



2014 Minerals Yearbook

REPUBLIC OF KOREA [ADVANCE RELEASE]

THE MINERAL INDUSTRY OF THE REPUBLIC OF KOREA

By Susan Wacaster

The Republic of Korea has reserves of some metallic minerals as well as significant reserves of some industrial minerals, including limestone, silica stone (quartzite), talc, and zeolites. The Republic of Korea, however, has few fossil fuel resources and depends almost entirely on imports to satisfy the country's energy demand. The country's role in the global mineral industry in 2014 was primarily as a consumer of imported raw materials for its globally ranked manufacturing sector and as a provider of foreign direct investment (FDI) to finance joint-venture exploration and mining projects abroad. The Republic of Korea was also active in the construction of industrial facilities, including those for power generation and oil and gas exploration and processing throughout the world, but particularly in Latin America and the Middle East.

The year-on-year rate of growth of the Republic of Korea's real gross domestic product (GDP) in 2014 was 3.3% compared with a revised 2.3% in 2013 and 3.2% in 2012. The modest increase in the GDP in 2014 was owing in part to increased imports and fixed capital formation, particularly in the first quarter. A decrease in prices, production, and domestic demand for mineral commodities and decreased exports to China tempered economic growth. Government and private consumption decreased in 2014, resulting in a 0.2% year-on-year decrease in final consumption compared with that of 2013. The value of the services and manufacturing sectors accounted for 59.4% and 30.3% of the nominal GDP, respectively, and constituted the largest shares of the GDP (Bank of Korea, 2015, p. 1, 18, 21).

Minerals in the National Economy

In 2014, the value of nonfuel mineral production, imports, and domestic demand decreased by 5%, 3%, and 3%, respectively, compared with that of 2013. Mining and quarrying activity accounted for just 0.2% of the GDP, which was the same as in 2013. Production of limestone accounted for 66.8% of the value of mineral production in 2014, followed by silica stone (5.3%), iron ore (2.9%), clays (1.9%), pyrophyllite (1.8%), silica sand (1.5%), feldspar (1.4%), titanium (1.3%), molybdenum (0.7%), and lead (0.6%), the sum of which accounted for 84.2% of the total. Owing to decreased international prices for metallic minerals, the value of imports decreased. The quantity of copper ore and concentrate imports decreased by 6% compared with that of 2013 owing to decreased demand (Bank of Korea, 2015, p. 18, 21; Korea Institute of Geoscience and Mineral Resources, 2015, p. 17, 29).

In 2014, the total value of production of nonfuel minerals and coal decreased by 5% to \$1.7 billion,¹ of which coal accounted

for 14%. In 2014, the value of nonfuel mineral imports alone decreased by 2.9% to \$17.3 billion, and that of coal decreased by 10.9% to \$12 billion. The value of stocks of nonfuel minerals at the beginning of 2014 decreased by 12% compared with that of 2013 to \$463.2 million, and those of coal remained the same at \$11.4 million. In 2014, the value of domestic demand for nonfuel minerals increased by 2.9% to \$18 billion compared with that of 2013, and that of coal decreased by 10.7% to \$12.2 billion. The value of nonfuel mineral exports increased by 16.5% to \$295.2 million, and that of coal increased by 20% to \$6 million. At the end of 2014, the value of the remaining stocks of nonfuel minerals decreased by 13.9% to \$439 million, and that of coal increased by 33% to \$11.4 million (Korea Institute of Geoscience and Mineral Resources, 2015, p. 8).

In 2014, the Republic of Korea had diversified investments in 110 countries and its outward FDI was \$24.7 billion. The number of enterprises that were newly established in foreign countries through FDI decreased by 1.5% compared with that of 2013 to 2,768. By value, the three countries that received the most FDI from the Republic of Korea in 2014 were the United States, China (which replaced Australia as second), and Vietnam (which replaced China as third). The United States, China, and Vietnam combined received 39.0% of the total outward FDI; the Republic of Korea's investment in China was the least it had been since 2009.

The Republic of Korea directed the greatest amount of FDI in 2014 (\$7.2 billion) towards the manufacturing sector. Of that amount, 35.5% was received by countries in Asia. The second greatest amount, \$5.2 billion, was directed towards the mining sector. Oceania was the leading region for FDI in mining, accounting for 28.0% of the total. The Export Import Bank of Korea (Korea Eximbank) provided services to Korean enterprises conducting international business. Korea Eximbank provided financing to Korean and (or) foreign companies with Korean equity shares that conducted exploration for and development and production of natural resources outside the country. In December 2014, Korea Eximbank approved \$1.3 billion in loans and guarantees to the Companhia Siderurgica do Pecem (CSP) Steel Complex project in Brazil, which was the largest contract value awarded to a single company in the history of Republic of Korea overseas construction. The CSP Steel Complex project was a joint venture among Vale S.A. of Brazil (50%), Dongkuk Steel Mill Co. Ltd. (30%), and POSCO Ltd. (20%). The project, which was projected to cost \$4.8 billion to develop, was expected to produce 3 million metric tons per year (Mt/yr) of steel plate for export. Construction at the plant was 56% complete as of February 2015 (Export Import Bank of Korea, 2015, p. 13, 29; Vale S.A., 2015).

¹Estimates by the Bank of Korea used Republic of Korea prices and value-added ratios. Where necessary, values have been converted from Republic of Korea won (KRW) to U.S. dollars (US\$) at an annual average exchange rate of KRW1,094=US\$1.00 for 2013 and KRW1,052=US\$1.00 for 2014.

Government Policies and Programs

The Ministry of Trade, Industry, and Energy (MOTIE) is the Government agency responsible for implementing the country's mineral laws and policies. The Korea Mining Act provides the basic guidelines for exploitation of the country's mineral resources. Korea Resources Corp. (KORES) supports development of the domestic private-sector mineral industry, conducts research, and provides technical assistance for the acquisition and development of overseas mineral resources. KORES has foreign investments in 32 mineral projects in 16 countries; the projects include mining for coal in Australia, lithium and rare metals in Africa, and copper in Latin America (Korea Resources Corp., 2015).

The Korea Institute of Geoscience and Mineral Resources (KIGAM) is the entity that developed from the Korean Geological Survey, which was founded in 1918. Divisions within the KIGAM include the Geologic Environment Division, the Geological Research Division, the Mineral Resources Research Division, the Petroleum and Marine Research Division, and the R&D Tech-Biz Division (Korea Institute of Geoscience and Mineral Resources, 2015).

The Republic of Korea had nearly 33 free trade agreements (FTAs) in various stages of completion, ranging from consultation and study (10) to signed and in effect (12). Other agreements were being negotiated (7) or were signed but not yet in effect (4). The Republic of Korea's trade agreement with China, for which negotiations began in 2012, was expected to be signed in 2015. The total value of bilateral trade between the two countries was about \$270 billion in 2013, making the Republic of Korea China's sixth-ranked trading partner and third-ranked source of imports. On January 1, 2015, the Canada-Korea Free Trade Agreement (the Agreement) entered into force, marking the first trade agreement established by Canada in the Asia and the Pacific region. As of that date, about 90% of Canada's exports to the Republic of Korea became duty free, and almost all exports were expected to become duty free in the near term. In 2014, Canada accounted for 15.8% of the value of copper imported by the Republic of Korea (\$575 million), 3.4% of iron ore (\$288 million), and 1.9% of gold (\$2.5 million) (Asia Regional Integration Center, 2015; Korea Institute of Geoscience and Mineral Resources, 2015, p. 16).

Production

In 2014, the tonnage of mined minerals and refined metals produced in the Republic of Korea changed little compared with that of 2013. The year-on-year percentage decrease in gold production and the increase in iron content of iron ore were the greatest changes among metals. The quantity of talc produced in 2014 increased by 95% compared with that of 2013, and the amount of diatomaceous earth produced increased by 94% (table 1).

Structure of the Mineral Industry

The Republic of Korea's mining and quarrying sector produced small amounts of coal and ferrous and nonferrous metals and relatively larger amounts of industrial minerals. The mineral-processing sector, which consisted of the cement,

ferrous and nonferrous metals, and refined petroleum industries, was, in terms of the value and quantity of output, much larger than the mining and quarrying sector. Most of the mining, quarrying, and ferrous- and nonferrous-metal-processing companies were privately owned and operated and were incorporated in the Republic of Korea. Some larger coal mining, natural gas, petrochemical, and petroleum-refining companies were state owned, including KORES. Both state-operated and privately owned petroleum companies were active in foreign exploration and production projects. Korea National Oil Corp. (KNOC) was involved in oil exploration, development, and production in 21 countries, including oilfields in the North Sea and shale gas fields in North America (table 2; Korea National Oil Corp., 2015).

Mineral Trade

The total year-on-year value of exports from the Republic of Korea increased by 2.3% in 2014 to \$572.7 billion. The value of nonfuel mineral and coal exports in 2014 was \$300.3 million, which accounted for less than 1% of total trade. The value of raw material exports as a whole decreased by 0.6% compared with that of 2013. In 2014, the total value of imports decreased by 1.9% to \$525.5 billion. The value of nonfuel mineral and coal imports decreased by 3% to \$29.3 billion. The leading imported raw material product to the Republic of Korea continued to be crude petroleum (accounting for 18.1% of the total value of all imports), followed by chemicals (8.3%), natural gas (7.0%), and iron and steel products (5.1%). In 2014, the rate of growth in the value of natural gas imports increased by 0.7% compared with an increase of 7.3% in 2013 and that of crude petroleum imports decreased by 4.5% compared with an increase of 8.3% in 2013. In 2014, the Republic of Korea imported 99.3% of the metallic minerals and 27.2% of the nonmetallic minerals required to satisfy the country's domestic demand (Bank of Korea, 2014, p. 28–29; Korea Institute of Geoscience and Mineral Resources, 2015, p. 6–8).

In terms of value, Australia, Brazil, and Chile were the leading suppliers of nonfuel minerals to the Republic of Korea in 2014, as they had been in 2012 and 2013, accounting for about 50% of the country's nonfuel mineral imports. On average, from 2012 through 2014, Australia accounted for 38% of nonfuel mineral imports; Brazil, 12%; and Chile, 9%. In terms of value, Hong Kong and Japan were the two leading recipients of nonfuel mineral commodities from the Republic of Korea from 2012 through 2014. For that entire 3-year period, Hong Kong was the leading recipient, accounting for 29% of the total. Japan was the leading recipient in 2013 alone and accounted for 27% of the total from 2012 through 2014 (Korea Institute of Geoscience and Mineral Resources, 2015, p. 12–13).

Commodity Review

Metals

Copper.—Production of mined copper had not been reported since 2010. The Republic of Korea relied on imports to meet the raw material requirements for its copper refineries. In 2014, the country reported imports of

about 1.6 million metric tons (Mt) of copper ore and concentrate and exports of about 22,566 metric tons (t) of refined copper. Chile was the leading supplier of imported copper ore and concentrate, followed by Australia, Peru, and Indonesia; other countries also supplied copper ore and concentrate to the Republic of Korea (Korea Institute of Geoscience and Mineral Resources, 2015, p. 29).

Gold.—About 96% of the Republic of Korea's gold production was mined in Jeonnam Province at the southwestern terminus of the country. Mined production of gold, which remained insignificant in the country, decreased by 31% in 2014 compared with that of 2013. Nevertheless, consumption of gold had been increasing since at least 2009. In 2014, imports of refined gold increased to about 17.2 t from 15.4 t in 2013, 12.6 t in 2012, 12.7 t in 2011, and 12 t in 2010. Exports of refined gold metal decreased to 14.5 t in 2014 from 16.9 t in 2013, 42.8 t in 2012, 43.4 t in 2011, and 47.1 t in 2010. Hong Kong was the leading recipient (by quantity) of the Republic of Korea's refined gold exports in 2014, followed by the Philippines, Mongolia, and Taiwan. The production of refined gold in the Republic of Korea in recent years remained at less than 50% of the country's known capacity (table 1; Korea Institute of Geoscience and Mineral Resources, 2015, p. 24–25).

Iron and Steel.—In 2014, domestic iron ore production amounted to 693,000 t and domestic consumption was 74 Mt. Australia and Brazil continued to be the first- and second-ranked suppliers, respectively, of iron ore and concentrate imports to the Republic of Korea. The country produced about 71 Mt of crude steel in 2014, which was an increase of 8% from that of 2013 and accounted for 4% of the global total in 2013. According to the International Steel Statistics Bureau, the Republic of Korea had the greatest year-on-year production increase in the Asia and the Pacific region in 2014 after being the only major country in the region to have recorded a decrease in 2013. The Republic of Korea remained the third-ranked steel-exporting country in Asia, after China and Japan. Prior to 2011, the Republic of Korea was a net importer of crude steel, but it had since become a net exporter; in 2014, its crude steel exports increased by 11% to 31.1 Mt compared with those of 2013. The country still imported significant quantities of crude steel. Steel imports increased by 18% in 2014 to 21.8 Mt compared with 18.5 Mt in 2013. The Republic of Korea was Asia's leading steel-importing country and the world's third-ranked steel-importing country in 2014 (table 1; International Steel Statistics Bureau, 2015; Korea Institute of Geoscience and Mineral Resources, 2015, p. 37; World Steel Association, 2016).

In July 2014, the International Trade Commission ruled that South Korean companies (along with companies in other countries, including India, the Philippines, Taiwan, Thailand, Turkey, Ukraine, and Vietnam) were selling steel pipes, tubes and fittings used by oil companies [also known as oil country tubular goods (OCTG)] at unfairly low prices on the U.S. market, thereby harming the domestic OCTG industry. As a result, the U.S. Department of Commerce imposed antidumping duties on imports of OCTG to reduce the imports of subsidized steel that were determined to have contributed to decreased sales, mill closures, and domestic job losses in the United States (Zacks Equity Research, 2014).

Industrial Minerals

Calcite, Dolomite, Limestone, and Marble.—The Republic of Korea met its demand for limestone resources of about 80 to 90 Mt/yr almost completely from domestic production. The country, however, did trade in quantities of limestone, including exports of 174,000 t and imports of 1.7 Mt in 2014. The majority of limestone imports came from Japan. In 2014, 75% of limestone production was consumed in the production of cement, 14% was consumed in the manufacture of steel products, and the rest was consumed by manufacturing in the construction, chemical, desulfurization (flue gas processes) and milling industries, and other unspecified uses. Japan was by far the leading recipient of calcareous minerals and stone from the Republic of Korea, followed by Indonesia, Taiwan, and China. In 2014, 50% of domestic calcite production was consumed to produce ground calcium carbonate for manufacturing; 22% was consumed by the construction industry; 16%, for cement production; and 7%, for desulfurization processes. The majority of domestic dolomite production was consumed by construction industries (31%), steel industries (31%), and agricultural industries (13%). The remainder was consumed to produce ground calcium carbonate for manufacturing (6%), chemical production and glass manufacturing (5% each), cement manufacturing (4%), and other unspecified uses (5%) (table 1; Korea Institute of Geoscience and Mineral Resources, 2015, p. 40–43).

Mineral Fuels and Related Materials

Petroleum, Natural Gas, and Refinery Products.—In 2014, the Republic of Korea's average year-on-year rate of consumption of petroleum decreased by 3% to 2.4 million barrels per day (about 875 million barrels per year. The country's dependence on foreign supplies (about 39% of the country's primary energy consumption in 2014 was generated from imported petroleum and other liquids) made it one of the world's 10 leading energy importers. The KNOC had accrued a domestic above-ground petroleum stockpiling capacity of 146 million barrels since its inception in 1979, and it had reported shares of foreign reserves of 1.3 billion barrels. Consumption of natural gas decreased by 9% to 47.8 billion cubic meters in 2014 compared with that of 2013. The Republic of Korea used naphtha as a feedstock for its petrochemical processing industry, which is much more expensive than using either coal or shale-based ethane; naphtha accounted for about 46% of total petroleum product demand. Exports of petrochemical products had been negatively affected by decreased demand from China and lower international prices for petrochemical commodities. The Republic of Korea was expected to import greater quantities of liquefied natural gas, including shale gas, from North America in order to meet demand for power generation and to satisfy increasingly strict environmental regulations (Lee, 2014; Jangkeun and Yongwon, 2015; Korea Institute of Geoscience and Mineral Resources, 2015, p. 50, 52–53; Korea National Oil Corp., 2015; U.S. Department of Energy, 2015).

Outlook

Economic growth in the Republic of Korea was not expected to change much in 2015 compared with that of 2014. Increased growth was projected in construction investment, exports, financial facilities investment, and private consumption. The value of industrial facility contracts was projected to decrease in 2015, particularly in the Middle East, owing primarily to an expectation that international prices for crude petroleum would remain low. Diminished growth in such emerging nations as Brazil and China as well as in Japan and Europe was seen as a potential hindrance to the Republic of Korea's economic growth. Apart from the petrochemical industry, the demand for petroleum in the Republic of Korea's was expected to decline in the long term owing to a decreasing population, greater energy efficiency, and competition from other fuels, including coal, natural gas, and nuclear power (Export Import Bank of Korea, 2015, p. 12).

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TABLE 1
REPUBLIC OF KOREA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2010	2011	2012	2013	2014
METALS					
Cadmium, smelter	4,166	3,005	3,904	3,903	3,800
Copper:					
Mine output, Cu content	9	--	--	--	--
Metal, refined, primary and secondary	564,600	595,447	593,500	586,000	620,000
Gold:					
Mine output, Au content kilograms	235	209	336	413	284
Metal, refined do.	57,316	50,833	49,362	44,366	46,207
Iron and steel:					
Iron ore and concentrate:					
Gross weight thousand metric tons	513	542	593	663	693
Fe content do.	287	303	332	371	426
Metal:					
Pig iron do.	36,065 ^r	42,213	41,734	41,045	46,909
Ferroalloys:					
Ferromanganese	286,259	355,047	364,800	365,000 ^c	370,000 ^c
Ferrosilicomanganese	120,779	195,650	184,700	185,000 ^c	190,000 ^c
Total	407,038	550,697	549,500	550,000 ^c	600,000 ^c
Steel, crude thousand metric tons	58,914	68,519	69,073	66,061	71,036
Lead:					
Mine output, Pb content	584	1,289	1,940	2,500	2,764
Metal, refined:					
Primary	197,900	256,851	280,000	227,700	280,000
Secondary	130,000	160,000	180,000	200,000	200,000
Molybdenum	388	378	377	428	479
Nickel, ferronickel	20,512	19,011	20,858	28,100	30,000 ^c
Silver:					
Mine output, Ag content kilograms	2,187	2,649	2,925	3,897	3,289
Metal do.	1,736	2,197	2,547	3,248	3,117
Zinc:					
Mine output, Zn content	385	343	1,434	1,749	1,919
Metal, primary	717,100	828,735	881,100	1,044,300	900,943
INDUSTRIAL MINERALS					
Calcite	1,435	1,880	2,025	1,095	2,426
Cement:					
Clinker thousand metric tons	44,775	45,221	45,155	44,373	44,816
Hydraulic do.	47,420	48,300	52,613	53,252	63,247
Total do.	92,195	93,521	97,768	97,625	108,063
Clays:					
Acid	83,476	46,623	57,787	51,309	54,001
Bentonite	88,255	94,987	88,543	80,188	71,850
Kaolin	764,008	798,690	514,841	532,050 ^r	429,081
Pottery	198,267	253,082	281,762	327,336	253,668
Other	1,005,519	1,361,283	968,014	801,264	719,390
Total	2,139,525	2,554,665	1,910,947	1,792,147	1,527,990
Diatomaceous earth	2,200	5,150	6,000	34,000	65,893
Feldspar	496,511	384,221	360,413	343,241	544,058
Mica, all grades	36,486	31,260	25,594	25,143	25,000 ^c
Salt	222,509	372,230	308,847	421,259	303,510
Stone, sand and gravel:					
Dolomite thousand metric tons	2,567	2,697	2,474	2,610	2,558
Limestone do.	79,625	82,368	82,413	83,802	86,191
Marble do.	39	38	35	8	8
Quartzite do.	3,603	3,603	4,184	4,194	4,057
Sand, unspecified do.	51,745	57,826	57,593	46,912	41,728

See footnotes at end of table.

TABLE 1—Continued
REPUBLIC OF KOREA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	2010	2011	2012	2013	2014	
INDUSTRIAL MINERALS—Continued						
Talc and related materials:						
Pyrophyllite	673,936	510,708	483,133	524,881	622,865	
Talc	5,729	15,608	21,625	2,808	5,484	
Zeolites	242,190	231,420	245,285	221,298	203,051	
MINERAL FUELS AND RELATED MATERIALS						
Petroleum, refinery products:						
Asphalt	thousand 42-gallon barrels	29,500	24,700	25,700	30,000	33,000
Butane	do.	14,500	14,200	13,500	13,900	15,700
Fuel oil	do.	4,500	4,300	3,400	2,700	2,300
Gasoline	do.	107,400	122,400	136,700	135,900	143,600
Jet fuel	do.	107,700	120,900	130,900	129,700	136,900
Kerosene	do.	39,400	37,400	31,800	30,700	23,300
Naphtha	do.	167,004	191,715	197,057	188,227	203,886
Propane	do.	10,600	11,100	12,400	12,000	12,500
Residual oil	do.	120,100	119,100	98,700	74,300	57,800
Total	do.	600,704	645,815	650,157	617,427	628,986

²Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ¹Revised. do. Ditto. -- Zero.

¹Table includes data available through December 4, 2015.

²In addition to the commodities listed, the Republic of Korea also produced bismuth, carbon black, coal, coke, graphite, gypsum, indium, magnesite, magnesium, phosphate rock, secondary iron, iron and steel semimanufactures, sulfur (as a byproduct of petroleum processing), titanium, thorium, and uranium, but available information is inadequate to make reliable estimates of output.

TABLE 2
REPUBLIC OF KOREA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Bismuth, metal	metric tons Korea Zinc Co. Ltd.	Onsan	500
Cadmium	do. do.	do.	2,100
Do.	do. Young Poong Corp.	Sukpo	2,100
Cement	Ssangyong Cement Industrial Co. Ltd.	Plants at Tonghae, Kwang Yang, Munkyeong, Pukpyong, and Yeongwol	15,040
Do.	Sung Shin Cement Manufacturing Co. Ltd.	Tanyang plant	13,700
Do.	Tong Yang Major Corp.	Plants at Pukpyong and Samchok	11,580
Do.	Lafarge Halla Cement Corp.	Plants at Kwang Yang and Okkye	9,500
Do.	Hyundai Cement Co. Ltd.	Plants at Tanyang and Yongwol	8,600
Do.	Hanil Cement Manufacturing Co.	Plants at Chungbuk and Tanyang	7,200
Do.	Asia Cement Manufacturing Co. Ltd.	Plants at Daegu and Jaechon	4,600
Coal	Korea Coal Corp.	Mines at Changsung, Dogae, and Hwasoon	2,500
Copper, metal, primary	Korea Zinc Co. Ltd.	Onsan	24
Do.	LS-Nikko Copper Inc.	Changhang	60
Do.	do.	Onsan	510
Gas, natural	Korea National Oil Corp.	Ulleung Basin	NA
Gold:			
In concentrate	kilograms Hangum Co. Ltd.	Muguk Mine, Haenam, Jeonnam (South Jeolla) Province	1,600
Refined	do. Korea Zinc Co. Ltd.	Onsan	50,000
Do.	do. LS-Nikko Copper Inc.	do.	60,000
Graphite	Kaerion Graphite Ltd.	Kangwon	NA
Do.	Wolmyong Mining Co.	do.	NA
Indium, metal	kilograms Korea Zinc Co. Ltd.	do.	55,000
Iron ore	POSCO Ltd.	Mines at Sinyemi, Gangwon Province	600
Lead, metal, primary	Korea Zinc Co. Ltd.	Kangwon	300

See footnotes at end of table.

TABLE 2—Continued
 REPUBLIC OF KOREA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Magnesium		Pohang Iron and Steel Co. Ltd.	Magnesium refinery plant, Gangneung City, Gangwon Province	10
Do.		do.	Magnesium metal sheet plant, Suncheon City, Jeonnam (South Jeolla) Province	3
Molybdenum	metric tons	Korea Resources Corp. (KORES)	Mine at Uljin; Smelter at Yeosu, Jeonnam (South Jeolla) Province	6,000
Do.	do.	NMC Resource Corp. (100%)	Moland Mine at Daejang-ri, Geumseongmyeon, Jecheon-si, Chungcheongbuk-do District	900
Nickel:				
Ferronickel		Pohang Iron and Steel Co. Ltd.	Gwangyang ferronickel plant	30
Metal		Vale S.A. 25% and Korea Zinc Co. Ltd., 19%	Onsan nickel refinery	30
Petroleum, refinery products	thousand 42-gallon barrels per day	SK Energy Corp.	Ulsan and Incheon	1,115
Do.	do.	GS-Caltex Corp.	Yocheon (Yosu)	785
Do.	do.	Hyundai Oil Refinery Co.	Daesan and Incheon	589
Do.	do.	S-Oil Corp.	Onsan	669
Pyrophyllite		NA	Wan-Do, Sungsan, Hwansan, Okmesan, Dae-Do, and Chin-Do Mines in Haenam	446
Do.		NA	Nilyang, Yangsan, Kimhae, Pusan, and Kyong-Nam Mines in Dong-Nae	446
Silver:				
In concentrate	kilograms	Hangum Co. Ltd.	Haenam, Jeonnam (South Jeolla) Province	3,700
Refined	metric tons	Korea Zinc Co. Ltd.	Onsan	1,700
Do.	do.	LS-Nikko Copper Inc.	do.	370
Steel, crude		POSCO Ltd.	Kwangyang (Gwangyang) Works	15,000
Do.		do.	Pohang Works	17,400
Do.		Hyundai Steel Co. Ltd.	Incheon Plant	4,800
Do.		do.	Pohang Plant	3,200
Do.		do.	Dangjin Plant	23,000
Do.		Dongkuk Steel Mill Co. Ltd.	Incheon Works	1,450
Do.		do.	Pohang Works	3,600
Do.		Korea Iron and Steel Co. Ltd.	Masan and Changwon Works	1,200
Zinc		Korea Zinc Co. Ltd.	Onsan	560
Do.		Young Poong Corp.	Sukpo	350

Do., do. Ditto. NA Not available.