



2013 Minerals Yearbook

POLAND

THE MINERAL INDUSTRY OF POLAND

By Sean Xun

In 2013, Poland was estimated to be the world's 2d-ranked producer of rhenium, the 7th-ranked producer of silver, the 11th-ranked producer of cadmium, and the 13th-ranked producer of mined copper. Industrial minerals, such as feldspar, gypsum, lime, salt, sand and gravel, and sulfur, were also produced in significant quantities. For mineral fuels, Poland was estimated to be the world's ninth-ranked producer of coal in 2013, but it was dependent on imports to meet domestic demand for natural gas and oil (World Coal Association, 2014; Apodaca, 2015; Bolen, 2015; Brininstool, 2015; Corathers, 2015; Crangle, 2015; Dolley, 2015; Katrivanos, 2015; Polyak, 2015; Tanner, 2015; Tolcin, 2015).

Minerals in the National Economy

In 2013, Poland's real gross domestic product (GDP) increased by 1.6% compared with that of 2012. The GDP for 2013 was \$505 billion. Mining and quarrying accounted for about 1.9% of the total GDP. In 2012 (the latest year for which data were available), the total value of mineral commodity production was estimated to be \$22.9 billion, which was a 1% increase from 2011. Mineral fuels, metals, and industrial minerals made up about 49%, 33%, and 18%, respectively, of the value of Poland's mineral commodity production. Bituminous (hard coal) accounted for 60% of the total value of mineral fuels production, followed by lignite (13%), natural gas (7%), and crude oil (5%). Copper production accounted for 60% of the value of metals production, followed by silver (30%), lead (5%), and zinc (4%). Cement production accounted for 34% of the value of industrial minerals production, followed by aggregates (29%), limestone (11%), dimension stone (10%), and lime (4%) (Burkowicz and others, 2013, p. 11, 12; Dmochowska, 2014, p. 476; International Monetary Fund, 2014, p. 54).

Government Policies and Programs

The Polish Geological and Mining Law (GML) of June 9, 2011, which included particular regulations on hydrocarbons, became effective on January 1, 2012. In March 2013, a draft proposal to amend the GML was published by Poland's Ministry of Environment, adding some new features on licensing, the environment, impact on communities, taxation, and the National Energy Mineral Operator Fund (a national fund for environmental protection and water management). It proposed new taxes based on the value of the extracted raw materials for gas, oil, and other hydrocarbons, and a limit on the extraction tax equal to 40% of the company's gross profit (Rutkowska-Subocz, 2012; Library of Congress, 2013).

Poland's Ministry of Finance started collecting new taxes on the extraction of copper and silver on April 18, 2012, under the Act of March 2, 2012. The new tax targeted the country's sole copper and silver producer, KGHM Polska Miedz S.A. (KGHM).

Also in March, the Ministry of Finance completed a draft hydrocarbon taxation proposal, which called for a 39% tax rate for shale deposits and a 41.92% tax rate for conventional oil and gas deposits (Library of Congress, 2013; Ministry of Finance of the Republic of Poland, 2013).

In March 2012, the Government announced its new Privatization Plan for the years 2012–2013. The primary purpose of the plan was to present the main objectives of the privatization policy and to list the affected companies. The plan included leading mining and energy companies, which are discussed in the Structure of the Mineral Industry section below. Implementation of the plan was reported to be on schedule by September 2013 (European Bank for Reconstruction and Development, 2013; Ministry of Treasury of the Republic of Poland, 2012, p. 14, 16).

Other relevant laws and policy documents included the Polish Energy Law of April 10, 1997; the Environmental Protection Law of April 27, 2001; the Act on Reserves of Crude Oil, Petroleum Products and Natural Gas of February 16, 2007; and the Energy Policy of Poland until 2030 of November 10, 2009 (Rutkowska-Subocz, 2012; Library of Congress, 2013).

Production

In 2013, rock salt production increased by 66% to 1.3 million metric tons (Mt); crude petroleum, by 42% to 7.1 million barrels (Mbbbl); crude bentonite, by 31% to 1,050 metric tons (t); crude magnesite, by 27% to 165,000 t; secondary copper, by 24% to 102,000 t; secondary lead, by 18% to 103,000 t; gold metal, by 16% to 1,066 kilograms (kg); refined zinc, by 12% to 154,379 t; foundry sand, by 9% to 1.311 Mt; crude kaolin, by 8% to 268,000 t; cold-rolled steel, by 8% to 815,000 t; total refined lead, by 6% to 142,000 t; total smelter copper metal, by 6% to 584,356 t. Secondary aluminum production decreased by 75% to 2,733 t; peat, fuel, and agricultural, by 33% to 507,000 t; lime-sand brick, by 29% to 519,000 cubic meters; native, frasch sulfur, by 22% to 526,300 t; primary lead, by 17% to 39,000 t; total sulfur, by 13% to 1.060 Mt; crude fire clay, by 12% to 105,000 t; natural gypsum rock and anhydrite, by 12% to 1.085 Mt; cement clinker, by 11% to 10.5 Mt; selenium, by 11% to 80 t; hydraulic cement, by 9% to 14.538 Mt; silver metal, by 9% to 1,161 t; total lead content in copper ore and lead-zinc ore, by 9% to 51,710 t; pipe steel, by 9% to 860,000 t; rhenium content in ammonium perhenate, by 7% to 7,530 kg; and crude steel, by 6% to 8.0 Mt. Coal and refined copper production were relatively unchanged in 2013 compared with 2012. Pig iron production increased slightly (by 2%) to about 4.0 Mt. Data on mineral production are in table 1.

Structure of the Mineral Industry

The majority of companies in the mineral industry in Poland were privately owned. The Polish Government (through

ownership of shares by the Polish Ministry of Treasury) also owned shares in a small number of significant producers of mineral products but was attempting to privatize many of these holdings. The Ministry of Treasury's Privatization Plan for the years 2012–2013 listed 300 companies, in which some or all the Government's shares were available for sale. The Ministry of Treasury planned to completely exit from 85% of supervised companies while retaining a controlling stake in strategically important companies. The strategically important companies included energy production companies ENEA S.A., ENERGA S.A., PGE Polska Grupa Energetyczna S.A., Zespół Elektrowni "Patnow-Adamow-Konin" S.A., and Zespół Elektrowni Wodnych Niedzica S.A.; and mining companies Jastrzebska Spolka Weglowa S.A., Katowicki Holding Weglowy S.A., Kompania Weglowa S.A., Kopalnia Wegla Brunatnego "Adamow" S.A., Kopalnia Wegla Brunatnego "Konin" w Kleczewie S.A., and Lubelski Wegiel Bogdanka S.A. (Ministry of Treasury of the Republic of Poland, 2012, p. 14, Appendixes 1–3; European Bank for Reconstruction and Development, 2013).

The Privatization Plan also identified the following mining-related companies as entities of key importance that would remain under the supervision of the Ministry of Treasury: PGE Polska Grupa Energetyczna S.A., TAURON Polska Energia S.A., KGHM Polska Miedz S.A. (KGHM), Operator Gazociągów Przesyłowych GAZ-SYSTEM S.A., Polskie Górnictwo Naftowe i Gazownictwo S.A. (PGNiG), Grupa LOTOS S.A., and Polski Koncern Naftowy Orlen S.A. (PKN) (Ministry of Treasury of the Republic of Poland, 2012, p. 16, Appendixes 1–3).

As of 2013, the Government's most important holdings in the mining and mineral sector included a 31.79% stake in KGHM (copper, rhenium, silver, and other metals), a 53.20% stake in Grupa LOTOS (oil and gas), a 72.41% stake in PGNiG (oil and gas), a 27.52% stake in PKN (refinery), a 55% stake in Jastrzebska Spolka Weglowa S.A. (bituminous coal), and a 61.88% stake in PGE Polish Energy Group plc. (bituminous coal and lignite). Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2012 (the latest year for which mineral trade data were available), the total value of exported mineral commodities was \$9.85 billion; the total value of imported mineral commodities was \$34.82 billion. Trade statistics for mineral materials in years 2008 to 2012 showed that about 20 commodities were exported from Poland in large amounts, and that the domestic needs for 70 of 140 minerals were met exclusively by imports (Burkowicz and others, 2013, p. 17–18).

In 2013, the value of the country's exports amounted to \$206 billion, and the value of imports was \$208 billion. The leading export mineral commodity in 2013, in terms of value, was copper and copper alloys at about \$2.56 billion, followed by silver at about \$894 million. The country's major export trade partners for copper and copper alloys were Germany (42%), China (27%), France (9%), and Italy (8%). The leading import commodity in terms of value was crude petroleum and natural gas condensate (about \$18.0 billion), followed by natural gas at \$1.5 billion, and iron ore and concentrates (including roasted

iron pyrites) at \$689 million. Russia supplied 94% of Poland's crude petroleum imports (Central Statistical Office of Poland, 2014b).

Poland's exports to the United States were valued at about \$4.9 billion in 2013 compared with \$4.6 billion in 2012. Of this amount, fuel oil accounted for about \$245 million; bauxite and aluminum, about \$11.4 million; copper, about \$6.7 million; stone, sand cement, about \$3.9 million; and zinc, about \$175,000. Imports from the United States were valued at about \$3.8 billion in 2013 compared with about \$3.3 billion in 2012. Of this amount, metallurgical-grade coal accounted for about \$74.9 million; iron and steel mill products, about \$15.8 million; other coal and fuels, about \$11.5 million; and aluminum and alumina, about \$5.4 million (U.S. Census Bureau, 2014a, b).

Commodity Review

Metals

Copper.—As of 2013, Poland's estimated copper resources were 1,762 Mt containing 34 Mt of copper, and they were ranked ninth in the world. The mines were mainly located in the areas of the Fore-Sudetic Monocline and North Sudetic Basin. Exploited deposits in the area of the Fore-Sudetic Monocline accounted for 82% of the total economic resources (Polish Geological Institute, 2014b).

KGHM was Poland's only producer of mined copper and primary copper metal. The company had three mining divisions (the Lubin, the Polkowice-Sieroszowice, and the Rudna divisions), and it operated three copper refineries (Glogow I, Glogow II, and Legnica). About 40% of the refined copper from the smelters was further processed to copper wire rod at the Cedynia copper rolling mill in Orsk. In 2013, the company produced 32.2 Mt of copper ore, which was 0.5 Mt more than in 2012. The average copper content decreased to 1.57% copper in 2013 from 1.59% in 2012 owing mainly to the lower copper content in the ore. The copper content of the extracted ore was 481,770 t compared with 479,250 t in 2012. The production of concentrate was about 1.86 Mt containing 23.10% or about 429,000 t of copper. Production of electrolytically refined copper amounted to more than 565,000 t. In 2013, the revenue from copper and copper products was \$4.5 billion. Domestic sales accounted for 20% of the company's total copper sales. The largest foreign customers were from China, the Czech Republic, France, and Germany. In recent years, the copper content of the ore had been steadily decreasing and required the extraction of more ore to maintain the level of copper content. KGHM also used increasing amounts of purchased copper scrap, blister, and imported concentrates to maintain refined copper production. In 2013, secondary copper production increased by 24% compared with the 3% increase in primary copper production (KGHM Polska Miedz S.A., 2014, p. 108–114, 148–150, 258).

The existing mining concessions for the extraction of copper that are located in the Lubin-Malomice, the Polkowice, the Rudna, and Sieroszowice areas were expected to expire by yearend 2013, and that in the Radwanice-Wschod area, by 2015. On August 14, the Ministry of the Environment signed three concession decisions for continued extraction of copper from

the deposits. By the end of 2013, three mine operating plans were approved by the District Mining Office. The company continued mining operations from January 1, 2014, based on the new concessions, which were valid through December 31, 2063 (KGHM Polska Miedz S.A., 2014, p. 113).

Gold and Silver.—In 2013, the reserves of silver in Poland were estimated to be 84,030 t, which were the third largest in the world. Resources of gold were estimated to be about 350 t. In 2013, all silver and gold was extracted from copper-silver deposits in the area of the Fore-Sudetic Monocline in the southwest of Poland. Gold and silver production were entirely a byproduct of copper ore processing at KGHM's Glogow refinery. The anode slime produced as a byproduct of the electrorefining process was further processed to recover precious metals. In 2013, KGHM produced 1,066 kg of gold, a 16% increase compared with that of 2012. The silver production was 1,161 t, a 9% decrease from that of 2012. The company's revenues from the sales of silver and gold were about \$1.1 billion and \$45.6 million, respectively. Export sales to European Union (EU) countries accounted for 98% of total sales of silver; the major importers were Belgium, the United Kingdom, and the United States (Katrivanos, 2014; KGHM Polska Miedz S.A., 2014, p. 109–114; Polish Geological Institute, 2014b, c).

Iron and Steel.—Poland has not produced iron ore since 1990 and was dependent on imported iron ore and concentrates for domestic pig iron production. Iron ore and concentrates imports were 6.6 Mt in 2013 compared with 6.5 Mt in 2012. About 63% of these imports came from the Ukraine and about 17% came from Russia. All the imported iron ore and concentrates were used for pig iron production at ArcelorMittal Poland S.A.'s iron and steel plants at Dabrowa Gornicza and Krakow, which were the only pig iron producers in Poland (Burkowicz and others, 2013, p. 279; Central Statistical Office of Poland, 2014b).

In 2013, steel production amounted to 8.0 Mt, of which 55% was produced by the basic oxygen furnace (BOF) process and 45% by the electric arc furnace process. In the years 2009 to 2013, BOF production increased gradually in terms of the percentage of total production. The average production capacity utilization in Poland's steel industry was 63%, which was 1% lower than in 2012. Poland's consumption of steel products decreased in 2013 by 1% from that of 2012 to 10.3 Mt. Flat products accounted for 57% of consumption; long products, 33%; and pipe and hollow sections, 10%. Exports of steel products were 4.9 Mt, which was a 12% decrease compared with those of 2012. The major importers of Polish steel products were the Czech Republic and Germany (56% of exports). Imports of steel products were 7.9 Mt, of which 75% were from EU countries. Employment in the steel industry decreased by 8% compared with 2012 to 22,200 (Polish Steel Association, 2014, p. 18, 21–27).

ArcelorMittal Poland S.A. was the largest steel producer in Poland, representing about 70% of the country's steel production capacity. Approximately 50% of raw steel in the country was produced at ArcelorMittal's plants at Dabrowa Gornicza and Krakow using the BOF process. In 2013, A.M. Warsawa Sp. Z.O.O. temporarily idled its Warszawa steel plant and rolling

mill, citing decreased sales owing to illegal practices in steel trading in Poland. Cognor S.A. held a 100% interest in Ferrostal Labedy Sp. z o.o. and Huta Stali Jakosciowych S.A., which had a combined crude steel production capacity of 636,000 t. The capacity utilization was 79.6% in 2013, and 504,503 t of crude steel was produced, which was a 9% increase compared with 462,847 t in 2012. The market share of Cognor's billet sales in Poland was about 20% (ArcelorMittal Poland S.A., 2013; Burkowicz and others, 2013, p. 282; Cognor S.A., 2014, p. 13).

Rhenium.—The average rhenium content in the copper ore from the Fore-Sudetic Monocline deposits was 0.6 parts per million (ppm) with a range of 0.4 to 1.1 ppm. KGHM Ecoren S.A. was the only European producer of ammonium perrhenate (APR) and metallic rhenium from its own sources. The company started APR production at the Glogow copper smelter in 2006 by using byproducts (sulfuric acid waste) from copper production. Metallic rhenium capacity (3.5 metric tons per year of rhenium pellets) was established in 2010 near the Legnica copper smelter. The facility was capable of producing marketable quantities of metallic pellets containing 99.95% rhenium, which is an important additive in superalloys used in the production of jet engines and catalysts. As the second-ranked producer in the world responsible for about 10% of total world production of rhenium contained in APR, the company produced 11,630 kg of APR containing 8,076 kg of rhenium (estimated) in 2012. In 2013, KGHM Ecoren reported rhenium production of 7,530 kg in 10,800 kg (estimated) of APR. The major importers of the APR product from Poland included Austria, Japan, the United Kingdom, and the United States (Burkowicz and others, 2013, p. 419–420; Polish Geological Institute, 2014b; Polyak, 2015).

Industrial Minerals

Cement.—HeidelbergCement Group (Heidelberg) of Germany through its subsidiary Gorazdze Cement S.A. operated one cement plant in Gorazdze and one grinding plant in Katowice. The company launched three new cement products with lower proportions of clinker on the market in Poland in 2013. By the end of 2013, Heidelberg's total cement capacity in the country increased to 6.0 million metric tons per year (Mt/yr) compared with 5.6 Mt/yr in 2012. The company sold five concrete plants in Poland in 2013 as part of a geographical realignment. An increase of 2.0% in domestic cement demand in 2014 was expected by the company (HeidelbergCement Group, 2014, p. 47, 59, 102, 278).

Mineral Fuels

Coal.—The country's estimated bituminous coal resources as of 2013 were about 51,000 Mt. All the operating coal mines were situated in the Upper Silesian Coal Basin region except the large Bogdanka Mine. Total resources at exploited deposits were 19,485 Mt, accounting for 38% of total estimated resources. There were five new deposits documented in 2013, adding about 3,188 Mt of estimated resources in comparison with 2012. Estimated resources of brown coals (subbituminous) amounted to about 22,700 Mt as of the end of 2013. Estimated resources within exploited deposits amounted to 1,514 Mt, accounting

for 6.8% of total estimated resources. Brown coal was being exploited in the following five deposits: Adamow, Belchatow, Konin, Sieniawa, and Turow. The two leading producers in 2013 were the Belchatow-pole Adamow deposit (32.94 Mt, or 49.8% of the country's total) and the Belchatow-pole Szczercow deposit (9.12 Mt, or 13.8% of the country's total) (Polish Geological Institute, 2014a, d).

In 2013, Poland was the world's ninth-ranked coal (including bituminous coal and lignite) producer. In 2013, bituminous coal and lignite accounted for 84% of primary energy production in the country. Consumption of bituminous coal and lignite was 78.5 Mt and 65.8 Mt in 2013, compared with domestic production of about 76.8 Mt and 65.8 Mt, respectively. Even though Poland's oil and gas production was low, its dependence on energy imports was 31% in 2012 compared with an average of 52% for EU countries because of its high levels of coal production and consumption (Central Statistical Office of Poland, 2014a, p. 4, 10, 18; World Coal Association, 2014).

Kompania Węglowa (KW) S.A. was the leading bituminous coal producer in Poland and in the EU. It operated mines in Silesia Province and Małopolskie Province. The company had estimated resources of about 7,812 Mt. The 14 coal mines operated by KW S.A. had a total mining capacity of 34 Mt/yr. The company ended the first half of 2013 with losses of about \$31 million. In September, the company started to implement measures to deal with the financial situation. One of the measures was to transfer miners and equipment from the Piekary Mine to the Bielszowice Mine. KW S.A. planned to decrease the number of its mines from 14 in 2013 to 8 by 2020, and to reduce production volume from about 38 to 40 Mt in 2012 to about 25 Mt in 2020. One reason for the high cost of mining was that the coal seams were too deep to be mined cost effectively (Kompania Węglowa S.A., 2014; Vorutnikov, 2014).

Natural Gas and Petroleum.—As of 2012, the crude petroleum reserves in the Barnowko-Mostno-Buszewo (BMB), Cychry, Grotow, and Lubiatow deposits were about 145 Mbbbl. The reserves of the B3 and B8 blocks on the Baltic Sea Shelf were about 35 Mbbbl. The natural gas reserves of the deposits in the Carpathian Foredeep, Carpathian Mountains, and Polish Lowland were 64.1 billion cubic meters; the natural gas reserves of the B4 and B6 offshore blocks on the Baltic Sea Shelf were 5.1 billion cubic meters. Shale gas resources in the Lower Paleozoic shale were estimated to be between 348 to 768 billion cubic meters. By the end of 2012, the Ministry of Environment had granted 115 shale gas prospecting licenses (Burkowicz and others, 2013, p. 217, 218, 377).

Production of crude oil increased by 42% in 2013 compared with 2012, reaching about 7.1 Mbbbl; the domestic consumption of crude oil was about 173 Mbbbl, indicating an import dependency of 96%. Production of natural gas was about 5.88 billion cubic meters; the domestic consumption of natural gas was about 13.37 billion cubic meters (Central Statistical Office of Poland, 2014a, p. 19–20).

Grupa LOTOS S.A. through its subsidiary LOTOS Petrobaltic S.A. operated concessions for oil and gas within the Polish Economic Zone (PEZ) on the Baltic Sea Shelf. At the end of 2013, for crude oil, LOTOS Petrobaltic held about 39.3 Mbbbl

of reserves and about 1.4 Mbbbl of additional resources in the Baltic Sea. For natural gas, the company held licenses for exploration of fields that contain about 0.37 billion cubic meters of reserves and about 3.28 billion cubic meters of additional resources in the Baltic Sea. In 2013, about 1.1 Mbbbl of crude oil and about 16 million cubic meters of natural gas were produced from the B3 field. The refinery at Gdansk operated by Grupa LOTOS had an annual capacity of 50 Mbbbl and processed about 41 Mbbbl of crude oil in 2013. The underutilization was attributed to the 30-day overhaul shutdown in the spring. In 2013, Grupa LOTOS obtained two new exploration licenses for crude oil and gas in the PEZ of the Baltic Sea—Slupsk W and Slupsk E. In August, LOTOS Petrobaltic signed an agreement with PGNiG S.A. on joint operations in the Kamien Pomorski license area. On April 24, the open-end fund ING Otworthy Fundusz Emerytalny increased its shareholding in Grupa LOTOS and exceeded the threshold of 5% of total voting rights, second only to the Ministry of Treasury (53.20%) (Grupa LOTOS S.A., 2014, p. 15, 128, 130, 134, 139).

PGNiG was Poland's leading producer of oil and gas. At the end of 2013, the company held licenses for exploration of fields that contain 140 Mbbbl of oil and condensate reserves and 85 billion cubic meters of natural gas reserves. In 2013, the BMB, Grotow, and Lubiatow fields operated by PGNiG accounted for about 87% of the total crude oil production in the country. The company produced about 6.0 Mbbbl of crude oil and about 4.6 billion cubic meters of natural gas, compared with 3.6 Mbbbl of crude oil and 4.3 billion cubic meters of natural gas in 2012. In July, PGNiG officially opened the Lubiatow facility, which was the largest oil and gas production facility in Poland. The launch of the Lubiatow-Miedzychod-Grotow project increased crude oil production by about 2.4 Mbbbl in 2013. The company had a total reserve to production ratio of 20.6 in 2013 (Polskie Górnictwo Naftowe i Gazownictwo S.A., 2014, p. 38–40).

PKN Orlen Group operated three refineries in Poland—Jedlicze, Plock, and Trzebinia. The company's largest refining and petrochemical production complex was located at Plock. In 2013, the company processed about 110 Mbbbl of crude oil in Poland. The Plock facility accounted for 108 Mbbbl with a fuel yield of 78%. FX Energy Inc. of the United States was an oil and gas exploration and production company with operations in Poland and the United States. It produced about 125 million cubic meters of natural gas in Poland in 2013. The company did not produce crude oil in Poland in 2013 (FX Energy, 2014; Polski Koncern Naftowy Orlen Group, 2014, p. 40).

Outlook

Poland's real GDP was expected to increase by 3.1% in 2014 and 3.3% in 2015, in comparison with 1.6% in 2013. The continuing recovery from the global economic crisis and an accompanying increase in domestic demand could lead to increased mineral commodity production, but much of the growth could depend on demand by Poland's trade partners, especially those in the EU. Coal and copper will remain the leading mineral products in terms of production value. The dependence on imports of mineral fuels (predominantly from Russia) will remain one of Poland's biggest challenges. In the longer run, coal production

will gradually decline due to weakening cost competitiveness and tightening environmental regulations. Plans to develop oil, natural gas, and shale gas deposits are expected to strengthen the mineral fuel sector. The Government's privatization efforts are expected to continue and the Government's ownership of mineral producing companies will continue to decline (International Monetary Fund, 2014, p. 54).

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TABLE 1
POLAND: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²		2009	2010	2011	2012	2013
METALS						
Aluminum, metal, secondary ³	metric tons	16,900 ^e	16,000 ^e	14,000 ^e	11,090 ^r	2,733
Cadmium, metal, primary	do.	534	451	526	370	370 ^e
Copper:						
Ore:						
Gross weight		31,253	30,805	31,241	31,725	32,215
Cu content	metric tons	498,960	480,600	479,300	479,250	481,770
Concentrate:						
Gross weight		1,930	1,842	1,877	1,862 ^r	1,858
Cu content	metric tons	439,000	425,400	426,700	427,064 ^r	429,275
Metal:						
Smelter:						
Primary	do.	457,500 ^r	469,700 ^r	481,900 ^r	466,700 ^r	482,000
Secondary	do.	57,600 ^r	78,400 ^r	68,200 ^r	82,300 ^r	102,356
Total	do.	515,100 ^r	548,100 ^r	550,100 ^r	549,000 ^r	584,356
Refined, electrolytically	do.	502,491	547,100	571,000	565,834 ^r	565,155
Gold, metal	kilograms	814	776	704	916	1,066
Iron and steel:						
Pig iron		2,984	3,638	3,975	3,944	4,011
Ferroalloys:						
Blast furnace, ferromanganese	metric tons	1,700	800	800 ^r	800 ^r	760 ^e
Electric furnace:						
Silicomanganese	do.	--	100	400 ^r	200 ^r	190 ^e
Ferrosilicon	do.	9,673	53,206	72,668	79,400 ^r	75,500 ^e
Other	do.	4,200	200	300 ^r	300 ^r	280 ^e
Total	do.	15,573	54,306	74,168 ^r	80,700 ^r	76,730 ^e
Steel, crude:						
From oxygen converters		3,235	3,995	4,424	4,333	4,400
From electric arc furnaces		3,893	4,001	4,353	4,206	3,600
Total		7,128	7,996	8,777	8,539	8,000
Finished steel products:						
Hot rolled		6,232	6,658	7,504	7,700 ^r	7,400
Cold rolled		558	835	807	755 ^r	815
Pipe (cold formed and hollow sections)		780 ^r	840 ^r	910 ^r	945 ^r	860
Lead:						
Mine output:						
Pb content of Pb-Zn ore	metric tons	51,500	35,300	28,200 ^r	26,600 ^r	25,000
Pb content of Cu ore	do.	28,900	24,900	24,900 ^r	30,000 ^r	26,710
Total	do.	80,400	60,200	53,100 ^r	56,600 ^r	51,710
Metal, refined:						
Primary	do.	38,000	38,000 ^r	47,000 ^r	47,000 ^r	39,000
Secondary	do.	62,400	82,000	87,000 ^r	87,000 ^r	103,000
Total	do.	100,400	120,000 ^r	134,000 ^r	134,000 ^r	142,000
Rhenium:						
Ammonium perrhenate:						
Gross weight	kilograms	3,500	6,709	8,650	11,630 ^r	10,800 ^e
Re content of ammonium perrhenate	do.	2,400	4,656	6,000	8,100 ^{r,e}	7,530
Rhenium metal in pellet form	do.	--	620	620 ^e	620 ^e	620 ^e
Selenium	metric tons	73	79	85 ^r	90 ^r	80
Silver:						
Mine output, Ag content of Cu concentrate	do.	1,207	1,181	1,167	1,149	1,199
Metal	do.	1,221	1,175	1,260 ^r	1,274 ^r	1,161
Zinc:						
Mine output, Zn content	do.	116,000	88,500	81,800 ^r	75,200 ^r	73,000
Metal, refined, primary and secondary	do.	139,100	135,100 ^r	144,100 ^r	138,300 ^r	154,379

See footnotes at end of table.

TABLE 1—Continued
POLAND: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²	2009	2010	2011	2012	2013
INDUSTRIAL MINERALS					
Cement:					
Clinker	10,659	11,768	13,630	11,807	10,500 ^e
Hydraulic	15,422	15,812	18,993	15,919	14,538
Clays and clay products:					
Bentonite:					
Crude metric tons	3,000	2,200 ^r	900 ^r	800 ^r	1,050
Processed, including imported material do.	81,354	86,000	113,800	102,100	105,000 ^e
Fire clay, crude	115	82	136	119	105
Kaolin:					
Crude	261	238	285 ^r	249 ^r	268
Beneficiated	136	125	164 ^r	138 ^r	150 ^e
Diatomite metric tons	700	500	600 ^r	600 ^r	600
Feldspar:					
Run of mine do.	445,500	513,700	550,000 ^{r,3}	376,500 ^r	374,000 ^e
Processed, including imported material do.	478,000	485,000	538,800 ^r	487,200 ^r	500,000 ^e
Gypsum and anhydrite					
Natural:					
Gypsum rock	1,125	1,012	1,067 ^r	1,078 ^r	952
Anhydrite	152	167	158 ^r	150 ^r	133
Total	1,277	1,179	1,225 ^r	1,228 ^r	1,085
Synthetic gypsum	2,076	2,389	2,586 ^r	2,790 ^r	2,700 ^e
Grand total	3,353	3,568	3,811 ^r	4,018 ^r	3,780 ^e
Lime, hydrated and quicklime	1,704	1,799	2,036	1,799	1,665
Magnesite:					
Crude metric tons	85,258	108,809	129,166	129,641	165,000 ^e
Concentrate do.	47,000	63,000	75,000 ^r	84,000 ^r	97,000
Nitrogen, N content of ammonia	1,697 ^r	1,700	1,918 ^r	2,026 ^r	2,100 ^e
Quartz, quartzite, and quartz schist, marketable:					
Quartz and quartz crystal metric tons	5,000 ^r	5,600	6,100	5,300 ^r	5,000 ^e
Quartzite, refractory do.	20,400 ^r	34,200	46,500	53,200	50,000 ^e
Quartz schist do.	700	700	700 ^r	600 ^r	550 ^e
Salt:					
Rock	999	1,236	1,234	793 ^r	1,320
Evaporated salt	299	411	415	658 ^r	676
Other (brine and desalination of mine waste water)	2,533	2,464	2,633	2,891 ^r	2,805
Total	3,831	4,111	4,282	4,342 ^r	4,801
Sand and gravel:					
Aggregates (construction sand and gravel), natural, mine output	141,114	157,236	248,690 ^r	184,745 ^r	173,267
Filling sand thousand cubic meters	5,928 ^r	5,090 ^r	4,405 ^r	3,762 ^r	3,649
Foundry sand	1,074 ^r	1,053 ^r	1,475 ^r	1,206 ^r	1,311
Lime-sand brick production sand thousand cubic meters	561 ^r	615	780 ^r	731 ^r	519
Moulding sand	1,701	1,817	2,096 ^r	2,934	2,900 ^e
Silica sand (glass sand), marketable	1,793 ^r	1,995 ^r	2,290 ^r	2,149 ^r	2,112
Sodium compounds:					
Carbonate (soda ash), 98%	890	1,010	1,061	1,111 ^r	1,052
Caustic soda (96% NaOH)	381	285	361	388	391
Stone, mine output:					
Dimension stone	3,836	4,598	6,224 ^r	4,118 ^r	3,800 ^e
Dolomite	1,834	1,821	1,880	1,830	1,851
Limestone:					
For lime production	14,881	17,588	21,703 ^r	16,728 ^r	16,808
For non-lime end use	28,883	35,528	47,929 ^r	40,178 ^r	38,000 ^e
Road stone	260	168 ^r	326 ^r	289 ^r	300 ^e

See footnotes at end of table.

TABLE 1—Continued
POLAND: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²	2009	2010	2011	2012	2013	
INDUSTRIAL MINERALS—Continued						
Sulfur:						
Native, Frasch	metric tons	263,000	517,000	657,000	676,800 ^r	526,300
Byproduct:						
From natural gas	do.	24,800	24,900	23,800 ^r	25,300 ^r	24,300
From oil refineries and coking plants	do.	190,000	225,000	234,600 ^r	259,700 ^r	259,000 ^e
From metallurgy	do.	257,000	253,000	250,000 ^e	250,000 ^e	250,000 ^e
Other	do.	500	500	600 ^r	400 ^r	500 ^e
Total	do.	472,300	503,400	509,000 ^{r,e}	535,400 ^{r,e}	534,000 ^e
Grand total	do.	735,300	1,020,400	1,166,000 ^{r,e}	1,212,200 ^{r,e}	1,060,000 ^e
MINERAL FUELS AND RELATED MATERIALS						
Carbon black	metric tons	27,800	34,700	45,000 ^r	11,100 ^r	11,000 ^e
Coal:						
Bituminous		78,064	76,728	76,448	79,813 ^r	76,775
Lignite		57,108	56,510	62,841	64,280	65,849
Total		135,172	133,238	139,289	144,093 ^r	142,624
Coke		7,091	9,738	9,377	8,891	9,213
Gas:						
Natural	million cubic meters	5,537	5,666	5,825	5,871 ^r	5,883
Coke oven gas, manufactured	do.	3,076	4,239	4,200 ^e	3,873 ^r	4,079
Peat, fuel and agricultural		594	672	746	762 ^r	507
Petroleum:						
Crude ⁴	thousand 42-gallon barrels	5,100	5,100	4,600	5,000	7,100
Refinery products ⁵	do.	150,000	158,000	160,000	195,000 ^r	190,000

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through October 8, 2014.

²In addition to the commodities listed, palladium, platinum, beneficiated barite, cobalt, gold content of copper concentrate, nickel sulfate, and town gas are thought to have been produced, but available information is inadequate to make reliable estimates of output.

³Based on official Polish Government estimates.

⁴Figures were converted to barrels from production in metric tons, which was reported as the following: 2009—686,992; 2010—686,487; 2011—616,525; 2012—673,582; and 2013—956,807.

⁵Figures were converted to barrels from production in metric tons, which was reported as the following: 2009—20,499,407; 2010—21,557,363; 2011—21,770,253; 2012—26,587,000; and 2013—25,849,000.

TABLE 2
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2013¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, secondary	Huta Aluminium Konin (Impexmetal S.A., 95.52%)	Konin	NA.
Do.	Boryszew S.A. Branch Modern Products Aluminium Skawina (Boryszew Capital Group, 100%)	Skawina	NA.
Do.	Grupa KETY S.A.	Kety	NA.
Do.	Nicromet	Bestwinka	NA.
Do.	Alumetal S.A.	Kety	NA.
Do.	POLST Sp. z o.o.	Walbrzych	NA.
Bentonite	Zakłady Gorniczo-Metalowe "Zebiec" S.A.	Starachowice	40. ^e
Cadmium, refined	metric tons Huta Cynku "Miasteczko Slaskie" S.A. (Stalprodukt S.A.)	Miasteczko Slaskie smelter	540.
Cement	Gorazdze Cement S.A. (HeidelbergCement AG, 100%)	Gorazdze	4,000 clinker, 5,600 cement.
Do.	Grupa Ozarow S.A. (CRH plc., 100%)	Plants at Ozarow and Rejowiec	2,800 clinker, ^e 3,250 cement. ^e
Do.	Cemex Polska Sp. Z o.o. (CEMEX S.A.B de C.V., 100%)	Plants at Chelm and Rudniki	2,300 clinker, ^e 3,000 cement. ^e
Do.	Cementownia Warta S.A. (Polen Zement Beteiligungsgesellschaft GmbH)	Dzialoszyn	1,500 clinker, ^e 2,000 cement. ^e
Do.	Lafarge Cement S.A.	Plants at Malogoszcz and Piechcin	3,000 clinker, ^e 5,700 cement.
Do.	Dyckerhott Sp. z o.o. (Dyckerhott/Buzzi Unicem's)	Nowiny	1,100 clinker, ^e 1,600 cement.
Do.	Cementownia "Nowa Huta" S.A.	Krakow	300 clinker, ^e 500 cement. ^e
Do.	Cementownia "Odra" S.A.	Opole	400 clinker, ^e 800 cement. ^e
Cement, aluminous	Gorka Cement Sp. z o.o.	Trzebinia	70 clinker, ^e 70 cement. ^e
Coal:			
Bituminous	Includes: 100% Government owned: Kompania Weglowa S.A. Katowicki Holding Weglowy S.A. Poludniowy Koncern Weglowy S.A. KWK Kazimierz-Juliusz Sp. z o. o. Jastrzebska Spolka Weglowa S.A. (Government, 55%) Lubelski Wegiel "Bogdanka S.A." (Government, 5%) SILTECH Sp. z o. o.	Of which: Upper Silesia (14 mines) Upper Silesia (4 mines) Upper Silesia (2 mines) Upper Silesia (1 mine) Upper Silesia (5 mines) Bogdanka, east of Leczna, eastern Poland (1 mine) Upper Silesia (1 mine)	90,000. ^{e,2}
Brown coal and lignite	Includes: PGE KWB Belchatow S.A. [PGE Polish Energy Group Plc. (Government, 61.88%)] PGE KWB Turow S.A. [PGE Polish Energy Group Plc. (Government, 61.88%)] Kopalnia Wegla Brunatnego "Konin" w Kleczewie S.A. Kopalnia Wegla Brunatnego "Adamow" S.A. Kopalnia Wegla Brunatnego Sieniawa Sp. z o.o.	Of which: Belchatow, south of Lodz (2 open pit mines) Bogatynia, at the southwest corner of Poland (1 mine) Kleczew (4 open pit mines) Turek (3 open pit mines) Sieniawa (1 mine)	95,000. ^{e,2}
Coke	Includes: Zakłady Koksownicze Zdzeszowice (ArcelorMittal Poland S.A., 100%) Koksownia Przyjazn S.A. Kombinat Kokschemiczny Zabrze S.A. ArcelorMittal Poland S.A. ISD Huta Czestochowa Sp. z o.o. Zakłady Koksownicze "Victoria" S.A. CARBO-KOKS Sp. z o.o.	Of which: Upper Silesia (Zdzeszowice) Upper Silesia (Dabrowa Gornicza) Upper Silesia (Cokeries at Jadwiga, Radlin, and Debiensko) Upper Silesia (Krakow) Upper Silesia (Czestochowa) Upper Silesia (Walbrzychu) Upper Silesia (Bytom)	10,800. ²

See footnotes at end of table.

TABLE 2—Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2013¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Copper:			
Ore, gross weight (averaged 1.57% Cu)	KGHM Polska Miedz S.A. (Government, 31.79%)	Lubin Mine, Lubin-Glogow District	7,000.
Do.	do.	Polkowice-Sierszowice Mine, Lubin-Glogow District	11,000.
Do.	do.	Rudna Mine, Lubin-Glogow District	12,000.
Concentrate, gross weight (averaged 23.1% Cu)	KGHM Polska Miedz S.A. (Government, 31.79%)	Lubin beneficiation plant, Lubin-Glogow District	440. ^e
Do.	do.	Polkowice beneficiation plant, Lubin-Glogow District	520. ^e
Do.	do.	Rudna beneficiation plant, Lubin-Glogow District	940. ^e
Metal, refined	do.	Refineries at Glogow I, Glogow II, and Legnica	540.
Feldspar	Strzeblowskie Kopalnie Surowcow Mineralnych Sp. z o.o.	Sobotka, Lower Silesia, exploiting the Pagorki Zachodnie, Pagorki Wschodnie, and Strzeblow I deposits	652.
Do.	Pol-Skal Sp. z o.o.	Karpniki, southwestern region of Jelenia Gora	100.
Ferroalloys:			
Electric furnace (FeSiMn, FeMn, FeSi)	Huta Laziska S.A.	Upper Silesia at Laziska Gorne	120. ^e
Blast furnace (FeMn)	STALMAG Sp. z o.o.	Upper Silesia at Ruda Slaska	50. ^e
Gold, metal	kilograms KGHM Polska Miedz S.A. (Government, 31.79%)	Refinery at Glogow	1,000. ^e
Gypsum and anhydrite	Includes: Zaklady Przemyslu Gipsowego "Dolina Nidy" S.A. Rigips Polska Stawiany Sp. z o.o. (Saint-Gobain) Kopalnia Gipsu i Anhydrytu "Nowy Lad" Sp. z o.o.	Of which: Southeastern Poland, Gacki Southeastern Poland, Szarbkow Lower Silesia, mines at Niwnice and Iwiny	1,400. ²
Helium	million cubic meters Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.40%)	Western Poland, Odolanow	3.5. ^e
Kaolin, crude and washed	KSM "Surmin-Kaolin" S.A.	Lower Silesia, Nowogrodziec	90. ^e
Do.	Grudzen Las Sp. z o.o.	Grudzen Las, in Lodz Voivodeship	55. ^e
Do.	Tomaszowskie Kopalnie Surowcow Mineralnych "Biala Gora" Sp. z o.o.	Smardzewice, Tomaszowski Voivodeship	30. ^e
Lead-zinc:			
Mine output	Zaklady Gorniczo-Hutnicze (ZGH) "Boleslaw" S.A. (Stalprodukt S.A., 86.92 %)	Mine and concentrator at Olkusz and Pomorzany, Bukowno region	30 lead, ^e 110 zinc. ^e
Metal:			
Pb, refined	Huta Cynku Miasteczko Slaskie (HCM) S.A.	Refinery at Miasteczko Slaskie	35.
Do.	"Baterpol" Sp. z o.o. (Impexmetal S.A.)	Refinery at Katowice	20. ^e
Do.	Orzel Bialy S.A.	Refinery at Bytom	40. ^e
Do.	KGHM Polska Miedz S.A. (Government, 31.79%)	Smelter at Legnica	50. ^e
Zn, refined	Huta Cynku Miasteczko Slaskie (HCM) S.A. (ZGH, 91%)	Imperial smelter at Miasteczko Slaskie	85.
Do.	Zaklady Metalurgiczny Silesia S.A.	Refinery at Katowice	12.
Do.	Zaklady Gorniczo-Hutnicze (ZGH) "Boleslaw" S.A. (Stalprodukt S.A., 86.92%)	Refinery at Boleslaw	75.
Lime	Includes: Zaklady Przemyslu Wapienniczego (ZPW) Trzuskawica S.A. (CRH plc, 100%) Lhoist Group: Lhoist Opolwap S.A. Lhoist Bukowa Sp. z o.o. Zaklad Wapienniczy Wojcieszow Sp. z o.o. Zaklady Wapiennicze Lhoist Sp. z o.o.	Of which: Plants in Sitkowka-Nowiny and Bielawy Tarnow Opolski, Opole County Bukowa, 90 kilometers north of Krakow Wojcieszow Gorazdze	2,200. ^{e,2}

See footnotes at end of table.

TABLE 2—Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2013¹

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Natural gas	million cubic meters	Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.41%)	Gasfields in southeastern Poland in the Carpathian Mountains, the Carpathian Foothills, and the Polish Lowlands	4,600. ^c
Do.	do.	FX Energy, Inc.	Western Poland	120. ^c
Do.	do.	LOTOS Petrobaltic S.A. [Grupa LOTOS S.A. (Government, 53.20%)]	Baltic Sea Shelf	20. ^c
Nitrogen:				
Ammonia (NH ₃)		Includes: Zakłady Azotowe "Pulawy" S.A. Zakłady Azotowe "Kedzierzyn" S.A. Zakłady Azotowe "Anwil Wloclawek" S.A. Zakłady Azotowe S.A. w Tarnowie Azoty-Adipol S.A. (former Chorzow plant) Zakłady Chemiczne "Police"	Of which: Pulawy in eastern Poland Kedzierzyn in Upper Silesia Wloclawek in central Poland Tarnow in southern Poland Chorzow in Upper Silesia Police in northwestern Poland	2,600. ^{e,2}
Petroleum:				
Crude	thousand 42-gallon barrels	Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.41%)	Oilfields in southeastern and western Poland with about 75% of production from the Barnowko-Mostno-Buszewo field near Debno	4,000. ^c
Do.	do.	LOTOS Petrobaltic S.A. [Grupa LOTOS S.A. (Government, 53.20%)]	Baltic Sea Shelf	1,200. ^c
Do.	do.	FX Energy, Inc.	Western Poland	50. ^c
Refined		Petrochimia-Plock [PNK Orlen S.A. (Government, 27.52%)]	Plock in central Poland	115,000.
Do.	do.	Rafineria "Gdansk" (Grupa LOTOS S.A.)	Gdansk in northern Poland	70,000. ^c
Do.	do.	Rafineria "Trzebinia" [PNK Orlen S.A. (Government, 27.52%)]	Trzebinia in southern Poland	3,000.
Do.	do.	Rafineria "Jedlicze" [PNK Orlen S.A. (Government, 27.52%)]	Jedlicze in southern Poland	1,000.
Rhenium:				
Rhenium content of ammonium perrenate	kilograms	KGHM Ecoren S.A. [KGHM Polska Miedz S.A. (Government, 31.79%)]	Lubin	7,500.
Rhenium metal	do.	do.	do.	3,500.
Salt:				
Brine		Inowroclawskie Kopalnie Soli Solino S.A. Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.94%) Kopalnia Soli "Wieliczka" S.A.	Of which: Mines at Gora and Mogilno in central Poland Mine at Mogilno in central Poland Wieliczka in southern Poland, near Krakow, mining deposits at Barycz and Wieliczka	5,000. ^{e,2}
Rock salt		Kopalnia Soli "Klodawa" S.A. KGHM Polska Miedz S.A. (Government, 31.79%)	Klodawa in central Poland Siersoszowice in southwestern Poland	
Desalination of mine wastewater		Zakład Odsalania Wod Dolowych "Debiensko" Sp. z o.o.	Czerwionka-Leszczyny, west of Debiensko	
Selenium	metric tons	KGHM Polska Miedz S.A. (Government, 31.79%)	Refinery at Glogow	90.
Silver, refined	do.	do.	Precious metals plant at the Glogow smelter	1,400.
Do.	do.	Institute of Non-ferrous Metals	Gliwice	30. ^c
Steel, crude		ArcelorMittal S.A., of which: ArcelorMittal Poland S.A. do. ArcelorMittal Warszawa Sp. z o.o.	Steelworks at Dabrowa Gornicza (former Huta Katowice S.A.) Steelworks at Krakow (former Huta Sendzimir S.A.) Steelworks in Warsaw (former Huta "Lucchini-Warszawa" Sp. z o.o.)	8,000.

See footnotes at end of table.

TABLE 2—Continued
 POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2013¹

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Steel, crude—Continued	CMC Zawiercie S.A. (Commercial Metals Co.)	Steelworks at Zawiercie	1,200.
Do.	ISD Huta Czestochowa S.A. (Industrial Union of Donbass Corp.)	Steelworks at Czestochowa	800. ^c
Do.	Celsa Huta Ostrowiec S.A. (Celsa Group)	Steelworks at Ostrowiec-Swietokrzyski	800. ^c
Do.	Ferrostal Labedy Sp. z o.o. (Cognor S.A.)	Steelworks at Gliwice	375.
Do.	Huta Stali Jakosciowych S.A. (Cognor S.A.)	Steelworks at Stalowa Wola	261.
Do.	Huta Batory Sp. z o.o. (Alchemia S.A., 100%)	Steelworks at Chorzow	150. ^c
Sulfur	P.P. Kopalnie i Zaklady Chemiczne Siarki "Siarkopol"	Osiek deposit at Grzybow	800.

^cEstimated. Do., do. Ditto. NA Not available.

¹The data presented in this table were compiled, in large measure, from information provided in the Minerals Yearbook of Poland 2012, which was prepared and published by the Division of Mineral Policy, Mineral and Energy Economy Research Institute of the Polish Academy of Sciences.

²Annual capacity listed is total for all deposits, mines, or companies that produce the commodity.