



# 2013 Minerals Yearbook

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## MACEDONIA

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# THE MINERAL INDUSTRY OF MACEDONIA

By Sean Xun

Macedonia hosts mineral deposits containing copper, iron, lead, lignite, zinc, and other minerals. In 2013, the country produced a number of metals, including copper, ferroalloys, and steel, as well as mine output of copper ores, lead ores, and zinc ores. Other mineral commodities produced in the country included bentonite, feldspar, gypsum, lignite, lime, and sand and gravel. Petroleum was imported and processed at the country's sole refinery.

## Minerals in the National Economy

In 2013, Macedonia's real gross domestic product (GDP) increased by 2.7% to about \$10.6 billion compared with that of 2012. In 2013, mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply, sewerage and waste management combined made up 15.7% of GDP compared with 15.4% in 2012. The mining and quarrying sector had 4,146 employees in 2013, of which 2,351 were working on mining of metal ores, 1,614 on mining and quarrying of minerals other than metal ores and lignite, 104 on mining support service activities, and 77 on mining of coal and lignite. The manufacturing sector had 104,214 employees, of which 5,991 were working on the manufacture of iron and steel and ferroalloys, aluminum and aluminum products, and foundry work service, 3,385 on the manufacture of nonmetallic mineral products, and 705 on the manufacture of refined petroleum products. The mining and quarrying sector and the manufacturing sector accounted for about 0.9% and 21.5% of the country's total employment (483,447), respectively (Republic of Macedonia State Statistical Office, 2014c; 2014e, p. 268; 2014f, p. 77).

## Production

In 2013, bentonite production increased by 686% compared with that of 2012 to 18,520 metric tons (t). The production of copper metal (by solvent extraction and electrowinning) increased by 73% to 1,900 t. Ferrosilicon production increased by 70% to 72,279 t. Crushed stone (excluding quartz and quartzite) production increased by 62% to 98,138 t. The production of pumice and related materials and volcanic tuff, increased by 28% to 67,663 t.

The production of petroleum, refinery products decreased by 71% to 552,000 barrels. The production of steel (crude and semimanufactured flat products) decreased by about 54%. The production of agglomerated dolomite decreased by 45% to 1,434 t. The production of marl decreased by 17% to 788,049 t. Data on mineral production are in table 1.

## Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

## Mineral Trade

In 2013, the value of Macedonia's exported goods amounted to \$4.27 billion; leading mineral-related products included ferronickel (valued at \$337 million, or 7.9% of the country's total exports), flat-rolled iron and crude steel (\$220 million, or 5.2%), ferrosilicon (\$87 million, or 2.0%), petroleum oils and oils obtained from bituminous minerals, other than crude (\$81 million, or 1.9%), lead ores and concentrates (\$76 million, or 1.8%), copper ores and concentrates (\$65 million, or 1.5%), zinc ores and concentrates (\$29 million, or 0.7%), and marble and other monumental or building stones (\$19 million, or 0.5%). The value of Macedonia's imported goods amounted to \$6.60 billion; leading mineral-related products included petroleum oils and oils obtained from bituminous minerals, other than crude (valued at \$664 million, or 10.1% of the country's total imports), platinum and platinum alloys, unwrought or in powder form (\$404 million, or 6.1%), flat-rolled iron and nonalloy steel (\$161 million, or 2.4%), other platinum-group metals, and alloys thereof, unwrought or in powder form (\$118 million, or 1.8%), nickel ores and concentrates (\$100 million, or 1.5%), natural gas in the gaseous state (\$61 million, or 0.9%), petroleum oils and oils obtained from bituminous minerals, crude (\$46 million, or 0.7%). Based on the total volume of international commodity trade in 2013, the leading export trade partners of Macedonia were Germany (which received 29.4% of Macedonia's exports), Bulgaria (7.6%), and Kosovo (6.5%). The leading import trade partners of Macedonia were the United Kingdom (which supplied 17.0% of Macedonia's imports), Greece (16.3%), and Germany (16.3%) (Republic of Macedonia State Statistical Office, 2014b, p. 528, 529, 535–540).

## Commodity Review

### Metals

**Gold.**—There was no mined gold production in 2013. Euromax Resources Ltd. of Canada held 100% interest in the Ilovitza gold-copper project, which is located about 18 kilometers (km) east of Strumica in southeastern Macedonia. In December 2013, the company announced an increase in the mineral resource estimate for the Ilovitza project. The estimated measured and indicated resources were updated to 237 million metric tons (Mt) grading 0.33 gram per ton (g/t) gold and 0.22% copper from the previous estimate of 184 Mt. The measured resource was estimated to be 18.4 Mt grading 0.34 g/t gold and 0.22% copper, and the indicated resource was estimated to be 218.4 Mt grading 0.33 g/t gold and 0.22% copper. The inferred resource was estimated to be 19.9 Mt grading 0.36 g/t gold and 0.22% copper. A prefeasibility study report was scheduled to be published in the first quarter of 2014 (Euromax Resources Ltd., 2013).

Genesis Resources Ltd. of Australia held a 62% interest in the Plavica project, which is located about 65 km east of Skopje in northeastern Macedonia. The project included seven exploration concessions and covers an area of about 185 square kilometers. In May 2012, the company announced inferred mineral resources based on the Australian Joint Ore Reserves Committee (JORC) standards. The inferred gold resources were estimated to be 55.46 Mt at an average grade of 1.0 g/t and a cutoff grade of 0.75 g/t; the inferred silver resources were estimated to be 22.63 Mt at an average grade of 29.7 g/t and a cutoff grade of 20 g/t; and the inferred copper resources were estimated to be 7.98 Mt at an average grade of 0.43% and a cutoff grade of 0.4%. In May 2013, the first results of the 2013 drilling program delineated a new east-west trending zone on the northern flank of the Plavica prospect. In June 2013, the second batch of results extended the known mineralization to the west and continued to add to the resource base at Plavica. The Government-mandated final feasibility study report for the Plavica project was submitted to the Macedonian Ministry of Economy in 2013 (Genesis Resources Ltd., 2012; 2013, p. 4; 2014, p. 7).

**Iron and Steel.**—Cunico Resources NV (Cunico) of the Netherlands produced ferronickel at Kavadarci, Macedonia through its subsidiary FENI Industries (FENI). In 2013, FENI achieved a new production record with 20,000 t of nickel content in ferronickel. All the output was exported. In 2013, the export of ferronickel amounted to 94,700 t. The Rzanovo Mine, which was operated by FENI, was an open pit nickel mine that supplied a portion of the raw materials used by FENI's smelter before 2013. The ore was transported from the mine into the smelter by a 36.5-km-long conveyor belt, which was considered to be the longest conveyor belt in the world. In January 2013, the Rzanovo Mine was closed and some 30 miners were laid off. In October 2012, Cunico acquired the Guaxilan nickel ore mining complex in Guatemala and started to import ore from Guatemala. In 2013, about 1.26 Mt of nickel ore and concentrate were imported for use at FENI's ferronickel smelter. Nickel ores used as raw materials contain 0.9% to 2.2% nickel and 15% to 40% iron, and the typical ferroalloys produced by FENI contain about 20% nickel and 80% iron. FENI had 855 employees in Macedonia as of December 2013 (Dimitrievska, 2013; Cunico Resources NV, 2014a; 2014b, p. 3; Republic of Macedonia State Statistical Office, 2014b, p. 535, 538).

Makstil AD, which was a major producer of hot-rolled heavy plates in Macedonia, operated a steelmaking plant and rolling mill in Skopje. In 2013, Makstil AD had 986 employees and produced 224,174 t of plates and 216,935 t of slabs. ArcelorMittal Skopje was one of the largest steel product manufacturers in Macedonia. The main products of ArcelorMittal Skopje included cold-rolled coils and sheets and galvanized and prepainted coils. The hot mill capacity was 1.0 million metric tons per year (Mt/yr). Flat-rolled products were of economic significance for Macedonia. In 2013, Macedonia produced 252,862 t of rolled products and exported 246,095 t of rolled products (ArcelorMittal, 2014; Makstil A.D., 2014; Republic of Macedonia State Statistical Office, 2014b, p. 535; 2014d, p. 46).

## **Industrial Minerals**

**Cement.**—Titan S.A. of Greece held a 100% interest in Cementarnica "Usje" A.D. (USJE), the sole cement production facility in Macedonia. In 2013, USJE produced about 762,000 t of cement, with an overall cement mill utilization factor of less than 35%. The cement demand in Macedonia increased by approximately 5% compared with 2012 mainly owing to the improvement in the construction sector. The company had 331 employees at the end of 2013. In 2013, USJE installed a new steam boiler that reduced environmental effects and introduced a chromium reducing agent in processing to reduce health risks to end users in line with European Union legislation. The company also supplied cement for construction of the new highway section connecting Demir Kapija and Smokvica (Titan S.A., 2014, p. 48, 75, 95; Cementarnica "Usje" A.D., 2014, p. 3).

## **Mineral Fuels**

**Coal.**—Macedonia has 2.5 billion metric tons of lignite reserves and is a significant lignite producer. State-owned AD ELEM mined lignite at the Brod-Gneotino, the Oslomej-East, the Oslomej-West, and the Suvodol Mines. In 2013, AD ELEM produced about 6.6 Mt of lignite compared with 7.3 Mt in 2012. The Suvodol Mine was the largest mine, producing about 5.3 Mt in 2012. Gross domestic consumption of lignite in 2012 was 7,653,390 t, of which 95.75% was used for power generation. The Bitola and Oslomej thermal powerplants, which are operated by ELEM, had a total capacity of 800 megawatts and generated 77% of Macedonia's electricity in 2011 (the latest year for which data were available). In 2013, AD ELEM continued to work on the development of the Zivojno Bitola lignite mine project, which had estimated geological reserves of 105 Mt, and the Suvodol-Bitola deep underlying seam project, which was expected to extend the coal reserves in Suvodol (AD ELEM, 2013, p. 29; 2014a–c; European Association for Coal and Lignite, 2013, p. 71; Republic of Macedonia State Statistical Office, 2014a).

**Refinery Products.**—EL.P.ET. Balkaniki S.A. of Greece, which was a subsidiary of Hellenic Petroleum of Greece, owned an 81.51% interest in OKTA A.D., which was the sole petroleum refinery in Macedonia. The refinery was located in Skopje and had a nominal capacity of 2.5 Mt/yr and a storage capacity of 330,000 cubic meters. The plant was connected to the Thessaloniki refinery in Greece by a pipeline used to transport high-value-added products. In 2013, OKTA produced 20,789 t of fuel oil, 18,846 t of transport diesel, 14,362 t of unleaded motor gasoline, 7,213 t of heating and gas diesel oil, 4,699 t of kerosene, and 2,818 t of propane. Production in 2013 decreased by 71% compared with 2012 owing to reductions in fuel consumption caused by the recession in Europe throughout 2013 (EL.P.ET. Balkaniki S.A., 2014; Hellenic Petroleum, 2014, p. 60, 64, 115; Republic of Macedonia State Statistical Office, 2014d, p. 37, 38).

## Outlook

The modernization and rehabilitation of the Bitola and the Oslomej thermal powerplants, the expansion plans at the Suvodol project, and plans to develop the Mariovo and the Zivojno deposits are expected to strengthen the lignite mining industry in the short run. In the longer run, new projects in the nonfuel mineral sector, such as the possible development of new gold-copper deposits, may attract foreign investment in the mineral sector and to increase interest in nonfuel mineral prospecting. The steel industry is expected to face challenges in the coming years owing to overcapacity globally and locally.

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

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	2009	2010	2011	2012	2013	
<b>METALS</b>						
Copper, mine and concentrator output:						
Ore, gross weight	thousand metric tons	3,767	4,199	4,118	4,435	4,646
Concentrate:						
Gross weight		35,430	37,678	35,976	45,266	46,677
Cu content <sup>c</sup>		7,600	7,900	7,600	10,400	10,700
Metal, refined, electrowon		--	--	--	1,100 <sup>r</sup>	1,900
Iron and steel:						
Ferroalloys:						
Ferronickel <sup>c</sup>		52,200	62,700	75,200	83,700	87,000
Ferrosilicon		7,657	30,044	56,167	42,402	72,279
Silicomanganese		--	36,705	50,756	14,179	--
Total		59,857	129,449	182,123	140,281	159,279
Steel:						
Crude, secondary		276,215	292,126	386,000	216,000	100,000
Semimanufactures, flat slabs, stainless steel		270,397	291,886	385,816	216,934	99,689
Lead, mine output, concentrate, Pb content		38,000	41,000 <sup>r</sup>	37,000 <sup>r</sup>	36,000 <sup>r</sup>	39,000
Nickel, Ni content of ferronickel		12,000	14,413	17,292	19,247	20,001
Zinc, mine output, concentrate, Zn content		29,000	33,000 <sup>r</sup>	28,000 <sup>r</sup>	29,000 <sup>r</sup>	30,000
<b>INDUSTRIAL MINERALS</b>						
Cement	thousand metric tons	909	820	981	683	762
Clays, bentonite		15,350	12,798	8,918 <sup>r</sup>	2,355 <sup>r</sup>	18,520
Dolomite:						
Agglomerated		3,814	4,748	5,249	2,606	1,434
Not frayed, not calcined		78,523	116,290	125,700	129,120	122,142
Sintered		21,607	24,989	28,251	23,062	21,663
Feldspar, crude		19,377	23,188	25,032	17,168	15,168
Gypsum, crude		154,550	143,118	162,984	157,844	162,661
Lime <sup>c</sup>		2,713 <sup>3</sup>	2,700	2,700	2,700	2,700
Limestone flux		694,968	1,063,839	1,142,662	818,559	976,452
Marl		560,170	749,750	861,666	954,495	788,049
Pumice and related materials, volcanic tuff		113,064	113,323	57,356	52,911	67,663
Sand and gravel, excluding glass sand		49,009	64,789	2,443	124,442	126,773
Silica sands (quartz sands or industrial sands)		112,106	116,079	125,949	126,000 <sup>r,e</sup>	126,000 <sup>c</sup>
Stone, excluding quartz and quartzite:						
Crushed		59,715	130,105	104,209	60,403	98,138
Dimension, crude		69,082	78,603	64,320	64,384	72,786
Talc, crude		682	1,292	547	286	--
<b>MINERAL FUELS AND RELATED MATERIALS</b>						
Lignite	thousand metric tons	7,454	6,583	7,902	7,310	6,633
Petroleum, refinery products <sup>e,4</sup>	thousand 42-gallon barrels	7,700	6,600	5,400	1,900	550

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through January 15, 2015.

<sup>2</sup>In addition to commodities listed, secondary aluminum in small amounts, common clay, diatomite, and gold contained in copper concentrate also are thought to have been produced, but available information is inadequate to make reliable estimates of output.

<sup>3</sup>Reported figure.

<sup>4</sup>Figures were converted to barrels from production in thousand metric tons, which was reported as the following: 2009—963; 2010—829; 2011—680; 2012—243; and 2013—69.

TABLE 2  
MACEDONIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement	Cementarnica USJE AD (Titan S.A., 100%)	Plant at Skopje	2,100 <sup>e</sup>
Copper:			
Ore	Solway Investment Group Ltd.	Mine and mill at Bucim, west of Radovis	4,500
Metal	do.	Solvent-extraction and electrowinning plant at Bucim, west of Radovis	3
Ferroalloys:			
Ferrosilicon	Jugohrom Ferroalloys DOO (Camelot Group)	Plant at Jegunovce	66
Silicomanganese	Skopski Leguri DOOEL	Plant at Skopje	56
Ferromanganese	do.	do.	66
Ferronickel, Ni content	FENI Industries (Cunico Resources)	Ferronickel plant at Kavadarci	22 <sup>e</sup>
Gold, mine output, Au in copper concentrate	Bucim Mine (Solway Investment Group Ltd.)	Mine and mill at Bucim, west of Radovis	NA
Lead-zinc, concentrate	Sasa Mine (Solway Investment Group Ltd.)	Mill at Sasa, north of Makedonska Kamenica	NA
Lead-zinc, ore	do.	Mine at Sasa, north of Makedonska Kamenica	1,000 <sup>e</sup>
Do.	Zletovo Mine (Indo Minerals and Metals DOOEL)	Mine and mill near Probistip	NA
Do.	Toranica Mine (Indo Minerals and Metals DOOEL)	Mine near Dolga Livada	NA
Lignite	AD ELEM (state owned)	Mine at Suvodol	6,500
Do.	do.	Mine at Oslomej	1,000
Do.	do.	Star Rudnik Mine at Oslomej	310 <sup>e</sup>
Do.	do.	Brod-Gneotino Mine, south of Suvodol near Brod	2,000
Nickel, ore	FENI Industries (Cunico Resources)	Open pit mine at Rzanovo, 32 kilometers south of Kavadarci	NA <sup>1</sup>
Petroleum, refined	OKTA A.D. Skopje (EL.P.ET Balkaniki S.A., 81.51%)	Oil refinery at Skopje	2,500
Steel, crude, secondary	Makstil A.D. Skopje (Duferco Group, 62%)	Plant at Skopje	360
Steel, semimanufactured	do.	do.	750 <sup>e</sup>
Do.	ArcelorMittal Skopje (ArcelorMittal)	do.	1,000

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

<sup>1</sup>The mine was closed in early 2013.