



2017–2018 Minerals Yearbook

RUSSIA

THE MINERAL INDUSTRY OF RUSSIA

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Note: In this chapter, information for 2017 is followed by information for 2018.

The Russian Federation was one of world's leading producers of mineral commodities and produced a diverse range of metals and industrial minerals. In 2017, Russia was the world's leading producer of asbestos (59% of world output) and diamond (30%); the 2d-ranked producer of aluminum (6.0%), antimony (11%), cobalt (4.9%), gallium (2.2%), germanium (5.7%), magnesium metal¹ (3.8%), nitrogen (9.9%), palladium (38%), platinum (11%), potash (18%), silicon (10%), and vanadium (25%); the 3d-ranked producer of gold (8.4%), rare earths (2.0%), sulfur (8.8%), tellurium (9.4%), titanium sponge (22%), and tungsten (2.5%); the 4th-ranked producer of arsenic (4.3%), lime (2.7%), magnesium compounds (5.2%), nickel (9.9%), pig iron (4.4%), and phosphate rock (4.9%); the 5th-ranked producer of alumina (2.2%), iron ore (4.1%), selenium (5.5%), and vermiculite (3.3%); the 6th-ranked producer of cadmium (4.7%), graphite (1.9%), lead (4.4%), and raw steel (4.1%); the 7th-ranked producer of bauxite (1.8%); the 8th-ranked producer of barite (2.5%), indium (0.7%), peat (3.4%), and silver (4.2%); the 9th-ranked producer of cement (1.4%), copper (3.5%), and molybdenum (1.0%); and the 11th-ranked producer of gypsum (2.8%) and salt (2.0%). It also was a significant world producer of boron, scandium, and tin (Anderson, 2019a–d; Apodaca, 2019a, b; Bedinger, 2019; Bennett, 2019; Bolen, 2019; Bray, 2019a–d; Brioche, 2019a, b; Corathers, 2019; Crangle, 2019; Flanagan, 2019a, b; Gambogi, 2019a, b; George, 2019a, b; Jasinski, 2019a, b; Jaskula, 2019; Klochko, 2019a–c; McRae, 2019a, b; Olson, 2019a, b; Polyak, 2019a, b; Schnebele, 2019; Shedd, 2019a, b; Singerling, 2019; Tanner, 2019; Thomas, 2019; Tolcin, 2019; Tuck, 2019a, b; van Oss, 2019).

In 2017, Russia was also one of the leading world producers of mineral fuels. According to BP's Statistical Review of World Energy, the country accounted for 17.3% of the world's production of natural gas, 12.2% of its crude petroleum, 5.5% of its coal, and 3.9% of its liquefied natural gas. Russia was also the sixth-ranked world producer of uranium (BP.com, 2018; World Nuclear Association, 2020).

Minerals in the National Economy

In 2017, the real gross domestic product (GDP) of Russia increased by 1.6% compared with a 0.2% decrease in 2016; the nominal GDP increased to 92.0 trillion rubles (\$1.52 trillion).² In 2017, the total value of output from mining and quarrying

¹For bauxite, cadmium, germanium, magnesium compounds, magnesium metal, selenium, tellurium, and titanium sponge, the world rank and percentage of world output do not include U.S. production, which has been withheld to avoid disclosing company proprietary data.

²Where necessary, values have been converted from Russian rubles (RUB) to U.S. dollars (US\$) at an annual average exchange rate of RUB62.845=US\$1.00 for 2018; RUB60.692=US\$1.00 for 2017, and RUB69.685=US\$1.00 for 2016. All values are nominal, at current prices, unless otherwise stated.

in current prices was 13.92 trillion rubles (\$229 billion), which was an 18.5% increase compared with the value in 2016, but real output increased by 2.1%. Mining and quarrying of coal and lignite accounted for 1.23 trillion rubles (\$20 billion), and production of crude petroleum and natural gas, 9.29 trillion rubles (\$153 billion). The total value of coke and refined petroleum production was 8.20 trillion rubles (\$135 billion), which was a 20.3% increase compared with the value in 2016 and a real output increase of 1.1%. Production of base metals was valued at 5.17 trillion rubles (\$85 billion), which was a 13.9% increase compared with 2016 production value; and real output increased by 0.1%. The output of fabricated metal products was valued at 2.30 trillion rubles (\$38 billion), which was a 5.7% increase compared with the value in 2016 and a real increase of 3.4%. The total value of output of chemical products was 2.74 trillion rubles (\$45 billion), which was a 7.4% increase compared with the value in 2016 and a 5.1% increase in real output. The total value of other nonmetallic mineral products was 1.44 trillion rubles (\$23.7 billion), which was a 10.0% increase compared with the value in 2016 and an 11.2% increase in real output (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2018, p. 259–275, 337–361).

In 2017, a total of 305.2 billion rubles (about \$5.03 billion) was spent on geologic exploration, of which 86.3% was financed from company funds, 7.0% was funded from the Federal budget, and 5.2% came from domestic and foreign investors. Of the total funds spent on exploration, 76.6% was spent on exploration for petroleum, natural gas, and condensate; 8.2%, precious metals; 1.8%, diamond; 1.3%, nonferrous and rare metals; 0.9%, coal; 0.9%, other nonmetallic minerals; and 0.3%, ferrous metals (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2018, p. 81).

In 2017, AO Rosgeologiya (Russia's holding company engaged in a variety of geological services) had a 14.4% market share of exploration services, which was a fivefold increase from that of 2014. In 2017, the company worked on 171 government contracts with a total cost of more than 54 billion rubles (about \$890 million), of which 86 included exploration for solid minerals; 33, for geophysics; 26, for groundwater; 11, for drilling; 9, for continental-shelf work; and 6, for sea-bottom work. Rosgeologiya included 53 subsidiaries with operations all over Russia and discovered more than 1,000 hydrocarbon and solid mineral deposits, such as the Astrakhanskoye Field (2.5 trillion cubic meters of natural gas), the Kovyktinskoye Field (1.9 trillion cubic meters of natural gas), the Tengizskoye Field (3.1 billion metric tons of petroleum), and the Sukhoy Log deposit [about 2,000 metric tons (t) of contained gold]. Rosgeologiya was created in 2011 from one of the oldest exploration companies in Russia—Tsentrgeologiya—and was

100% Government owned (Interfax.ru, 2011; Neftegaz.ru, 2018; Rosgeo.com, 2018).

Government Policies and Programs

The legislative framework for exploration, mining, and other extractive activities related to the production of solid minerals, hydrocarbons, and groundwater in Russia is described by the “Subsoil Law” that was adopted on February 21, 1992. Major amendments to this law were made in 1995, 1999, 2014, and 2016 in conjunction with related modifications of other relevant laws, such as the Tax Law (Konsortium Kodeks, 2021; Konsultant.ru, 2021).

In the beginning of 2019, the Ministry of Natural Resources and Environment (Minprirody) announced that it had estimated the value of all mineral reserves in Russia as of yearend 2017. The total value of all mineral reserves was estimated to be 55.2 trillion rubles (about \$910 billion), or about 60% of Russia’s 2017 GDP. The value of petroleum equaled 39.6 trillion rubles (about \$650 billion); natural gas, 11.3 trillion rubles (about \$190 billion); and coking coal, almost 2 trillion rubles (about \$32 billion). In addition, the value of iron ore reserves was estimated to be 808 billion rubles (about \$13.3 billion); diamond, 505 billion rubles (about \$8.3 billion); and gold, 480 billion rubles (about \$7.9 billion). Petroleum reserves were estimated to be 9.04 billion metric tons (Gt); natural gas, 14.47 trillion cubic meters; gold, 1,407 t; and diamond, 375 million carats. Minprirody included in its calculations only licensed deposits, and it used a revenue-based methodology; that is, the value was calculated based on the discounted revenue stream that could be earned by resource development. As a comparison, according to the BP Statistical Review of World Energy, proven petroleum reserves in Russia were estimated to be 14.5 Gt, and proven natural gas reserves, 35 trillion cubic meters. Some analysts warned that the Minprirody’s reserves are likely underestimated, stating that the estimates were calculated using data produced from inconsistent assumptions, especially regarding hydrocarbon reserves. Nevertheless, Minprirody announced that this was the first comprehensive estimate of this kind and that the ministry planned to update the figures on an annual basis (BP.com, 2018; Gazeta.ru, 2019; Tkachev and Fadeeva, 2019).

Production

In 2017, Russia’s production of mineral commodities was largely stable. Production of iodine increased by 167%; nickel matte, by 153%; ferromanganese, by 104%; ferrochromium, by 62%; mined tin, by 61%; iridium, by an estimated 50%; anthracite coal, by 44%; mica, by 41%; graphite, by 30%; mined antimony and secondary silver, by 21% each; direct-reduced iron, by 20%; kaolin, by 15%; steel pipe, by 13%; magnesium metal and magnesite, by 12% each; and refined copper, other ferroalloys, and potash, by 11% each. At the same time, bentonite production decreased by 85%; mined titanium, by 83%; silicomanganese, by 78%; laterite ore, by 74%; barite, by 59%; refined cobalt, by 33%; vermiculite, by 25%; peat, by 24%; gallium, by an estimated 22%; tungsten, by 21%; ferroniobium, by an estimated 20%; rhodium, by 20%; and

nickel metal, by 17%. Production data for these and other mineral commodities are in table 1.

Structure of the Mineral Industry

At the end of 2017, Russia had 17,600 enterprises engaged in mining and quarrying, which was a 2.8% decrease compared with that of 2016. Of these enterprises, 3,000 were engaged in mining metal ores; 1,700, in the production of petroleum and natural gas; 900, in mining coal; and the rest, in mining other minerals. Of all mining and quarrying enterprises, 16,300 were owned by Russian citizens, about 200 were owned by foreign companies or jointly owned by domestic and foreign entities, and about 100 were owned by central and municipal governments. The ownership of the other 1,000 enterprises was not reported. In addition, Russia had 41,600 enterprises engaged in metal processing, 40,200 of which were owned by Russian citizens. Table 2 provides information on the structure of Russia’s mineral industry (Federal’naya Sluzhba Gosudarstvennoy Statistiki, 2018, p. 309–315).

Mineral Trade

In 2017, the total value of Russia’s exports of goods was \$353.5 billion, which was a 25.5% increase compared with the value of exports in 2016. The value of Russia’s imports increased in 2017 to \$238.1 billion, or by 24.4%. In 2017, Russia had a positive trade balance of \$115.4 billion (Federal’naya Sluzhba Gosudarstvennoy Statistiki, 2018, p. 577).

The primary goods exported from Russia were chemicals, manufactured goods, metals, natural gas, petroleum and petroleum products, and wood and wood products. Mineral products made up 58.6% of the total value of Russia’s exports; crude petroleum, 26.4%; petroleum refinery products, 16.5%; natural gas, 10.8%; and ferrous metals, 5.3%. The leading categories of exported ferrous metals were semifinished products made from carbon steel (32.1%) and flat-rolled iron and steel (27.5%). Other products that contributed to Russia’s export revenue included bituminous coal (3.8%), aluminum (1.5%), copper (1.03%), complex mineral fertilizers (0.78%), nitrogen fertilizers (0.66%), potassium fertilizers (0.60%), ferrous metal pipe (0.57%), and nickel (0.39%). The major recipients of Russia’s exports in 2017 were China (which received 11.0% of Russia’s exports), the Netherlands (10.1%), Germany (7.3%), Belarus and Turkey (5.3% each), Italy (3.9%), Kazakhstan (3.5%), the Republic of Korea (3.5%), Poland (3.3%), the United States (3.0%), Japan (2.9%), the United Kingdom and Finland (2.5% each), and Ukraine (2.2%) (Federal’naya Sluzhba Gosudarstvennoy Statistiki, 2018, p. 577–601).

In 2017, Russia imported \$5.3 billion worth of ferrous-metal products (which constituted 2.2% of total imports) and \$4.9 billion worth of ferrous metals (2.0%). The major sources of Russia’s imports were China (which supplied 20.2% of Russia’s imports), Germany (10.2%), the United States (5.3%), Belarus (5.0%), Italy (4.2%), France (4.0%), Japan (3.3%), and Kazakhstan, Poland, and Ukraine (2.1% each) (Federal’naya Sluzhba Gosudarstvennoy Statistiki, 2018, p. 577–601).

Commodity Review

Metals

Platinum-Group Metals.—In 2017, Russia produced about 88,000 kilograms (kg) of palladium, which was estimated to be a 6% increase from that of 2016. Production of platinum was estimated to have remained unchanged at 22,000 kg. As of 2016 (the latest year for which data were available), Russia had 7,600,000 kg of palladium and 2,400,000 kg of platinum reserves in deposits currently in production or in development (table 1; *Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii*, 2018, p. 247–249).

Russia's platinum-group metals (PGMs) were both hard-rock and alluvial-type deposits. The most common ore was the sulfide-copper-nickel type, which accounted for 96% of all reserves. In these ores, all six platinum-group elements were byproducts of copper and nickel production. About 3.5% of PGM reserves were low-sulfide ores where platinum and palladium dominated. The third type of PGMs were found in vanadium-iron-copper and uranium-vanadium types of ores, but the PGM reserves in such deposits were less than 0.2% of the total. Finally, alluvial deposits contained 0.3% of the reserves, the most significant containing exclusively platinum. Also, platinum was found as a coproduct in gold and diamond placers (*Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii*, 2018, p. 248–2649).

In 2017, PGMs in Russia were produced at 44 deposits, of which 36 were alluvial deposits and 8 were hard-rock deposits. About 97.5% of PGMs were produced from complex sulfide copper-nickel deposits. Only about 0.1% of total palladium production came as a byproduct in the production of vanadium-iron-copper ores. PAO GMK Norilskiy Nickel (Nornickel) was the leading company engaged in producing and processing PGMs in Russia, accounting for about 97.7% of all PGMs produced there. Nornickel's Polar Division operated in the Norilsk ore district, which included three deposits—the Norilsk I, the Oktyabr'skoye, and the Talnakhskoye. Total production capacity of all mines in the Norilsk group was 17.5 million metric tons per year (Mt/yr) of ore. Nornickel's AO Kola GMK Division operated in the Murmanskaya Oblast' and developed sulfide deposits from the Pechengskaya group. The Pechengskaya group included four deposits—the Kotselvaara-Kammikivi, the Semiletka, the Zapolyaroye, and the Zhdanovskoye. The total production capacity of the Pechengskaya group was 7.5 Mt/yr of ore, but PGMs were extracted primarily from the ore produced at the Zhdanovskoye deposit. The production cycle in both the Norilsk group and the Pechengskaya group included ore beneficiation resulting in collective copper-nickel concentrate, melting into the first matte, conversion into the second matte, and the electrolytic process to separate the slurry containing gold, silver, and PGMs, which is then processed into a concentrate of precious metals that is later refined. Nornickel did not have refining facilities for precious metals and therefore sent their precious metals on tolling conditions to outside refineries (*Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii*, 2018, p. 247–260).

Another PGM producer in Russia was OAO AS Amur, which was a subsidiary of OAO Russian Platinum Co. The company

was developing the two largest placer deposits in the country—the Kondyor deposit and the Uorgalan deposit—using open pit mines and had a capacity to produce between 2.9 million and 3.6 million cubic meters per year of sand. The extracted sand was washed and beneficiated into placer concentrate, which was then sent to outside refineries, usually under tolling agreement. In 2016 (the latest year for which information was available), OAO AS Amur produced 1,800 kg of platinum, mostly from the Kondyor deposit. In addition, another 11 companies produced PGMs in Russia, mostly from alluvial deposits (*Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii*, 2018, p. 247–260).

In Russia, there were three refineries capable of processing complex concentrates of precious metals that were certified as LBMA (London Bullion Market Association) “Good Delivery” refineries—the AO Krasnoyarskiy Plant for nonferrous metals (Krastsvetmet), the AO Priokskiy Plant for nonferrous metals, and the AO Yekaterinburg Plant for nonferrous metals processing. Krastsvetmet was the primary refiner of PGMs; it accounted for up to 98% of the platinum and palladium processing in the country. Krastsvetmet processed primarily precious-metal concentrates shipped by Nornickel subsidiaries (*Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii*, 2018, p. 247–260).

In 2017, 14 new deposits were being developed for mining, of which 9 were sulfide deposits and 5 were alluvial deposits. The largest projects were in Siberia—the Chernogorskoye, the Kingashskoye, and the Verhnekingashskoye sulfide deposits in Krasnoyarskiy Kray; and the alluvial deposits in Sverdlovskaya Oblast' and in Sakha Republic. OOO Kingashskaya GRK, which was a subsidiary of OOO UK Intergeo, was developing two large deposits of the Kingash ore cluster (the Kingashskoye and the Verhnekingashskoye) where the company planned to build common infrastructure for both mines. According to preliminary data, the deposits would be mined using open pit methods with a total annual production of 9 Mt/yr of ore. As of yearend, it was not clear when the company would begin production (*Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii*, 2018, p. 247–260).

At the Chernogorskoye deposit, Chernogorskaya GRK (which was a subsidiary of Russian Platinum) continued preparation of the eastern section of the deposit for open pit mining. According to the company's plan, mining of sulfide ore would begin at the end of 2020 and the mine would have a capacity of 5.8 Mt/yr of ore. The company planned to process ore at its own processing plant using gravity and flotation methods and to produce a copper-nickel-platinum-palladium mineral concentrate with joint production of gold, silver, selenium, and tellurium (*Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii*, 2018, p. 247–260).

Industrial Minerals

Cement.—In 2017, Russia produced about 54.7 million metric tons (Mt) of cement, which was a 0.4% decrease compared with that of 2016. In 2017, cement production increased in three of the eight Federal okrugs (jurisdictions) but decreased in the other five. The Privolzhskiy Federal Okrug increased cement production by 7.3%, which was the highest

percent increase in Russia; the North-Western Federal Okrug decreased cement production by 10.0%. The cement market in Russia was stagnant during the past 3 years, after production had reached its historic maximum in 2014. In 2017, the Government took measures to increase construction activity in the residential sector, which might increase cement production in the near future. In 2017, the share of high-grade cement in the Russian market increased to 78% from 74%. If the construction sector expanded, the share of high-grade cement on the market would also likely increase (Rucem.ru, 2018; Semenov, 2018).

As of 2017, about 70 cement plants were in operation in Russia, most of which belonged to large integrated holding companies. The leading cement producer in the country was Eurocement Group, which owned and operated a total of 16 cement plants in Russia. Eurocement owned about 50% of all cement production capacity in the country. Eurocement also owned large deposits of raw materials used in cement production; the total (combined) resources of these deposits was about 5.5 Gt. Overall, Eurocement plants produced about 16.65 Mt of cement in 2017. The second-ranked cement producer in Russia was Gazmetallproekt that owned the 8.2-Mt/yr-capacity Verkhnebakanskiy cement plant and the Novorostsement Co., which managed three cement plants that had a total (combined) production capacity of about 5.8 Mt/yr of cement. In 2017, Gazmetallproekt produced a total of 5.15 Mt of cement. The third-ranked cement company, AO Holding Company Sibirskiy Tsement, owned three cement plants with a combined capacity of 5.6 Mt/yr of cement, as well as a processing plant for limestone and gypsum. In 2017, Sibirskiy Tsement plants produced 3.1 Mt of cement. International companies operating in Russia—LafargeHolcim Ltd., HeidelbergCement AG, and Dyckerhoff AG—produced 4.3 Mt, 3.9 Mt, and 3.2 Mt of cement, respectively (Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii, 2018, p. 315–324; Semenov, 2018).

In 2017, Russia exported 1.1 Mt of cement, which was a 7.3% increase from that of 2016. The main export destinations were Kazakhstan (62%) and Belarus (24%). Russia imported 1.9 Mt of cement, which was a 1.4% increase from that of 2016. Russia's cement imports came mainly from Belarus (66%) and Kazakhstan (20%). Cement consumption in Russia was 1.3% lower than in 2016 and amounted to 55.2 Mt. In recent years, exports of cement remained between 2% and 4% of domestic production. The export of cement was limited by a complicated certification process, high standards of the European Union, and the relatively high costs and high energy consumption in the “wet” production technology prevalent at most of Russia's plants (Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii, 2018, p. 315–324; Rucem.ru, 2018).

Raw materials used in cement production were mined primarily by the open pit method. In 2017, 91.9 Mt of the raw materials used in cement production were produced at 84 mines and quarries. More than two-thirds of domestic cement raw material production took place in the Provolzhskiy Okrug, the Central Okrug, and the Southern Federal Okrug. More than 10 Mt was produced by PAO Mordovtsement (a subsidiary of Eurocement Group) at the Alekseevskoye deposit in Mordovia Republic. OAO Serebryakovtsement produced more than 5 Mt of cement raw materials at the

Serebryakovskoye deposit in Volgogradskaya Oblast'. Other leading producers were ZAO Podgorenskiy Tsementnik at the Podgorenskoye deposit in Voronezhskaya Oblast', OAO Stoylenskiy GOK [mining and metallurgical complex] at the Stoylenskoye deposit in Belgorodskaya Oblast', and OOO Holcim (Rus)(a subsidiary of LafargeHolcim) at the Bol'shevi deposit in Saratovskaya Oblast', all of which produced more than 3 Mt of cement raw materials. The technology of cement production included preparation of a blend of carbonate minerals (75%), clay minerals (25%), and small amounts of various additives. About 55.6% of all Portland cement produced in Russia had no additives, about 35.6% had additives, and 7.9% included metallurgical slag. In 2016, cement was placed on the list of products whose quality had to be certified by the Government. As a result, cement prices in Russia increased by about 16% in 2016 and by another 3% in 2017. At the current level of production, Russia had enough cement raw material resources for 350 years of production (Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii, 2018, p. 315–324; Semenov, 2018).

Mineral Fuels and Related Materials

Uranium.—In 2017, Russia produced 2,917 t of uranium, which was a 3% decrease from that of 2016. According to AO Atomredmetzoloto [Uranium Holding OAO Atomredmetzoloto (ARMZ)], its reserves as of 2017 amounted to 524,000 t of contained uranium. The distribution of uranium resources in Russia was very uneven—almost 90% of all reserves were concentrated in Sakha Republic (Yakutiya), Zabaykal'skiy Kray, and Tyva Republic. More than 50% of all reserves were in 17 deposits in the Elkon uranium ore district in Sakha Republic; the uranium is contained in gold-uranium ores in potash metasomatic rocks (Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii, 2018, p. 77–86; Rosatom.ru, 2019).

All Russia's uranium-producing mines were managed by ARMZ, which was a part of the mining division of the State Corporation Rosatom. ARMZ included currently producing companies [AO Dalur, AO Khiagda, AO Lunnoye, and PAO Priargunskoye Production Mining and Chemical Association (PAO PPGHO)] and companies developing future mines (AO Elkon'skiy GMK and AO UDK Gornoye) (Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii, 2018, p. 77–86).

PAO PPGHO was mining deposits in the Strel'tsovskiy ore district in Zabaykal'skiy Kray. In 2017, PAO PPGHO mined six deposits—Antey, Luchisty, Malo-Tulukuevskiy, Martovskiy, Oktyabr'skiy, and Strel'tsovskiy. PPGHO had been in operation since 1968 and had recently begun to reduce production owing to ore depletion. PPGHO processed uranium ore using the heap-leach method at its hydrometallurgical plant to obtain uranium oxide. In 2017, PPGHO accounted for about 60% of Russia's uranium production (Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii, 2018, p. 77–86).

AO Dalur in Kurganskaya Oblast' mined the Dolmatovskoye and the Khokhlovskoye deposits using underground leaching, which was considered to be both more environmentally friendly and economically efficient than other methods. In 2017, AO Dalur produced about 19% of Russia's uranium. AO Khiagda

in Buryatiya Republic mined the Khiagdinskoye deposit using underground leaching. In 2017, AO Khiagda produced 693 t of uranium, which was a 28% increase compared with production in 2016. The increase was owing to the completion of several infrastructure projects—a new production building, a sulfuric acid plant, and a new energy complex. AO Khiagda planned to reach design capacity of 1,000 metric tons per year (t/yr) of uranium in 2019. AO Lunnoye, in cooperation with AO Zoloto Seligidara, mined the Lunnoye gold-uranium deposit in Sakha Republic. In 2016 (the latest year for which information was available), the company produced 54 t of uranium. The primary production activity, however, was production of gold and silver using the heap-leach method (Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii, 2018, p. 77–86).

In 2017, ARMZ companies continued to develop new deposits for production. AO Khiagda was in the process of preparing two deposits—the Istochnoye and the Vershinnoye—both of which were a part of the Khiagda ore field. It was expected that production would begin in 2018. PPGHO was also preparing the Argunskoye and the Zherlovoye deposits for production. In 2017, the company designed a blueprint for a mine plan with a uranium production capacity of 1,800 t/yr; it planned to begin construction in 2018, start production in 2023, and reach design capacity between 2024 and 2026. In 2016, AO Elkonskiy GMK postponed development of the Kunrug deposit and the Elkon Plato deposit in Sakha Republic until 2019. Historically low world market prices, complicated geographic and economic conditions in the region, and the significant depth of the ore body contributed to the slow development of those deposits. In 2017, AO Dalur obtained a license for exploration and development of the Dobrovol'noye deposit in Kurganskaya Oblast' and began preparation of an environmental impact analysis for a pilot underground leaching project expected to begin in 2018 (Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii, 2018, p. 77–86).

After the ore is mined, the second stage in uranium production is the conversion and beneficiation of uranium and the production of nuclear fuel. Within Rosatom, AO TVEL was the unit responsible for those functions. Uranium produced at Russia's mines was shipped to AO Siberian Chemical Complex (SHK), a subsidiary of AO TVEL, where all the company's conversion facilities were located. At these facilities, raw uranium was converted to uranium hexafluoride, which was then shipped to plants to separate the uranium isotopes. As of 2016, AO TVEL held 46.6% of the world's uranium beneficiation capacity (Ministerstvo Prirodnih Resursov i Ekologii Rossiyskoy Federatsii, 2018, p. 77–86).

MINERAL INDUSTRY HIGHLIGHTS IN 2018

Minerals in the National Economy

In 2018, Russia's real GDP increased by 2.3% compared with a 1.6% (revised) increase in 2017; the nominal GDP was 103.9 trillion rubles (\$1.65 trillion). In 2018, the total value of output from mining and quarrying in current prices was 18.19 trillion rubles (\$290 billion), which was a 30.7% increase compared with the value in 2017, but the real output

increased by 4.1%. Mining and quarrying of coal accounted for 1.57 trillion rubles (\$24.9 billion) and production of crude petroleum and natural gas, 12.9 trillion rubles (\$205 billion). The total value of coke and refined petroleum production was 10.4 trillion rubles (\$165 billion), which was a 26.7% increase compared with the value in 2017, but the real output increased by 1.8%. The production of base metals was valued at 6.1 trillion rubles (\$97 billion), which was an 18.1% increase compared with the 2017 value, but the real output increased by 1.7% (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2019, p. 275–296; 380–404).

In November 2018, the Government of the Russian Federation approved a bill that reduced the tax rate on mineral production extraction, known as NDPI, on rare metal production, to 4.8% from 8.0%. The new tax rate would apply both to the production of rare metals from ore deposits where rare metals are the primary components of the ore and where rare metals are co-products in complex polymetallic deposits. According to the bill, for tax purposes, "rare metals" included beryllium, bismuth, cadmium, cesium, gallium, germanium, hafnium, indium, lanthanides, lithium, niobium, rhenium, rubidium, scandium, selenium, strontium, tantalum, tellurium, thallium, vanadium, and zirconium (Metaltd.ru, 2018).

In December 2018, the Government approved a new state development strategy for mineral resources of Russia through 2035. The strategy defined priorities, goals, and tasks for the exploration and mining sector, and focused on the production of raw materials in support of the country's economy. This strategy would become the basis for the formation and implementation of Government policy in geology, replenishment of resources, and mineral production at the Federal and regional levels. In the strategy, all minerals were divided into three groups—those for which reserves were sufficient for any development scenario through 2035; those for which reserves were insufficient for current production levels; and those that were in deficit and for which current consumption was heavily reliant on either imports or stockpiles. The program defined production levels for all groups of minerals and emphasized the importance of regional geologic exploration (Finmarket.ru, 2018).

In 2018, the total value of Russia's exports of goods was \$443.1 billion, which was a 25.5% increase compared with the value of exports in 2017. The value of Russia's imports increased in 2018 to \$248.7 billion, or by 4.3%. Mineral products made up 64.9% of the total value of Russia's exports. Crude petroleum accounted for 29.1% of total exports; petroleum refinery products, 17.6%; natural gas, 11.1%; and ferrous metals, 5.3% (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2019, p. 591–617).

Production

In 2018, production of mined manganese was 57 times greater than in 2017. Production of vermiculite increased by 180%; fluorspar, by 122%; mined antimony, by 108%; peat, by 53%; mined tin, by 51%; gypsum, by 38%; kaolin, by 30%; rhodium, by 28%; silver (secondary), by 26%; anthracite coal, by 14%; direct-reduced iron, by 13%; and ferromanganese, by 11%. At the same time, bentonite production decreased by 45%; iridium, by 33%; mined molybdenum, by 26%;

ferrochromium, by 24%; gallium and mica, by 14% each; native sulfur and refined cobalt, by 13% each; and ferrotitanium, by 12%. These and other production data are in table 1.

Commodity Review

Metals

Copper and Gold.—In August, KAZ Minerals LLC, which was registered in London, United Kingdom, and had most of its operations in Kazakhstan, announced that it had signed an agreement to purchase the Bayimskoye copper project in Chukotskiy Avtonomnyi Okrug for \$900 million. According to the agreement, KAZ Minerals paid 75% of the project value (\$675 million) and would pay the remaining 25% (\$225 million) at a later date. The previous 100% owner of the deposit was GDK Bayimskaya (a subsidiary of Millhouse Capital) that acquired it at auction in 2008. The Bayimskaya field is one of the largest undeveloped copper fields in the world, and it has the potential to host low-cost open pit copper production. The most recent Joint Ore Reserves Committee (JORC)-compliant reserves were estimated to be 9.5 Mt of contained copper and 16.5 million troy ounces (about 513,000 kg) of contained gold. Average grades were 0.43% copper and 0.23 gram per metric ton (g/t) gold. KAZ Minerals expected to produce 250,000 t/yr of copper and 400,000 troy ounces per year (about 12,400 kilograms per year) of gold with an approximate mine life of 25 years. Capital expenses for mine development were estimated to be \$5.5 billion. The project is located in a region defined by the Government as strategically important for economic development, and thus KAZ Minerals expected to benefit from Government infrastructure development and reduced taxes (Kursiv.kz, 2018; Vedomosti.ru, 2018).

In September 2018, Baykal'skaya Gornaya Kompaniya (BGK, a subsidiary of USM Holdings) restarted its project for developing the Udokan copper deposit, which was located in the Kalarskiy Region of Zabaykal'skiy Kray. The state corporation Rostech, which had a 25% option in the Udokan project, decided not to exercise it. Rostech had held the option since 2008, when Metalloinvest, another subsidiary of USM Holdings, won a development license for Udokan. BGK planned to finance the first stage of the Udokan project with 40% of its own funds and 60% in loans. By September 2018, BGK had already invested about \$830 million (which included the cost of the license) and planned to invest another \$100 million and to borrow \$1.35 billion from a consortium of banks. At the first stage, BGK planned to build a GOK capable of processing 12 Mt/yr of ore and producing 130,000 t/yr of copper (about 70,000 t/yr in cathodes and the rest in 45% concentrate). BGK planned to begin construction in 2019, to start production in 2021, and to reach design capacity in the third quarter of 2022. BGK expected that the Udokan infrastructure could be expanded to process up to 48 Mt/yr of ore. The Udokan deposit was the largest copper deposit in Russia; it had JORC-compliant reserves estimated to be 15 Mt of contained copper and resources estimated to be 26.7 Mt of contained copper (Eastrussia.ru, 2018; Metalbulletin.ru, 2018; Metaltorg.ru, 2018a; Poyarkina, 2018).

In October 2018, ZAO Russkaya Mednaya Kompaniya (RMK) completed acquisition of a 100% share in Amur Minerals, which was the operator of the Malmyzhskoye copper porphyry-gold deposit, located in Nanayskiy Region of Khabarovskiy Kray. The seller was OOO Khabarovsk Minerals LLC, which was owned by IG copper LLC of Canada (51%) and Freeport McMoRan Corp. of the United States (49%). The total amount of the sale was \$200 million. According to RMK's plan, the company would build a GOK with a production capacity of 30 Mt/yr of ore and a mine life of 37 years. Earlier, the total investment in the Malmyzhskoye deposit was estimated to be \$1.5 billion. Amur Minerals had held a development license for the Malmyzhskoye ore field since 2006 and, in 2015, the company obtained a certificate of discovery for the Malmyzhskoye deposit. The proved reserves of the four sections of the deposit were estimated to be 5.6 Mt of contained copper and 298 t of contained gold, and the additional resources of the deposit were 3.3 Mt of copper and 151 t of gold (Fomag.ru, 2018; Metaltorg.ru, 2018b; Nedradv.ru, 2018).

Platinum-Group Metals.—In March 2018, Polymetal International announced that it expected to begin platinum production at its Viksha platinum deposit in Kareliya in 2025. The company had conducted exploration and confirmed the production potential of the Viksha deposit and continued work on a detailed reserves estimate. Polymetal was planning an open pit mining operation and expected to produce copper concentrate with joint production of PGM and other precious metals. The total investment in the deposit was projected to be \$500 million, and the mine life was projected to be about 30 years. Polymetal acquired Viksha in 2012, and the project was the first PGM project in the company's portfolio. In 2012, JORC-compliant mineral resources of the deposit were estimated to be 213 Mt of indicated and inferred resources grading 0.98 g/t precious metals and 0.1 % copper. The total amount of contained precious metals was estimated to be 6.6 million troy ounces (about 205,300 kg), which made the Viksha deposit one of the largest PGM deposits in the world that could be mined by an open pit method (Metaltorg.ru, 2019).

Tungsten.—In January 2018, the regional government of Primorskiy Kray signed an agreement with the director of AO Volfram regarding construction of a mining and beneficiation plant in the Krasnoarmeyskiy Region in Primorskiy Kray. AO Volfram planned to build electricity infrastructure for the new GOK involving either new powerlines or a small hydropower plant on the Ussurka River and possibly a new automobile road. Additionally, signatories agreed to support the struggling Lermontovskiy GOK, conduct exploration for tungsten, and build a new ferroalloys plant that would produce ferrotungsten. The total investment would amount to 1.5 billion rubles (about \$23.9 million) and development would take place between 2018 and 2025. Prior to 2016, the Lermontovskiy GOK produced about 35% of the tungsten concentrate mined in Russia. In September 2016, the plant stopped operations and was idle until October 2017. In the fall 2017, the GOK received a subsidy of 250 million rubles (about \$4.1 million) to restart production. Between November 2017 and January 2018, the Lermontovskiy GOK shipped more than 73 t of tungsten concentrate to its customers (Metaltorg.ru, 2018c; Varakina, 2018).

Another new tungsten GOK (the Malinovskiy GOK) was to be built by OAO Primorskiy GOK in the Dal'norechenskiy Region between 2023 and 2026. This new GOK was projected to create at least 500 new jobs and cost about 8 billion rubles (about \$127 million). The Primorskiy GOK and its partner, whose entity was not disclosed, would invest in the new GOK on a 50–50 basis. The Malinovskiy GOK would be capable of a complete cycle of tungsten ore production and processing, including mining, separation, beneficiation (flotation and gravity), and concentrate calcination. As of 2018, the Primorskiy GOK mined the Vostok-2 deposit, but the deposit was largely depleted, and the decision was made to begin development of the Skrytoye deposit in Dal'norechenskiy Region, which was located within 280 kilometers from the Vostok-2 deposit. The Skrytoye's reserves would allow Primorskiy GOK to continue tungsten production for 40 to 50 years (Varakina, 2018; Interfax-russia.ru, 2019).

In 2018, the Primorskiy GOK produced 267,000 t of tungsten ore, which was a 6% increase compared with production in 2017. The AO AIR mining company, which was affiliated with the Primorskiy GOK, produced 2,574 t of tungsten and copper concentrates, which was a 15% increase compared with 2017. The Primorskiy GOK was Russia's leading company engaged in tungsten ore production and processing. Together, the Primorskiy GOK and AO AIR, produced and sold tungsten concentrate, ammonium paratungstate, and tungsten trioxide (Interfax-russia.ru, 2019).

Outlook

Russia has large reserves of a variety of mineral commodities and most likely will continue to be one of the world's leading mineral producers. Although the country's emphasis historically has been on mineral fuels, Russia is a global leader in the production of many metals and industrial minerals and has significant resources to potentially increase production in the future.

In the short to medium term, Russia is likely to deal with the effects of reduced petroleum prices, decreased value of the ruble against other currencies, and economic sanctions. It is likely that some of the most ambitious mineral industry projects will be either canceled or delayed until better economic conditions prevail in the country. Other projects that are related to national security, such as lithium and rare earths, will become more prominent. It remains to be seen, however, how this new economic reality will affect the structure and resilience of Russia's mineral industry.

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TABLE 1
RUSSIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018	
METALS						
Aluminum:						
Bauxite	thousand metric tons	6,293	5,900	5,431	5,523	5,651
Nepheline ores	do.	28,990	31,407	31,900 ^r	33,300	35,600
Alumina	do.	2,572	2,593	2,682 ^r	2,822	2,763
Metal, primary	do.	3,300	3,529	3,561	3,583	3,627
Antimony, mine, recoverable, Sb content		8,000 ^c	6,300	11,900 ^r	14,400	30,000 ^c
Bismuth, mine, Bi content		40 ^c	NA	324 ^r	300 ^c	300 ^c
Cadmium, refinery, primary ^c		1,200	1,200	1,200 ^r	1,200	1,200
Chromium, mine, chromite, ores and concentrates, marketable		380,000	503,000	465,000 ^r	488,000	507,000
Cobalt:						
Mine, Co content, recoverable ^c		6,300	6,200	5,500 ^r	5,900	6,100
Refinery, metal		2,302 ^r	2,040	3,092 ^r	2,077	1,800
Copper:						
Mine, Cu content:						
Ore		878,100	870,100 ^r	848,100 ^r	847,000	884,100
Concentrates		690,000	710,000	701,000 ^r	761,000	784,000
Solvent extraction		1,500 ^r	1,400 ^r	1,300 ^r	1,300	1,300
Smelter, blister:						
Primary		664,000 ^r	661,000 ^r	665,000	730,000	754,300
Secondary		220,400 ^r	218,900 ^r	202,000 ^r	200,000	210,000
Total		884,000	880,000	867,000	930,000	964,000
Refinery:						
Primary:						
Electrowon, leaching		1,500 ^r	1,400 ^r	1,300 ^r	1,300	1,300
Other		667,000 ^r	655,700 ^r	662,300 ^r	735,100	799,000
Secondary		222,300 ^r	218,600 ^r	197,800 ^r	219,600	240,000
Ferroalloys:						
Ferromanganese		439,600	363,286	268,439	434,452	332,261
Ferromanganese		178,600	155,700	124,200	253,000	281,000
Ferromanganese		160 ^r	255 ^r	125 ^r	100	100
Ferrophosphorus		1,500 ^{r,c}	1,500 ^{r,c}	1,500 ^{r,c}	1,538	1,500 ^c
Ferrosilicochromium		67,160	102,000 ^c	75,000 ^c	75,000 ^c	75,000 ^c
Ferrosilicon		1,026,190	1,057,909	935,912	840,765	841,000 ^c
Ferrotitanium		7,500 ^c	9,961	10,741	10,200	9,000
Ferrovandium		11,380	12,277	12,392	12,593	11,383
Silicomanganese		179,910	188,895 ^r	203,216 ^r	44,917	43,334
Other, unspecified, electric furnace ^c		6,500 ^r	8,000 ^r	9,000 ^r	10,000	10,000
Gallium ^c	kilograms	1,000	1,000	9,000 ^r	7,000	6,000
Germanium, Ge content ^c		6	6	5	5	5
Gold:						
Mine, Au content	kilograms	246,904 ^r	248,945 ^r	253,579 ^r	270,300	279,850
Refinery, secondary	do.	35,812 ^r	38,474 ^r	35,014 ^r	36,600	34,570
Indium, refinery, primary, In content ^c	do.	4,000	5,000	5,000	5,000	5,000
Iron ore, mine, concentrate:						
Gross weight		102,018,500	101,049,000	101,097,000	95,042,000	96,063,000
Fe content, 55% to 63% Fe		60,200,000	59,619,000	59,647,000	56,074,000	56,700,000
Iron and steel:						
Direct-reduced iron		5,350,000	5,436,000 ^r	5,820,000 ^r	6,990,000	7,900,000 ^c
Pig iron ³		51,460,000	52,411,000	51,874,000 ^r	52,127,000	51,797,000
Steel:						
Raw steel	thousand metric tons	70,548	69,422	70,808 ^r	71,300	71,682
Products:						
Rolled	do.	65,200	60,420	60,472 ^r	60,483	61,650
Pipe	do.	11,300	11,402	10,518 ^r	11,833	12,151

See footnotes at end of table.

TABLE 1—Continued
RUSSIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018
METALS—Continued					
Lead:					
Mine, recoverable, Pb content	239,000	171,200	204,300 ^r	210,800	220,000
Refinery, primary and secondary	96,500 ^e	106,000	130,000 ^r	140,000	140,000
Magnesium, primary, metal ⁴	62,000 ^e	60,000 ^e	58,000	65,000	70,000 ^e
Manganese, mine, concentrate, marketable:					
Gross weight	--	9,000	--	1,000	57,000
Mn content	--	2,000	--	250	14,000
Molybdenum, mine, concentrate, Mo content	3,114	3,254	3,359 ^r	3,227	2,400
Nickel:					
Mine, marketable, Ni content:					
Laterite ore	11,200 ^e	7,400 ^r	7,000 ^{r,e}	1,800 ^e	--
Sulfide ore, concentrate	271,950	269,310	251,840 ^r	265,500	272,300
Smelter, matte	--	812 ^r	16,862 ^r	42,690	43,918
Refined, metal, electrolytic	234,700 ^r	231,200 ^r	188,700 ^r	157,396	158,005
Products, chemicals	2,700	2,900	2,400 ^{r,e}	--	--
Platinum-group metals, mine, elemental content:					
Palladium ^e kilograms	86,000 ^r	85,000 ^r	83,000 ^r	88,000	90,000
Platinum ^e do.	23,000 ^r	23,000 ^r	22,000 ^r	22,000	22,000
Iridium ^e do.	200	200	200	300	200
Rhodium do.	2,830	2,613	2,644	2,115	2,700 ^e
Ruthenium ^e do.	1,000	1,000	1,000	1,000	1,000
Rare earths, mineral concentrate, rare-earth-oxide equivalent	2,200 ^e	2,500 ^e	2,700 ^r	2,700	2,700
Selenium, Se content kilograms	130,810	135,000	150,000	150,000 ^e	150,000 ^e
Silicon, metal	60,000 ^e	60,000 ^e	59,300	59,300 ^e	59,300 ^e
Silver:					
Mine, Ag content kilograms	2,357,000	2,297,000	2,261,000 ^r	2,030,000	2,040,000
Refinery, metallurgical:					
Primary do.	1,047,000	1,039,000	886,000 ^r	798,000	809,100
Secondary do.	249,280	207,520	203,000 ^r	246,300	310,800
Tantalum:					
Mine, loparite concentrates, Ta content do.	32,677	25,879	39,966	36,444	38,000 ^e
Refinery do.	32,540	35,000	42,900	44,000	42,000 ^e
Tin, mine, Sn content	321	578	627	1,011	1,530
Titanium:					
Mineral concentrates, ilmenite and leucoxene	178,426	193,236	18,900 ^r	3,300	3,600
Sponge	42,000	41,000	38,900 ^r	42,000	44,200
Tungsten, mine, concentrate, W content	3,775	3,262	2,707 ^r	2,144	2,234
Vanadium, metallurgical, V content	15,125	16,000 ^e	16,886 ^r	18,636	17,052
Zinc:					
Mine, Zn content	229,000 ^r	246,100 ^r	245,800 ^r	255,200	260,000
Smelter, primary and secondary	223,311	229,602	247,300 ^r	256,700	254,600
Zirconium, baddeleyite concentrate, averaging 98% ZrO ₂	7,903	8,180	7,704	7,200	7,400
INDUSTRIAL MINERALS					
Arsenic trioxide, white ^e	1,500	1,500	1,500	1,500	1,500
Asbestos	733,067	650,375	691,712	714,105	752,917
Barite	360,000 ^{r,e}	361,000	434,000	178,000	163,000
Boron	81,234	80,000 ^r	78,800 ^r	75,100	80,000 ^e
Cement, hydraulic thousand metric tons	69,139	62,104	54,935	54,721	53,678
Clay:					
Bentonite	560,000 ^e	497,900	603,000 ^r	91,000	50,100
Kaolin, including kaolinic clays	787,000	786,000 ^r	1,064,800	1,226,000	1,593,000
Diamond, natural: ^e					
Gem thousand carats	21,500 ^r	23,500 ^r	22,600 ^r	23,900	24,200
Industrial do.	16,900 ^r	18,400 ^r	17,700	18,800	19,000
Diatomite	72,000 ^e	66,200	47,300	52,000	50,600
Feldspar	400,000 ^e	232,995	278,142	281,326	294,411
Fluorspar, 55% to 96.4% CaF ₂	8,200	3,000 ^r	3,000 ^r	2,700	6,000

See footnotes at end of table.

TABLE 1—Continued
RUSSIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons, gross weight, unless otherwise specified)

Commodity ²	2014	2015	2016	2017	2018	
INDUSTRIAL MINERALS—Continued						
Graphite	15,000 ^{†,e}	15,900	19,400	25,200	17,800	
Gypsum, mine ⁵	thousand metric tons	4,419	4,223	3,996	3,975	5,487
Iodine	--	14	3	8	8	
Lime, industrial and construction	11,583,000	11,221,000	11,549,000 [†]	11,179,000	11,305,000	
Magnesite	thousand metric tons	1,300 ^e	1,493	1,342	1,500 ^e	1,500 ^e
Mica	10,000 ^e	4,823	3,701	5,219	4,465	
Nitrogen, ammonia, N content	thousand metric tons	12,030	12,455 [†]	13,300 [†]	14,056	14,859
Phosphate rock, P ₂ O ₅ content	4,150,000	4,475,000 [†]	5,409,000 [†]	5,690,000	5,777,000	
Potash, K ₂ O content	thousand metric tons	7,439	6,954	6,588	7,320	7,168
Salt, all types	do.	5,600	5,600	6,887 [†]	7,073	6,710
Soda ash, synthetic	do.	3,052	3,078	3,234	3,376	3,416
Sodium, compounds, caustic soda	do.	1,076	1,115	1,151	1,239	1,279
Stone, crushed, limestone	58,707,400	60,000,000 [†]	59,800,000 [†]	64,430,000	67,251,000	
Sulfur:						
Byproduct, S content:						
Metallurgy	200,000	200,000	200,000	200,000 ^e	200,000 ^e	
Natural gas	5,859,000	5,961,000	6,098,000 [†]	6,321,000	6,597,000	
Petroleum ^e	500,000	500,000	500,000	500,000	500,000	
Native, S content	119,000	110,155	94,418	96,316	83,707	
Pyrites, S content	180,000	180,000	180,000	180,000	180,000 ^e	
Compounds, sulfuric acid	thousand metric tons	10,176	10,381	11,739	12,388	13,026
Vermiculite	21,000 ^e	8,282	12,363	9,262	25,904	
Zeolites	NA	15,000	37,000	35,000 ^e	35,000 ^e	
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite	thousand metric tons	13,500	13,497	13,386 [†]	19,237	21,989
Bituminous	do.	198,200	201,600	215,800	226,950	235,848
Lignite	do.	68,900	73,361	73,485 [†]	74,886	80,478
Metallurgical	do.	76,300	82,900	83,800	88,260	94,385
Coke, metallurgical, 6% moisture content	do.	26,500	26,027	26,326	27,998	26,977
Natural gas, marketable	million cubic meters	643,000	633,551	640,784 [†]	691,488	727,932
Peat, horticultural and fuel uses	1,149,000 [†]	899,700	959,700	732,900	1,124,200	
Petroleum:						
Crude ⁶	thousand 42-gallon barrels	3,668,000	3,720,000	3,810,500 [†]	3,806,000	3,860,000
Refinery ⁷	do.	2,371,000	2,308,000	2,281,000 [†]	2,279,000	2,289,000
Uranium, mine, U content	2,991	3,055	3,005 [†]	2,917	2,904	

^eEstimated. [†]Revised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through January 27, 2020. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the commodities listed, lithium, oil shale, and scandium may have been produced, but available information was inadequate to make reliable estimates of output.

³Includes spiegeleisen.

⁴Includes metal used in titanium sponge production.

⁵Excludes gypsum used in cement production.

⁶Production has been reported in thousand metric tons as follows: 2014—526,600; 2015—534,081; 2016—547,499; 2017—546,800; 2018—554,600; includes gas condensate.

⁷Production has been reported in thousand metric tons as follows: 2014—295,000; 2015—287,200; 2016—285,158; 2017—284,873; 2018—286,100.

TABLE 2
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ²
Alumina	Achinsk (United Company RUSAL)	Achinsk in East Siberia	900,000
Do.	Bogoslovsk (United Company RUSAL)	Krasnotur'insk	1,050,000
Do.	Boksitogorsk (United Company RUSAL)	Leningradskaya Oblast'	200,000
Do.	Pikalyovo (United Company RUSAL)	Pikalyovo	300,000
Do.	Uralsk (United Company RUSAL)	Kamensk-Uralskiy	700,000
Aluminum, primary smelters	Bogoslovskiy AZ (United Company RUSAL)	Krasnotur'insk	175,000
Do.	Bratskiy AZ (United Company RUSAL)	Bratsk	1,000,000
Do.	Irkutskiy AZ (United Company RUSAL)	Irkutskaya Oblast'	420,000
Do.	Kandalakskiy AZ (United Company RUSAL)	Kola Peninsula	75,000
Do.	Khakasskiy AZ (United Company RUSAL)	Khakasiya	300,000
Do.	Krasnoyarskiy AZ (United Company RUSAL)	Krasnoyarskiy Kray	1,000,000
Do.	Nadvoitskiy AZ (United Company RUSAL)	Nadvoitsy, Kareliya Republic	75,000
Do.	Novokuznetskiy AZ (United Company RUSAL)	Novokuznetsk	300,000
Do.	Sayanogorskiy AZ (United Company RUSAL)	Sayanogorsk	550,000
Do.	Uralskiy AZ (United Company RUSAL)	Kamensk-Uralskiy	150,000
Do.	Volgogradskiy AZ (United Company RUSAL)	Volgogradskaya Oblast'	175,000
Do.	Volkhovskiy AZ (United Company RUSAL)	Volkhov, east of St. Petersburg	20,000
Amber	Kaliningrad Amber enterprise (Kaliningrad regional authorities and Alrosa Co. Ltd.)	Kaliningrad Oblast'	250
Antimony:			
Sb content of concentrate	GeoProMining, Ltd. (GPM)	Sarylakh deposit, Ust'-Nera region, Sakha Republic (Yakutiya)	8,000 ²
Do.	do.	Sentachan deposit, Northeastern Sakha Republic (Yakutiya)	NA
Do.	PAO Polyus Gold	Sakha Republic (Yakutiya)	23,000
Do.	Zabaykal'skiy GOK (ZabGOK) (OOO NefteChimMash)	Zabaykal'skiy Kray	360,000
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.	"Orenburg Minerals" Co., Kiembraevskoye chrysotile deposit	Orenburgskaya Oblast'	500,000
Do.	"Tuvaasbest" plant, Ak-Dovurakskoye chrysotile deposit	Tyva Republic	250,000
Do.	"Uralasbest" mining and clarification plant	Central Urals	1,100,000
Barite	Salarinskiy mining and beneficiation complex	Kvartsitovaya Sopka deposit	100,000
Bauxite	Komi Aluminum (United Company RUSAL)	Sredne-Timanskiy	3,000,000
Do.	OAO Sevuralboksitrudra (United Company RUSAL)	Severoural'sk region	NA
Do.	Severnaya Onega Mine (United Company RUSAL)	Northwest region	800,000
Do.	South-Urals mining company (United Company RUSAL)	South Urals	NA
Boron, boric acid	Bor Association	Primorskiy Kray	140,000
Do.	Alga River chemical complex	do.	12,000
Do.	Amur River complex	Russian Far East	8,000
Cement	thousand metric tons Eurocement Group	16 plants all over the country	40,000
Do.	do. OOO HeidelbergCement Russia	Central region, Bashkortostan	11,000
Do.	do. LafargeHolcim Russia	Central region	9,000
Do.	do. Gazmetallproekt	Verkhnebakanskiy Cement Plant, Krasnodarskiy Kray	8,200
Do.	do. Novorostsement (Gazmetallproekt)	3 plants in Novorossiysk, Krasnodarskiy Kray	5,800
Do.	do. AO Holding Company Sibirskiy Tsement	Kemerovskaya Oblast	5,600
Do.	do. OOO Dyckerhoff Korkino Cement	Chelyabinskaya Oblast'	4,300
Do.	do. OOO VostokTsement	Evreyskaya AO, Yakutiya	4,300
Do.	do. AO Sebyakovtsement	Volgogradskaya Oblast'	4,000
Do.	do. Holding BaselTsement	Ryazanskaya Oblast'	3,200
Do.	do. OOO Yuzhno-Ural'skaya mining and processing company	Orenburgskaya Oblast'	NA

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018¹

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ⁶
Chromite		Saranovskiy complex	Saranovskiy	200,000
Coal:	thousand metric tons	OAO SUEK	Siberia and Russian Far East	106,000
Do.	do.	OAO UK Kuzbassrazrezugol'	Kuznetskiy Basin	45,000
Do.	do.	AO KhKSDS-Ugol'	Kemerovskaya Oblast'	29,000
Do.	do.	OAO Mechel-Mining	Kuznetskiy Basin and Yakutiya	22,700
Do.	do.	Evraz Holding	Kuznetskiy Basin	22,300
Do.	do.	OAO Russkiy Ugol'	Russian Far East	14,000
Do.	do.	Kompaniya Vostsibugol'	Eastern Siberia	13,200
Cobalt		PAO GMK Norilskiy Nickel (Nornickel)	Norilsk, Kola Peninsula	4,000
Do.		Rezh and Yuzhuralnikel enterprises	South Urals	2,100 ³
Do.		Ufaleynikel Co.	Chelyabinskaya Oblast', Urals	2,000 ³
Do.		Khovu-Aksynskoe (nickel-cobalt) deposit	Khovu-Aksy, Tyva Republic	NA
Copper:				
Cu in concentrate		PAO GMK Norilskiy Nickel (Nornickel)	Norilsk region, Kola Peninsula	500,000
Do.		OAO Ural'skaya Gorno-Metallurgicheskaya Kompaniya (UGMK)	Urals	230,000
Do.		ZAO Russkaya Mednaya Kompaniya (RMK)	do.	70,000
Do.		Metalloinvest Holding	Udokan, Zabaykal'skiy Kray	NA
Metal, refinery		PAO GMK Norilskiy Nickel (Nornickel)	Norilsk region, Kola Peninsula	450,000
Do.		ZAO Russkaya Mednaya Kompaniya (RMK)	Urals	170,000
Do.		OAO Ural'skaya Gorno-Metallurgicheskaya Kompaniya (UGMK)	do.	360,000
Diamond, gem and industrial	thousand carats	Almazy Rossii-Sakha Joint Stock Co. (Alosa Co. Ltd.) enterprises: Aikhal mining and beneficiation complex	Sakha Republic (Yakutiya) mines: Aikhal and Komsomol'skiy	NA
Do.	do.	Anabaraskiy mining and beneficiation complex	Alluvial mines	NA
Do.	do.	Lomonosov	Arkhangel'skaya Oblast'	NA
Do.	do.	Mirny mining and beneficiation complex	Internatsional'naya and Mir	NA
Do.	do.	Nyurbinskiy mining and beneficiation complex	Nyurbinskiy and Botuobinskiy	NA
Do.	do.	Udachnyy mining and beneficiation complex	Zarnitsa and Udachnyy	NA
Feldspar		Kheto-Lanbino and Lupikko deposits	Kareliya Republic	NA
Ferroalloys		ChEMK Industrial Group enterprises: Chelyabinsk electrometallurgical plant	Locations: Chelyabinskaya Oblast'	450,000
Do.		Kuznetsk ferroalloys plant	Novokuznetsk	400,000
Do.		Chusovoy iron and steel plant	Permskiy Kray	NA
Do.		Klyuchevsk ferroalloy plant	Dvurechensk	160,000
Do.		Kosaya Gora iron works	Kosaya, Gora	200,000
Do.		Lipetsk iron and steel works	Lipetskaya Oblast'	NA
Do.		Serov ferroalloy plant [a subsidiary of Eurasian Natural Resources PLC (ENRC)]	Sverdlovskaya Oblast'	NA
Ferrovandium		OAO Vanadii-Tulachermet (Evraz Group)	Tula City	NA
Do.		OOO Chusovskoy Metallurgical Plant	Permskiy Kray	NA
Fluorspar		Abagaytuy deposit	Transbaikal	NA
Do.		Kalanguy mining complex	Zabaykal'skiy Kray	NA
Do.		Kyaktinsky deposit	Transbaikal	NA
Do.		Usugli Mine	do.	NA
Do.		Yaroslavskiy mining and beneficiation complex	Pogranichnoye and Vosnesenskoye deposits, Primorskiy Kray	NA
Gallium		Achinsk (United Company RUSAL)	Achinsk in eastern Siberia	15
Do.		OOO Galliy	NA	NA
Do.		Novosibirsk tin complex	Novosibirsk	NA
Do.		Pikalevo (United Company RUSAL)	Pikalevo	NA
Germanium, metal and products		Federal State Unitary Enterprise Germanium	City of Kranoyarsk	7

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018¹

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ²
Gold, mine output, Au content	kilograms	AS Oyna	Tyva Republic	1,500
Do.	do.	AS Polyarnaya	Chukotskiy Avtonomnyy Okrug	1,000
Do.	do.	AS Vitim	Irkutskaya Oblast'	2,900
Do.	do.	AS Vostok	Khabarovskiy Kray	1,100
Do.	do.	AS Zapadnaya	Krasnoyarskiy Kray	1,900
Do.	do.	IK Arlan (Pavlik ZRK)	Magadanskaya Oblast'	3,700
Do.	do.	Highland Gold Mining Ltd. (HGM)	Khabarovskiy and Zabaykal'skiy Kray	6,900
Do.	do.	Kinross Gold Corp.	Chukotskiy Avtonomnyy Okrug	20,700
Do.	do.	LT-Resurs, ZAO	Irkutskaya Oblast'	2,700
Do.	do.	Nordgold N.V.	Buryatiya and Sakha Republics	10,200
Do.	do.	OAO AS Amur (OOO Russian Platinum Co.)	Khabarovskiy Kray	5,500
Do.	do.	OAO Buryatzoloto	Buryatiya Republic	5,000
Do.	do.	OAO Omchak	Magadanskaya Oblast'	3,000
Do.	do.	OAO Omolonskaya ZRK	do.	5,000
Do.	do.	OAO Pokrovskiy Mine	Amurskaya Oblast'	6,000
Do.	do.	OAO Polimetal	Magadanskaya and Sverdlovskaya Oblast's, Khabarovskiy Kray	7,500
Do.	do.	OAO Susumanzoloto	Magadanskaya Oblast'	4,500
Do.	do.	OAO Uralelktomed'	Sverdlovskaya Oblast'	1,400
Do.	do.	OAO Zoloto Kamchatki	Kamchatka Peninsula	5,500
Do.	do.	OOO Mining and Geological Co. (GRK) Aldanzoloto	Sakha Republic (Yakutiya)	4,000
Do.	do.	OOO Neryungri-Metallik	Sakha Republic (Yakutiya)	1,500
Do.	do.	OOO Nirungan	Sakha Republic (Yakutiya)	1,100
Do.	do.	OOO Priisk Drazhnyy	do.	1,200
Do.	do.	OAO Priisk Solov'yevskiy	Amurskaya Oblast'	1,500
Do.	do.	OOO Ros-DV	Khabarovskiy Kray	1,100
Do.	do.	OOO Russdragmet	Khabarovskiy Kray, Zabaykal'skiy Kray	6,000
Do.	do.	OOO Sovrudnik	Krasnoyarskiy Kray	3,900
Do.	do.	OOO Yuzhuralzoloto	Chelyabinskaya Oblast'	6,500
Do.	do.	PAO Polyus Gold	Krasnoyarskiy Kray	60,000
Do.	do.	PAO Seligdar	Sakha Republic (Yakutiya)	4,300
Do.	do.	PAO Vysochayshiy (GV Gold)	Irkutskaya Oblast' and Sakha Republic (Yakutiya)	5,500
Do.	do.	Petropavlovsk plc	Petropavlovsk	23,000
Do.	do.	ZAO Chukotskaya Mining and Geological Co. (Chukotskaya GGK)	Chukotskiy Avtonomnyy Okrug	15,000
Do.	do.	ZAO Omsukchanskaya GGK	do.	3,000
Do.	do.	ZAO Zolotaya, ZDK	Khakassiya Republic	1,200
Indium:				
Primary		Chelyabinsk zinc plant	Chelyabinskaya Oblast'	6
Secondary		Elektrozink plant	Vladikavkaz, North Caucasus	6
Iron ore		Kursk Magnetic Anomaly (KMA) region, which contains the following enterprises: Lebedi and Stoilo Mikhaylovka	Locations: Gubkin Zheleznogorsk	50,000,000 ²
Do.		Northwest region, which contains the following enterprises: Kostomuksha Kovdor Olenegorsk	Locations: Kostomuksha Kola Peninsula Olenegorsk	22,000,000 ²

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ²	
Iron ore—Continued	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 ²	
Do.	Urals region, which contains the following enterprises: Akkermanovka Bakal Goroblagodat Kachkanar Magnitogorsk Peshchanka	Locations: Novotroitsk Bakal Kushva Kachkanar Magnitogorsk Rudnichnyy	22,000,000 ²	
Lead, metal	Dalpolymetal lead smelter	Rudnaya in Primorskiy Kray	20,000	
Do.	Elektrozink lead smelter [Ural Mining and Metallurgical Co. (UMMC)]	Vladikavkaz, North Caucasus	40,000	
Lead-zinc, recoverable content of ore:				
Lead, recoverable Pb content of ore	Altay mining-beneficiation complex	Altay Kray, southern Siberia	2,000	
Do.	Dalpolymetal mining and beneficiation complex	Primorskiy Kray	20,000	
Do.	Nerchinsk polymetallic complex	Zabaykal'skiy Kray	7,000	
Do.	Sadon lead-zinc complex	North Ossetia	5,000	
Do.	Salair mining-beneficiation complex	Kemerovskaya Oblast'	2,000	
Zinc, recoverable Zn content of ore	Altay mining-beneficiation complex	Altay Kray, Southern Siberia	1,000	
Do.	Dalpolymetal mining-beneficiation complex	Primorskiy Kray	25,000	
Do.	Nerchinsk polymetallic complex	Zabaykal'skiy Kray	12,500	
Do.	Sadon lead-zinc complex	North Ossetia	14,000	
Do.	Salair mining-beneficiation complex	Kemerovskaya Oblast'	10,500	
Limestone	Mazulsky Mine (United Company RUSAL)	Goryachegorsk massif, Eastern Siberia	NA	
Lithium and its compounds	OAO Novosibirsk Chemical Plant (TVEL Corp.)	Novosibirsk	NA	
Do.	OAO Chemical-Metallurgical Plant (TVEL Corp.)	Kransnoyarsk	NA	
Magnesite	Karagayskiy open pit (Magnezit Group) and Magnezitovaya underground mine (Magnezit Group)	Sakha group of deposits (Chelyabinskaya Oblast')	3,800,000	
Magnesium, metal	Avisma plant (VSMPO-Avisma)	Berezniki	45,000	
Do.	Solikamskiy magnesium plant	Permskiy Kray	30,000	
Mica	Emel'dzhak deposit, Aldan Shield	Sakha Republic (Yakutiya)	NA	
Do.	Kovdor phlogopite Mine (Mica Mine; Slyuda Mine; Kovdorslyuda Shaft)	Kola Peninsula, Murmanskaya Oblast'	NA	
Do.	Lopatova Guba mica pit, Northern Kareliya	Kareliya Republic	NA	
Do.	Irkutsk complex (OAO "Vostoksluda")	Mam deposit, Irkutskaya Oblast'	NA	
Molybdenum, mined	Dzhida tungsten-molybdenum mine	West Transbaikal	NA	
Do.	Sorsk molybdenum mining enterprise	Khakasiya Republic	NA	
Do.	Shakhtaminskoye molybdenum mining enterprise	Zabaykal'skiy Kray	NA	
Do.	Tymyauz tungsten-molybdenum mine [OAO Kabardino-Balkarskaya Tungsten-Molybdenum Co. (Government of Kabardino-Balkarskaya Republic)]	Republic of Kabardino-Balkariya, North Caucasus	NA	
Natural gas	million cubic meters	PAO Gazprom	Deposits throughout Russia	405,000
Do.	do.	OAO Novatek	Yamalo-Nenetskiy Avtonomnyy Okrug	50,100
Do.	do.	OAO NK Rosneft'	Deposits throughout Russia	46,700
Do.	do.	Arktikgaz	Yamalo-Nenetskiy Avtonomnyy Okrug	25,800
Do.	do.	OAO Lukoil	West Siberia, Volga Region	18,400
Do.	do.	Gazpromneft'	Deposits throughout Russia	13,500
Do.	do.	OAO Surgutneftegaz	Eastern Siberia and Western Siberia	9,800

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ⁶
Nepheline syenite	Apatite complex	Kola Peninsula	1,500,000
Do.	Kiya-Shaltyr Mine (United Company RUSAL)	Goryachegorsk massif, Eastern Siberia	NA
Nickel:			
Ore, Ni content	PAO GMK Noril'skiy Nickel (Normickel)	Kola Peninsula and Norilsk region	300,000
Do.	OAO Ufaleynickel (Koks Company of Industrial Metallurgical Holding)	Chelyabinskaya Oblast', Urals	17,000
Do.	OAO Yuzhuralnickel (OAO Mechel)	South Urals	3,000 ³
Metal:			
Smelting	PAO GMK Noril'skiy Nickel (Normickel)	Norilsk region, Kola Peninsula	160,000
Do.	do.	Pechenga	50,000
Do.	do.	Monchegorsk	50,000
Refining	do.	do.	140,000
Do.	do.	Norilsk region, Kola Peninsula	100,000
Ni products and Ni in FeNi	Enterprises: ZAO Rezhnickel [Ural Mining and Metallurgical Co. (UMMC)] OAO Ufaleynickel (Koks Industrial Metallurgical Holding Co.) Yuzhuralnickel (Mechel OAO)	Location: South Urals do. do.	65,000 ²
Niobium (columbium)	Karnasurt mining enterprise (AO Sevredmet)	Lovozerskoye deposit, Kola Peninsula	12,000
Oil shale	Leningradslanets Association	Slantsy, Leningradskaya Oblast'	5,000,000 ³
Petroleum, crude	Bashneft'	Bashkortostan Republic	12,000,000
Do.	Gazprom Neft'	Deposits throughout Russia	50,000,000
Do.	OAO Novatek	Western Siberia	5,000,000
Do.	OAO NK Rosneft'	Central and Western Siberia, Urals and Povolzhye regions	135,000,000
Do.	OAO Surgutneftegas	Khanty-Mansiyskiy Avtonomnyy Okrug (HMAO)	60,000,000
Do.	OAO TNK–BP Holding	Deposits: Kamennoye Kovyatka Russkoye Suzunskoye Tagul'skoye Uvat Verkhnechonsk	80,000,000 ²
Do.	PAO Lukoil	West Siberian deposits: Kechimovskoye Nivagalskoye Urals deposits Volga Region Timen Pechora deposit: Yuzhnaya Khylychuya Komi Republic deposits: Kyrta'yelskoye Pashshorskoye Perevoznoye	100,000,000 ²
Do.	Slavneft'	Western Siberia and Krasnoyarskiy Krai	20,000,000
Do.	Tatneft'	Deposits: Romashkinskoye Novo-Elkhovskoye Bavlinskoye Bondyuzskoye Pervomayskoye Sabandchinskoye	30,000,000 ²

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ⁶
Phosphate rock	Kingisepp complex (OAO Fosforit)	Leningradskaya Oblast'	3,500,000
Do.	Lopatino and Yegorevsk deposits	Moscow Oblast'	NA
Do.	Polpinskoye deposit	Bryanskaya Oblast'	NA
Do.	Verkhnekamsk deposit	Urals	NA
Phosphate rock, apatite concentrate	OAO Apatit (Phosagro)	Kola Peninsula	12,000,000
Do.	Kovdorskiy GOK	do.	700,000
Platinum-group metals:			
Ore, PGM content	PAO GMK Norilskiy Nickel (Nornickel)	Norilsk region, Kola Peninsula	150
Do.	AO Koryakgeoldobycha, Amur Prospectors	Placer deposits (mostly platinum), Urals; Siberia; Russian Far East	10
Do.	OAO AS Amur (OAO Russian Platinum Co.)	Placer deposits (mostly platinum), Urals; Siberia; Russian Far East	10
Do.	Lopatino and Yegorevsk deposits	Moscow Oblast'	NA
Do.	Polpinskoye deposit	Bryanskaya Oblast'	NA
Do.	Verkhnekamsk deposit	Ural'skiye Gory	NA
Metals	AO Ekaterinburgskiy plant for nonferrous metal processing	Sverdlovskaya Oblast'	NA
Do.	AO Krasnoyarskiy Plant for nonferrous metals (Krastsvetmet)	Krasnoyarskiy Krai	NA
Do.	AO Priokskiy Plant for nonferrous metals	Khanty-Mansiyskiy Avtonomnyy Okrug (HMAO)	NA
Potash, K ₂ O equivalent	OAO Uralkali	Verkhnekamskoye deposit	8,000,000
Do.	OAO Akron	Novgorod	NA
Rare earths	OAO Apatit	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
Silver, mine output, Ag content	Dukat Mine	Magadanskaya Oblast'	1,000
Do.	Kinross Gold Corp.	Chukotskiy Avtonomnyy Okrug	NA
Soda ash	Achinsk plant	Eastern Siberia	595
Do.	Berezniki plant	Ural'skiye Gory	1,080
Do.	Pikalyovo plant	Leningradskaya Oblast'	200
Do.	Sterlitamak plant	Bashkortostan Republic	2,140
Do.	Volkhov plant	Leningradskaya Oblast'	20
Steel, raw	Beloretsk Iron and Steel Works	Bashkirkoye	380,000
Do.	Chusovskoy Iron and Steel Works	Permskiy Krai	570,000
Do.	Gorkovskoy Metallurgichesky Zavod	Nizhegorodskaya Oblast'	78,000
Do.	Gur'yevsk Steel Works	Kemerovskaya Oblast'	160,000
Do.	Kuznetsk Steel Works	Kemerovskaya Oblast'	4,700,000
Do.	Lys'va Metallurgical Plant complex (MMK)	Permskiy Krai	350,000
Do.	Nizhniy Sergi Steel Works	Sverdlovskaya Oblast'	300,000
Do.	Nizhniy Tagil mining and metallurgical complex (NTMK) (Evraz Group) Works)	do.	8,000,000
Do.	Novolipetskiy mining and metallurgical complex (NLMK)	Lipetskaya Oblast'	9,900,000
Do.	Novosibirsk Steel Works (Novosibprokat)	Novosibirskaya Oblast'	1,100,000
Do.	OAO Amurmetal	Komsomol'sk-na-Amure	1,600,000
Do.	OAO Asha Metallurgical Plant	Chelyabinskaya Oblast'	450,000
Do.	OAO Electrostal Metallurgical Plant	Moscow	314,000
Do.	OAO Magnitogorsk mining and metallurgical	Chelyabinskaya Oblast'	16,200,000
Do.	OAO Mechel (Mechel)	Chelyabinskaya Oblast'	7,000,000
Do.	OAO Nosta (OAO Orsk-Kahlilovo Iron and Steel	Novotroitsk, Orenburgskaya	4,600,000
Do.	OAO Severstal	Vologodskaya Oblast'	14,000,000
Do.	OAO Tulachermet	Tul'skaya Oblast'	18,400

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ⁶
Steel, raw—Continued	Omutninskiy Metallurgical Plant	Kirovskaya Oblast'	210,000
Do.	Oskol Electric Steel Works (OEMK)	Staryi 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.	1,900
Do.	Serov Steel Works	do.	1,000,000
Do.	Serp i Molot (Moscow Metallurgical Works)	Moskovskaya Oblast'	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.	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.	Zapadno-Sibirskiy mining and metallurgical complex (ZSMK) (Evraz Group)	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	Facilities: Zabaykalskiy mining and beneficiation complex OOO Lovozerskiy GOK	Deposits: Etykinskoye deposit Lovozerskoye deposit, Kola Peninsula	10 ²
Tellurium	OJSC MMC Norilsk Nickel	Norilsk Region	5
Do.	Ural Mining and Metallurgical Co. (UMMC)	Urals	35
Tin:	Novosibirsk mining and beneficiation complexes:	Locations:	
Ore, Sn content	Khinganskoye olovo (Jewish Autonomous District)	Khabarovskiy Kray	11 ³
Do.	Tin Ore Co.	Solnechnyi deposit, Khabarovskiy Kray	NA
Do.	Pravourmiyskoye	Khabarovskiy Kray	NA
Do.	Deputatskiy (Sakhaolovo)	Sakha Republic (Yakutiya)	NA ³
Do.	Vostokolovo	Russian Far East	NA ³
Do.	Iultin mining and beneficiation complex	Magadanskaya Oblast'	NA ³
Do.	Khrustalnyi mining and beneficiation complex	Primorskiy Kray	NA ³
Do.	Pevek mining and beneficiation complex	Magadanskaya Oblast'	NA ³
Metal	Novosibirsk Processing Plant Ltd.	Novosibirskaya Oblast'	NA ³
Titanium:			
Ore	OOO Lovozerskiy GOK	Murmanskaya Oblast	NA
Do.	OAO Apatit	Kykvumchorrkoye and Yuksporskoye deposits	NA
Do.	OAO TGOK Ilmenit	Tyuganskoye deposit	NA
Do.	OOO Olekminskiy Rudnik	Kuranakhsokoye deposit	NA
Metal	Moscow plant	Moscow	NA
Do.	Podol'sk plant	Podol'sk	NA
Do.	OAO Corp. VSMPO-Avisma	Bereznikovskiy Complex, Permskiy Kray	NA
Sponge	do.	do.	45,000
Do.	Solikamskiy Magnesium Plant (SMZ)	Solikamsk, Permskiy Kray	2,000
Tungsten:			
Concentrate, W content	AS Quartz	Bom-Gorkhom deposit, West Transbaikal, Zabaykal'skiy Kray	NA
Do.	ZAO Novoorlovskiy GOK	Spokoyinskoye deposit, Zabaykal'skiy Kray	NA

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2018¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity ²
Tungsten:—Continued			
Concentrate, W content— Continued	KGUP Primteploenergo	Lermontovskoye deposit, Primorskiy Kray	NA
Do.	OAO Primorskiy GOK	Vostok-2 deposit	NA
Do.	AO AIR (OAO Primorskiy GOK)	do.	NA
Do.	ZAO Zakamensk	Ruchey Inkur deposit, Barun-Narynskoye deposit	NA
Do.	Tyrnyauz tungsten-molybdenum mine [OAO Kabardino-Balkarskaya Tungsten-Molybdenum Co. (Government of Kabardino-Balkarskaya Republic)]	Republic of Kabardino-Balkariya, North Caucasus	NA
Metal	Gidrometallurg plant	do.	NA
Uranium, U content of ore	Uranium Holding OAO Atomredmetzoloto (ARMZ): AO Dalur mining enterprise AO Khiagda mining enterprise AO Lunnoye PAO Priargunskoye mining and chemical association (PAO PPGHO)	Locations: Kurganskaya Oblast' Buryatiya Republic Sakha Republic Krasnokamensk, Zabaykal'skiy Kray	3,500 ²
Vanadium:			
Ore	Kachkanar iron mining complex	Ural'skiye Gory	NA
Metal	Chusovoy and Nizhniy Tagil plants	do.	17,000
Pentoxide	Vanadii-Tulachermet	Tul'skaya Oblast', North Caucasus	NA
Zinc:			
Copper-zinc ore, Zn content	Bashkir copper-zinc complex	Sibai, Southern Urals	5,000
Do.	Buribai copper-zinc mining complex	Buribai, Southern Urals	1,500
Do.	Gayskiy copper-zinc mining and beneficiation complex	Gai, Southern Urals	25,000
Do.	Kirovgrad copper enterprise	Kirovgrad, Central Urals	1,200
Do.	Sredneuralsk copper complex	Revda, Central Urals	5,000
Do.	Uchali copper-zinc mining and beneficiation complex	Uchalinskiy Rayon, Southern Urals	90,000
Metal	Chelyabinsk electrolytic zinc plant	Chelyabinskaya Oblast'	200,000
Do.	Elektrozink plant [Ural Mining and Metallurgical Co. (UMMC)]	Vladikavkaz, North Caucasus	90,000
Do.	Uralektromed plant [Ural Mining and Metallurgical Co. (UMMC)]	Verkhnyaya Pyshma	17,000
Zirconium:			
Baddeleyite concentrate	Kovdor iron ore mining and beneficiation complex	Kola Peninsula	3,500
Metal	Chepetsky metallurgical plant (TVEL Corp.)	Glazov, Udmurtiya Republic	NA

²Estimated; 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.

²Capacity estimates are totals for all enterprises that produce that commodity.

³Not in operation as of 2018.