

## THE MINERAL INDUSTRY OF

# ROMANIA

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Although Romania's economy showed mixed results, in 1997, the country remained a modest regional producer of metals (aluminum, copper, lead and zinc, manganese, and steel and ferroalloys) and industrial minerals and a significant producer of petroleum and natural gas. The growth rates of the gross domestic product (GDP) and industrial production declined by 6.6% and about 6%, respectively, compared with those of 1996. The transition to a market economy, however, remained on course as the private sector share of the GDP amounted to almost 60% during the year. Significant foreign investment activity in Romania's gold and steel sectors constituted the main event in the country's minerals industry.

In 1997, Romania's Government decided to accelerate the reform and rationalization of the country's mining sector. Pending parliamentary review, the draft of the new mining law will be adopted from a bill to a state decree; this decree would provide the Agency for Mineral Resources the right to issue licences to work mining sites for up to 20 years by domestic and foreign investors. The Government of Romania would close unprofitable operations, including petroleum refineries and such state-owned enterprises as coal mining companies, and would end subsidies to the mining sector. Before the state-owned enterprises could be privatized, they would have to be restructured as commercial companies. By 2005, the Government would eliminate 64,000 mining jobs (Industrial Minerals, 1997b); as of October 1997, 40,000 miners has accepted redundancy status. Redundant employees would be given severance pay equivalent to 12 months of average wages (Reuters Limited, 1997b).

The current law on environmental protection was adopted in 1995. The sections pertaining directly to the minerals industry are articles 14, 16, and 48. Article 14 describes the obligations that new and former owners have with respect to restoring environmental quality. Article 16 relates to the proscription of imports of raw or processed waste with the exception of those categories of waste that constitute a useful secondary resource of raw materials. Article 48 established procedures for monitoring the quality of soil and subsoil, which included plans for territorial development, exploratory drilling, geologic and hydrogeologic prospecting, and mining extraction activities.

As indicated above, Romania mined modest amounts of such nonferrous metal ores as bauxite, copper and lead, and zinc, as well as small quantities of iron ore.

By the start of 1997, the sole aluminum sector target of the denationalization by the State Ownership Fund (FPS) had been the Soc Com Alum SA alumina refinery in Tulcea. The 400,000-metric-ton-per-year (t/yr) alumina producer was purchased (51% interest) by Balli Group-UK and Bayraktar Holding of Turkey in early 1996. The bauxite feedstock for Alum was largely imported

from Australia, Greece, Guinea, and India. About 40% of the alumina was exported. The plant's upgrade program included the addition of Alusuisse-Lonza (Switzerland) technology, which changed production from flourey to sandy grade alumina (Standish, 1997c). This upgrade was necessary especially in view of Alro Slatina SA's requirements for sandy-grade material for the potlines. Alro's overall investment program called for increasing the plant's refined alumina production capacity to 600,000 metric tons (t) by 2003. The FPS would provide part of the finance for Alum's expansion, following a policy that would return 60% of the sale price to the owners of a given enterprise so long as the new owners settled the privatization debts and developed plans for modernization. The modernization effort, apart from facility expansion, also was to focus on reducing the plant's environmental impact (Standish, 1997b). Soc Com Alor SA in Oradea, Romania's other alumina refinery, remained entirely state owned in 1997; no plans were announced concerning changes to its ownership status.

Plans to fully denationalize Alro and Alprom SA, also of Slatina, the country's producer of rolled aluminum, were announced during the year. In 1997, Alro remained largely state owned, with the Government's share amounting to about 65% of total assets; 35% of the shares were distributed to the population through privatization vouchers. Similarly, the Government's share in Alprom amounted to 70%, with 12% held by institutional investors and 18% distributed to the population through privatization vouchers. The rolling mill had a rated production capacity of 67,000 t/yr, of which 45,000 t/yr represented rolled products; the balance covered extrusions and castings (Standish, 1997c).

Modernization programs at Alro included the upgrading of a potline with technical support from Pechiney of France. Modernization work on a second potline, also under contact with Pechiney, was begun in 1997. Additionally, the anode plant was upgraded during the year, and a new alumina feed system and modern dry scrubbers were installed. The latter raised dust entrainment from 68% to 98% (an increase of 44%) (Standish, 1997a).

Copper continued to be mined mostly in two districts—the northwestern part of the country with mines at Baia Mare, Baia Sprie, Cavnic, and Lesul Ursului and in the southwestern part of the country with major mines at Moldova Noua, Rosia Montana, and Rosia Poieni. Generally, the grade of ore has been low; major producing mines (Moldova Noua and Rosia Poieni) were hoisting ore grading only about 0.35% Cu or less. Concentrates from these areas have been smelted and refined at Baia Mare and Zlatna. At Baia Mare, Intreprinderea Metalurgica de Metale Neferoase (IMMN) operated an Outokumpu flash smelter, an

electrolytic copper refinery, and a continuous caster. To process copper concentrates, IMMN operated an Outokumpu flash smelter and an electrolytic refinery at Zlatna (Serjeantson, 1995).

The work of the Romanian-Australian joint venture, Aurul SA, continued in 1997. Aurul comprised Aurul Esmeralda Ltd. of Australia and Romania's Regia Autonoma a Plumbului si Zincului (Lead and Zinc National Corporation) and Geomin SA. Aurul reported plans to put on line a US\$28 million gold recovery plant at Baia Mare by the third quarter of 1998; the proposed facility would operate for about 7 years and would process about 15 million metric tons (Mt) of accumulated tailings in the region to produce 1.6 t/yr of gold and 6 t/yr of silver. The agreement called for the gold produced by the plant to be sold to the Romanian Central Bank at prevailing world prices. Aurul would receive payment in Romanian currency (Mining Journal, 1997a).

Gabriel Resources of Canada concluded a joint-venture agreement with the state-owned mining enterprise, Regia Autonoma a Cuprului Deva, to explore for and to mine gold in Transylvania's Golden Quadrilateral (comprising the cities of Baia de Aries, Brad, Sacarimb, and Zlatna) gold mining region. The initial distribution of stock in the joint venture was as follows: Gabriel Resources, 65%; Regia Deva, 33.8%; and others, 1.2%. The provisions in the agreement allow Gabriel to increase future holdings to 80% (Northern Miner, 1997). The area of interest to the joint venture comprises about 500 square kilometers and contains epithermal to mesothermal gold deposits associated with Badenian-Pliocene andesitic-dacitic volcanic and subvolcanic intrusions into breccia pipes, stockworks, and veins. Gold production in this region was reported to be about 140,000 ounces per year (Northern Miner, 1997). The Rosia Montana open pit and the Brad underground gold mines were the main assets in the region belonging to the joint venture. Gabriel has been doing feasibility studies connected with redeveloping the Rosia Montana Mine and reprocessing tailings from both mines. Rosia Montana's output has been reported to be from 10,000 to 12,000 ounces per year.

At yearend, an independently prepared resource evaluation of Rosia Montana was prepared for Gabriel by the Resource Service Group of Australia (Mining Journal, 1997b). According to this study, inferred resources at the two largest deposits, Cetate and Carnic, were put at 45 Mt of ore grading 1.7 grams per metric ton of Ag and 2.46 million ounces of Au.

Gabriel also reported negotiations to establish a joint venture with Minexfor, Romania's state exploration agency, to explore for gold in the Bucium intrusive complex in the Metaliferi Mountains, about 85 kilometers (km) northeast of Deva (Northern Miner, 1997).

Romania continued to mine small quantities of iron ore; most feedstocks of ores and concentrates for the country's steel industry, however, had to be imported, mostly from the former Soviet Union. The major steel mills operated in Calarasi, Caras-Severin, Cluj, Galati, Hunedoara, Resita, and Targoviste.

The Government's program for the steel industry for 2002 called for total steelmaking capacity to be 1 Mt, which Government specialists considered to be necessary to meet domestic and export needs. Before the revolution of 1989, Romania's installed annual steelmaking capacity exceeded 16 Mt. The plan to modernize the steel industry involved more than 25

projects designed, in part, to improve the mix of products, to raise production efficiency, and to decrease material inputs during a 10-year period (Metal Bulletin, 1996).

In 1997, the output of crude steel increased by almost 10% compared with that of 1996. The major event in the industry involved the privatization process, which included foreign investment, as well as bids for shares of stock.

CSR S.A. Resita undertook a rationalization process that entailed the closure of the company's blast furnaces, coke ovens, and sinter plant, with future plans oriented to transforming steelmaking exclusively to electric arc furnace (EAF) operations. Open-hearth operations at Resita were limited entirely to the treatment of scrap. The installation of an 80-t EAF, a ladle furnace, and a vacuum degassing unit was undertaken by outside Spanish contractors. Spanish investors reportedly also were interested in the acquisition of stock in the company (Metal Bulletin, 1997). In June, Romania's FPS reported bids submitted by Italy's Finven SpA and Stainless Steel International SpA, Samsung Deutschland GmbH of Germany, and Usinor Sasilor of France to acquire shares in Otelinor S.A. Targoviste, a producer of stainless steel. The initial offering involved the sale of 51% of the company's stocks, amounting to 2.8 million shares at US\$15 per share (Reuters Limited, 1997a).

Romania continued to produce low-grade lead and zinc ores grading from 0.4% lead and 0.6% zinc to 1.0% lead and 1.2% zinc at underground mines in the Baia Mare, Borsa, Certej, and Rodna districts; these lead and zinc ores also contained copper (0.35%), as well as associated antimony, bismuth, cadmium, gold, and silver. Owing to the complex mineralogy of the lead and zinc ores, concentrates produced from these ores proved to be uneven. Metal recovery in concentrate ranged between 50% and 75% for lead and zinc, respectively. Smelting and refining of lead and zinc from domestic and imported ores and concentrates were carried out at the Imperial Smelter at Copsa Mica, with capacities to produce about 42,000 t/yr of lead and 66,000 t/yr of zinc.

Romania produced a broad range of industrial minerals that included barite, bentonite, diatomite, feldspar, graphite, gypsum, kaolin, and limestone; these were produced at about 60 deposits throughout the country. The modernization Romania's economy and infrastructure has increased the demand for many of these commodities.

The trend to acquire cement plants in the Central European and Balkan region by European Union companies also extended to Romania in 1996-97. Major acquisitions included the purchases of the Romcim SA and Cimentul SA Turda cement plants by Lafarge of France and Holderbank Financiere Glaris Ltd. of Switzerland. Lafarge Romcim was established following the acquisition of 51% of Romcim shares of stock, valued at about US\$200 million, by Lafarge. Romcim, the largest of Romania's six cement-producing enterprises, has supplied more than 41% of the domestic market. The enterprise comprised four cement plants in Asled, Hoghiz, Medgidia, and Tigru Jiu; the largest, the Medgidia plant, had a capacity of 2.5 million metric tons per year (Mt/yr) (Industrial Minerals, 1997c). Earlier in the year, Holderbank similarly acquired controlling interest in Cimentul, valued at a significantly lesser amount (US\$11.5 million) than that in the Lafarge-Romcim transaction. Cimentul, about 30 km southeast of Cluj-Napoca in the northern part of the country, was

Romania's smallest cement-producing enterprise, accounting for less than 7% of domestic cement supply and comprised cement, gypsum, and lime operations (Industrial Minerals, 1997a). Annual production was about 800,000 t of portland cement and 100,000 t of white cement. At yearend, discussions among several West European cement producers and the Government of Romania about further acquisitions in this sector continued.

The Government of Romania placed the country's two phosphate fertilizer plants on the enterprise privatization list. At midyear, the Government offered 51% of the shares in the Fertilchim enterprise of Novodari and Romfoschim in Valea Calugareasca for sale. In addition to producing 70,000 t/yr and 50,000 t/yr, respectively, of phosphoric acid, the plants also produced sulfuric acid for the domestic market. Reportedly, the sale of the plants was to be handled by international investment banks rather than the FPS, which was undergoing reorganization (Fertilizer Week, 1997).

Romania produced coal, natural gas, and petroleum in sufficient quantities to meet domestic needs. Romania was among the world's oldest petroleum producers. The country reached its apogee of natural gas and petroleum output in 1976 when 14 Mt of petroleum and 1.33 trillion cubic feet of natural gas were produced. From 1976 to 1989, Romania's output of both commodities declined by more than 40%. The decline was the result of depletion and the need for modern oilfield technology. In 1997, total recoverable reserves of petroleum at deposits under exploitation in Romania amounted to 206 Mt, an amount that would be sufficient for about 30 years at a production rate of about

6.5 Mt/yr. Romania's oil refineries had the capacity to process more than 33 Mt/yr of petroleum.

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TABLE 1  
ROMANIA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1993	1994	1995	1996	1997
<b>METALS</b>					
<b>Aluminum:</b>					
Bauxite, gross weight	186,000	184,100	175,000	174,500 r/	127,450
Alumina, calcined, gross weight	293,000	301,576	322,774	260,637 r/	281,636
<b>Ingot including alloys:</b>					
Primary	116,000	119,600	140,500	140,874 r/	162,987
Secondary	3,700	2,814	3,446	3,678 r/	2,042
Total	119,700	122,414	143,946	144,552 r/	165,029
Bismuth, mine output, Bi content e/	40	40	40	40	40
Cadmium metal, smelter	10 e/	4	5	5	5
<b>Copper:</b>					
Mine output, Cu content	25,300	26,034	24,520	24,434 r/	23,190
<b>Metal:</b>					
<b>Smelter:</b>					
Primary	25,200 e/	23,499	23,355	32,622 r/	25,024
Secondary e/	1,000	1,000	1,000	1,000	1,000
Total	26,200	24,499	24,355	33,565	26,024
<b>Refined:</b>					
Primary	22,000 e/	22,113	22,013	24,305 r/	17,912
Secondary e/	3,000	4,600 3/	5,000	5,000	5,000
Total	25,000	26,713	27,013	29,305	22,912
Gold, mine output, Au content e/ kilograms	4,000	4,000 3/	4,000	4,000	3,500
<b>Iron and steel:</b>					
<b>Iron ore:</b>					
Gross weight thousand tons	855	951	565	500 r/	520
Metal content do.	130	198	147	140 r/	146
<b>Metal:</b>					
Pig iron do.	3,189	3,496	4,203	4,025	4,557
<b>Ferroalloys:</b>					
Ferrochromium	3,907	3,885	15,053	9,650	950
Ferrosilicon	23,600	28,385	19,320	23,827 r/	9,620
Ferromanganese	16,400	31,295	28,410	20,150	11,505
Ferrosilicomanganese	22,000 e/	35,215	57,149	78,590	62,570
Silicon metal e/	400	300	300	300	300
Steel, crude thousand tons	5,446	5,800	6,557	6,082	6,674
<b>Semimanufactures:</b>					
Pipes and tubes do.	414	472	546	591 r/	633
Rolled products do.	4,092	4,510	4,959	4,479 r/	4,804
<b>Lead:</b>					
Mine output, Pb content	16,929	23,838	23,194	21,356 r/	17,083
Smelter, primary e/	9,000 3/	12,000	12,000	12,000	10,000
<b>Refined: e/</b>					
Primary	11,800 3/	22,000	22,000	20,000	20,000
Secondary	5,610 3/	4,000	4,000	4,000	4,000
Total	17,410 3/	26,000	26,000	24,000	24,000
<b>Manganese:</b>					
Ore, gross weight thousand tons	125	137	130	150 e/	100 e/
<b>Concentrate: 4/</b>					
Gross weight do.	15	108	104	104	68
Mn content do.	4	28	27	26	17
Silver, mine output, Ag content	70	70	60	60 e/	60 e/
<b>Zinc:</b>					
Mine output, Zn content	28,017	35,357	34,730	32,082 r/	29,366
Metal, smelter, primary and secondary	14,100	18,500	29,300 r/	27,800 r/	25,000 e/
<b>INDUSTRIAL MINERALS</b>					
Barite, processed	12,050	29,274	18,169	12,541	12,729
Cement, hydraulic thousand tons	6,240	6,676	6,842	6,956 r/	7,298
<b>Clays:</b>					
<b>Bentonite:</b>					
Run of mine e/	120,000	100,000	100,000	100,000	60,000
Marketable	50,000 e/	41,056	42,277	43,543 r/	27,133

See footnotes at end of table.

TABLE 1--Continued  
ROMANIA: PRODUCTION OF MINERAL COMMODITIES 1/ 2/

(Metric tons unless otherwise specified)

Commodity	1993	1994	1995	1996	1997
<b>INDUSTRIAL MINERALS--Continued</b>					
Clays--Continued:					
Kaolin:					
Run of mine e/	200,000	150,000	150,000	145,000	90,000
Marketable	60,000 e/	47,566	49,024	45,200	29,169
Diatomite	9,970	34,858	49,790	56,906 r/	23,880
Feldspar	87,700	31,123	30,920	34,975 r/	25,962
Fluorspar e/	15,000	15,000	15,000	15,000	15,000
Graphite	3,160	2,335	2,179	2,931	2,563
Gypsum	100 e/	124	111	91 r/	79
Lime	1,738	1,621	1,763	1,748 r/	1,599
Nitrogen, N content of ammonia	1,328	--	1,000	1,000 e/	1,000
Pyrites, gross weight	560	350	250	250 e/	250 e/
Salt:					
Rock salt	808	892	669	808 r/	254
Other	1,380	1,310	1,820	1,881 r/	2,369
Total	2,188	2,202	2,489	2,689	2,623
Sand and gravel	4,400	831	901	907 r/	711
Sodium compounds, n.e.s.:					
Caustic soda	330	298	383	326	322
Soda ash, manufactured, 100% Na <sub>2</sub> CO <sub>2</sub> basis	371	449	504	537 r/	548
Sulfur:					
S content of pyrites	225	148	97	42 r/	52
Byproduct, all sources e/	200	200	200	200	200
Total e/	425	348	297	242 r/	252
Sulfuric acid	527	491	477	422 r/	330
Talc	9,000	8,952	9,976	10,248	7,578
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Carbon black	27,400	19,325	21,555	26,023	21,400
Coal, washed:					
Anthracite and bituminous:					
For coke and semicoke production	465	444	349	312 r/	324
For other uses	3,760	921	800 e/	10 r/	10
Brown	573	--	--	1,000 r/	692
Lignite	35,000	39,182	39,979	40,546 r/	32,281
Total	39,798	40,547	41,128	41,868 r/	33,307
Coke:					
Metallurgical	2,403	2,664	3,164	2,948 r/	3,110
Other	198	--	220	1 r/	1
Total	2,601	2,664	3,384	2,949 r/	3,111
Fuel briquets (from brown coal) e/	70	71	--	-- 3/	--
Gas, natural, gross:					
Associated	7,000 e/	1,499	1,410	1,361 r/	1,245
Nonassociated	14,300 e/	18,099	17,606	16,801 r/	14,671
Total	21,300 e/	19,598	19,016	18,162 r/	34,078
Petroleum:					
Crude:					
As reported	6,680	6,737	6,717	6,626 r/	6,515
Converted	50,600	50,460	50,270	49,400	48,760
Refinery products e/	95,000	115,200	145,000	132,000	125,000

e/ Estimated. r/ Revised.

1/ Includes data available through December 1998.

2/ In addition to the commodities listed, antimony, asbestos, and a variety of crude construction materials are produced, and molybdenum may have been produced as a byproduct of copper from 1988 on; output is not reported quantitatively, and available information is inadequate to make reliable estimates of output levels.

3/ Reported figure.

4/ Estimated series were based on published data on concentrate production.

TABLE 2  
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1997

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies (Government-owned unless otherwise specified)	Location of main facilities	Annual capacity
Alumina	Soc Com Alor SA	Plant at Oradea, near Hungarian border	250
Do.	Soc Com Alor SA (51%-owned by the Balli Group of the UNited Kingdom and the Bayrakter Co. of Turkey)	Plant at Tulcea, Danube Delta	400
Aluminum, primary	Alro SA (Slatina Aluminium Enterprise)	120 kilometers west of Bucharest	270
Barite	Ministry of Industry	Ortra Mine, Rosia Montana, southwest of Cluj	100
Bauxite	do.	Oradea-Dobresti Mining Complex, near Hungarian border	350
Cement	Cimentul SA Turda	Plant at Turda, 600 kilometers from port of Constanta	cement: 1,360 clinker: 850
Do.	Cimentul SA Cimus	Plant at Cimpulung, about 499 kilometers from port of Constanta	cement: 2,200 clinker: 1,360
Do.	Moldocim SA Bicaz	Plant at Bicaz, about 450 kilometers from port of Constanta	cement: 3,100 clinker: 1,520
Do.	Romcif SA Fieni	Plant at Fieni, about 420 kilometers from port of Constanta	cement: 1,600 clinker: 960
Do.	Romcim SA	Plant at Alesd, 812 kilometers from port of Constanta	cement: 3,500 clinker: 2,120
Do.	do.	Plant at Hoghiz, 437 kilometers from port of Constanta	cement: 2,200 clinker: 1,520
Do.	do.	Medgidia plant, about 35 kilometers west of Constanta	cement: 3,500 clinker: 1,980
Do.	do.	Plant at Jiu, about 533 kilometers from the port of Constanta	cement: 3,000 clinker: 2,045
Coal:			
Bituminous	Ministry of Industry	Valea Jiului Mining Complex, near Hunedoara	10,400
Lignite	Ministry of Industry, Oltenia Mining Complex, including Rovinari Mining Enterprise	Jiu Valley, Oltenia County, north of Craiova	20,300
Do.	Ploesti Mining Complex	About 50 kilometers north of Bucharest.	8,700
Copper:			
Ore (concentrate)	Ministry of Industry Department of Nonferrous Metals	Baia mare, Baia-Sprie, and Cavnic mines, northwestern area near the Ukrainian border; Rosia Montana, Noud, Borsa Balan, and Lesul-Ursului Mines--in east-west arc along Carpathian range; Rosia Poieni Mine; and Moldova Noua Mine, southwest near Danubian border with Yugoslavia	180
Metal	Intreprinderea Metalurgica de Metale Neferoase	Outokumpu flash smelter and electrolytic refinery at Baia Mare in the Northwestern area, near the Ukrainian border	35
Do.	do.	Zlatna smelter and refinery, Apuseni, northwest Romania	13
Ferroalloys	Ferom-Joint Stock Co.	Complex at Tulcea	280
Iron ore	Ministry of Industry	Mining complex at Hunedoara, in west-central Romania	1,320
Do.	do.	Resita Mining Complex, southwestern Romania, near Yugoslav border	660
Do.	do.	Napoca-Cluj Mining Complex, northwestern Romania on the Somesul River	990

TABLE 2--Continued  
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 1997

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies (Government-owned unless otherwise specified)	Location of main facilities	Annual capacity
Lead in ore	Ministry of Industry	Baia Mare Mine, near Ukrainian and Hungarian borders	24
Do.	do.	Balan Mine, 50 kilometers southwest of Piatra Neamt	10
Lead metal	Metallurgical Enterprise for Nonferrous Metals	Imperial Smelter at Copsa Mica, central Romania, on the Tirnava Mare River	42
Natural gas million cubic feet per year	Ministry of Petroleum and Gas	Tirgu Mures Field at Tirgu Mures, north-central Romania	996,000
Do. do.	Ministry of Industry, Department of Energy	Ploesti Field, 50 kilometers north of Bucharest	249,000
Petroleum, crude barrels per day	do.	Ploesti-Teleajen, Pitesti, and Tiroviste Fields, in Prahova Valley around Bucharest; Bacau Field at Bacau, east-central Romania near the Siretul River; and West Carpathian Field, southeastern Carpathian Mountains, between the west bank of the Olt River and Tirgu Jiu	250,000
Petroleum, refined	do. Ministry of Industry, Department of Energy	Refineries at Brazil, Pitesti, Onesti, Barcau, Borzesti, Brasov, Cimpina, Darmanesti, Oradea, Ploesti, Teleajen, and Navodari	664,000
Steel	EAssteel Siderurgica Romana SA Otel Rosu	Caras-Severin, southeastern region, near Yugoslav border	400
Do.	SC Industrie Sarmei SA	Campia Turzii, Cluj, northwestern Romania	300
Do.	Sidex S A Galati	Danube River, north of Brail, near the Ukrainian border	10,000
Do.	Siderurgica SA Hunedoara	West-central Romania, near Calan	2,135
Do.	CSR SA Resita	Southwestern Romania, about 20 kilometers southwest of Caransebes	1,200
Do.	Siderica SA Calarasi	Near the Bulgarian border close to the Danube	2,200
Do.	COST SA Targoviste	Targoviste, Dimbovita, near Bucharest	1,100
Zinc in ore	Ministry of Industry, Baia Mare	Baia Mare, near Ukrainian and Hungarian borders	60
Zinc metal	Ministry of Industry, Metallurgical Enterprise for Nonferrous Metals	Imperial Smelter at Copsa Mica, Tirnava River, central Romania	66