi region in the northwest of the country (United Company RUSAL, 2010a, p. 35).

RUSAL was planning to restart construction of the Cheremukhovskaya Mine at the Severuralbokistruda [North Urals] (SUBR) mining complex. The mine had been planned to be commissioned in 2009, but another 3 years of work were needed to make the mine operational. The new mine would increase the production capacity at SUBR by 1.35 Mt/yr (Podvishenskiy and others, 2010).

In 2009, RUSAL was actively seeking project financing to revive construction of the Boguchanskiy and the Tayshet aluminum smelters. RUSAL assumed that there would be a restoration of the global aluminum market in 2010 and, accordingly, was planning to increase production of aluminum by 3% during 2010. The increase in production was expected to result from increased production at RUSAL's Siberian plants and by having potline 5 at the Irkutsk aluminium smelter produce at full capacity (United Company RUSAL, 2010a, p. 19; 2010b).

Copper.—In 2009, refined copper production in Russia decreased slightly compared with that of 2008. Production of blister and refined copper took place at three enterprises—OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, Ural Mining and Metallurgical Co. (UMMC), and ZAO Russian Copper Co. (RCC); these enterprises mined copper and produced 47%, about 40%, and about 13%, respectively, of the country's refined copper output. Copper in ore and concentrate was also produced at a number of enterprises that mined polymetallic ores containing copper. Copper in concentrate production was estimated to have increased by about 10% compared with that of 2008. Exports of refined copper increased by almost 2.5 times to about 510,000 t from about 206,000 t in 2008. Domestic consumption of refined copper decreased to 373,600 t from 687,400 t in 2008 because of the sharp decrease in demand at practically all domestic enterprises that used copper (Podvishenskiy and others, 2010).

At Russia's leading copper producing enterprise, Norilsk, refined copper production totaled 402,000 t at the company's operations in Russia, which was about 4% less than Norilsk produced in 2008. In 2009, copper production accounted for 26% of Norilsk's revenue. At the company's major mining operations on the Taymyr Peninsula in East Siberia, Norilsk continued its trend of mining larger quantities of cuprous ores, which have a higher copper content than do the nickel-rich ores, which were being depleted. Norilsk also increased production of disseminated ores, which have lower grades of all metals [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 57].

In 2009, UMMC, which was the country's second-ranked copper producer, completely fulfilled its raw material production plan. The OAO Gayskiy mining and metallurgical complex, which was UMMC's largest mining complex in terms of the volume of production, exceeded its production target for ore by producing 5.664 Mt of ore, of which 4.370 Mt was mined from underground mines. UMMC produced 521,752 t of copper concentrate containing 78,263 t of copper. A new electrolytic refining shop was under construction at UMMC's leading metallurgical enterprise, OAO Uralektromed. The first stage of the shop was planned to go into operation in 2011. UMMC planned eventually to increase its production capacity to 500,000 t/yr of copper cathode (Podvishenskiy and others, 2010).

RCC, which was the country's third ranked copper producer, had the capacity to produce 200,000 t/yr of copper cathode. The major enterprises that comprised RCC were the Aleksandrinskaya copper mining company and the ZAO Karabashmed' and the ZAO Kyshtymskiy copper smelters. In 2009, Karabashmed produced 67,000 t of blister copper compared with 51,000 t in 2008; it planned to increase its output to 72,000 t in 2010 (Podvishenskiy and others, 2010).

Norilsk was planning to reduce its copper production to between 363,000 t and 367,000 t in 2010, but RCC and UMMC planned to increase copper output by between 40,000 and 50,000 t, which would compensate for decreased output at Norilsk. The country's most prospective site for increasing copper production was the Udokan deposit in Zabaykal'skiy Kray, which was one of the world's largest undeveloped copper deposits. Reserves at Udokan, which were reported according to the classification system used in the Soviet Union and then adopted by Russia, were 1.2752 billion metric tons (Gt) of ore containing 19.95 Mt of copper (Podvishenskiy and others, 2010).

The major problem that the Russian copper industry faced in increasing production to meet increasing global demand was insufficient reserves at existing mining enterprises. Norilsk was attempting to solve this problem by trying to confirm additional reserves at its existing enterprises and in other regions of the country, as well as by developing deposits abroad. For UMMC, the situation was more complicated, as its deposits were almost depleted and UMMC's deposits in the Altay region were not large. Furthermore, planning for the development of Udokan had been dragging on for many years. Besides Udokan, planning continued for the development of other known large deposits, including the Chineyskoye copper deposit in the Zabaykal'ye region (Podvishenskiy and others, 2010).

Gallium.—Russia produced between 10 and 13 t/yr of gallium, consumed up to 1 t/yr, and exported about 10 t/yr (Naumov, 2010). Gallium reserves in Russia reportedly exceed 9,000 t. Processing capacity existed for producing metallic gallium at the JSC Achinsk alumina plant, the JSC Pikalevo alumina plant, and the OOO Gallyi enterprise.

Germanium.—Russia produced between 5 and 6 t/yr of germanium (calculated in metal content), consumed up to 500 kilograms per year (kg/yr) of germanium metal and 600 kg/yr of germanium oxide (Ge_2O_3), and exported between 4 and 5 t/yr of germanium metal and up to 2 t/yr of Ge_2O_3 (Naumov, 2010). Germanium was produced at the Federal State Unitary Enterprise Germanium, which was founded in 1991 based on the germanium production facilities at the Krasnoyarsk nonferrous metals plant. The Germanium enterprise was the only large-scale germanium producer in Russia. It produced germanium from different materials, which included ashes from coal burning, germanium concentrates containing 2% or more germanium, production waste, and secondary raw material of various origins. Germanium production employed about 180 people (OJSC Germanium, 2010a-e).

Gold.—In 2009, gold production in Russia from mine output increased by almost 11% compared with that of 2008, and growth came mainly from deposits in Amurskaya Oblast', Chukotskiy Avtonomnyy Orkrug, Irkutskaya Oblast', and Kamchatskiy Kray. Gold mining took place in 23 regions, of which 13 produced more than 1 t each in 2009. The number of gold mining enterprises decreased by about 5% to 400 from 421 during 2009. The number of gold mining enterprises producing less than 100 kg/yr decreased by about 10% to 236 from 261. In 2009, 22 gold mining companies produced more than 1 t each, which was the same number as in 2008. These 22 enterprises mined 14.6% more gold in 2009 than in 2008 and produced

79.8% of the total output of the country in 2009 compared with 75.8% in 2008. Foreign-owned companies increased their extraction of gold by 29.5%, and their output accounted for 27.4% of the country's total output (Brayko and Ivanov, 2010).

In 2009, output from hard rock deposits increased by 15,575 kg but decreased at placer deposits by 1,178 kg. Gold held by the Russian Government as currency reserves as of January 1, 2009, totaled 520 t; on January 1, 2010, the total was 637.6 t (Brayko and Ivanov, 2010).

Indium.—In Russia, indium reserves are present mainly in deposits of copper-zinc-pyrite and tin ores. In Russia, zinc and indium were extracted from porphyry copper deposits in the Ural Mountains, where 75% of the country's zinc concentrates were produced and which had an average indium content of 3.2 grams per metric ton (g/t). Indium was also obtained from lead-zinc ores from deposits in southern Siberia and the Maritime Province in the Russian Far East where the indium content averaged 14.7 g/t. Indium reserves have been identified in 61 deposits in the country.

Indium reserves in Russia, reportedly, have been estimated to be about 4,000 t (Global Information, Inc., 2007). Until the middle of the 1990s, indium was being produced at the Chelyabinsk zinc plant, the OAO Elektrotsink plant in Vladikavkaz, and the Novosibirsk tin complex. High-purity indium (99.99%) also was being produced at the Podol'sk chemical-metallurgical plant. In 2007, indium was being produced only at the Chelyabinsk and the Elektrotsink plants. The Chelyabinsk plant had the capacity to produce from 3 to 6 t/yr of indium, and the Elektrotsink plant had the capacity to produce up to 6 t/yr. In 2008, Russia exported 4.7 t of indium, of which 750 kg was secondary indium produced from recycled material. Primary indium was produced only at the Chelyabinsk plant, which had been producing between 4 and 5 t/yr of indium in recent years; the remaining indium was produced from recycled material (Naumov, 2009).

Iron and Steel.—In 2009, production of crude steel decreased by almost 14% compared with that of 2008. Structural changes took place in the methods used to produce steel—the percentage of steel produced in oxygen converter furnaces increased to 64.3% of total output compared with 56.6% in 2008, that of steel produced in electric furnaces decreased to 27.2% of the total compared with 29.1% in 2008, and that of steel produced in open hearth furnaces decreased to 8.5% of the total compared with 14.3% in 2008. Less steel was produced in each furnace type in 2009 than in 2008. Output in the iron and steel industry was highly concentrated in nine enterprises, which, in 2009, produced 84.5% of the country's total steel output, 91.4% of its pig iron output, and 86.6% of its rolled-steel output. Production of crude steel at these nine leading enterprises in 2009 was as follows: the Magnitogorsk mining and metallurgical complex (9.7421 Mt), Cherepovets metallurgical complex (9.4829 Mt), Novolipetsk metallurgical complex (8.5072 Mt), Zapsib metallurgical complex (6.0039 Mt), Chelyabinsk metallurgical complex (4.5396 Mt), Nizhniy Tagil metallurgical complex (3.8783 Mt), Oskol electric metallurgical complex (3.2499 Mt), Ural Steel Works (3.165 Mt), and Novokuznetsk metallurgical complex (1.3975 Mt). In 2009, production of steel and rolled steel decreased at seven of these nine enterprises, increasing at only the Novokuznetsk and the Oskol complexes.

Production of pig iron increased at only the Chelyabinsk and the Novolipetsk complexes and the Ural Steel enterprise (Katunin, 2010).

Iron Ore.—In 2009, iron ore output decreased at all the country's major iron ore mining complexes except for the KMaruda, the Kovdor, and the Olenegorsk complexes. The nine leading iron ore mining and beneficiation complexes produced 87.3% of the total value of output. In 2009 compared with 2008, output decreased at the following iron ore mining enterprises: Mikhaylovka mining and beneficiation complex (GOK) (by 14% to 15.6846 Mt), Lebedi GOK (12.7% to 16.0403 Mt), Korshunovo GOK (11.5% to 4.2075 Mt), Karel'skiy pelletizing complex (5.6% to 9.3017 Mt), Stoilo GOK (3.8% to 12.6598 Mt), and Kachkanar GOK (2.8% to 8.4494 Mt). Output increased at the following enterprises: KMaruda complex (by 4.3% to 2.1953 Mt), Olenegorsk GOK (2.5% to 4.7939 Mt), and Kovdor GOK (2.2% to 5.5446 Mt). Almost all iron ore mining enterprises remained under the control of metallurgical holding companies, which ensured the supply of iron ore for the domestic steel industry. The main market for Russian iron ore remained the domestic market (Katunin, 2010).

Lead and Zinc.—In 2009, production of lead, including secondary lead, decreased by about 8.8% compared with that of 2008, but output of lead in concentrate increased by about 17%. Primary lead was produced at the Elektrotsink enterprise and the Dalpolimetal mining and metallurgical complex. Secondary lead production was widely dispersed among various types of enterprises and locations. Owing to the steep drop in lead prices, the Dalpolimetal enterprise ceased lead production from November 2008 to April 2009, and fully resumed production in May 2009. Dalpolimetal was the country's leading producer of lead concentrates and accounted for about 70% of the country's production. Because of Dalpolimetal's location in the far eastern part of Russia, it exported most of its concentrates, but it also had the capacity to produce lead metal. Resources of lead scrap were generally in short supply, which created greater demand for the high-quality concentrate produced at Dalpolimetal. In 2009, Dalpolimetal exported 133,400 t of lead concentrate, which was 11.1% more than in 2008; the majority of its exports of lead concentrate went to China (Podvishenskiy and others, 2010).

In 2010, the Elektrotsink enterprise was expected to increase its production of lead metal to 40,000 t with the recovery in the price of lead. Elektrotsink's development plans for the period from 2007 to 2015 called for increasing lead output to 50,000 t/yr. Dalpolimetal would continue to produce mainly lead concentrates for export (Podvishenskiy and others, 2010).

In 2009, zinc metal production decreased by more than 13% compared with that of 2008. Almost all zinc metal production took place at two enterprises—the OAO Chelyabinsk electrolytic zinc plant and the Elektrotsink plant, which also produced lead metal. Apparent domestic consumption of zinc was 162,200 t, which was 17.2% less than in 2008 (Podvishenskiy and others, 2010).

The country's leading zinc producer was the Chelyabinsk plant, which in 2009 produced 119,931 t of commercial special high grade (SHG) zinc (99.995% zinc) and alloys based on SHG zinc, which was 20% less than in 2008. Chelyabinsk also

controlled several zinc mining and metals producing enterprises outside the country. Chelyabinsk sold about 64% of the zinc it produced on the domestic market. In 2010, Chelyabinsk planned to increase production of SHG zinc and its alloys to 153,000 t in 2010, to 160,000 t by 2011, and to 175,000 t by 2012. If there were to be a sufficient increase in the price of zinc, Chelyabinsk could increase zinc output to almost 200,000 t in 2014 (Podvishenskiy and others, 2010).

The Elektrotsink plant, which ranked second in domestic zinc metal production, produced 100,000 t of zinc metal in 2009. It exported 79,700 t of zinc metal, primarily to Turkey (40,200 t), the Netherlands (12,400 t), and Malaysia (9,100 t). Elektrotsink planned to produce about 110,000 t of zinc metal in 2010. Domestic demand was projected to increase to 186,000 t. In order to supply the domestic zinc metal plants with adequate raw material, the company planned to restart production at the Korbalkhinskoye and the Stepnoye polymetallic deposits in the Altayskiy Republic, which contain copper, gold, lead, silver, and zinc (Podvishenskiy and others, 2010).

Molybdenum.—In 2009, Russian molybdenum concentrate production totaled 10,500 t, which was 14.6% more than in 2008. Production of ferromolybdenum was 6,700 t, which was an increase of 15.2%. Russia's leading producer of molybdenum and ferromolybdenum was the Strikeforce Mining and Resources Co. (SMR), which was part of the holding company Bazovyy Element [Basic Element]. SMR included a number of companies engaged in exploration, mining, beneficiation, and metallurgy. The major companies within SMR were the Chelyabinsk electro-metallurgical complex, the Sorsk ferromolybdenum plant, the Sorsk mining and beneficiation complex, the Zabaykalsk'invest mining and beneficiation complex, the Zhireken ferromolybdenum plant, and the Zhireken mining and beneficiation complex. The Sorsk and the Zhireken mining and beneficiation complexes and the Sorsk and the Zhireken ferromolybdenum plants produced all the country's output of molybdenum concentrate and ferromolybdenum in 2009 (Podvishenskiy and others, 2010).

In 2009, the major increase in molybdenum output took place at the Sorsk complex in the Republic of Khakasiya, which was the county's leading enterprise for mining molybdenum ore; the increase in ferromolybdenum output took place mainly at the Sorsk ferromolybdenum plant. In 2009, the Sorsk complex produced 6,900 t of molybdenum concentrate and the Sorsk ferromolybdenum plant produced 3,900 t of ferromolybdenum (Podvishenskiy and others, 2010).

The Zhireken complex and Zhireken ferromolybdenum plant also increased output in 2009. They produced 3,600 t of molybdenum concentrate and 2,800 t of ferromolybdenum, respectively, which was a 15% and a 40% increase, respectively, compared with that of 2008 (Podvishenskiy and others, 2010).

In 2009, Russia exported 21 t of molybdenum concentrate, of which 20 t went to Latvia. In 2008, Russia exported 18 t. In 2009, Russia imported 752 t of molybdenum concentrate, with imports coming primarily from Iran (278 t), the Netherlands (250 t), and Chile (120 t). Russia's apparent consumption of molybdenum concentrate was 11,230 t; the vast majority of the concentrates was used in the production of ferromolybdenum, which was then exported (Podvishenskiy and others, 2010).

Russia's plans called for producing 12,000 t of molybdenum concentrate and between 7,500 t and 7,700 t of ferromolybdenum in 2010. To increase molybdenum production, the Government planned to commission an open pit mine and beneficiation plant based on ore from the Yuzhno-Shameyskoye copper-molybdenum deposit in Sverdlovsk Oblast', and to examine the feasibility of developing the Oynogorskoye tungsten-molybdenum deposit in the Republic of Buryatiya; the development period for this project was projected to be 8.5 years (Podvishenskiy and others, 2010).

Nickel.—In 2009, nickel production in Russia was relatively stable, decreasing by less than 2%, which was less than the world decrease in nickel production. In 2009, Russia's nickel exports decreased by 3.2% compared with those of 2008. The country exported almost 95% of the nickel it produced, and domestic nickel consumption apparently accounted for most of the remaining output.

Russia was the world's leading nickel mining country in 2009 (Kuck, 2011). Norilsk was the country's leading nickel producer and the world's leading nickel mining company. Nickel accounted for 50% of Norilsk's revenues in 2009. Norilsk's operations in Russia were located on the Kola Peninsula in the northwest of the country and in the Noril'sk region on the Taymyr Peninsula in East Siberia. Norilsk mined mixed sulfide ores on the Taymyr Peninsula from seven mines at the Oktyabrskoye, the Norilsk-1, and the Talnakh deposits. Ores mined were classified as nickel rich, cuprous, and disseminated, and had differing contents of cobalt, copper, gold, nickel, palladium, platinum, and other ore constituents. Ore was beneficiated at the Norilsk and Talnakh concentrators. The Norilsk concentrator beneficiated the entire volume of cuprous and disseminated ores from the Oktyabrskoye and the Talnakh deposits. The Talnakh concentrator processed nickel rich ores mined at the Oktyabrskoye and the Talnakh deposits to produce copper, nickel, and pyrrhotite concentrates [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 18].

Metallurgical facilities on the Taymyr Peninsula included the Nadezhda metallurgical plant, the Nickel plant, and the Copper plant. The Nadezhda metallurgical plant processed all nickel and pyrrhotite concentrates produced by the Talnakh concentrator and about 15% of the nickel concentrates from the Norilsk concentrator. The Nickel plant processed about 85% of the nickel concentrate produced by the Norilsk concentrator, all beneficiated stockpiled pyrrhotite concentrate, and some high-grade matte from the Nadezhda metallurgical plant to produce nickel cathodes and cobalt [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 18].

On the Kola Peninsula, three mines extracted disseminated mixed sulfide ores from the Kotselvaara, the Semiletka, the Zapolyarnoye, and the Zhdanovskoye deposits. The mined ore was beneficiated at a concentrator, which produced copper and nickel concentrates that were then sent to the smelting shop for further processing. The refinery at Monchegorsk on the Kola Peninsula processed both high-grade matte from the Kola Peninsula and matte received from the Taymyr Peninsula to produce (in order of economic value) nickel cathodes, carbonyl nickel, copper cathodes, precious metal concentrates, cobalt

concentrate, and sulfuric acid [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 19].

In 2009, the mines on the Taymyr Peninsula produced a total of 15.3 Mt of ore. Ore output for all ore grades changed compared with that of 2008; the output of nickel-rich ore decreased by 131,700 t (or by 1.8%), the output of cuprous ore increased by 381,600 t (7.9%), and the output of disseminated ore increased by 14,400 t (0.5%) [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 56].

In 2009, ore mined by Norilsk on the Kola Peninsula totaled 7.9 Mt, which was 257,000 t less than in 2008. This reduction was attributed primarily to the depletion of reserves as well as to difficulties that arose in switching from open pit mining to underground mining at the Zhdanovskoye deposit [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 59].

In 2009, Norilsk's output of refined nickel increased by 2%. To maintain nickel output levels, stockpiled pyrrhotite concentrate from the Kayerkanskiy coal strip mine was processed using the hydrometallurgical and pyrometallurgical facilities of the Nadezhda metallurgical plant [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 58].

On the Taymyr Peninsula, the average grade of nickel in ore was 1.52%, and the average grade on the Kola Peninsula was 0.65%. Norilsk continued with construction of mining facilities and continued with its construction, design, and feasibility studies for projects on the Taymyr Peninsula, including development of the Skalisty Mine. At the Oktyabrskiy Mine, construction of shafts was continuing, which would increase the cuprous ore mining capacity to 3 Mt/yr; the design capacity was scheduled to be achieved in 2013.

In 2010, investment at Norilsk was to be concentrated on exploration to increase the company's raw material base to maintain and increase output. Investment was also being directed towards modernizing equipment and introducing new technology. Norilsk reportedly had adequate reserves to maintain production levels for 25 years at its 2009 level of output, and its explored mineral-raw material base in eastern Siberia was declared sufficient to maintain production for 60 years [Podvishenskiy and others, 2010; OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2011].

Nickel was also produced in much smaller amounts at three other producers in the Ural Mountains region—OAO Ufaleynikel, OAO Yuzhuralnikel, and ZAO Rezhnikel. Ufaleynikel was the country's second ranked nickel producer and was part of the company Industrial Metallurgical Holding. Ufaleynikel had the capacity to produce 18,000 t/yr of nickel and accounted for 3% of the country's nickel output. In 2009, Ufaleynikel decreased output by 46.1% compared with that of 2008. Construction of a fourth furnace had been underway at the Ufaleynikel facility and was commissioned in February 2010 with the capacity to produce 150 metric tons per day (t/d) of nickel. No plans were in place to restore cobalt production at Ufaleynikel, which was stopped when shipments of cobalt concentrate to the enterprise stopped (Podvishenskiy and others, 2010).

Yuzhuralnikel had a loss of 165 million rubles¹ in the fourth quarter of 2009 compared with a profit of 407 million rubles in the third quarter of the year. The main reason for the loss of profitability was a 53% increase in the price of coke in the third quarter. Total profits in 2009 were 22 million rubles compared with 233 million rubles in 2008 (Podvishenskiy and others, 2010).

Owing to the sharp drop in the price of nickel, in 2009, Rezhnikel discontinued production and resumed producing in July only at two of its three furnaces. Rezhnikel expected that nickel prices would stabilize in 2010 and planned to restart the third furnace then (Podvishenskiy and others, 2010).

Niobium (Columbium).—The country's niobium reserves are located in 22 deposits. Russia reportedly ranked second in the world to Brazil in its quantity of reserves of niobium pentoxide. More than 65% of the reserves are located in eastern Siberia, and 30% are located in Murmanskaya Oblast'. Among the country's large niobium deposits are the Beloziminskoye and the Bol'shyegtagninskoye carbonate deposits in Irkutskaya Oblast' which have ore with an average Nb₂O₅ content of up to 1%. The Tomtor deposit in the Sakha (Yakutiya) Republic, has ore assessed to have an Nb₂O₅ content of up to 7% and a rare-earth elements content of up to 9% (Kremnetskiy and others, 2009).

Despite having considerable niobium reserves, Russia produced only a small amount of niobium and had been importing annually up to 1,000 t for its metallurgical industry. The only enterprise that mined niobium was the Karnasurt mining enterprise, which was subsidiary of AO Sevredmet, which mined the Lovozerskoye loparite deposit on the Kola Peninsula (Kremenetskiy and others, 2009).

A number of mining enterprises had produced niobium during the Soviet period, but closed following its dissolution; these included those mining the Orlovskoye tantalum-niobium deposit, the Zavitsinskoye beryllium-lithium-niobium-and tantalum deposit, and the Etykinskoye tantalum-niobium deposit in Zabaykal'skiy Krai; the Vyshnevogorskoye niobium deposit in Chelyabinskaya Oblast', and the Tatarskoye niobium deposit in Krasnoyarskiy Krai (Kremenetskiy and others, 2009).

A Russian development program envisioned processing 12,000 t/yr of loparite ore from Lovozerskoye at the OAO Chepetskiy machinery manufacturing plant, which would result in production of 3,900 t/yr of titanium dioxide, 873 t/yr of niobium pentoxide, 472 t/yr of neodymium oxide, 310 t/yr of zirconium dioxide, 280 t/yr of lanthanum oxide, 61 t/yr of tantalum pentoxide, and 56 t/yr of praseodymium oxide (Kurkov and Kotova, 2007). The Katuginskoye deposit in Zabaykal'skiy Krai was projected to be a significant supplier of niobium after 2010. The largest and most significant prospective source of niobium was the Tomtorskoye deposit on the Taymyr Peninsula in East Siberia, which had an average contained niobium oxide content of 6.71%. The first stage of a planned mining enterprise to develop this deposit was projected to produce 10,000 t/yr of ore with reserves adequate to maintain production for about 100 years (Kurkov and Kotova, 2007; Mashkovtsev and others, 2009).

¹Where necessary, values have been converted from Russian rubles to U.S. dollars (US\$) at the rate of 31.74 rubles=US\$1.00 in 2009 and 24.853 rubles=US\$1.00 in 2008.

Platinum-Group Metals.—In 2009, Russia was the world's second ranked producer of platinum-group metals (PGM) following South Africa, and these two countries combined produced more than 85% of the world's PGM output (Loferski, 2011). Because of differences in the composition of the ores in Russia and South Africa, Russia was the world's leading palladium producer and the second ranked platinum producer whereas South Africa ranked first in platinum production but second in palladium production. Russia's production of PGM, unlike that of South Africa's, was a byproduct of the mining of mixed sulfide ores by Norilsk. Norilsk mined these ores mainly in East Siberia but also on the Kola Peninsula. The ores were mined primarily for their nickel content, but the ores also were rich in cobalt, copper, gold, PGM, and other ore constituents. A small amount of PGM in Russia was mined from placer deposits, which produced primarily platinum.

Data for Norilsk's mineral resources and ore reserves in Russia as of December 31, 2009, were reported based on the results of the independent audit performed by Micon International Company Ltd. in accordance with the principles of the Joint Ore Reserves Committee (JORC) Code of the Australasian Institute of Mining and Metallurgy. Proved and probable reserves for the six PGM (iridium, osmium, palladium, platinum, rhodium, and ruthenium) was 71,778,000 troy ounces (about 2,200 t), of which 55,018,000 troy ounces (about 1,700 t) was palladium and 13,439,000 troy ounces (about 420 t) was platinum [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010b]. The ore grade of PGM at Norilsk had been decreasing and in 2009 averaged 8.06 g/t compared with 8.43 g/t in 2008 and 8.92 g/t in 2007 [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 53].

Production of platinum and palladium each accounted for 11% of Norilsk's revenues in 2009 [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2011]. In 2009, Norilsk's operations in Russia produced 636,000 troy ounces (19.8 t) of platinum, which was slightly more than the 632,000 troy ounces (19.7 t) it produced in 2008, and 2,676,000 troy ounces (83.2 t) of palladium, which was slightly less than the 2,707,000 troy ounces (84.2 t) it produced in 2008. Norilsk's production of both platinum and palladium was higher in 2007 than in 2008 and 2009 [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 55].

In 2009, the ZAO Amur Artel placer mined 3,654 kg of platinum, which was 4% less than in 2008. The ZAO Koryakgeoldobycha placer mining enterprise, owing to depleted reserves, curtailed platinum output by about 50% in 2009 to 817 kg compared with 1,630 kg in 2008 [OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel, 2010a, p. 55; Brayko and Ivanov, 2010].

Barrick Gold Corp. of Canada estimated at the end of 2006 that its Fedorova Tundra deposit in the Murmansk region contains measured and indicated resources of 1.1 million troy ounces (about 34 t) of palladium and 300,000 troy ounces (about 9 t) of platinum, and inferred resources of 1.3 million troy ounces of palladium (about 40 t) and 300,000 troy ounces (about 9 t) of platinum. Barrick later stated that continued exploration might double the size of the reserves (Interfax Russia & CIS

Metals and Mining Weekly, 2009). Barrick planned to mine the deposit to produce concentrate, which would be processed at Norilsk's Severonikel plant on the Kola Peninsula. Production was scheduled to commence in 2010, and output was projected to be 150,000 t/yr of concentrate that contains 98 g/t of PGM (Interfax Russia & CIS Metals and Mining Weekly, 2009).

Rare Earths.—Reserves of rare earths are located in 14 deposits but were being mined only at the Lovozerskoye deposit on the Kola Peninsula. Rare-earth elements make up 32% of the loparite ore. The largest source of rare-earth metal resources are the apatite-nepheline ores on the Kola Peninsula, which contain more than 60% of the country's resources; this ore, however, was not being processed for rare-earth metals. Other deposits include the Seligdarskoye apatite deposit in the Sakha (Yakutiya) Republic, which contains almost 23% of the country's reserves, and the Ulug-Tanzekskoye and the Yeregskoye oil-bearing sandstone deposits, which contain rare-earth metal reserves and are also located in the north of the Sakha (Yakutiya) Republic (Kurkov and Kotova, 2007).

The JSC Sevredmet enterprise, which is located in the mountainous part of Lovozero district, produced loparite concentrate, which is a raw material for the production of niobium, rare-earth metals, and tantalum. At the Lovozero deposit, one of the two underground mines of the Karnasurt Mine had started operations in 1951, and the Umbozero Mine began operations in 1984.

In 1990, the Soviet Union produced 744 t of rare-earth metal oxides and 25,400 t of loparite concentrate. Following the dissolution of the Soviet Union, rare-earth metal consumption practically ceased. By 1998, the Sevredmet enterprise faced serious difficulties owing to a large decrease in product sales—the production of loparite concentrate was only 1,000 t. After the dissolution of the Soviet Union, yttrium and other rare earths were mined and processed mainly in Kazakhstan and Kyrgyzstan (Kurkov and Kotova, 2007; Vereschagin and others, 2006).

The potential existed to implement or restart rare-earth metals production at enterprises of the Russian Federal Agency for Atomic Energy and Non-Ferrous Metals, which include the JSC Uralredmet in Verkhnyaya Pyshma, the Production Association Mayak in Ozersk in the Chelyabinsk region, and the Siberian Integrated Works in Seversk in the Tomsk region. Russian enterprises that produced rare-earth metal end products were using imported raw materials (Vereschagin and others, 2006).

The richest source of rare-earth ores in Russia is the Tomtorskoye deposit on the Taymyr Peninsula. The yttrium oxide content of the ore is between 0.5% and 0.8%. An economic assessment of this deposit determined that it would be economic to mine even at the small production level of 100,000 t/yr of ore. Much effort also was being directed towards exploring for compact heavy rare-earth deposits, and success was reported in discovering such deposits in the Primorskiy Kray (Vereschagin and others, 2006; Kurkov and Kotova, 2007; Kremnetskiy and others, 2009).

Selenium.—Russia produced about 140 t/yr of selenium, consumed between 50 and 60 t/yr, and exported between 80 and 100 t/yr (Naumov, 2010). In Russia, selenium was produced at the JSC Kyshtym copper electrolytic plant, which produced

between 3 and 4 t/yr; by Norilsk, which produced up to 80 t/yr; and by the UMMC, which produced between 80 and 90 t/yr (Kul'chitskiy and Naumov, 2010a).

Silver.—In 2009, silver output increased by 8% compared with that of 2008, mainly owing to increased output in the Amurskaya Oblast', the Chukotskiy Avtonomnyy Okrug, and the Khabarovskiy Kray. Domestic demand for silver for jewelry decreased by 16.3% to 224.98 t in 2009 compared with 268.83 t in 2008. OAO Polimetal was the country's leading silver producing enterprise, and it increased production in 2009 by 0.6% to 538 t. Polimetal's major silver mining enterprise was the Dukat Mine. Polimetal was planning to increase production in 2010 to between 590 and 620 t. The ZAO Chukotka mining and processing complex was the country's second ranked silver producer; in 2009, it produced 255 t (Brayko and Ivanov, 2010).

Tantalum.—Russia produced between 39 and 40 t/yr of tantalum pentoxide, consumed between 1 and 2.5 t/yr, and exported between 37 and 39 t/yr (Naumov, 2010). Russian tantalum consumption in 2007 (the latest year for which data were available) was reported to be about 10 t/yr, but could be 100 t/yr by 2010. Reserves of tantalum occur in 21 deposits and almost all these deposits contain niobium. Tantalum was being mined from the Lovozerskoye deposit on the Kola Peninsula. Tantalum mining at the Etykinskoye deposit of the Zabaykalskiy mining and beneficiation complex had practically ceased. It would likely not be possible to satisfy future Russian tantalum demand by mining these two deposits. Mining at the Lovozerskoye deposit and Zabaykalskiy mining enterprises was either on the verge of being unprofitable or was unprofitable. Russia did not have any enterprises that produced metallic tantalum and had depended on tantalum metal that had been produced at the Ulba plant in Kazakhstan. The most prospective deposit for tantalum development was considered to be the Katuginskoye deposit in Zabaykal'skiy Kray (Kurkov and Kotova, 2007).

Tellurium.—Russia produced between 33 and 35 t/yr of tellurium, consumed up to 10 t/yr, and exported between 20 and 25 t/yr (Naumov, 2010). The UMMC produced more than 30 t/yr and Norilsk produced less than 3 t/yr (Kul'chitskiy and Naumov, 2010b).

Tin.—In 2009, production of tin in ore was estimated to have decreased by 20% compared with that of 2008, and production of tin metal decreased by 17%. Tin and its alloys and compounds were produced at three enterprises—the OAO Novosibirsk tin complex (OAO NOK), which was the country's leading tin producing enterprise; OAO Ryaztvetmet; and the Zavod pripoyev. At OAO NOK, production decreased owing to the decrease in the global price for tin following the decrease in demand that took place because of the global economic crisis. In 2009, tin metal exports totaled 430 t compared with 384 t in 2008. Of the total volume of tin exports, 307 t went to Kazakhstan, 52 t went to Uzbekistan, and 42 t went to the Netherlands. Russia also imported tin metal; in 2009, the country imported 1,703 t compared with 1,915 t in 2008. Apparent tin consumption in 2009 was 2,820 t. Tin production was projected to increase to 2,100 t in 2010, and apparent tin consumption was projected to increase to 3,000 t. In June 2010, however, OAO NOK was seeking to declare bankruptcy

because of outstanding loans from a number of Russian banks. Increasing tin ore production would be difficult without special Government subsidies because Russia's tin resources were not considered profitable to develop; it appeared, therefore, that Russia would have to maintain imports of tin to meet domestic needs (Podvishenskiy and others, 2010).

Titanium.—In 2009, production of titanium sponge in Russia decreased by 24% compared with that of 2008 to 26,600 t. Production of rolled titanium decreased by 30.3% to 19,500 t. Russia was dependent on imports from Ukraine for the majority of its titanium raw material (Podvishenskiy and others, 2010).

OAO Verkhnyaya Salda Metallurgical Production Association-Avisma (VSMPO-Avisma) was Russia's only major titanium producer and one of the world's leaders in titanium production. More than 85% of its output was titanium products; it also produced aluminum panels and profiles and ferrotitanium. The Russian titanium industry was oriented to producing for the global market, and the global downturn in demand for titanium in industrial uses, including in the aerospace industry, directly affected Russian titanium output (Podvishenskiy and others, 2010).

In 2009, Russia exported 20,200 t of rolled titanium compared with 22,300 t in 2008. The main recipients of Russian titanium exports were the United States (8,503 t), Germany (2,671 t), the Netherlands (2,295 t), the United Kingdom (1,599 t), China (1,486 t), and Ukraine (855 t). Estimated domestic consumption of rolled titanium in 2009 was 3,000 t compared with 5,500 t in 2008. VSMPO-Avisma planned to increase rolled titanium output by 10% to about 21,500 t in 2010 and was looking to China to increase its sales (Podvishenskiy and others, 2010).

Tungsten.—In 2009, production of tungsten concentrate decreased by 31.9% to an estimated 6,600 t. Almost all Russian enterprises curtailed production in conjunction with the decrease in demand on the domestic and international markets. The major enterprises producing tungsten concentrate were the Lermontovo, the Novo Orlovsk, and the OAO Primorsk mining and beneficiation complexes, and the Kvartz Artel. The major portion of tungsten concentrate was processed in the Kabardino-Balkariya Republic at the Gidrometallurg plant, and a lesser amount was produced at the Pobedit plant in Vladikavkaz. In 2009, both plants experienced serious economic difficulties (Podvishenskiy and others, 2010).

The leading enterprise that produced tungsten concentrate was Primorsk, which in 2009 operated at a loss. Production of tungsten concentrate at Primorsk decreased by 23% compared with that of 2008, which was attributed to the decrease in price for tungsten and the decrease in global demand (Podvishenskiy and others, 2010).

The Lermontovo enterprise practically ceased production in 2009. The volume of tungsten concentrate production at the Kvartz Artel and the Novo Orlovsk complex increased by 10% compared with that of 2008. In 2009, these enterprises extracted 1,300 t of tungsten metal. Owing to the continued low prices for tungsten, however, these enterprises were not expected to increase output in 2010 (Podvishenskiy and others, 2010).

Russia exported 5,461 t of tungsten concentrate in 2009, which was 38.2% more than in 2008. China, which received

4,573 t, was the leading recipient of Russian tungsten concentrate. In 2009, Russia imported about 18 t of tungsten concentrate from Mongolia whereas in 2008, Russia imported 188 t, of which 112 t came from the Democratic Republic of the Congo [Congo (Kinshasa)]. In 2009, apparent domestic consumption of tungsten concentrate was 1,100 t (Podvishenskiy and others, 2010).

Production of tungsten concentrate in 2010 was planned to be about 7,300 t based on an expected increase in demand and in the price for tungsten. The short-term and medium-term outlooks for Russian tungsten concentrate production were dependent to a significant degree on increasing the amount of exploration and the amount of investment in the renovation of existing capacity. In planning for future tungsten production, not only was the low price of tungsten a factor, but so was the dominant role of China in the world tungsten market (Podvishenskiy and others, 2010).

Industrial Minerals

Diamond.—About 97% of Russia's diamond production was by the Almaz Rosii-Sakha JSC (Alrosa Company Ltd.). In 2009, Alrosa mined almost 32.8 million carats valued at \$2,264,600,000 and was the world's leading diamond producer. Russia's estimated production (in carats) of gem and industrial diamond, however, decreased by 11% compared with that of 2008, and gem diamond output was estimated to have decreased by 19%. The value of output of gem diamond decreased more significantly than the physical output in carats. In 2010, Alrosa planned to increase production to 33.54 million carats (Brayko and Ivanov, 2010).

Phosphate Rock.—In Russia, the major source of phosphate raw material was apatite ore in the Khibiny massif and Kovdor deposit on the Kola Peninsula. The Khibiny apatite-nepheline ores contain about 90% of the country's apatite reserves and have a P_2O_5 content of 12% to 16%; the Kovdor ores contain about 6% of the country's reserves and have a P_2O_5 content of between 6% and 7%. Sedimentary phosphate rock containing about 6% P_2O_5 was mined primarily by the OAO Fosforit enterprise from the Kingisepp deposit. Fosforit produced a phosphate flour with a 28% P_2O_5 content. Fosforit was constructed with the capacity to mine 7 Mt/yr of ore, but owing to the lack of demand in the world market for phosphate flour, it had mothballed about one-half of its production capacity. The remaining phosphate flour was used domestically to produce complex fertilizers (Brylyakov and others, 2007).

In November, 2009, the OAO Apatit mining and chemical complex, which was the country's main supplier of phosphate raw material, completed 80 years of operation. The complex consisted of four mining enterprises, which included two underground mines and four open pits, and a beneficiation complex, which consisted of two beneficiation plants that had a combined capacity to produce 8 Mt/yr of apatite concentrate. In 2009, the Apatit complex employed 11,500 people. Development plans for the Apatit complex until 2020 called for apatite concentrate production to stabilize at 8 Mt/yr, which would fully supply the country's phosphate raw material needs. Achieving this plan would entail developing underground mining, which would account for 75% of the ore mined in 2020

compared with 45% in 2005 owing to reserves being depleted at two open pits. Plans up to the year 2050 envisioned developing existing mines to maintain production levels beyond 2020 and developing new deposits, including the Eveslogchorr deposit (Shaposhnik, 2009; Svinin and others, 2009).

As of 2009, apatite reserves were reported in 10 apatite-nepheline deposits on the Kola Peninsula, of which 6 were under development. As of January 1, 2009, economic reserves (balansovye zapasy) (reported according to the reserve classification system Russia inherited from the Soviet Union) in the 10 apatite-nepheline deposits were reportedly about 3.56 Gt. The Apatit complex reportedly had economic reserves in categories A, B, and C1 of 2.13 Gt containing 320 Mt P_2O_5 , of which 245 Gt containing 57 Gt P_2O_5 was considered suitable for open pit development and about 1.89 Gt containing 276 Mt P_2O_5 was considered suitable for underground mining. An additional 224 Gt of resources containing 29 Gt of P_2O_5 was reported in category P2. About 45% of the reserves of the Apatit complex was in categories A and B (Glubokiy, 2009).

Mineral Fuels and Related Materials

Coal.—In 2009, coal production decreased by 2.4% compared with that of 2008. Anthracite production decreased by about 6% to 6 Mt. Brown coal and lignite production decreased by about 16% to 69.3 Mt. Bituminous coal production increased by almost 3% and accounted for about 75% of total coal production. In 2009, about 35% of coal was produced by underground mining and 65% was produced by open pit mining (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011a).

The leading thermal coal mining company in the country was OAO Sibirskaya ugol'naya energeticheskaya Kompaniya (SUEK), which mined approximately 90 Mt/yr of coal or about 36% of Russia's output. SUEK mined primarily brown coal. The leading producer of thermal hard coal was OAO Kuzbazugol', which mined 41 Mt/yr of thermal coal. Coking coal was mined at 10 enterprises, most of which were vertically integrated with metallurgical holding companies. The Russian market for coking coal was about 41.5 Mt/yr of coal concentrate. Coking coal production was concentrated in three production associations—the Evraz Group (which included the OAO Raspadskaya Mine), the Sibuglemet holding, and the OAO Ugol'naya kompaniya Yuzhniy Kuzbas. These three associations accounted for 57% of the domestic open market for coking coal and mined between 70% and 80% of the most highly valued hard coals. Approximately 20% to 25% of the country's total coking coal output was exported. The leading exporters of coking coal were OAO Yakutugol' and Sibuglemet (Kontorovich and Churashev, 2009).

The basic growth in Russian coal production was expected to come from the Kuznetsk Basin, which was producing about 50% of the country's total coal output and 80% of the most highly valued coking coal used in metallurgy. About 40% of the coal produced in the Kuznetsk Basin was exported, which constituted about 80% of the country's total coal exports (Kontorovich and Churashev, 2009).

Two factors were inhibiting the development of the Russian coal industry. The first was the low domestic price for gas,

which made coal-burning powerplants not competitive with those using gas. The second factor was that the majority of coal was mined in Siberia whereas the majority of coal was consumed in the European part of the country, which added significantly to the cost of using coal (Kontorovich and Churashev, 2009).

Russia, which ranked second in the world in coal reserves (reported according to the Russian reserve system), had 157 Gt of proven reserves and 4.45 Gt of prognosticated resources, of which 66% of the reserves and prognosticated resources were located in Siberia. According to estimates of the Siberian Branch of the Russian Academy of Sciences, coal output in the Siberian coal basins could be increased to between 350 and 400 Mt/yr if sufficient investment were made to develop production capacity and infrastructure (Kontorovich and Churashev, 2009).

Natural Gas.—According to the Oil and Gas Journal, Russia holds the world's largest natural gas reserves, with 1,680 trillion cubic feet (about 47.5 trillion cubic meters), and Russia's reserves account for about one-quarter of the world's total proven reserves. The majority of these reserves are located in the western Siberia economic region at the Medvezh'ye, the Urengoy, and the Yamburg fields, which account for about 45% of Russia's total reserves. In 2009, Russia ranked second in the world following the United States as a natural gas producer (with output of about 584 billion cubic meters), but Russia was the world's leading gas exporter [7.3 trillion cubic feet (about 207 billion cubic meters)] (U.S. Energy Information Administration, 2010).

In 2009, Russia's natural gas production decreased by almost 12% compared with that of 2008, and Russia's natural gas exports also decreased. The country's leading gas producing company was OAO Gazprom, which was also the world's leading natural gas producing company. Although Gazprom was partially privatized, the Russian Government held the controlling stake. Gazprom's major producing fields were located in the Yamalo-Nenetskiy Avtonomnyy Okrug in West Siberia. Gazprom was developing gasfields on the Yamal Peninsula in West Siberia, which it expected to become the company's main gas producing region (U.S. Energy Information Administration, 2010).

The Medvezhye, the Urengoy, and the Yamburg gasfields, which were the country's leading gas producing fields, had decreasing output in recent years. In response, in late 2008, the Yamal megaproject was launched to develop gas deposits on the Yamal Peninsula in West Siberia. In addition, the Zapolyarnyy field, which was commissioned in 2001, was expected to offset some of the declines at Gazprom's leading three producing fields. Preparations also were underway by Gazprom for the development of Shtokman field offshore in the Barents Sea. The Shtokman project would become a resource base for Russia to export gas to Europe through the Nord Stream pipeline (U.S. Energy Information Administration, 2010; OAO Gazprom, 2011a).

Gazprom possessed the largest gas transmission system in the world, which included 159,500 km of gas trunk lines. The company was engaged in developing major new pipeline projects, which included the Nord Stream and South Stream pipelines (OAO Gazprom, 2011a). The Nord Stream pipeline would create a link with Russia's Baltic Sea coast near Vyborg

to Germany's Baltic Sea coast in the vicinity of Greifswald. The pipeline would be 1,224 km in length. Gas supplies shipped through the Nord Stream pipeline would go to Denmark, France, Germany, the Netherlands, the United Kingdom, and other countries (OAO Gazprom, 2011b). The South Stream project was planned to include a section that would lie under the Black Sea from the Russkaya compressor station on the Russian coast to the Bulgarian coast. The total length of the offshore section would be about 900 km and would be at a maximum depth of more than 2 km. To provide the required amount of gas to the South Stream pipeline, gas transmission system capacities in Russia would need to be expanded. A pre-investment feasibility study for this pipeline was being conducted (OAO Gazprom, 2011c).

In Russia, natural gas associated with oil production was often flared. According to the U.S. National Oceanic and Atmospheric Administration, Russia flared an estimated 1,432 billion cubic feet (about 40.4 billion cubic meters) of natural gas in 2008, which was the largest amount of gas flared by any country in the world. The Russian Government was attempting to reduce gas flaring and had set a target for 95% utilization of associated gas by 2012 (U.S. Energy Information Administration, 2010).

Petroleum.—In 2009, Russia increased crude oil production, mainly owing to the development of new oil and gas projects in East Siberia in the Timan-Pechora oil and gas province and on Sakhalin Island (Korzhubayev and Eder, 2010). The largest increases in production in 2009 compared with 2008 occurred at the following companies: OAO Rosneft', 2.4 Mt; OAO Lukoil, 1.9 Mt; OAO TNK-BP, 1.4 Mt, and OAO Bashneft, 0.5 Mt (Korzhubayev and Eder, 2010).

Russia was facing difficulties in maintaining or increasing production levels because from 1994 to 2009 the extraction of oil had exceeded the growth in reserves by 1.2 Gt. In 2009, the growth in oil reserves, however, exceeded production and totaled 620 Mt, which was only the second year that the growth in reserves had exceeded production between 1994 and 2009 (the first time by a very small amount in 2008), and the first significant growth in reserves exceeding production. The growth in reserves occurred primarily in the Vankorskoye and adjacent deposits in Krasnoyarskiy Krai in East Siberia. In previous years, growth in reserves had taken place primarily at existing deposits rather than as a result of exploration of new deposits. Growth in reserves corresponded with a growth in exploration expenditures, which in 2008 were 3.7 times as great as in 2001 in real ruble value, although expenditures for exploration for oil and gas decreased by about 12% in 2009 (Korzhubayev and Eder, 2010).

The major area for Russian oil production was in West Siberia. In 2009, production in West Siberia was 322.8 Mt, which was a 2.8% decrease compared with that of 2008. In 2009, the Khanty-Mansiyskiy Avtonomnyy Okrug, which was the leading oil producing region in West Siberia, produced 270 Mt, or 84% of production in West Siberia. Growth in production in West Siberia happened at a new project to develop the Salymskaya group of deposits, where production in 2009 reached a peak level of 7.7 Mt, which was 20% more than in 2008.

In the Yamalo-Nenetskiy Avtonomnyy Okrug, which was the second-ranked producing region in West Siberia, production had

been decreasing since 2005, and had decreased by 34% to 35 Mt in 2009 from 53.3 Mt in 2004. Large-scale production in West Siberia also took place in Tomskaya Oblast', where production, after having fallen in 2005 and 2006, had stabilized from 2007 to 2009 at between 10.2 and 10.6 Mt/yr. The most prospective area for new production in western Siberia was in the south of Tyumenskaya Oblast' at the Uvatskiye group of deposits, where production was 2 Mt in 2008 and by 2010 was planned to increase to 4 Mt (Korzhubayev and Eder, 2010).

About 30% of Russia's oil production in 2009 took place in the European part of the country where production reached 148.5 Mt, which was 4.9% greater than in 2008. The major volume of oil production was in the Povolzh'ye (along the Volga) region, which in 2009 produced 61.9 Mt mainly from the traditional producing areas of the Republics of Tatarstan (32.9 Mt) and Bashkortostan (11.4 Mt), and Samarskaya Oblast' (11.8 Mt). Production in the Povolzh'ye region had been increasing at the rate of 3% to 4% per year despite decreasing levels of extraction. Increased production was the result of increased recovery levels because of the use of state-of-the-art technology and also because of bringing small deposits of high-viscosity oil into production (Korzhubayev and Eder, 2010).

The second ranked producing region in the European part of the country was in the Ural Mountains region where production in 2009 was 45.3 Mt, which was 4.7% more than in 2008. One of the most dynamic areas in the European part of the country for oil and gas development was in the Timan-Pechora oil and gas province, where oil production in 2009 was 31.6 Mt (Korzhubayev and Eder, 2010).

In East Siberia, the volume of oil production was increasing rapidly. In 2009, oil extraction totaled 7.5 Mt, which was a fivefold increase compared with output in 2008. Oil extraction in East Siberia was taking place in Irkutskaya Oblast', Krasnoyarskiy Krai, and the Sakha (Yakutiya) Republic. Oil production in the Russian Far East (on Sakhalin Island) totaled 15.363 Mt and was projected to increase (Korzhubayev and Eder, 2010).

Uranium.—In Russia, uranium mining and processing was conducted by enterprises, which included JSC Dalur in the Kurgan region, JSC Khiagda in the Republic of Buryatiya, and JSC Priargunsky Industrial Mining and Chemical Union in Zabaykal'skiy Krai. Priargunsky mined uranium by underground methods, and the other two enterprises employed in situ leaching (Corporation TVEL, 2009).

Russia had plans to increase electric power generation from nuclear powerplants to 360 billion kilowatthours in 2020 from 155 billion kilowatthours in 2006. The country was facing difficulties in securing its uranium supply, however. Existing stocks of uranium stored in warehouses were being depleted, and the country did not have a sufficient quantity of uranium deposits slated for development to meet domestic demand. In 2009, the country consumed about 15,000 t of uranium, whereas uranium extraction was less than 3,600 t. Growth in uranium demand was expected to far outstrip domestic supply from existing mining enterprises (Corporation TVEL, 2009).

Russian uranium reserves were assessed to be 650,000 t, of which 70% was in the reserve category C2, which was the lowest category considered to be reliably verified according

to the reserve classification system that was used in the Soviet Union and then Russia. Russia also had 830,000 t of uranium resources in categories P1 and P2, which were termed prognosticated resources (Bablov and Mashkovtsev, 2009).

To secure Russia's future uranium supply, the country created a plan that called for increasing production at existing enterprises and for the development of new deposits. The country's total demand for uranium was forecasted to grow to 36,000 t/yr by 2020. By 2020, Russia planned to increase uranium mining to 28,800 t/yr. Production at Priargunsky was projected to increase to 5,000 t/yr; at Khiagda, to 2,000 t/yr; and at Dalur, to between 1,000 and 1,500 t/yr. The Elkonsky group of deposits would be developed to provide an additional 5,000 t/yr of uranium. The remainder was planned to be mined at new uranium deposits in Buryatiya and Zabaykal'skiy Kray, as well as at new joint ventures abroad. Not only Russian deposits, but also deposits of other countries, including Kazakhstan, Ukraine, and Uzbekistan, were expected to be used to meet Russia's demand for uranium (Corporation TVEL, 2009).

Priargunsky could increase uranium production by more than 50% to 5,000 t/yr by 2014-15. Plans called for Priargunsky to develop the Sixth and Eighth Mines. The Sixth Mine would be the main source of uranium and was projected to produce 1,000 t/yr; the Eighth Mine was projected to produce 800 t/yr. With production from these two mines, Priargunsky could produce 5,000 t/yr. It would require considerable investment to commission these new mines and also to implement associated measures to protect the environment (Interfax Russia & CIS Metals and Mining Weekly, 2007).

In 2008, JSC Atomredmetzoloto (ARMZ Uranium Holding Co.) consolidated under its control all uranium mines in Russia and Russian uranium mining assets abroad. ARMZ planned to meet certain goals, which included technologically upgrading and developing operating uranium mining enterprises, prospecting for uranium, and creating uranium mining ventures in countries of the Commonwealth of Independent States and other countries [Corporation TVEL, 2009; JSC Atomredmetzoloto (ARMZ Uranium Holding Co.), 2011].

Outlook

Although Russia reportedly has adequate resources of most minerals to provide for the needs of its domestic enterprises and to maintain its level of exports for the near future, the country is facing a number of longer term issues in ensuring the continued development of its mineral resources. These issues include the fact that the growth in production of minerals is exceeding the growth in discovery of reserves of these minerals. Expenditures on exploration would have to be increased, as current levels are not adequate to discover needed new deposits. Remaining reserves of nonfuel minerals are often characterized by low ore grades and for fuel minerals by the small size of deposits, and remaining reserves of fuel and nonfuel are located in difficult to access regions. It was also going to be necessary to develop technologies to extract a range of useful byproducts found in low concentrations in nonfuel mineral ores along with the main minerals being developed and to develop technologies to lessen

the losses of nonfuel minerals during mining (Kleshchev and others, 2009; Vercheba, 2009).

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TABLE 1
RUSSIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2005	2006	2007	2008	2009
METALS					
Aluminum:					
Ore and concentrate:					
Alumina thousand metric tons	3,259	3,265	3,333 ^r	3,112 ^r	2,794
Bauxite	5,000,000 ^{r,e}	6,300,000 ^r	5,775,000 ^r	5,675,000 ^r	5,775,000
Nepheline concentrate, 25% to 30% ^e	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Metal, smelter, primary	3,647,072	3,717,907	3,955,417	4,190,000 ^r	3,815,000
Antimony, mine output, recoverable Sb content ^e	3,000	3,500	3,500	3,500	3,500
Arsenic, white ^e	1,500	1,800	1,500	1,500	1,500
Bismuth:^e					
Mine output, Bi content	50	55	55	70	65
Metal, refined	10	11	12	13	12
Cadmium, metal, smelter	621	690	810	800	700 ^e
Chromium, chrome ore, marketable	772,000	966,065	776,681	913,000 ^r	416,194
Cobalt:^e					
Mine output, recoverable Co content	6,300	6,300	6,300	6,200	6,100
Metal, refined	5,000	5,000	3,800	2,500	2,352 ³
Copper:					
Ore, recoverable Cu content ^e	700,000	725,000	740,000	750,000	825,000
Metal:					
Blister, smelter:^e					
Primary	696,000	635,000	650,000	630,000	625,000
Secondary	262,000	312,000	290,000	235,000	235,000
Total	958,000	947,000	940,000	865,000	860,000
Refined:					
Primary	684,000	635,000	650,000	610,000	605,000
Secondary	249,000	312,000	289,000	250,000	250,000 ^e
Total	933,000	947,000	939,000	860,000	855,000
Gallium ^e	10	11	11	11	11
Gold:					
Mine output, Au content kilograms	164,186	159,340	156,975	172,031 ^r	190,693
Secondary recovery do.	4,884	4,981	5,867	8,140	3,367
Indium ^e	10 ^r	10 ^r	10 ^r	10 ^r	4
Iron and steel:					
Iron ore:					
Gross weight	96,764,400	102,000,000	105,000,000	99,900,000	92,000,000
Fe content, 55% to 63% ^e	56,100,000	59,100,000	60,800,000	57,800,000	53,200,000
Metal:					
Pig iron	49,175,000	51,683,000	51,523,000	48,300,000	43,930,000
Direct-reduced iron ^e	3,340,000	3,340,000	4,000,000	4,000,000	4,000,000
Ferrous:^e					
Blast furnace:					
Ferromanganese	110,000	130,000	120,000	110,000	100,000
Ferrophosphorus	3,500	3,500	3,500	3,500	3,000
Spiegeleisen	7,000	7,000	7,000	7,000	6,500
Electric furnace:					
Ferchromium	578,000 ³	600,000	570,000	490,000 ^{r,e}	378,000 ³
Ferchromiumsilicon	4,000	4,000	4,000	4,000	3,500
Ferrous:^e					
Ferronickel, gross weight:⁴					
High-nickel	12,900	11,330 ³	14,020 ³	14,000	17,489 ³
Other	8,160	18,800	20,000	20,000	4,822 ³
Ferromanganese (ferrocolumbium)	--	--	121	121	120

See footnotes at end of table.

TABLE 1—Continued
 RUSSIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2005	2006	2007	2008	2009	
METALS—Continued						
Iron and steel—Continued:						
Metal—Continued:						
Ferrous—Continued:^c						
Electric furnace—Continued:						
Ferrosilicon	742,000 ³	882,300 ³	896,100 ³	850,000	745,000	
Ferrovandium	12,880 ³	11,000	12,000	12,000	11,500	
Silicomanganese	48,000	40,000	40,000	40,000	35,000	
Silicon metal	58,000	54,500	54,000	54,000	54,000	
Other	22,000	22,000	22,000	22,000	20,000	
Total, ferroalloys	1,610,000	1,780,000	1,760,000	1,630,000 ^r	1,380,000	
Steel:						
Crude	66,186,200	70,816,000	72,370,000	68,711,000 ^r	59,166,000	
Finished, rolled	54,600,000	58,200,000	59,660,000	56,564,000	50,846,000	
Pipe	6,673,000	7,898,400	8,706,000	7,772,000 ^r	6,655,000	
Lead:^c						
Mine output, recoverable Pb content	36,400	34,000	50,000	60,000	70,000	
Metal, refined, primary and secondary	66,000	78,000	94,000	80,000	73,000	
Magnesium:^c						
Magnesite	930,000	1,200,000	1,200,000	1,200,000	1,000,000	
Metal, including secondary	45,000	35,000	37,000	37,000	37,000	
Manganese ore:^c						
Gross weight	8,000	12,000	44,000	45,000	45,000	
Mn content	1,600	2,400	9,000	9,200	9,200	
Mercury ^c	50	50	50	50	50	
Molybdenum, in concentrate ^c	3,000	3,100	3,300	3,600	3,800	
Nickel:						
Marketable mine production, Ni content:						
Laterite ore	34,419	37,754	45,690	36,807 ^r	32,359	
Sulfide concentrate	242,758	239,231	234,083	230,000 ^r	229,493	
Total	277,177	276,985	279,773	266,807 ^r	261,852	
Matte, for export	700	1,300	670 ^e	600 ^e	240 ^e	
Nickel products:						
Ferronickel:						
High-nickel	12,600	14,436 ^r	17,111 ^r	16,158 ^r	15,565	
Other	5,396 ^r	9,738 ^r	12,710 ^r	16,051 ^r	3,600	
Metal	249,479 ^r	255,045 ^r	248,363 ^r	242,409 ^r	237,270	
Oxide sinter	4,075	2,713	235	-- ^r	--	
Chemicals	3,200 ^r	3,500 ^r	3,100 ^r	2,900 ^r	2,700	
Total	274,750 ^r	285,432 ^r	281,519 ^r	277,518 ^r	259,135	
Niobium (columbium)	NA ^r	NA ^r	NA ^r	NA ^r	NA	
Platinum-group metals:^c						
Platinum	kilograms	29,000	29,000	27,000	23,000	21,000
Palladium	do.	97,400	98,400	96,800	87,700	83,200 ³
Other	do.	15,500	15,600	14,500	12,500	11,900
Total	do.	142,000	143,000	138,000	123,000	116,000
Rhenium ^c	do.	1,400	1,400	1,500	1,500	1,500
Selenium ^c	do.	100,000	110,000	120,000 ^r	130,000 ^r	140,000
Silicon ^c		525,000	600,000	635,000	640,000	640,000
Silver^c						
Mine output, Ag content	kilograms	1,350,000 ³	1,250,000	1,200,000	1,300,000	1,400,000
Secondary recovery	do.	265	265	265	265	265

See footnotes at end of table.

TABLE 1—Continued
 RUSSIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2005	2006	2007	2008	2009
METALS—Continued					
Tin:^c					
Mine output, recoverable Sn content	3,000	3,000	2,500	1,500	1,200
Metal, smelter:					
Primary	5,000	4,980	3,800	2,000	1,650
Secondary	500	500	400	300	300
Total	5,500	5,480	4,200	2,300	1,950
Titanium sponge ^c	29,560 ^r	32,170 ^r	34,150 ^r	34,950 ^r	26,600
Tungsten, concentrate, W content ^c	2,800	2,800	3,300	3,000	2,500
Vanadium, metal ^c	15,100	15,100	14,500	14,500	14,500
Zinc:^c					
Mine output, recoverable Zn content	180,000	190,000	185,000	204,000	225,000
Metal, smelter, primary and secondary	220,000	240,000	260,000	260,000	225,000
Zirconium, baddeleyite concentrate, averaging 98% ZrO ₂	6,700 ^e	7,500 ^e	7,136	7,000	5,000
INDUSTRIAL MINERALS					
Asbestos, grades I-VI ^c	925,000	925,000	1,025,000 ³	1,017,000 ³	1,000,000
Barite ^c	63,000 ^r	63,000	63,000	63,000	63,000
Boron ^c thousand metric tons	400	400	400	400	400
Cement, hydraulic	48,500,000	54,700,000	59,900,000	53,600,000	44,300,000
Clays:					
Bentonite	NA ^r	NA ^r	NA ^r	NA ^r	NA
Kaolin concentrate ^c	45,000 ^r	45,000 ^r	45,000 ^r	45,000 ^r	45,000
Diamond:^c					
Gem carats	23,000,000	23,400,000	23,300,000	21,925,000 ³	17,791,400 ³
Industrial do.	15,000,000	15,000,000	15,000,000	15,000,000	15,000,000
Synthetic do.	80,000,000	80,000,000	80,000,000	80,000,000	80,000,000
Total do.	118,000,000	118,000,000	118,000,000	117,000,000	113,000,000
Feldspar ^c	45,000 ^r	45,000 ^r	45,000 ^r	45,000 ^r	45,000
Fluorspar, concentrate, 55% to 96.4% CaF ₂ ^c	245,500 ³	210,000	180,000	269,000	240,000
Germanium	3	2	2	2 ^e	2 ^e
Graphite	14,000 ^r	14,000 ^r	14,000 ^r	14,000 ^r	14,000
Gypsum ^c	2,200,000	2,600,000 ^r	3,000,000 ^r	3,600,000 ^r	2,900,000 ³
Iodine ^c	300,000	300,000	300,000	300,000	300,000
Lime, industrial and construction ^c	8,200,000	8,200,000	8,200,000	8,200,000	7,000,000
Mica ^c	100,000	100,000	100,000	100,000	100,000
Nitrogen, N content of ammonia	10,000,000	10,500,000	10,500,000 ^e	10,425,000	10,441,000
Perlite	NA ^r	NA ^r	NA ^r	NA ^r	NA
Phosphate rock:					
Gross weight ^c	11,317,400 ³	10,866,000 ³	11,400,000 ^r	10,400,000 ^r	10,000,000
P ₂ O ₅ content:					
Apatite concentrate, 37% to 39.6%	4,210,000	4,040,000	4,120,000	3,800,000	3,650,000
Sedimentary rock, 19% to 30%	290,000 ^r	393,000 ^r	375,000 ^r	700,000 ^r	850,000 ^e
Total	4,500,000 ^r	4,433,000 ^r	4,495,000 ^r	4,500,000 ^r	4,500,000 ^e
Potash, marketable, K ₂ O equivalent	7,131,000	6,610,000 ^e	7,275,000	6,730,000	3,727,000
Salt, all types	2,700,000	2,800,000	2,200,000	2,200,000 ^e	2,200,000 ^e
Soda ash ^c	2,600,000	2,800,000	2,900,000	2,800,000	2,300,000
Sulfur:^c					
Native	50,000	50,000	50,000	50,000	50,000
Pyrites	304,000	304,000	200,000	200,000	200,000
Byproduct:					
Metallurgy	640,000	695,000	800,000	820,000	820,000
Natural gas	6,301,000 ³	6,346,000 ³	6,000,000	6,100,000	6,000,000
Total, sulfur	7,300,000	7,400,000	7,050,000	7,170,000	7,070,000

See footnotes at end of table.

TABLE 1—Continued
 RUSSIA: PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity	2005	2006	2007	2008	2009	
INDUSTRIAL MINERALS—Continued						
Sulfur, sulfuric acid	9,500,000 ^e	9,500,000 ^e	9,689,000	9,106,000	8,445,000	
Talc ^c	160,000	160,000	170,000	160,000	160,000	
Vermiculite ^c	25,000	25,000	25,000	25,000	25,000	
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite	thousand metric tons	6,300	8,290	8,662	6,383 ^r	6,560
Bituminous	do.	202,913 ^r	202,128	209,216	216,049 ^r	222,042
Lignite	do.	73,668	74,148	71,143	82,530 ^r	68,158
Total	do.	282,881 ^r	284,566	289,021	304,962 ^r	296,760
Coke, metallurgical, 6% moisture content	do.	29,998	30,701	33,900 ^r	32,000	27,400
Natural gas, marketed	million cubic meters	640,612 ^r	656,016 ^r	653,000	663,000 ^r	583,610
Oil shale		1,200,000 ^r	1,200,000 ^r	1,200,000 ^r	1,200,000 ^r	1,200,000
Peat, fuel use		1,600,000	1,300,000	1,300,000	1,300,000	1,300,000 ^e
Petroleum:						
Crude in:						
Gravimetric units		469,600,000	480,484,000	491,000,000	488,105,000	494,000,000
Volumetric units ^c	thousand 42-gallon barrels	3,500,000	3,530,000	3,610,000	3,590,000	3,630,000
Refinery products ⁵		208,000,000 ^r	219,575,000	229,000,000 ^r	237,000,000 ^r	236,000,000
Uranium:						
U content		3,431	3,262	3,413	3,521	3,564
U ₃ O ₈ content		4,045	3,847	3,762	4,152	4,203

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹In addition to the commodities listed, Russia produces a number of other mineral commodities, which include rare-earth metals concentrates, tantalum, and tellurium, but information is inadequate to estimate production.

²Table includes data available through January 31, 2011.

³Reported figure.

⁴In December 2001, Mechel OAO acquired a 79.9% interest in the South Urals Nickel Plant previously operated by Yuzhuralnikel Combine JSC. The new owner made substantial improvement to the Orsk ferronickel plant and produced a low-iron ferronickel (greater than 85% nickel). Excludes nickel-chromium remelt alloy produced from scrap. The remelt alloy typically has a nickel content of 20% to 50%.

⁵Not distributed by type and therefore not suitable for conversion to volumetric units. Data include all energy and nonenergy products but exclude losses.

TABLE 2
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit name	Annual capacity ^e
Alumina	Achinsk (United Company RUSAL) ²	Achinsk	900,000
Do.	Bogoslovsk (United Company RUSAL) ²	Krasnotur'insk	1,050,000
Do.	Boksitogorsk (United Company RUSAL) ²	European north	200,000
Do.	Pikalyovo (United Company RUSAL) ²	Pikalyovo	300,000
Do.	Uralsk (United Company RUSAL) ²	Kamensk-Uralskiy	700,000
Aluminum, primary smelters	Bogoslovsk (United Company RUSAL) ²	Krasnotur'insk	175,000
Do.	Bratsk (United Company RUSAL) ²	Bratsk	950,000
Do.	Irkutsk (United Company RUSAL) ²	Irkutskaya Oblast'	300,000
Do.	Kandalaksha (United Company RUSAL) ²	Kola Peninsula	75,000
Do.	Khakas (United Company RUSAL) ²	Khakasiya Republic	300,000
Do.	Krasnoyarsk (United Company RUSAL) ²	Krasnoyarskiy Kray	875,000
Do.	Nadvoitsy (United Company RUSAL) ²	Nadvoitsy, Kareliya Republic	75,000
Do.	Novokuznetsk (United Company RUSAL) ²	Novokuznetsk	300,000
Do.	Sayansk (United Company RUSAL) ²	Sayanogorsk	425,000
Do.	Uralsk (United Company RUSAL) ²	Kamensk-Uralskiy	150,000
Do.	Volgograd (United Company RUSAL) ²	Volgogradskaya Oblast'	175,000
Do.	Volkhov (United Company RUSAL) ²	Volkhov, east of St. Petersburg	20,000
Amber	Kaliningrad Amber enterprise (Kaliningrad regional authorities and Alrosa Co. Ltd.)	Kaliningradskaya Oblast'	250
Antimony:			
Sb content of concentrate	Sarylakh deposit	Ust'-Nera region, Sakha (Yakutiya) Republic	6,000 ³
Do.	Sentachan deposit	Northeastern Sakha (Yakutiya) Republic	NA
Compounds and metals	Ryazsvetmet plant	Ryazanskaya Oblast'	NA
Apatite, concentrate	Khibiny apatite association (OAO Apatit)	Kola Peninsula	15,000,000
Do.	Kovdor iron ore mining association	do.	700,000
Asbestos	Bazenovskoye chrysotile deposit	Sverdlovskaya Oblast'	NA
Do.	Molodezhnoye deposit	Zabaykal'skiy Kray	NA
Do.	"Ogenburg Minerals" Co., Kiembraevskoye chrysotile deposit	Orenburgskaya Oblast'	500,000
Do.	Tuvaasbest complex	Tyva Republic	250,000
Do.	Uralasbest Mining and Ore Dressing Co.	Central Ural Mountains	1,100,000
Barite	Salarinskiy mining and beneficiation complex	Kvartsitovaya Sopka deposit	100,000
Bauxite	North-Urals mining company (United Company RUSAL) ²	Severoural'sk region	3,400,000
Do.	South-Urals mining company (United Company RUSAL) ²	Southern Ural Mountains	NA
Do.	Severnaya Omega Mine (United Company RUSAL) ²	Northwest region	800,000
Do.	Komi Aluminum (United Company RUSAL) ²	Sredne-Timan	2,500,000
Boron, boric acid	Bor Association	Primorskiy Kray	140,000
Do.	Amur River complex	Russian Far East	8,000
Do.	Alga River chemical complex	do.	12,000
Chromite	Saranov complex	Saranovskiy	200,000
Coal	Donets (east) Basin	Rostovskaya Oblast'	30,000,000
Do.	Kansk Achinsk Basin	East Siberia	50,000,000
Do.	Kuznetsk Basin (Kuzbass)	West Siberia	160,000,000
Do.	Moscow Basin	Moscow region	15,000,000
Do.	Neryungri Basin	Sakha (Yakutiya) Republic	15,000,000
Do.	Pechora Basin	Komi Republic	30,000,000
Do.	South Yakutiya Basin	Sakha (Yakutiya) Republic	17,000,000
Cobalt:	OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel	Noril'sk region, Kola Peninsula	4,000
Do.	ZAO Rezh and OAO Yuzhuralnikel enterprises	Southern Ural Mountains	2,100

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ^e	
Cobalt—Continued	AO Ufaleynikel (Industrial Metallurgical Holding)	Chelyabinskaya Oblast'	4,000	
Do.	Khovu-Aksynskoe (nickel-cobalt) deposit	Khovu-Aksy, Tyva Republic	NA	
Copper:				
Cu in ore	OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel	Noril'sk region, Kola Peninsula	500,000	
Do.	ZAO Russian Copper Co. (RMK)	Ural Mountains	70,000	
Do.	Ural Mining and Metallurgical Co. (UMMC)	do.	230,000	
Metal, refined	OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel	Noril'sk region, Kola Peninsula	450,000	
Do.	ZAO Russian Copper Co. (RCC)	Ural Mountains	170,000	
Do.	Ural Mining and Metallurgical Co. (UMMC)	do.	360,000	
Diamond, gem and industrial	Almaz Rossii-Sakha JSC (Alosa Co. Ltd.) enterprises:	Sakha (Yakutiya) Republic, including:		
	thousand carats	Udachnyy mining and beneficiation complex	Zarnitsa and Udachnyy	NA
Do.	do.	Mirny mining and beneficiation complex	Mir and International	NA
Do.	do.	Aikhal mining and beneficiation complex	Aikhal and Komsomol'skiy	NA
Do.	do.	Anabaraskiy mining and beneficiation complex	Alluvial mines	NA
Do.	do.	Nyurbinskiy mining and beneficiation complex	Nyurbinskiy and Botuobinskiy	NA
Do.	do.	Lomonosov	Arkhangel'skaya Oblast'	NA
Feldspar	Kheto-Lanbino and Lupikko deposits	Kareliya Republic	NA	
Ferroalloys	Kosaya Gora iron works	Kosaya, Gora	200,000	
Do.	Kuznetsk ferroalloys plant	Novokuznetsk	400,000	
Do.	Lipetsk iron and steel works	Lipetskaya Oblast'	NA	
Do.	Serov ferroalloy plant	Sverdlovskaya Oblast'	NA	
Do.	Chelyabinsk electrometallurgical plant	Chelyabinskaya Oblast'	450,000	
Do.	Chusovoy iron and steel plant	Permskiy Kray	NA	
Do.	Klyuchevsk ferroalloy plant	Dvurechensk	160,000	
Ferromolybdenum	Sorsk ferromolybdenum plant [Strikeforce Mining and Resources Co. (SMR)]	Khakasiya Republic	NA	
	Zhireken ferromoybdenum plant [Strikeforce Mining and Resources Co. (SMR)]	East Transbaikal region	NA	
Ferronickel	AO Ufaleynikel	Chelyabinskaya Oblast'	5,000	
Ferovanadium	Vanadii-Tulachermet	Tula, North Caucasus	NA	
Fluorspar	Abagaytuy deposit	Transbaikal	NA	
Do.	Usugli Mine	do.	NA	
Do.	Kyakhtinsky deposit	do.	NA	
Do.	Kalanguy mining complex	Zabaykal'skiy Kray	NA	
Do.	Yaroslavsky mining and beneficiation complex	Pogranichnoye and Vosnesenskoye deposits, Russian Far East's Primorskiy Kray	NA	
Gallium	JSC Achinsk (United Company RUSAL) ²	Achinsk in East Siberia	15 ³	
Do.	OOO Galliy	NA	NA	
Do.	Novosibirsk tin complex	Novosibirsk	NA	
Do.	JSC Pikalevo (United Company RUSAL) ²	Pikalevo	NA	
Germanium, metal and products	Federal State Unitary Enterprise Germanium	Kranoyarsk	7	
Gold	kilograms	Mining companies:	Mining regions:	
		Amur a/s ZAO	Khбаровskiy Kray	5,500
Do.	do.	Buryatzoloto OAO	Buryatiya Republic	5,000
Do.	do.	Chukotka a/s	Chukotskiy Avtonomnyy Okrug	1,700
Do.	do.	GRK Aldanzoloto OOO	Sakha (Yakutiya) Republic	4,000
Do.	do.	LT-Resurs, ZAO	Irkutskskaya Oblast'	2,700
Do.	do.	Neryungri-Metallik, OOO	Sakha (Yakutiya) Republic	1,500

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ^e	
Gold—Continued	kilograms	Mining companies—Continued: Nirungan, OOO	Mining regions—Continued: do.	1,100
Do.	do.	Omchak OAO	Magadanskaya Oblast'	3,000
Do.	do.	Omolonskaya ZRK, OAO	do.	5,000
Do.	do.	Omsukchanskaya GGK, ZAO	do.	3,000
Do.	do.	Oyna, a/s	Tyva Republic	1,500
Do.	do.	Pokrovskiy Mine OAO	Amurskaya Oblast'	6,000
Do.	do.	Polimetal, MNPO, OAO	Magadanskaya and Sverdlovskaya Oblast's, Khabarovskiy Kray	7,500
Do.	do.	Polyarnaya, a/s	Chukotskiy Avtonomnyy Okrug	1,000
Do.	do.	Polyus ZAO	Krasnoyarskiy Kray	38,000
Do.	do.	Priisk Drazhnyy, OOO	do.	1,200
Do.	do.	Priisk Solov'yevskiy, OAO	Amurskaya Oblast'	1,500
Do.	do.	Ros-DV, OOO	Khabarovskiy Kray	1,100
Do.	do.	Russdragmet OOO	Khabarovskiy Kray and Zabaykal'skiy Kray	6,000
Do.	do.	Seligdar, a/s	Sakha (Yakutiya) Republic	2,000
Do.	do.	Sovrudnik, OOO	Krasnoyarskiy Kray	2,000
Do.	do.	Susumanzoloto, OAO	Magadanskaya Oblast'	3,000
Do.	do.	Seligdar, a/s	Sakha (Yakutiya) Republic	2,000
Do.	do.	Sovrudnik, OOO	Krasnoyarskiy Kray	2,000
Do.	do.	Susumanzoloto, OAO	Magadanskaya Oblast'	3,000
Do.	do.	Uralktomed', OAO	Sverdlovskaya Oblast'	1,400
Do.	do.	Vitim, a/s	Irkutskaya Oblast'	2,900
Do.	do.	Votok, a/s	Khabarovskiy Kray	1,100
Do.	do.	Yuzhuralzoloto	Chelyabinskaya Oblast'	4,200
Do.	do.	Zapadnaya, a/s	Krasnoyarskiy Kray	1,900
Do.	do.	Zolotaya, ZDK, ZAO	Khakasiya Republic	1,200
Indium:				
Primary	OAO Chelyabinsk electrolytic zinc plant	Chelyabinskaya Oblast'	6	
Secondary	OAO Elektrotsink plant [Ural Mining and Metallurgical Co. (UMMC)]	Vladikavkaz, North Caucas	6	
Iron ore	Kursk Magnetic Anomaly (KMA) region, which contains the following enterprises: KMAruda Lebedi and Stoilo Mikhaylovka	Locations: Korobkovskoye deposit Gubkin Zheleznogorsk	50,000,000 ³	
Do.	Northwest region, which contains the following enterprises: Kostomuksha Kovdor Olenegorsk	Locations: Kostomuksha Kola Peninsula Olenegorsk	22,000,000 ³	
Do.	Siberia region, which contains the following enterprises: East: Korshunovo Rudnogorsk West: Abakan Sheregesh Tashtagol Teya	Locations: Zheleznogorsk Rudnogorsk Abaza Sheregesh Tashtagol Vershina Tei	18,000,000 ³	

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ⁶
Iron ore—Continued	Ural Mountains region, which contains the following enterprises: Akkermanovka Bakal Goroblagodat Kachkanar Magnitogorsk Peshchanka	Locations: Novotroitsk Bakal Kushva Kachkanar Magnitogorsk Rudnichnyy	22,000,000 ³
Lead, metal	Dalpolimetal lead smelter	Rudnaya in the Primorskiy Kray	20,000
Do.	OAo Elektrotsink lead smelter [Ural Mining and Metallurgical Co. (UMMC)]	Vladikavkaz in North Caucasus	40,000
Lead-zinc, recoverable content of ore:			
Lead, recoverable Pb content of ore	Altay mining and beneficiation complex	Altayskiy Kray, South Siberia	2,000
Do.	Dalpolimetal mining and beneficiation complex	Primorskiy Kray	20,000
Do.	Nerchinsk polymetallic complex	Zabaykal'skiy Kray	7,000
Do.	Sadon lead-zinc complex	Severnaya Osetiya-Alaniya Republic	5,000
Do.	Salair mining and beneficiation complex	Kemerovskaya Oblast'	2,000
Zinc, recoverable Zn content of ore	Altay mining and beneficiation complex	Altayskiy Kray, South Siberia	1,000
Do.	Dalpolimetal mining and beneficiation complex	Primorskiy Kray	25,000
Do.	Nerchinsk polymetallic complex	Zabaykal'skiy Kray'	12,500
Do.	Sadon lead-zinc complex	Severnaya Osetiya-Alaniya Republic	14,000
Do.	Salair mining and beneficiation complex	Kemerovskaya Oblast'	10,500
Lithium and its compounds	JSC Novosibirsk Chemical Plant (Corporation TVEL)	Novosibirsk	NA
Do.	JSC Chemical-Metallurgical Plant (Corporation TVEL)	Kransnoyarsk	NA
Magnesite	Karagayskiy open pit (Magnezit Group) and Magnezitovaya underground mine (Magnezit Group)	Sakha group of deposits (Chelyabinskaya Oblast')	3,800,000 ³
Magnesium, metal (for sale)	Avisma plant	Berezniki	35,000
Do.	Solikamsk plant (Uralkaliy)	Permskiy Kray	30,000
Mica	Emel'dzhak deposit, Aldan Shield	Sakha (Yakutiya) Republic	NA
Do.	Lopatova Guba mica pit, Northern Kareliya	Kareliya Republic	NA
Do.	Kovdor phlogopite mine (Mica Mine; Slyuda Mine; Kovdorslyuda Shaft)	Kola Peninsula, Murmanskaya Oblast'	NA
Do.	Irkutsk complex (JSC "Vostoksluda")	Mam deposit, Irkutskaya Oblast'	NA
Molybdenum	Dzhida tungsten-molybdenum mine	West Transbaikal	NA
Do.	Sorsk molybdenum mining and beneficiation complex [Strikeforce Mining and Resources Co. (SMR)]	Khakasiya Republic	NA
Do.	Tyrnyauz tungsten-molybdenum mine	North Caucasus	NA
Do.	Shakhtaminskoye molybdenum mining enterprise	Zabaykal'skiy Kray	NA
Do.	Zhireken mining and beneficiation complex [Strikeforce Mining and Resources Co. (SMR)]	East Transbaikal	NA

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ^e
Natural gas	million cubic meters	Komi Republic	8,000
Do.	do.	Noril'sk area	5,500
Do.	do.	North Caucasus	6,000
Do.	do.	Sakhalin	2,000
Do.	do.	Tomskaya Oblast'	500
Do.	do.	Tyumenskaya Oblast, of which	575,000 ³
Do.	do.	Medvezhye field	(75,000)
Do.	do.	Urengoy field	(300,000)
Do.	do.	Vyrngapur field	(17,000)
Do.	do.	Yamburg field	(170,000)
Do.	do.	Bovanenko field	NA
Do.	do.	Pestsovoy field	NA
Do.	do.	Zapolyarny field	NA
Do.	do.	Shtokman field	NA
Do.	do.	Urals	45,000
Do.	do.	Volga	6,000
Do.	do.	Sakha (Yakutiya) Republic	1,500
Nepheline syenite	Apatite complex	Kola Peninsula	1,500,000
Do.	Kiya-Shaltyr Mine (United Company RUSAL)	Goryachegorsk massif, east Siberia	5,000,000
Nickel:			
Ni in ore	OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel	Noril'sk region, Kola Peninsula	300,000
Do.	AO Yuzhuralnikel	Southern Ural Mountains	3,000
Do.	AO Ufaleynikel	Chelyabinskaya Oblast'	18,000
Metal:			
Smelting	OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel	Noril'sk region, Kola Peninsula	160,000
Do.	do.	Pechenga	50,000
Do.	do.	Monchegorsk	50,000
Refining	do.	Noril'sk region, Kola Peninsula	100,000
Do.	do.	Monchegorsk	140,000
Ni products and Ni in FeNi	ZAO Rezhnikel, OAO Ufaleynikel, and OAO Yuzhuralnikel	Southern Ural Mountains	65,000
Niobium (columbium)	Karnarsurt mining enterprise (AO Sevredmet)	Lovozerkoye deposit, Kola Peninsula	12,000
Oil shale	Leningradslanets Association	Slantsy, Leningradskay Oblast'	5,000,000
Petroleum	OAO Bashneft	Bashkortostan Republic	12,000,000
Do.	OAO Gazprom	Deposits throughout Russia	50,000,000
Do.	OAO Lukoil	West Siberian deposits: Kechimovskoye Nivagalskoye Ural Mountains deposits Volga deposits Timen-Pechora deposit: Yuzhnaya Khylochuya Komi Republic deposits: Kyrtaelskoye Pashshorskoye Perevozhnoye	100,000,000 ³
Do.	OAO Novatek	West Siberia	5,000,000
Do.	OAO Rosneft	Deposits throughout Russia	120,000,000
Do.	Rusneft	Central and West Siberia, Ural Mountains and Volga regions	15,000,000

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ⁶
Petroleum—Continued	JSC Slavneft	West Siberia and Krasnoyarskiy Kray	20,000,000
Do.	OJSC Surgutneftegas	East and West Siberia	60,000,000
Do.	OAO Tatneft	Deposits: Romashkinskoye Novo-Elkhovskoye Bavlinskoye Bondyuzskoye Pervomayskoye Sabandchinskoye	30,000,000 ³
Do.	OAO TNK-BP	Deposits: Kammenoye Kovyatka Russkoye Suzunskoye Tagulskoye Uvat Verkhnechonsk	75,000,000 ³
Phosphate rock	OAO Fosforit	Kingisepp deposit in Leningradskaya Oblast'	3,500,000
Do.	Lopatino and Yegorevsk deposits	Moskovskaya Oblast'	NA
Do.	Polpinskoye deposit	Bryanskaya Oblast'	NA
Do.	Verkhnekamsk deposit	Ural Mountains	NA
Phosphate rock, apatite concentrate	OAO Apatit mining and chemical complex	Kola Peninsula	12,000,000
Do.	Kovdor iron mining complex	do.	700,000
Platinum-group metals:			
Ore, PGM content	OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel	Noril'sk region, Kola Peninsula	150
Do.	ZAO Koryakgeoldobycha and unspecified artels	Placer deposits (mostly platinum), Ural Mountains; Siberia; Russian Far East	10 ³
Do.	ZAO Amur Artel	Amur region	4
Metals	Krasnoyarsk Nonferrous Metals Plant (Krastsvetmet)	Krasnoyarskiy Kray	NA
Do.	Ekaterinburgskiy plant (EZOTsM)	Sverdlovskaya Oblast'	NA
Do.	Priobsk plant (OJSC Gazprom Neft)	Khanty-Mansiyskiy Avtomnyy Okrug	NA
Potash, K ₂ O equivalent	Uralkaliy	Verkhnekamsk deposit	3,000,000
Do.	OAO Silvinit	Solikamsk-Berezniki regions, Ural Mountains	2,000,000
Rare earths	JSC Sevredmet	Lovozerkoye deposit, Kola Peninsula	NA
Salt	AO Bassol'	Lake Baskunchak in Astrakhanskaya Oblast'	2,500,000
Do.	Dus-Dagskoe deposit	Dus-Dag Mountains	25,000
Selenium	Joint Stock Company (JSC) Kyshtym copper electrolytic plant	Kyshtym	5
Do.	OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel	East Siberis, Kola peninsula	80
Do.	Ural Mining and Metallurgical Co. (UMMC)	Ural Mountains	90
Silver	OAO Polimetal	Magadanskaya Oblast'	1,000
Do.	ZAO Cukotka mining and processing complex	NA	300

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ^e
Soda ash	Achinsk plant	East Siberia	595
Do.	Berezniki plant	Ural Mountains	1,080
Do.	Pikalevo plant	Leningradskaya Oblast'	200
Do.	Sterlitamak plant	Bashkortostan Republic	2,135
Do.	Volkhov plant	Leningradskaya Oblast'	20
Steel, crude	Companies:	Locations:	
Do.	OAo Amurmetal	Komsomol'sk-na-Amure	1,600,000
Do.	JSC Asha Metallurgical Plant	Chelyabinskaya Oblast'	450,000
Do.	Beloretsk Iron and Steel Works	Bashkirskoye	380,000
Do.	Chelyabinsk Metallurgical Complex (OAo Mechel)	Chelyabinskaya Oblast'	7,000,000
Do.	Cherepovets Metallurgical Complex (Severstal')	Cherepovets	14,000,000
Do.	Chusovskoy Iron and Steel Works	Permskiy Kray	570,000
Do.	JSC Electrostal Metallurgical Plant	Moscow	314,000
Do.	Gorkovskoy Metallurgichesky Zavod	Nizhegorodskaya Oblast'	78,000
Do.	Gur'yevsk Steel Works	Kemerovskaya Oblast'	160,000
Do.	Karaganda	Orenburgskaya Oblast'	6,300,000
Do.	Kuznetsk Steel Works	Kemerovskaya Oblast'	4,700,000
Do.	Lys'va Metallurgical Plant	Permskiy Kray	350,000
Do.	Magnitogorsk Metallurgical Complex (MMK)	Chelyabinskaya Oblast'	16,200,000
Do.	Nizhniy Sergi Steel Works	Sverdlovskaya Oblast'	300,000
Do.	Nizhniy Tagil Metallurgical Complex (NTMK)	do.	8,000,000
Do.	Nosta JSC (JSC Orsk-Kahlilovo Iron and Steel Works)	Novotroitsk, Orenburgskaya Oblast'	4,600,000
Do.	Novokuznetsk Metallurgical Complex	Novokuznetk	NA
Do.	Novolipetsk Metallurgical Complex (NLMK)	Lipetskaya Oblast'	9,900,000
Do.	Novosibirsk Steel Works (Novosibprokat)	Novosibirskaya Oblast'	1,100,000
Do.	CJSC Omutninsk Metallurgical Plant	Kirovskaya Oblast'	210,000
Do.	Oskol Electric Metallurgical Complex (OEMK)	Staryy Oskol	2,500,000
Do.	Petrovsk-Zabaykal'skiy Steel Works	Petrovsk-Zabaykal'skiy	426,000
Do.	Revdinskiy Steel and Wire Production Works	Sverdlovskaya Oblast'	281,000
Do.	Salda Steel Works	do.	NA
Do.	Serov Steel Works	do.	1,000,000
Do.	Serp i Molot (Moscow Metallurgical Works)	Moscow	70,000
Do.	Severskiy Tube Works	Polevskoy, Sverdlovskaya Oblast'	825,000
Do.	Sibelektrostal Metallurgical Works	Krasnoyarskiy Kray	110,000
Do.	Sulinskiy Steel Works (Staks)	Rostovskaya Oblast'	280,000
Do.	Taganrog Iron and Steel Works (Tagmet)	do.	925,000
Do.	OAo Tulachemet	Tul'skaya Oblast'	18,400
Do.	Ural Steel Works	Orsko-Khalilovo	4,000,000
Do.	Viz-Stal (Verkh-Isetsk Steel Works)	Sverdlovskaya Oblast'	132,000
Do.	Volgograd Steel Works (Red October)	Volgogradskaya Oblast'	2,000,000
Do.	Vyksa Steel Works	Nizhegorodskaya Oblast'	540,000
Do.	Zapsib Met Kombinat Metallurgical Complex	Kemerovskaya Oblast'	6,900,000
Do.	Zlatoust Iron and Steel Works	Zlatoust, Chelyabinskaya Oblast'	1,200,000
Talc	Onotsk deposit	Irkutskaya Oblast'	NA
Do.	Kirgiteysk deposit	Krasnoyarskiy Kray	NA
Do.	Miass deposit	Chelyabinskaya Oblast'	NA
Do.	Shabrovsk deposit	Sverdlovskaya Oblast'	NA
Tantalum, ore	Lovozerskoye deposit	Kola Peninsula	10 ³
	Zabaykalskiy mining and beneficiation complex	Etykinskoye deposit	

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ^e
Tellurium	OJSC Mining and Metallurgical Company (MMC) Norilsk Nickel	NA	5
Do.	Ural Mining and Metallurgical Co. (UMMC)	Ural Mountains	35
Tin:			
Ore	OAO Novosibirsk mining and beneficiation complexes: Khinganskoye olovo (Jewish Autonomous District)	Locations: Khabarovskiy Kray	NA
Do.	Dalolovo	Solnechnyy deposit, Primorskiy Kray	NA
Do.	Deputatskiy (Sakhaolovo)	Sakha (Yakutiya) Republic	NA
Do.	Vostokolovo	Russian Far East	NA
Do.	Iultin mining and beneficiation complex	Magadanskaya Oblast'	NA
Do.	Khrustalnyy mining and beneficiation complex	Primorskiy Kray	NA
Do.	Pevek mining and beneficiation complex	Magadanskaya Oblast'	NA
Metal	Novosibirsk smelter	Novosibirskaya Oblast'	NA
Do.	Podol'sk smelter	Podol'sk	NA
Do.	OAO Ryaztsvetmet	Ryazanskaya Oblast'	NA
Do.	OAO Zavod pripoyev	Ryazan	NA
Titanium:			
Metal	Moscow plant	Moscow	NA
Do.	Podol'sk plant	Podol'sk	NA
Do.	OAO Verkhnyaya Salda Metallurgical Production Association Avisma (VSMPO)-Avisma titanium-magnesium complex	Sverdlovskaya Oblast', Ural Mountains	NA
Sponge	do.	do.	40,000
Tungsten:			
W content of concentrates	Aginskoye deposit	Sakha (Yakutiya) Republic	NA
Do.	Antonovogorsk deposit	East Transbaikal,	NA
Do.	Balkan deposit	Northeast of Magnitogorsk, Ural Mountains	NA
Do.	Belukha deposit	East Transbaikal,	NA
Do.	Bom-Grokhom deposit	West Transbaikal	NA
Do.	Dzhida deposit	do.	NA
Do.	Iultin deposit	Magadanskaya Oblast'	NA
Do.	Kti-Teberdaskoye deposit	North Caucasus	NA
Do.	Kvartz Artel	Dzhida region	NA
Do.	Lermontovo enterprise	Lermontovo deposit in Russian Far East	NA
Do.	Novo Orlovsk mining and beneficiation complex	do.	NA
Do.	OAO Primorsk mining and beneficiation complex	do.	NA
Do.	Solnechnoye deposit	Southern Khabarovskiy Kray	NA
Do.	Tyrnyauz tungsten-molybdenum mining and processing complex	Kabardino-Balkariya Republic North Caucasus	NA
Metal, tungsten anhydride	Gidrometallurg plant	do.	NA
Do.	OJSC Pobedit plant	Vladikavkaz	NA
Uranium, U content	JSC Atomredmetzoloto (ARMZ Uranium Holding Co.) enterprises: JSC Dalur mining enterprise JSC Khiagda mining enterprise JSC Priargunsky Industrial Mining and Chemical Union	Locations: Kurganskaya Oblast' Buryatiya Republic Krasnokamensk, Zabaykal'skiy Kray	3,500 ³
Vanadium:			
Ore	Kachkanar iron mining complex	Ural Mountains	NA
Metal	Chusovoy and Nizhniy Tagil plants	do.	17,000
Pentoxide	Vanadii-Tulachermet	Tul'skaya Oblast', North Caucasus	NA

See footnotes at end of table.

TABLE 2—Continued
 RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2009¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ⁶
<u>Zinc:</u>			
Zn content of copper-zinc ore	Bashkir copper-zinc complex	Sibai, southern Ural Mountains	5,000
Do.	Buribai copper-zinc mining complex	Buribai, southern Ural Mountains	1,500
Do.	Gai copper-zinc mining and beneficiation complex	Gai, southern Ural Mountains	25,000
Do.	Kirovgrad copper enterprise	Kirovgrad, central Ural Mountains	1,200
Do.	Sredneuralsk copper complex	Revda, central Ural Mountains	5,000
Do.	Uchali copper-zinc mining and beneficiation complex	Uchalinskiy Rayon, southern Ural	90,000
Metal	OAO Chelyabinsk electrolytic zinc plant	Chelyabinskaya Oblast'	200,000
Do.	OAO Elektrosink plant [Ural Mining and Metallurgical Co. (UMMC)]	Vladikavkaz, North Caucasus	110,000
Do.	Uralkhromed plant [Ural Mining and Metallurgical Co. (UMMC)]	Verkhnyaya Pyshma	17,000
<u>Zirconium:</u>			
Baddaleyite concentrate	Kovdor iron ore mining and beneficiation complex	Kola Peninsula	3,500
Metal	Chepetsky metallurgical plant (Corporation TVEL)	Glazov, Udmurtiya Republic	NA

⁶Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

¹Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

²United Company RUSAL was formed by the merger of RUSAL (Russian Aluminum), SUAL (Siberian-Urals Aluminium Company Group), and the alumina assets of Glencore, completed in March 2007.

³Capacity estimates are totals for all enterprises that produce that commodity.