



# 2019 Minerals Yearbook

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**SERBIA [ADVANCE RELEASE]**

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# THE MINERAL INDUSTRY OF SERBIA

By Karine M. Renaud

In 2019, Serbia produced metals, such as aluminum, copper, gold, lead, pig iron, platinum-group metals, raw steel, selenium, silver, and zinc, and industrial minerals and mineral products, which included cement, kaolin, lime, limestone (crushed, including chalk and gypsum), magnesite, marble (dimension, including granite), nitrogen, salt, and sand and gravel. The country also produced mineral fuels and related materials, including coal, natural gas, crude petroleum, and refined petroleum products (table 1).

## Minerals in the National Economy

In 2019, Serbia's real gross domestic product (GDP) increased by 4.2% compared with an increase of 4.5% (revised) in 2018. The nominal GDP was \$51.5 billion. Serbia's industrial production, in terms of value, increased by 0.3% in 2019 compared with an increase of 1.3% in 2018; mining and quarrying production increased by 1.2% and accounted for 1.9% of the GDP in 2019 compared with a decrease of 4.8% and 2.0% of the GDP in 2018; and manufacturing production increased by 0.2% and accounted for 13.7% of the GDP compared with an increase of 1.9% and 14.5% of the GDP in 2018. In 2019, 25,989 people were employed in the mining and quarrying industry, of which 13,716 were employed in the mining of coal and lignite, 2,893 in the mining of crude petroleum and natural gas, 5,007 in the mining of metallic ores, 2,894 in other mining and quarrying, and 1,487 in activities that support mining (Statistical Office of the Republic of Serbia, 2019, p. 142; 2020, p. 74, 151, 152, 248).

In 2019, the country's exports totaled \$19.6 billion compared with \$19.2 billion in 2018. In 2019, exports of mining and quarrying products decreased by approximately 10% to \$80 million. Within mining and quarrying, exports of metallic ore decreased by 13% to \$60 million and exports of coal decreased by 25% to \$3 million. The country's major export trade partners were Germany (which received 12.6% of Serbia's exports), Italy (10.1%), Bosnia and Herzegovina (7.7%), and Romania (5.9%) (Statistical Office of the Republic of Serbia, 2020, p. 307, 309, 313).

In 2019, Serbia's imports totaled \$26.7 billion compared with \$25.9 billion in 2018. In 2019, imports of mining and quarrying products increased to \$2.57 billion from \$2.56 billion in 2018. Within mining and quarrying, imports of metallic ores increased by 49% to \$636 million; those of coal decreased by 9% to \$58 million; and those of crude petroleum and natural gas decreased by 11% to \$1.77 billion. The country's major import trade partners were Germany (which supplied 12.9% of Serbia's imports), Russia (9.7%), China (9.4%), and Italy (8.7%) (Statistical Office of the Republic of Serbia, 2020, p. 307, 310, 314).

The Law on Mining and Geological Explorations was adopted on December 4, 2015, and implemented on December 16, 2015. The law mandates the establishment of the Geological Institute

of Serbia and formulates a strategy of mineral resource management. Under the law, the minerals boron, coal, copper, gold, lithium, natural gas, crude petroleum, shale oil, zinc, and some other minerals were determined by the Government to be minerals of strategic importance to the country (Nikolic, 2015, p. 1; Serbia Energy, 2016).

## Production

In 2019, the production of mined zinc (Zn content) increased by 82%; mined lead (ore, Pb content) and refined silver, by 78% each; sand and gravel for construction (unspecified, excluding glass sand), by 13%; limestone (crushed, including gypsum and chalk), refined copper (primary), and refined lead (primary and secondary), by 11% each. The production of selenium (Se content) decreased by 41%; sand and gravel (industrial, silica) and mined palladium (Pd content), by 33% each; residual fuel oil, by 23%; lime, by 21%; mined platinum (Pt content), by 20%; kerosene, by 15%; and gasoline, by 14%. Data on mineral production are in table 1.

## Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

## Commodity Review

### Metals

**Copper and Gold.**—Zijin Mining Group Co. Ltd. (Zijin) of China held a 63% stake in Serbia Zijin Copper Doo [formerly known as Rudarsko Topionicki Bazen Bor (RTB Bor)], and the Government held the remaining 37%. Serbia Zijin Copper Doo operated four copper mines as well as the only copper smelter and refinery in Serbia. Serbia Zijin Copper Doo produced 43,550 metric tons (t) of copper concentrate (Cu content), 74,000 t each of smelted and refined copper, 910 kilograms (kg) of refined gold, 10,700 kg of refined silver, 17,000 kg of selenium, 37 kg of mined palladium, and 4 kg of mined platinum. As of 2019, the total copper resources at these mines were estimated to be 10.2 million metric tons (Mt) at an average grade of 0.40% copper. The company was working on upgrading and expanding the four mines and the refinery and smelter. After expansion, the date of which was not specified, the production capacity of the smelter was expected to increase to 120,000 metric tons per year (t/yr) from 80,000 t/yr (tables 1, 2; Zijin Mining Group Co. Ltd., 2020b).

In 2018, Zijin reached an agreement to acquire 100% of the upper zone and a 60.4% stake in the lower zone of the Timok copper-gold project from Nivsun Resources Ltd. of Canada. The remaining 39.6% stake in the lower zone was held by Freeport-McMoRan Co. of the United States. In 2019, Zijin acquired the 39.6% stake from Freeport-McMoRan for \$390 million. Production at the Timok upper zone was expected to start in 2021.

As of June 19, 2018, the inferred resources of the Timok lower zone were estimated to be 1.7 billion metric tons containing 14.3 Mt of copper and 299 t of gold (Daly, 2019; Jamasmie, 2019a; Kwok, 2019; Zijin Mining Co. Ltd., 2019, p. 228; 2020a).

In 2019, Dundee Precious Metals Inc. of Canada (DMP) continued exploration at the Levonac copper-gold project, the Timok gold project, and the Tulare copper-gold project. As of September 21, 2018 (the latest date for which detailed data were available), the total indicated resources at the Timok gold project were estimated to be 46.9 Mt at a grade of 1.32 grams per metric ton (g/t) gold and the total inferred resources were estimated to be 2.9 Mt at a grade of 0.8 g/t gold. On December 31, 2018, the agreement on the joint-venture exploration for Levonac between DPM and Rio Tinto Ltd. of the United Kingdom expired (Dundee Precious Metals Inc., 2019a, p. 38–40; 2019b, p. 2).

In 2019, Medgold Resources Corp. (Medgold) of Canada, in partnership with Fortuna Silver Mines Inc. (Fortuna) of Canada, continued to conduct drilling at the Tlamino gold-silver-lead-zinc project, which is located in southern Serbia. The Tlamino project consists of two areas—Donje Tlamino and Surlica-Dukat. All exploration work was funded by Fortuna. According to the Tlamino Option Agreement, Fortuna was expected to get a 70% stake in the project in exchange for funding exploration work at the project (Quarisa, 2018; eKapija, 2019; Medgold Resources Corp., 2019a, p. 9, 10; 2019b).

In 2019, Raiden Resources Ltd. of Australia entered into a joint-venture agreement with Rio Tinto Mining and Exploration Ltd. (a wholly owned subsidiary of Rio Tinto) for the Majdanpek West, the Majdanpek Pojas, and the Donje Nevlje copper-gold deposits, which are located in the Western Tethyan Metallogenic Belt in Serbia. Majdanpek West and Majdanpek Pojas are 100% owned by Raiden Resources through its Kingstown Resources d.o.o. and are located in the northern Timok magmatic complex near the town of Majdanpek. Donje Nevlje is 100% owned by Raiden Resources through its subsidiary Skarnore Resources d.o.o. and is located in southeastern Serbia approximately 125 kilometers (km) southeast of the Timok magmatic complex. In 2019, Raiden Resources requested the extension of the exploration licenses for the Donje Nevlje project. The Zupa project, located in the Dinaric metallogenic province, is another project that was 100% owned by Raiden Resources through its subsidiary Kingstown Resources (Creagh, 2018; de la Paz, 2018; Ralev, 2018; Raiden Resources Ltd., 2022a–c).

**Lead and Zinc.**—In 2019, MINECO Ltd. of the United Kingdom planned to invest \$1 million to modernize the equipment at the Veliki Majdan lead and zinc mine. The company also planned to conduct exploration at the Kosjeric and Veliki Majdan fields (Ralev, 2019).

### **Industrial Minerals**

**Boron and Lithium.**—Rio Tinto, through its wholly owned subsidiary Rio Sava Exploration DOO, held a 100% interest in the Jadar lithium-borate project, which is located about 100 km from Belgrade in western Serbia. In 2019, Rio Tinto plc continued the prefeasibility study at the Jadar lithium-borate project. As of yearend 2019, the indicated resources of lithium

were estimated to be 53 Mt at an average grade of 1.8% Li<sub>2</sub>O and the inferred resources were estimated to be 83 Mt at an average grade of 1.9% Li<sub>2</sub>O. The indicated resources were estimated to be 52.7 Mt at an average grade of 19.2% B<sub>2</sub>O<sub>3</sub>, and the inferred resources were estimated to be 83.4 Mt at an average grade of 13.2% B<sub>2</sub>O<sub>3</sub>. Rio Tinto expected to start production at Jadar in 2023; however, the final decision would be made at the end of 2020, when feasibility studies were scheduled to be completed (Jamasmie, 2019b; Rio Tinto plc, 2020, p. 55, 234, 277–279).

Erin Ventures Inc. of Canada, through its subsidiary Balkan Gold d.o.o., held a 100% interest in the Piskanja boron deposit, which is located within the Jarandol basin in southern Serbia. The Jarandol basin forms the eastern part of the Gradac-Baljevac graben, which is located in the Varder Zone. Erin Ventures anticipated that the drilling program at Piskanja would be completed in 2019 and that the project would then advance towards feasibility study stage. As of yearend 2019, the indicated mineral resources at Piskanja were estimated to be 7.8 Mt at an average grade of 31% B<sub>2</sub>O<sub>3</sub>, and the inferred mineral resources were estimated to be 3.4 Mt at an average grade of 28.6% B<sub>2</sub>O<sub>3</sub> (Erin Ventures Inc., 2019; Mining.com, 2019).

### **Outlook**

Serbia's real GDP was projected to decrease by 2.5% in 2020. Serbia has the potential to become a lithium and boron producer in the future if the Jadar lithium-borate project and the Piskanja boron project can be developed as planned. There are a number of copper and gold projects at the exploration stage in Serbia; however, copper and gold production are not expected to increase in the near term because these projects are still in the early stages. The production of lead and zinc is expected to increase in the future with the modernization of equipment at the Veliki Majdan lead-zinc mine (International Monetary Fund, 2020, p. 55).

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TABLE 1  
SERBIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2015	2016	2017	2018	2019
<b>METALS</b>					
Aluminum, metal, secondary, ingot, including alloys	65,957	68,713 <sup>r</sup>	87,562 <sup>r</sup>	78,540 <sup>r</sup>	78,500 <sup>e</sup>
<b>Copper:</b>					
<b>Mine:</b>					
<b>Ore:</b>					
Gross weight thousand metric tons	17,108	17,845	17,990	15,970	16,310
Cu content	47,200	50,000	49,400	43,900	45,700
Concentrate, Cu content	36,410	41,312	44,750	42,500	43,550
<b>Smelter:</b>					
Primary	43,000	61,000	68,200	75,000	73,000 <sup>e</sup>
Secondary	1,000	1,000 <sup>e</sup>	1,000 <sup>e</sup>	1,000 <sup>e</sup>	1,000 <sup>e</sup>
Total	44,000	62,000 <sup>e</sup>	69,200 <sup>e</sup>	76,000 <sup>e</sup>	74,000 <sup>e</sup>
<b>Refinery:</b>					
Primary	42,729	61,309	67,752	66,000	73,000
Secondary	1,917	1,000	1,469	1,000	1,000
Total	44,600	62,300	69,200	67,000	74,000
Gold, refinery kilograms	628	805	1,087	839	910
<b>Iron and steel:</b>					
Pig iron	904,000	1,154,000	1,340,000	1,593,000	1,577,000
<b>Steel:</b>					
Raw steel	955,000	1,173,000	1,477,000	1,973,000	1,929,000
Products, hot-rolled	820,000	1,503,000	1,741,756	2,079,175	2,083,400
<b>Lead:</b>					
Mine, ore, Pb content	3,300 <sup>e</sup>	3,500 <sup>e</sup>	3,200 <sup>e</sup>	3,200	5,700
Refinery, primary and secondary	15,000 <sup>e</sup>	15,000 <sup>e</sup>	15,000 <sup>e</sup>	13,000	14,400
<b>Platinum-group metals, mine, elemental content:</b>					
Palladium kilograms	31	31	38	55	37
Platinum do.	4	4	2	5	4
Selenium, Se content do.	14,950	18,300	19,000	29,000	17,000
Silver, refinery do.	5,470	11,345	11,858	6,000	10,700
Zinc, mine, Zn content	4,000	6,300	4,000	3,800 <sup>r</sup>	6,900
<b>INDUSTRIAL MINERALS</b>					
Cement, hydraulic thousand metric tons	1,654	1,801	1,908	2,093	2,151
Clay, kaolin	216,210	253,000	255,000	279,000	254,000
Lime	315,579	322,123	350,000 <sup>e</sup>	390,000 <sup>e</sup>	307,905
Nitrogen, ammonia, N content	73,000	60,000	60,000 <sup>e</sup>	60,000 <sup>e</sup>	60,000 <sup>e</sup>
Salt, all sources	13,202	13,000 <sup>e</sup>	13,000 <sup>e</sup>	13,000 <sup>e</sup>	13,464
Sand and gravel, industrial, silica thousand metric tons	259	205	205	185	124
<b>Stone, sand, and gravel, construction:</b>					
Sand and gravel, unspecified, excluding glass sand do.	9,826	6,986	7,795	7,602	8,604
<b>Stone:</b>					
Crushed, limestone, including gypsum and chalk do.	2,878	2,933	3,178	2,284	2,529
Dimension, marble, block, including granite do.	271	131	362	387	381
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
<b>Coal:</b>					
Bituminous thousand metric tons	129	105	342	101	108
Lignite do.	37,659	38,289	39,353	37,530	38,477
Natural gas million cubic meters	626	595	548	506	477
<b>Petroleum:</b>					
Crude thousand 42-gallon barrels	7,528	6,846	6,500	6,450	6,260
<b>Refinery:</b>					
Distillate fuel oil do.	9,422	9,526	10,220	11,500	10,451
Gasoline do.	4,820	4,930	5,177	5,400	4,649

See footnotes at end of table.

TABLE 1—Continued  
 SERBIA: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Commodity <sup>2</sup>	2015	2016	2017	2018	2019
MINERAL FUELS AND RELATED MATERIALS—Continued					
Petroleum:—Continued					
Refinery:—Continued					
Kerosene do.	835	943	1,200	1,470	1,245
Lubricants do.	90,500	112,022	117,000	116,700	106,462
Residual fuel oil do.	1,865	1,985	1,950	1,680	1,299
Total do.	107,000	129,000	136,000	137,000	124,000

<sup>0</sup>Estimated. <sup>1</sup>Revised. do. Ditto.

<sup>1</sup>Table includes data available through December 10, 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.

<sup>2</sup>In addition to the commodities listed, crude gypsum, magnesite, mined magnesium as byproduct, primary and secondary magnesium metal, and other mineral commodities may have been produced, but available information was inadequate to make reliable estimates of output.

TABLE 2  
SERBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity holders		Location of main facilities	Annual capacity <sup>c</sup>
Aluminum metal, secondary	Impol Seval AD		Sevojno smelter	45
Do.	Industrium d.o.o.		Sremska Mitrovica smelter	75
Do.	Nissal A.D.		Nis smelter	2
Cement	Beocinska Fabrika Cementa (LafargeHolcim Ltd., 100%)		Plant at Beocin	2,000
Do.	Holcim (Srbija) a.d. (CRH Group, 100%)		Plant at Novi Popovac	1,400
Do.	Titan Cementara Kosjerić Ltd. (Titan Group, 100%)		Plant at Kosjeric	750
Clay and shale, kaolin	Jugo-Kaolin d.o.o. (Quarzwerke GmbH, 87%)		Slatina Mine	NA
Coal:				
Bituminous	JP PEU Resavica		Ibarski Rudnici Mines near Baljevac and Vrska Cuka Mines	70
Lignite	do.		Underground mines near Resavica, Bogdinac, Bogovina, Krepoljin, at Lubnica, and Stavalj	460
Do.	million metric tons	MB Kolubara Ltd. (Electric Power Industry of Serbia)	Opencast mines: Field B, Field D, Veliki Crljeni, and Tamnava West near Vreoci	31
Do.		TPPs-OCMs Kostolac Ltd. (Electric Power Industry of Serbia)	Opencast mine at Drmno near Kostolac	8,500
Copper:				
Mine production, concentrate, Cu content	Serbia Zijin Copper DOO (Zijin Mining Co. Ltd., 63%, and Government, 37%)		Jama Mine and mill at Bor	8
Do.	do.		Majdanpek Mine and mill at Bor	30
Do.	do.		Veliki Krivelj Mine and mill at Bor	20
Metal	do.		Smelter at Bor	80
Do.	do.		Refinery at Bor	120
Gold, refined	kilograms	do.	do.	1,300
Iron and steel:				
Pig iron	Zelezara Smederevo d.o.o. (HBIS Group)		Two blast furnaces at Smederevo	NA
Raw steel	do.		Plant at Smederevo	2,200
Lead, metal, secondary	Farmakom M.B.		Smelter at Zajaca <sup>1</sup>	NA
Lead-zinc ore	Contango d.o.o.		Mine and mill at Rudnik	250
Do.	Farmakom M.B.		Mines at Rajiceva Gora, Ravnaja, and Veliki Cip <sup>1</sup>	350
Do.	MINECO Ltd.		Rudnik Mine, village of Rudnik, central part of Serbia	240
Do.	do.		Veliki Majdan, 10 kilometers from Gross	50
Do.	NA		Gross Mine near Vranje	330
Lime	Jelen Do AD (Nexe Grupa)		Plant in Jelen Dol, west of Cacak	90
Do.	Ravnaja AD		Plant at Mali Zvornik	NA
Do.	Zelezara Smederevo d.o.o.		Plant at Kucevo	70
Magnesite, concentrate	Afarak LLC Belgrade (Afarak Group, 100%)		Mines near Kraljevo	35
Magnesium:				
Mine (byproduct of dolomite mining), Mg content	MG Serbien d.o.o.		Bela Stena Mine, near Baljevac	2
Metal:				
Primary	do.		do.	6
Secondary	do.		do.	10
Natural gas	million cubic meters	Naftna Industrija Srbije a.d. (NIS) (JSC Gazprom Neft, 56.15%, and Government, 29.87%)	Gasfields in northern Serbia	600
Petroleum:				
Crude	thousand 42-gallon barrels	do.	Oilfields in northeastern Serbia	8,400
Refined	do.	do.	Refinery at Pancevo	96,000
Do.	do.	do.	Refinery at Novi Sad	52,000

See footnotes at end of table.

TABLE 2—Continued  
 SERBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2019

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity holders	Location of main facilities	Annual capacity <sup>e</sup>
Platinum-group metals	Serbia Zijin Copper DOO (Zijin Mining Co. Ltd., 63%, and Government, 37%)	Cerovo Mine at Bor	NA
Silica	Jugo-Kaolin d.o.o. (Quarzwerke GmbH, 87%)	Cucuge, Avala, Slatina, Dokmir	NA
Silver, refined	Serbia Zijin Copper DOO (Zijin Mining Co. Ltd., 63%, and Government, 37%)	Smelter and refinery at Bor	NA
Zinc, mine Zn content	MINECO Ltd.	Rudnik Mine, village of Rudnik, central part of Serbia	11

<sup>e</sup>Estimated. Do., do. Ditto. NA Not available.

<sup>1</sup>The company declared bankruptcy and was put up for sale in 2019.