



2014 Minerals Yearbook

ARMENIA

THE MINERAL INDUSTRY OF ARMENIA

By Elena Safirova

Armenia ranked seventh in the world in mine output of molybdenum in 2014. Besides molybdenum, Armenia produced other metals, such as copper, gold, silver, and zinc, and industrial minerals and products, including cement, diatomite, gypsum, limestone, and perlite. The country also produced aluminum foil from aluminum imported from Russia, and ferromolybdenum, molybdenum metal, and rhenium salts (ammonium perrhenate and potassium perrhenate) from local ores. It also had developed a diamond-cutting industry based on imported diamond. Armenia possesses resources of copper, gold, iron ore, lead, molybdenum, and zinc. It also has resources of construction materials, such as basalt, granite, limestone, marble, and tuff; semiprecious stones, such as agate, jasper, and obsidian; and other nonmetallic minerals, such as bentonite, diatomite, perlite, and zeolites (Polyak, 2016).

In October, Armenia signed a treaty declaring that it was planning to join the Eurasian Economic Union, which was the successor of the Eurasian Customs Union. The Eurasian Customs Union was created in January 2010 as a Customs Union of Belarus, Kazakhstan, and Russia, and was the first step in a plan to establish closer economic ties among member countries. According to the treaty, Armenia would become a member of the Eurasian Economic Union in January 2015, but initially its rights would be limited compared with those of the original members (Belarus, Kazakhstan, and Russia). In particular, the limitations would include the introduction of certain customs duties and restrictions on the country's voting rights within the union. The Government of Armenia expected that joining the Eurasian Economic Union would reduce the prices of natural gas and nuclear fuel and would provide Armenia with markets for its products and investment capital for its companies (Regnum.ru, 2013; Naberezhnov, 2015).

Minerals in the National Economy

In 2014, Armenia's real gross domestic product (GDP) increased by 3.9% compared with an increase of 4.6% in 2013. The nominal GDP in 2014 amounted to \$10.9 billion.¹ The share of industrial production in the total GDP was 31.6%, and the share of the mineral industry in total industrial production was 12.8%. In 2014, mining of metallic ores dominated the mining and quarrying sector, accounting for 98.1% of the value of production in this sector. In 2014, industrial production increased by 2.7% compared with that of 2013; mining and quarrying decreased by 7.4%; and mining of metallic ores decreased by 7.3%. (National Statistical Service of the Republic of Armenia, 2014; 2015b; U.S. Central Intelligence Agency, 2015).

¹Where necessary, values have been converted from Armenian drams (AMD) to U.S. dollars (US\$) at an annual average exchange rate of AMD415=US\$1.00 for 2014.

Production

In 2014, Armenia's estimated production of steel rebar increased 12.5 times owing to the opening of a new plant at the end of 2013. Production of rhenium increased by 17.8%; that of mined gold, by 15%; rolled aluminum, by 10.7%; aluminum foil, by 5.5%; and cadmium, by 5.3%. Production of bentonite decreased by 95%; perlite, by 74%; caustic soda, by 42%; and cut diamond, by 36.2%. Output of gypsum decreased by 22%; copper in concentrate, by 15.7%; and primary copper metal, by 8.9%. Data on mineral production are in table 1.

Structure of the Mineral Industry

Table 2 is a list of companies working in Armenia's mineral industry.

Mineral Trade

In 2014, Armenia had a significant trade deficit as the country's exports, which were valued at \$1.52 billion, were much lower than the country's imports of \$4.40 billion. Mineral commodities constituted a significant share of the country's export revenue. The main export commodities were cut diamond, energy (electric power), foodstuffs, nonferrous metals, pig iron, unwrought copper, and other mineral products. Overall, exports of mineral and energy products accounted for \$386 million, or 25.4% of the country's export revenue. Out of that amount, exports of copper ores and concentrates accounted for \$236 million (61.1%); electrical energy, for \$81 million (21.1%); precious metal ores and concentrates, \$32.7 million (8.5%); zinc ores and concentrates, \$13.8 million (3.6%); molybdenum ores and concentrates, \$8.7 million (2.7%). Exports of pearls, precious stones, and precious metals accounted for \$228 million, or 15% of the country's total exports; among them, cut diamond accounted for \$118 million (51.8%) and unwrought gold accounted for \$81.9 million (35.9%). Exports of base metals and articles made of them accounted for \$302 million, or 19.9% of the country's export revenue. Among them, ferroalloys contributed \$109.7 million (36.2%); aluminum and articles made of it, \$93.3 million (30.9%), and copper and articles made of it, \$75.4 million (24.9%). The main export partners of Armenia in 2014 were Russia (which accounted for 20.3% of Armenia's export revenue), China (11.3%), Germany (10.4%), Canada (6.1%), the United States (5.8%), Bulgaria and Iran (5.6% each), Georgia (5.5%), Iraq (5.3%); the Netherlands (4.9%), and Belgium (4.1%). In 2014, Armenia's imports of mineral products included rough diamond, natural gas, and petroleum. The main trade partners for imports were Russia (which provided 24.9%, by value, of Armenia's imports), China (9.5%), Germany (6.4%), Turkey (5.3%), Iran (4.7%); Ukraine (4.6%); Italy (4.1%), Switzerland (3.3%), and the United States (3.0%) (National Statistical Service of the Republic of Armenia, 2015a, b; U.S. Central Intelligence Agency, 2015).

Commodity Review

Metals

Aluminum.—The ARMENAL aluminum foil rolling mill was one of the leading production facilities in Armenia and the only producer of aluminum foil in the Caucasus and Central Asia regions. In 2014, the plant employed about 700 workers at an average monthly wage of 366,000 drams (about \$882), which was an increase of 9.2% compared with that of 2013. Aluminum foil from ARMENAL was exported to 15 countries in Africa, Asia, Europe and North America; the United States was the leading consumer of ARMENAL's foil. In 2014, the plant completed about 1,800 export orders. In 2014, ARMENAL produced 29,231 metric tons (t) of aluminum foil, which was an increase of 5.5% compared with the 2013 production volume. The plant planned to increase production to 33,600 t in 2015 or 2016 and to 40,000 t by 2020 (MetalDaily.ru, 2014; Delovoy Ekspres, 2015; Regnum.ru, 2014b, 2015; United Company RUSAL, 2015).

Copper.—In 2014, Armenia had three enterprises engaged in mining copper—Agarak copper-molybdenum Mining and Processing Complex (ACMC), Dundee Precious Metals Kapan, and Zangezur copper-molybdenum Complex (ZCMC); of the three, ZCMC was the leading producer. ACMC and ZCMC also produced molybdenum and rhenium as a byproduct of copper production. In Armenia, copper production was a significant source of export revenue, and copper producers were among the most significant taxpayers. In 2014, Armenia exported 185,000 t of copper concentrate and received \$236 million. In the same year, ZCMC was the fourth-ranked taxpayer in the country, having paid about 20 billion drams (\$48.2 million). The decrease in world copper prices, however, significantly affected Armenia. In 2013, the country exported 173,000 t, or 12,000 t less than in 2014, but received the revenue of \$280 million, or \$44 million more than in 2014 (Hetq.am, 2015).

In December, ZAO Teghout opened a new mine at the site of the Teghout copper-molybdenum deposit. In the first year of the operation, it was planning to mine and process 7 million metric tons per year (Mt/yr) of ore and then to increase annual ore processing to 7.5 million metric tons (Mt) in 2016 and 9 Mt in 2017. The company anticipated that ore mining and processing would be between 12 and 14 Mt/yr in about 5 years. During the first 10 years of operation, the company was expecting to produce 64,000 metric tons per year (t/yr) of copper concentrate with copper content of 31% and about 760 t/yr of molybdenum concentrate with molybdenum content of up to 50%. To address environmental and cultural concerns related to development of the deposit, the company was planning to plant trees in an area of 714 hectares to replace the 375 hectares of the Teghout Forest that would be cut when the mine was developed. Also, the Institute of Archeology and Ethnography will provide oversight during mining activities to identify any culturally significant artifacts that may be discovered (Manukyan, 2014; Regnum.ru, 2014c).

The Teghout deposit is located in northern Armenia, in Lori Martz, near the border with Georgia. The estimated resources of the Teghout deposit were 450 Mt at 0.355% copper

(1.6 Mt of contained copper) and 0.022% molybdenum (99,000 t of contained molybdenum). The deposit was considered to be the second-largest deposit in Armenia (after the Kajaran deposit) based on its resources. ZAO Teghout was founded in 2006 and was a part of the Vallex Group (Manukyan, 2014; Regnum.ru, 2014c).

In October, the Eurasian Development Bank (EABR) and the bank of the Eurasian Economic Union, which Armenia recently joined, agreed to provide an \$11 million loan to ZAO Sagamar for a period of 5 years. ZAO Sagamar had a development license for the gold-polymetallic deposit Armanisskoye, which is located within 5 kilometers (km) of the town of Stepanakert in Lori Martz. The borrowed funds would be spent on exploration activities, mine development, the purchase of mining equipment, and the refinancing of existing loans. The total cost of the project was estimated to be \$70 million. EABR representatives stated that the loan was the bank's first investment project in the country. The Armanisskoye deposit had significant resources of cadmium, copper, gold, lead, silver, and zinc; the Armanisskaya beneficiation plant, which was built in 2011, had the capacity to process up to 550,000 t/yr of polymetallic ore. ZAO Sagamar was a part of Global Metals Group and had been developing the deposit since 2002 (Ecolur.org, 2011; Evraziyskiy Bank Razvitiya, 2014; Regnum, 2014a).

Gold.—In 2014, Armenia produced 3,994 kilograms (kg) of gold, which was a 15% increase compared with the 2013 production volume. In 2014, Armenia exported 3.6 t of gold valued at about \$82 million, which was an all-time record. Over the past several years, the country significantly increased its exports of gold. In 2013, Armenia exported 2,730 kg of gold, while in 2008, the country exported only 252 kg. (HayastanNews.com, 2015).

The Ararat Gold Recovery Co. (AGRC), which was also known as GPM Gold, continued to mine the Sotk (Zod) deposit. AGRC (a subsidiary of GeoProMining of Russia) had a gold processing facility in the city of Ararat. In April 2014, AGRC completed a technical modernization that cost a total of \$140 million and included the application of Albion Process™ technology and completion of a new beneficiation plant in Ararat City. The Albion Process™ was initially developed by Glencore plc of Switzerland and was previously used in Germany, Spain and the Dominican Republic; Armenia was the fourth country in the world where this technology was used to treat refractory gold. AGRC expected that the new technology would allow the company to increase gold production to 4,500 kilograms per year (kg/yr) in 2015 and beyond. (Arka.am, 2014c).

In 2014, ZAO Geoteam of Armenia, which represented Lydian International Ltd. of the United Kingdom, was continuing exploration and preparation for development of the Amulsar gold deposit located in southeastern Armenia between the Arpa and the Vorotan Rivers. According to the most recent estimates, the proven and probable reserves of Amulsar were 70.3 t of gold and 300 t of silver; measured and indicated resources of gold were estimated to be 74.6 t, and inferred resources, 53 t of gold. The company was planning to begin producing gold on a commercial scale in 2016. The company already invested about \$46 million in exploration and

the cost of mine construction was estimated to be \$270 million. Geoteam was planning to produce about 6,200 kg of gold per year. Among the shareholders of Lydian International were the International Financial Corporation (IFC) and the European Bank for Reconstruction and Development (EBRD) (Delovoy Ekspress, 2014c).

In October, Armenia's Central Bank and Technosert SA of Switzerland signed a memorandum of understanding concerning construction of a precious metals refinery to process gold and silver. The refinery would process gold and silver concentrates produced in Armenia. The function of the new enterprise would be to produce 99.99% standard gold bullion and sell it in Armenia and on international markets; the envisioned company would also provide complex services, such as investment consulting and portfolio management, to investors (Volkov, 2014).

Iron and Steel.—In October 2013, a new metallurgical plant opened in the city of Charentsavan in the Kotaiks region, which is located 25 km to the northeast of Yerevan. The total investment in the plant was estimated to be \$30 million, more than 70% of which was the cost of the equipment itself. The new plant was producing steel-reinforcing bars (rebar) from metal scrap collected in Armenia; the existing supply of scrap in the country was estimated to be sufficient to provide raw material for the plant for the next 10 years. The plant's rolling mill would have the capacity to produce 125,000 t/yr of steel starting in 2014; at the time of opening the plant was operating at about 30% of its full capacity (News.am, 2013; Delevoy Ekspress, 2014b).

By November 2014, the plant reached a capacity of about 50,000 t/yr and was meeting about 60% of domestic demand for rebar. In 2015, the company was planning to start production of metal balls for the mining industry and to reach a production capacity of 20,000 t by the end of the year. In 2014, the plant employed 450 people; production of metal balls would create jobs for another 100 workers. In 2016, the plant was anticipating installation of an additional furnace and an expansion of production that would enable it to export some of its products (Arka.am, 2014b; Delevoy Ekspress, 2014b).

Industrial Minerals

Cement.—In 2014, Armenia produced 427,000 t of cement, which was a slight decrease compared with the 431,000 t produced in 2013. In 2014, Armenia exported 73,000 t of cement, which was a significant decrease compared with the 112,200 t exported in 2013. Experts suggest that the reason behind the decrease was the recent opening of a new HeidelbergCement plant in neighboring Georgia, which reduced that country's need to import cement to satisfy its domestic demand (Bizzzone.info, 2015).

In 2014, Armenia had two cement plants—the Mika Cement (also known as the Hrazdan Cement Plant) and the ZAO Ararat Cement Plant. Both plants were closed stock companies and, in the past decade, produced cement in an amount well below their capacities because of low levels of construction activity in Armenia. Mika Cement had two cement production lines and the capacity to produce up to 1.2 Mt of cement in 10 different

types of portland cement. At the beginning of 2014, the owners of Mika Cement went bankrupt, and the shares of the company were retained by the VTB Bank (Armenia). Production at the cement plant was stopped in April and the plant was not in operation until July, when VTB Bank provided an operating loan to the plant. The bank indicated that it wanted to preserve the cement plant as it was important to the town of Hrazdan, and it was looking to sell Mika Cement. As of yearend 2014, the plant employed 410 workers (Delovoy Ekspress, 2014a; Arka.am, 2015a, b).

Mineral Fuels and Related Materials

Uranium.—In August, the Government announced that it would agree to increase the charter capital of ZAO Armenian-Russian Mining Company (ARMC), which was a joint venture of the Government and OAO Atomredmetzoloto (ARMZ) of Russia, for uranium exploration in Armenia. The company had a monopoly right to conduct exploration for uranium in the country, without any restrictions or area specifications. ARMC was created in 2008, and the partners had a total of 300 shares (150 shares each) in the nominal charter capital. As of January 1, 2014, the value of the charter capital was 989.5 million drams (\$2.4 million). The Russian partner contributed \$3 million in exploration work. In 2014, ARMZ added 95 million drams (about \$229,000) to the charter capital, and the Government of Armenia contributed the same amount in the form of geologic information. The company's license was to expire in 2015 (AtomInfo.ru, 2009; Arka.am, 2014a; Ecolur.org, 2014).

Outlook

In the next few years, Armenia is likely to significantly increase its gold production, which could make a gold refinery economically viable. Armenia is also likely to continue producing copper, molybdenum, and rhenium. The country's ability to increase production of industrial minerals in the near future would probably depend on many factors, including building better infrastructure to facilitate exports. After Armenia joins the Eurasian Customs Union, the country's economy could receive a boost from lower energy prices and better access to the capital markets of Kazakhstan and Russia, or it could slow down because of the recessionary trends in the countries of the Eurasian Economic Union.

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TABLE 1
ARMENIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2010	2011	2012	2013	2014	
METALS						
Aluminum:						
Rolled	27	26	21	18	20	
Foil	24,617	25,289	26,243	27,700	29,231	
Cadmium	3	--	43	41	43	
Copper:						
Concentrate, Cu content	31,062	33,597	41,220	48,887	41,216	
Blister, smelter, primary	7,644	8,876	10,075	10,771	9,814	
Ferromolybdenum	5,126	5,525	5,836	6,619	6,528	
Gold, mine output, Au content	kilograms	1,946 ^r	2,736	2,896	3,473	3,994
Molybdenum:						
Concentrate, Mo content	5,408 ^r	5,745 ^r	6,525 ^r	6,900	7,162	
Metal	466 ^r	486	675	746 ^r	748	
Rhenium	kilograms	183 ^r	254 ^r	293 ^r	298 ^r	351
Silver	do.	21,892 ^r	25,205 ^r	22,244 ^r	19,458	19,333
Steel, rebar	--	--	--	4,000 ^c	50,000 ^c	
Zinc, concentrate, Zn content	7,808	8,475	10,700	10,530	9,710	
INDUSTRIAL MINERALS						
Barite ^c	600 ^r	600	600	600	NA	
Caustic soda	960	63	82	96	56	
Cement	thousand metric tons	488	422	438	431	427
Clays, bentonite	1,397	835	4,987	15,387	798	
Diamond, cut	carats	65,000	65,000	67,000	94,000	60,000
Diatomite ^c	220	220	220	220	NA	
Gypsum	38,700	34,027 ^r	30,446 ^r	28,679 ^r	22,317	
Lime	thousand metric tons	20,595	25,053	27,294	28,238	26,167
Perlite	95	229	181	53	14	
Salt	29,400	35,600	38,000	30,800 ^r	30,000	
Tuff	83,104	95,402	64,224	53,203	54,514	

^cEstimated; estimated data are rounded to no more than three significant digits. ^rRevised. do. Ditto. NA Not available. -- Zero.

¹Table includes data available through August 19, 2015.

TABLE 2
ARMENIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014¹

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit name	Annual capacity ²	
Aluminum, rolled and foil	ARMENAL (formerly Kanaker aluminum plant) (United Company RUSAL)	Kanaker	29,500	
Cement	thousand metric tons	ZAO Ararat Cement plant	Ararat region	1,200
Do.	do.	Mika Cement	Hrazdan	1,200
Copper:				
Mine output, Cu content	Agarak copper-molybdenum Mining and Processing Complex (ACMC) [GeoProMining, Ltd. (GPM)]	Agarak	NA ²	
Do.	Dundee Precious Metals Kapan (Dundee Precious Metals Inc.)	Kapan	NA	
Do.	Zangezur copper-molybdenum Complex (ZCMC) [Cronimet Mining GmbH, 60%; OAO Yerevan Pure Iron Plant, 15%; Armenian Molybdenum Production LLC (AMP), 12.5%; Zangezur Mining LLC, 12.5%]	Kajaran	NA	
Do.	ZAO Teghout (Vallex Group)	Lori Martz	NA	
Blister	ZAO Armenian Copper Programme (ACP) (Vallex Group)	Alaverdi	15,000	
Diamond, cut stones	Aghavni diamond-cutting works ³	Nor Geghi	NA	
Do.	Amma group diamond-cutting works ³	Artashat	NA	
Do.	Andranik-Dashk diamond-cutting works	Nor Hachyn	NA	
Do.	Arevakn diamond producing plant	do.	NA	
Do.	Diamond Company of Armenia (DCA)	Yerevan	NA	
Do.	Diamond Tech	Talin	NA	
Do.	Lori diamond-cutting works	Nor Hachyn	NA	
Do.	Lusampor ³	Melik'gyugh	NA	
Do.	Punji diamond-cutting works ³	Yerevan	NA	
Do.	Sapphire diamond-cutting works	Nor Hachyn	NA	
Do.	thousand carats	Shoghakan gem-cutting plant	do.	120
Gold	kilograms	Ararat Gold Recovery Co. (AGRC) [GeoProMining, Ltd. (GPM)]	Sotk (Zod)	2,000
Do.	Dundee Precious Metals Kapan (DPMK) (Dundee Precious Metals Inc.)	Shahumian deposit, Kapan	NA	
Molybdenum:				
Mine output, Mo content	Agarak copper-molybdenum mining and processing complex (ACMC) [GeoProMining, Ltd. (GPM)]	Agarak	2,000	
Do.	Zangezur copper-molybdenum complex (ZCMC) [Cronimet Mining GmbH, 60%; OAO Yerevan Pure Iron Plant, 15%; Armenian Molybdenum Production LLC (AMP), 12.5%; Zangezur Mining LLC, 12.5%]	Kajaran	20,400	
Metal, ferromolybdenum	Armenian Molybdenum Production LLC (AMP) (Cronimet Mining GmbH, 51%, and Armenian residents, 49%)	Yerevan	3,600	
Do.	OAO Yerevan Pure Iron Plant	Yerevan	NA	
Perlite	thousand metric tons	OAO Aragats Perlit	Aragats deposit	1,110
Rhenium	Agarak copper-molybdenum mining and processing complex (ACMC) [GeoProMining, Ltd. (GPM)]	Agarak	NA	
Do.	Zangezur copper-molybdenum complex (ZCMC) [Cronimet Mining GmbH, 60%; OAO Yerevan Pure Iron Plant, 15%; Armenian Molybdenum Production LLC (AMP), 12.5%; Zangezur Mining LLC, 12.5%]	Kajaran	NA	
Steel, rebar	Armenian Steel Casting Enterprise (ASCE) Group	Charentsavan	50,000	
Zinc, mine output, Zn content	Dundee Precious Metals Kapan (Dundee Precious Metals Inc.)	Kapan	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 the names of locations.

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

³Current existence of enterprise cannot be confirmed.