



2015 Minerals Yearbook

NORTH KOREA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF NORTH KOREA

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The Bank of Korea, which is the central bank of the Republic of Korea, estimated that the real gross domestic product (GDP) of North Korea decreased by 1.1% in 2015. This decrease in the GDP was largely attributed to a 12.7% decrease in the electricity, gas, and water supply. The drop in electricity production was caused by a drought that lasted through 2015, which had a major effect on the country's hydroelectric power generation. About 30% of North Korea's primary energy supply was generated from hydroelectric power, which was second only to coal (about 45% of the country's primary energy supply). Both coal and hydroelectric power accounted for a decreasing percentage of the country's primary energy supply in 2015, whereas petroleum accounted for an increasing share. Petroleum accounted for 12% of the primary energy supply in 2015 compared with 6.6% in 2014 (Bank of Korea, 2016, p. 1–2; Statistics Korea, 2016, p. 117).

In terms of metals, North Korea had resources of copper, gold, iron ore, lead, manganese, molybdenum, nickel, silver, tungsten, and zinc. North Korea had deposits with substantial resources of graphite and magnesite. For mineral fuels, North Korea had reserves of coal, including anthracite and lignite. North Korea had an estimated 728 mines, of which 241 were coal mines, 260 were metal mines, and 227 were nonmetal mines (Statistics Korea, 2016, p. 74).

Minerals in the National Economy

The mining and manufacturing sectors combined were estimated to have accounted for 32.7% of the country's nominal GDP of \$29 billion in 2015. The mining sector accounted for 12.2% of the GDP in 2015 compared with 13.1% in 2014. The production value of the mining industry decreased by 2.6% compared with that 2014 owing to a decrease in metallic mineral production; this was the first year in which the production value of North Korea's mining industry had decreased since 2010, when it decreased by 0.2%. Production in heavy and chemical industrial manufacturing fell by 4.6% in 2015 compared with that of 2014. The decrease was owing to decreased output of basic metal products, fabricated metals, and transport equipment (Bank of Korea, 2012, p. 3; 2016, p. 1–3).

Production

Production of processed minerals had been known to include cadmium, cement, coke, refined copper, ferroalloys, fertilizers, refined lead, pig iron, crude steel, and refined zinc. Notably, mine production of zinc (zinc content) decreased by about 19%, and production of zinc metal (primary and secondary) decreased by about 33% compared with output in 2014, whereas mine production of lead (lead content) increased by 17%. The production of crude steel decreased by about 11% in 2015 (table 1; Statistics Korea, 2016, p. 77).

Structure of the Mineral Industry

Although North Korea's mineral industry was dominated by coal and iron ore mining, it also produced nonferrous metals and industrial minerals and refined petroleum. Mining and mineral processing enterprises in North Korea were owned and operated primarily by the Government. Companies principally from China and the Republic of Korea had participated in joint ventures with North Korea for the development and operation of cement, coal, copper, gold, graphite, iron ore, lead, and zinc production facilities in North Korea (table 2).

Mineral Trade

Total bilateral trade between North Korea and the Republic of Korea in 2015 was valued at \$2.7 billion, which was an increase of 15.7% from that of 2014; the increase was driven mainly by an increase in the trade of chemical industry goods as well as electronic goods. This continued the decades-long trend of increasing trade between the two countries. The country's total trade (excluding trade with the Republic of Korea) was valued at \$6.2 billion, which was a decrease of 17.9% compared with that of 2014. This decrease marked the largest decrease in external trade since 1998, when trade fell by 33.7%, and was largely owing to a 14.7% decrease in the export and a 34.2% decrease in the import of mineral products. Of North Korea's \$6.2 billion in trade, China accounted for 91.3%. Exports to China were valued at \$2.5 billion, with mineral fuels accounting for 43% of exports and iron and steel accounting for 2.1% (Bank of Korea, 2016, p. 4; Statistics Korea, 2016, p. 83, 98).

Commodity Review

Metals

Iron Ore.—The Musan Mine, which was North Korea's largest iron ore mine, by capacity, was located in western North Hamgyong Province within 5 kilometers (km) of the North Korea-China border. The Musan Mine had the capacity to produce 10 million metric tons per year of iron ore. In late 2014, the Musan Mine, which had already been operating intermittently, halted all production and, in early 2015, about 40% of the mine's workforce was laid off. The decision to shut down the mine was likely owing to power shortages caused by drought conditions. The decision may have also been influenced by North Korea's reported rejection of a request from China to lower the price of its iron ore shipments to \$50 per metric ton. Exports of iron ore to China fell by more than 70% in the first 7 months of 2015. The Musan Mine appeared to have restarted in late 2015, as the Government began a campaign to attract workers back to the mine with the promise of increased wages (Gray, 2015; Min, 2015a, b).

Industrial Minerals

Rare Earths.—In December 2013, SRE Minerals Ltd., which was based in the British Virgin Islands, announced that it had discovered a substantial rare-earth deposit located in North Pyongan Province. SRE Minerals formed a joint-venture company, Pacific Century Rare Earth Mineral Ltd., in partnership with the state-owned Korea Natural Resource Trading Corp., with the goal of exploring and developing the resource. The deposit was named the Jongju Super Target. In 2015, the North Korea Resource Institute, a Seoul-based think tank, questioned the validity of the deposit. Owing to the insular nature of North Korea, the legitimacy of the deposit and the size of its resources could not be verified by outside sources (Schearf, 2014; Jamasmie, 2015).

Mineral Fuels

Coal.—North Korea's coal resources were estimated to be 200 billion metric tons, of which about 78% was thought to be lignite, and the remaining 22%, anthracite. North Korea's exports of anthracite rapidly increased during the past 5 years, to 19.6 million metric tons (Mt) in 2015 from 4.6 Mt in 2010, which is an average rate of increase of about 34% per year. Production of coal increased by 1.5% to 27.5 Mt in 2015. Coal accounted for a steadily decreasing share of North Korea's total primary energy supply, with coal accounting for 66.1% of the total primary energy supply in 2010 and 45.2% in 2015 (Statistics Korea, 2016, p. 74, 117, 123; United Nations Statistics Division, 2017).

In October 2014, the Government of Russia announced a production-sharing agreement with the Government of North Korea in which Russia agreed to invest \$25 billion into the modernization of 3,500 km of North Korean railroads during the course of 20 years in exchange for access to North Korea's coal market. The first railroad was planned to connect the coalfields in South Pyongan Province and the country's west coast at Nampo. In another deal, agreed upon in 2013, the Governments of North Korea, the Republic of Korea, and Russia agreed to a joint coal-shipment project. The project reconnects the railway between the North Korean port city of Rajin and the Russian border city of Khasan. Coal transported from Russia to North Korea using this railway would then be shipped from the Port of Rajin, which remains free of ice year-round, to the Republic of Korea. The first trial shipment took place in December 2014, with the successful delivery of 40,500 metric tons valued at \$4 million to the Port of Pohang in the Republic of Korea. A second trial shipment was successfully completed in May 2015, and a third was delivered in December 2015 (NK News, 2014; Yonho, 2014; Choi, 2015; Mundy, 2015).

Outlook

North Korea's mineral industry depended heavily on anthracite coal and iron ore exports to China. Drought

conditions and declining metal prices had a severe negative effect on the country's mining industry in 2015, causing the largest drop in the industry's production value in more than a decade. The mineral industry was expected to recover once the drought ends. Political tensions and a high level of sovereign risk remained the country's largest barriers to the growth of the country's mineral sector as well as future foreign investment in the sector. Mineral production may increase in coming years if Russia continues to invest in North Korea's infrastructure, which was largely outdated.

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TABLE 1
NORTH KOREA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES^{1,2}

(Metric tons unless otherwise specified)

Commodity ^{3,4}	2011	2012	2013	2014	2015
METALS					
Cadmium metal, smelter	200	200	200	200	200
Copper:					
Mine output, Cu content	12,000 ^r	16,000 ^r	17,000 ^r	19,300 ^r	20,000
Metal, primary and secondary:					
Smelter	12,000 ^r	12,000 ^r	12,000 ^r	12,000 ^r	12,000
Refinery	12,000	12,000	12,000	12,000	12,000
Gold, mine output, Au content	kilograms	2,000	2,000	2,000	2,000
Iron and steel:					
Iron ore and concentrate:					
Gross weight	thousand metric tons	5,200 ^r	5,200 ^r	5,500 ^r	5,500 ^r
Fe content	do.	3,000 ^r	3,000 ^r	3,200 ^r	3,200
Metal:					
Ferroalloys, unspecified	do.	21	25	28	30
Pig iron	do.	250	250	250	250
Steel, crude	do.	1,230 ^r	1,220 ^r	1,210 ^r	1,220 ^r
Lead:					
Mine output, Pb content		32,000	38,000	30,000 ^r	30,000 ^r
Metal, primary and secondary:					
Smelter		9,000	9,000	9,000	9,000
Refinery		3,000	3,000	3,000	3,000
Silver, mine output, Ag content		50	50	50	50
Tungsten, mine output, W content		110	100	65	70
Zinc:					
Mine output, Zn content		34,000 ^r	35,000 ^r	36,000 ^r	32,000 ^r
Metal, primary and secondary		36,000	35,000 ^r	35,000 ^r	30,000 ^r
INDUSTRIAL MINERALS					
Cement, hydraulic	thousand metric tons	6,300	6,400	6,600 ^r	6,700 ^r
Graphite		10,000	10,000	10,000	10,000
Magnesia		250,000	178,000	180,000	180,000
Nitrogen, N content of ammonia	thousand metric tons	217 ^r	219 ^r	231 ^r	230 ^r
Phosphorous content of fertilizer	do.	94 ^r	95 ^r	97 ^r	100 ^r
MINERAL FUELS AND RELATED MATERIALS					
Coal	thousand metric tons	25,500 ^r	25,800 ^r	26,600 ^r	27,100 ^r
Coke	do.	2,000	2,000	2,000	2,000

^rRevised. do. Ditto.

¹Estimated data are rounded to no more than three significant digits.

²Table includes data available through December 31, 2016.

³In addition to the commodities listed, crude construction materials (such as sand and gravel and stone), refined petroleum products, salt, and sulfur were produced, but available information was inadequate to make reliable estimates of output.

⁴Because of the lack of official reported data, mineral commodity production numbers have been estimated.

TABLE 2
NORTH KOREA: STRUCTURE OF THE MINERAL INDUSTRY IN 2015

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity ^e
Cement		Sunchon Cement Complex	Pyongnam Province	3,000
Do.		Samgwong Cement Complex	Kangwon Province	2,500
Do.		Gomusan Cement Factory	Hambuk Province	2,000
Do.		Cheonnaeri Cement Factory	Hamnam Province	1,000
Coal		Anju Coal Mining Complex and Sunchon Coal Mining Complex	Pyongbuk and Pyongnam Provinces	9,500
Do.		Saebjol Coal Mining Complex and Northern Coal Mine Enterprise	Hambuk Province	6,000
Copper, mine output, Cu content		Hyesan Youth Copper Mine (Wanxiang Industrial Group, 51%, and and Huizhong Mineral Industry, 49%)	Ryongyang Province	15
Gold, mine output, Au content	kilograms	Kumsan Joint Venture Co.	Hambuk Province	530
Do.	do.	Daebong Mine	Ryongyang Province	150
Graphite		Yeongchon Graphite Mine (joint venture of Korea Resources Corp. and the Government of North Korea)	Hwangnam Province	75
Iron ore, concentrate, gross weight		Ministry of Metal and Machinery, Department of Mines, Musan Iron Ore Mine Complex	Hambuk Province	10,000
Do.		Unryul Mine	Hwangnam Province	1,000
Lead:				
In concentrate		Korea Zinc Industrial Group	Hamnam and Hwangnam Provinces	60
Refined		do.	Kangwon Province	32
Magnesia clinker		Korea Magnesia Clinker Industry Group (KMCIG) and Quintermina AG	Hambuk and Hamnam Provinces	600
Magnesite, concentrate, gross weight		Korea Magnesia Clinker Industry Group (KMCIG)	do.	2,500
Petroleum, refined		Ponghwa Chemical Factory	Pyongbuk Province	NA
Steel, crude				
Do.		Kim Chaek Iron and Steel Complex (Ministry of Metal and Machinery)	Hambuk Province	2,400
Do.		Hwanghae (Hwanghai) Iron Works	do.	1,500
Do.		Kangson Works	Hwanbuk Province	960
Do.		Chollima Steel Works	Pyongnam	760
Zinc:				
In concentrate		Korea Zinc Industrial Group	Hamnam and Hwangnam Provinces	80
Refined		do.	Hamnam and Kangwon Provinces	100

^eEstimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.