



2013 Minerals Yearbook

JAPAN

THE MINERAL INDUSTRY OF JAPAN

By Susan Wacaster

The mineral sector in Japan is dominated by the metals and metal products industry, which includes the fabrication of iron and steel products and the processing and production of nonferrous metals. In 2013, Japan remained the world's second-ranked producer of steel after China and the second-ranked producer of iodine after Chile. Domestic production of gold, magnesium, and silver partially satisfied domestic demand, but the raw material requirements for the country's manufacturing sector were met through imports of ores and concentrates. Japan also imported intermediate products and refined them into such metals as molybdenum, tin, and tungsten. The country also imported most of its crude oil and natural gas, including liquefied natural gas (LNG).

Minerals in the National Economy

Japan's nominal gross domestic product (GDP) was \$4.9 trillion in 2013, which was the world's third-ranked GDP after the United States (\$16.8 trillion) and China (\$9.2 trillion). The manufacturing sector accounted for 26.3% of the GDP in 2013. The value of iron and steel manufacturing accounted for 1.3% of the GDP, and that of coal and petroleum products combined accounted for 1.0% of the total. Total exports were valued at \$679.7 billion, of which iron and steel products accounted for 5.4%. The country's total imports were valued at \$800.4 billion, of which petroleum accounted for 17.5%; LNG, 8.7%; and petroleum refinery products, 3.4% (Government of Japan, Cabinet Office, 2015; Ministry of International Affairs and Communications Statistics Bureau, 2015; World Bank, The, 2015).

Government Policies and Programs

The focus of Japan's resource development policy was to secure stable overseas sources of oil, gas, and mineral resources for the country's manufacturing sector. The Government stockpiled gallium and indium in addition to seven minor metals (chromium, cobalt, manganese, molybdenum, nickel, tungsten, and vanadium) for the needs of its high-tech industry. Owing to increased competition from manufacturing sectors in countries with emerging economies, the Government of Japan released an action plan in 2010 for domestic manufacturing industries that includes development and strengthening of industries that produce high-performance products, such as aircraft, carbon fiber, chemicals, robots, and vehicles (Ministry of Economy, Trade and Industry, 2010; Kuo, 2015).

In 2012, in order to stimulate domestic natural resource development, the Government of Japan amended the country's Mining Act (the Act) for the first time since 1950. Revisions to the Act strengthen the regulatory powers of the Ministry of Economy, Trade and Industry (METI) in terms of granting mining rights. Prior to the revisions, applicants were granted mining rights on a first-come-first-served basis without review

of the financial and technical capabilities of the applicant, and there were few or no restrictions on the methods of exploration that were allowed. As a result of that system, many applications were submitted for the purpose of holding the rights to a property but did not necessarily result in project development, as mining rights were valid for up to 20 years. The amendments to the Act define two classes of minerals—specified minerals and nonspecified minerals—and outline different application processes for obtaining mining rights for each class of minerals. Specified minerals are defined as those mineral commodities (including crude petroleum and natural gas) that the Government of Japan designates as particularly important to the national economy. Nonspecified minerals include all mineral commodities that are not defined as specified minerals. The first-to-file system still applies for nonspecified minerals, but applicants for both types of minerals must demonstrate financial solvency and that they have the technical capability to carry out development of a site (Clifford Chance LLP, 2012).

Production

Production of regular-grade aluminum and alumina decreased by 40% and 29%, respectively, in 2013 compared with that of 2012; production of primary gold decreased by 16%, whereas that of secondary gold increased by 4%. Production of other nonferrous mineral commodities decreased, including silicon, palladium, and primary gallium, which decreased by 27%, 23%, and 13%, respectively. Production of high-purity aluminum increased by 12% compared with that of 2012, and tin metal production increased by 58%. In the iron and steel sector, Japan's production of crude steel and pig iron increased by 3% each, and that of nickel content of ferronickel, by 10% (table 1).

Structure of the Mineral Industry

Japan's mineral industry was characterized by small-scale, low-tonnage mining operations and high-value-added mineral and metal processing and manufacturing activities. The country's mining industry was not significant to the economy, and the country consumed more minerals and metals from imports than it produced. In 2013, mining and quarrying of industrial minerals, including dolomite, iodine, limestone, pyrophyllite, silica sand, and silica stone, remained relatively stable, but operating mines and employment in the mining industry had been in decline because of depleted ore reserves, high mining costs, and the availability of cheaper imports. Japan had, however, a world-class metallurgical industry for nonferrous metals. The mining and mineral-processing businesses were owned and operated by private companies (table 2).

Mineral Trade

Japan imported raw materials and mineral fuels for its industrial production and use. These imported mineral commodities were mostly bauxite, coal, coke, copper concentrate, iron ore, LNG, and petroleum. In 2013, Japan imported about 1.3 million metric tons (Mt) of copper, 471,998 metric tons (t) of zinc, and 90,352 t of lead, all in concentrates. The country imported 41,426 t of refined copper and exported 572,140 t. Japan imported 21,816 t of refined zinc and 23,883 t of refined lead and exported 115,383 t and 8,621 t, respectively. The country also imported 1,778,354 kilograms (kg) of silver and exported 3,801,020 kg. Japan imported a total of 100,019 kg of cadmium metal entirely from the Republic of Korea and exported a total of 882,959 kg of cadmium metal to India (48%), China (36%), and Belgium (16%) (Japan Mining Industry Association, 2015, p. 5, 10–13, 28).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—In 2013, Japan produced 3,100 t of primary aluminum. Domestic consumption of aluminum decreased by 0.3% to 3.9 Mt, of which the transportation sector accounted for 40.9%; building and construction, 14.1%; fabricated metal, 11.8%; food packaging, 11.0%; and other uses, 22.2% (Japan Aluminum Association, 2015, p. 6).

Antimony.—In 2013, 139 t of antimony was produced in Japan compared with 143 t in 2012. Japan had a history of mining stibnite veins until the mid-1950s, but as reserves dwindled and less expensive imports became available, Japanese companies have produced antimony metal and derivative chemicals from imported material (Clarke, 2012; Japan Mining Industry Association, 2015, p. 4).

Cadmium.—At the end of 2013, Japan had stocks of 235 t of cadmium metal. With production of 1,826 t and imports of 100 t, the country's supplies decreased to 2,223 t compared with 2,348 t in 2012. With an apparent consumption of 1,105 t and exports of 883 t for a total quantity used and exported of 1,988 t, Japan's stocks decreased to 235 t at the end of 2013 (Japan Mining Industry Association, 2015, p. 30).

Copper.—Japan produced about 1.3 Mt of anode and blister copper from primary sources and 313,636 t from scrap. It also produced about 1.5 Mt of refined copper primarily from imported ore (82.4%) and scrap (11.7%) and other sources (5.9%). Consumption of refined copper was reported to be 911,601 t. Refined copper was used in the manufacturing of wire (61.0%), brass (36.9%), and miscellaneous products (2.1%) (table 3; Japan Mining Industry Association, 2015, p. 11).

Gold and Silver.—In 2013, Japan produced 93,769 kg of gold from imported ore, scrap, other sources, and domestic ore, which accounted for an estimated 65%, 15%, 15%, and 5% of the source material, respectively. The country also produced about 2,100 t of silver from imported ore, scrap, domestic ore, and other sources, which accounted for 58.8%, 20.4%, 0.3%, and 20.4% of the source material, respectively. Silver was

used in photographic materials (36.2%), in extension materials (11.6%), in point connectors (8.8%), as a nitrate for other uses (8.4%), for silver solder (4.7%), and for other (unspecified) miscellaneous applications (30.4%) (table 3; Japan Mining Industry Association, 2015, p. 10).

Iron and Steel.—In 2013, Japan's crude steel production increased by 3.1% to 110.6 Mt, which kept pace with the 3.2% increase in global steel demand, and was the greatest amount of crude steel produced in the country since 2008. Japan's increased production was owing to increased housing construction and continued redevelopment of areas affected by the 2011 Tohoku earthquake and tsunami (Obayashi, 2013; Ernst & Young Global Ltd., 2014).

Lead.—Japan's total supply of lead in 2013 was 251,556 t. Of that amount, 208,115 t was refined lead, which was made from 92,227 t of lead content in primary ore and from 115,888 t of scrap and material from other sources. The remainder of the total lead supply (43,441 t) was remelted lead. Consumption of refined lead was reported to be 209,488 t. Refined lead was used in batteries (86.6%), pipe and sheet (5.0%), chemicals (1.9%), solder (0.5%), and other miscellaneous applications (3.6%) (table 3; Japan Mining Industry Association, 2015, p. 12, 14).

Zinc.—Japan's total supply of zinc in 2013 was 618,998 t. Of that amount, 587,291 t was refined zinc made up of 470,573 t of zinc contained in primarily imported ore (76.0%), 112,386 t of zinc from other sources (18.2%), and 4,332 t of zinc from scrap (0.7%). The remainder (31,707 t) was remelted zinc. Consumption of refined zinc was reported to be 383,614 t. Refined zinc was used mainly in galvanized sheet (50.1%), other types of galvanized products (15.0%), brass (12.9%), die-casting alloy (11.2%), chemicals (7.3%), and miscellaneous uses (3.5%) (table 3; Japan Mining Industry Association, 2015, p. 13, 15).

Mineral Fuels

Petroleum and Petroleum Refinery Products.—In 2013, Japan produced about 5.8 million barrels of crude petroleum and imported \$186.4 billion of petroleum and petroleum products, which accounted for about 99.7% of the country's demand. Total fuel demand in Japan had been declining since 2000 owing to official policies aimed at reducing the country's reliance on petroleum imports, including the development of nuclear energy sources and a ban on the construction of heavy-fuel-fired powerplants. In the aftermath of the Tohoku earthquake of March 11, 2011, when electric and gas utilities were debilitated in some areas, petroleum products were used to power emergency operations. Delivery of sufficient crude petroleum and refinery products, however, was impossible not only because of damaged infrastructure in the disaster areas but also because many petroleum terminals outside the affected areas had inadequate inventories. As a result, the Government and the petroleum industry began to focus on increasing the country's domestic supply of petroleum and petroleum products. The Government and the petroleum industry also promoted the use of low-sulfur kerosene for heating; developed stand-alone oil-fueled water-heating systems, and recommended that public buildings use oil-based heating equipment. Japan had

23 active petroleum refineries, which were owned by 16 companies with a combined distillation capacity of about 3.9 million barrels per day (Mbbl/d). JX Nippon Oil & Energy Corp. owned five refineries with a combined capacity of about 1.1 Mbbl/d, or 26.8% of the country's total refinery capacity (Petroleum Association of Japan, 2014, p. 7, 69–70).

Reserves and Resources

Japan has large reserves of industrial minerals, including dolomite, iodine, limestone, pyrophyllite, silica sand, and silica stone. Limestone is the most abundant indigenous mineral resource. The country's reserves of nonferrous metals, such as lead, silver, and zinc, are small; gold deposits had been found and were being mined on a small scale in Kagoshima Prefecture on Kyushu Island. The country's coal reserves were reaching depletion.

Outlook

Because of an expected ban on exports of unprocessed nickel from Indonesia, which supplies Japan with about 40% of its ferronickel imports, Japanese smelting companies are expected to begin sourcing their raw material supplies from other low-cost producers in Asia, including companies in New Caledonia and the Philippines. In the energy sector, Japan is expected to remain dependent on imports. At yearend 2013, Japanese gas and oil companies had more than 140 development projects in Africa, Asia, Australia, Europe, North America, South America, and the countries of the Middle East. Commercial production from about 70 of those projects accounted for about 22% of Japan's domestic demand for crude petroleum and natural gas. Crude steel production is expected to decrease slightly in 2014 owing to decreased domestic demand, and the value of Japan's steel exports was expected to remain steady (Petroleum Association of Japan, 2014, p. 25).

References Cited

- Clarke, Gerry, 2012, Antimony (trioxide) on the watch list: Industrial Minerals, no. 540, September, p. 53.
- Clifford Chance LLP, 2012, New mining law for Japan: Clifford Chance LLP. (Accessed June 12, 2014, at <http://www.cliffordchance.com/contact.html>.)
- Ernst & Young Global Ltd., 2014, Global steel 2014: Ernst & Young Global Ltd., 41 p. (Accessed March 31, 2015, at [http://www.ey.com/Publication/vwLUAssets/EY_-_Global_steel_2014/\\$FILE/EY-Global-steel-2014.pdf](http://www.ey.com/Publication/vwLUAssets/EY_-_Global_steel_2014/$FILE/EY-Global-steel-2014.pdf).)
- Government of Japan, Cabinet Office, 2015, Gross domestic product account production and expenditure approach: Government of Japan, Cabinet Office. (Accessed March 4, 2015, at http://www.esri.cao.go.jp/en/sna/data/kakuhou/files/2013/27annual_report_e.html.)
- Japan Aluminum Association, 2015, Aluminum statistics: Tokyo, Japan, Japan Aluminum Association, February 15, 6 p.
- Japan Mining Industry Association, 2015, Monthly statistics: Tokyo, Japan, Japan Mining Industry Association, March 4, 31 p.
- Kuo, C.S., 2015, The mineral industry of Japan, *in* Area reports—International—Asia and the Pacific: U.S. Geological Survey Minerals Yearbook 2012, v. III, p. 13.1–13.4.
- Ministry of Economy, Trade and Industry, 2010, Japan's manufacturing industry: Ministry of Economy, Trade and Industry, July, 16 p. (Accessed February 14, 2015, at http://www.meti.go.jp/english/policy/mono_info_service/overall/overview.pdf.)
- Ministry of Internal Affairs and Communications Statistics Bureau, 2015, Foreign trade, balance of payments and international cooperation (15-1–15-9), chap. 15 of Japan statistical yearbook 2015: Ministry of Internal Affairs and Communications Statistics Bureau, 25 p. (Accessed February 17, 2015, at <http://www.stat.go.jp/english/data/nenkan/1431-15.htm>.)
- Obayashi, Yuka, 2013, UPDATE—Japan's 2013 crude steel output could hit 5-year high—METI: Thomson Reuters, October 1. (Accessed March 17, 2015, at <http://www.reuters.com/article/2013/10/01/japan-steel-idUSL4N0HR11420131001>.)
- Petroleum Association of Japan, 2014, Petroleum industry in Japan 2014: Petroleum Association of Japan, September, 71 p. (Accessed April 1, 2015, at <http://www.paj.gr.jp/english/data/paj2014.pdf>.)
- World Bank, The, 2015, GDP ranking: The World Bank. (Accessed February 17, 2015, at <http://data.worldbank.org/data-catalog/GDP-ranking-table>.)

TABLE 1
JAPAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2009	2010	2011	2012	2013	
METALS						
Aluminum:						
Alumina	thousand metric tons	550 ^r	550 ^r	500 ^r	350 ^r	250
Aluminum hydroxide ^e	do.	710	700	690	650	600
Metal:						
Primary:						
Regular grades ^c	do.	6	5	4	5	3 ²
High-purity	do.	33	49	43	26	29
Secondary ³	do.	111	126	142	137	140 ^e
Antimony:						
Oxide		4,884	6,846	9,500 ^{e,r}	3,000 ^{e,r}	3,000 ^e
Metal		239	304	435	143	139
Arsenic, trioxide ^c		40	40	45	45	45
Bismuth ^c		423 ²	454 ²	460	470	500
Cadmium, refined		1,824	2,053	1,755	1,855	1,826
Chromium, metal ^c		650	700	800	750	750
Cobalt, metal		1,332	1,935	2,007	2,542	2,747
Copper, metal:						
Blister and anode:						
Primary		1,297,943	1,382,655	1,168,284	1,304,916	1,249,332
Secondary		243,859	260,245	269,748	303,900	313,636
Total		1,541,802	1,642,900	1,438,032	1,608,816	1,562,968
Refined:						
Primary		1,238,012	1,333,787	1,094,999	1,270,914	1,210,200
Secondary		201,831	214,901	233,289	245,440	257,900
Total		1,439,843	1,548,688	1,328,288	1,516,354	1,468,100
Gallium, metal: ^c						
Primary		7	5 ^r	5 ^r	8 ^r	7
Secondary		80	75 ^r	75	85 ^r	80
Germanium: ^c						
Oxide		50	45	50	50	50
Metal, polycrystal	kilograms	1,730	1,750	1,760	1,780	1,800
Gold:						
Mine output, Au content	do.	7,708	8,544	7,922	7,233	7,411
Metal:						
Primary	do.	89,281	98,398	95,549	74,735	63,070
Secondary ⁴	do.	43,979	37,413	36,288	29,544	30,699
Total	do.	133,260	135,811	131,837	104,279	93,769
Indium, metal ^c	do.	67,000	69,000	70,000	71,000	70,000
Iron and steel, metal:						
Pig iron	thousand metric tons	66,943	82,283	81,028	81,405	83,849
Electric-furnace ferroalloys:						
Ferrosilicon		7,698	16,208	17,217	19,392	21,671
Ferromanganese		361,375	453,265	456,798	436,171	460,936
Ferronickel		284,884	348,420	279,944	371,913	402,768
Ferromolybdenum		3,598	4,615	5,167	4,616	4,550
Ferrovandium		2,560	4,190	3,980	4,403	4,433
Silicomanganese		49,205	49,865	49,798	52,287	24,741
Unspecified		12,957	16,374	20,913	19,364	19,394
Total		722,277	892,937	833,817	908,416	938,493
Steel, crude	thousand metric tons	87,534	109,599	107,601	107,232	110,595
Semimanufactures, hot-rolled: ^c						
Ordinary steels	do.	68,000	67,000	65,000	66,000	77,006 ²
Special steels	do.	16,000	15,000	15,000	16,000	19,960 ²

See footnotes at end of table.

TABLE 1—Continued
JAPAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2009	2010	2011	2012	2013
METALS—Continued					
Lead, metal, refined:					
Primary	96,794	101,610	100,058 ^r	91,037 ^r	92,227
Secondary	150,900 ^r	165,600 ^r	152,500 ^r	167,500 ^r	159,600
Total	247,694 ^r	267,210 ^r	252,558 ^r	258,537 ^r	251,827
Magnesium, metal, secondary ^c	13,000	14,000	14,000	15,000	15,000
Manganese, oxide ^c	44,000	43,000	43,000	40,000	40,000
Molybdenum, metal	695	1,154	1,234	1,013	1,000 ^e
Nickel metal:					
Refined	29,351	40,228	41,290	41,944	42,000 ^e
Ni content of nickel oxide sinter	58,808	59,011	50,437	52,000 ^e	53,000 ^e
Ni content of ferronickel	54,491	64,349	62,773	73,248	80,554
Ni content of chemical	1,669	2,497	2,383	2,362	2,500 ^e
Total ^c	144,000	166,000	157,000	170,000	178,000
Platinum-group metals:					
Palladium, metal kilograms	6,675	6,107	7,534	8,052	6,239
Platinum, metal do.	1,417	1,331	1,765	1,735	1,963
Selenium, metal	709	754	750 ^e	755 ^e	750 ^e
Silicon, multicrystalline	8,633	8,700 ^e	12,133	10,964	8,001
Silver:					
Mine output, Ag content kilograms	1,500 ^e	1,200 ^e	4,486	3,577	3,644
Metal:					
Primary do.	1,865,936	1,898,208	1,724,218	1,764,533	1,731,478
Secondary ⁴ do.	326,487	313,931	325,373	348,620	346,296
Total do.	2,192,423	2,212,139	2,049,591	2,113,153	2,077,774
Tantalum, metal ^c	95	95	100	98	100
Tellurium, metal	49	47	40	45 ^e	45 ^e
Tin, metal, smelter	757	841	947	1,133	1,786
Titanium:					
Dioxide	161,928	207,561	214,417	185,320	173,904
Metal ^c	35,000	38,000	40,000	38,000	35,000
Tungsten, metal	1,400	3,361	3,299	3,025	3,000 ^e
Vanadium, metal ^{e,5}	560	560	560	580	600
Zinc:					
Oxide	75,000 ^e	72,000 ^e	66,325	58,896	57,840
Metal:					
Primary	435,905	470,057	444,446	459,322	469,833
Secondary	104,699	103,951	100,228	111,990	117,458
Total	540,604	574,008	544,674	571,312	587,291
Zirconium, oxide ^c	12,000	13,000	13,000	14,000	14,000
INDUSTRIAL MINERALS					
Bromine ^c	20,000	25,000	25,000	30,000	30,000
Cement, hydraulic thousand metric tons	54,800	51,526	51,291	54,737	57,962
Clays: ^c					
Bentonite	432,000	430,000	425,000	420,000	420,000
Fire clay, crude	440,000	440,000	430,000	430,000	341,445 ²
Kaolin	12,000	12,000	13,000	13,000	13,000
Diatomite ^c	110,000	110,000	100,000	100,000	100,000
Feldspar and related materials ^c	115,000	110,000	104,109 ²	100,000	100,000
Gypsum ^e thousand metric tons	5,750	5,700	5,600	5,500	5,500

See footnotes at end of table.

TABLE 1—Continued
JAPAN: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity	2009	2010	2011	2012	2013	
INDUSTRIAL MINERALS—Continued						
Iodine	8,232	9,216	9,277	9,315	9,334	
Lime, quicklime	thousand metric tons	6,746	8,547	8,005	7,581	7,619
Nitrogen, N content of ammonia	do.	1,021	1,178	1,211	1,055	1,007
Perlite ^c	220,000	210,000	200,000	200,000	200,000	
Rare-earth oxides ⁶	5,121	10,699	10,700 ^e	10,800 ^e	10,000 ^e	
Salt, all types	thousand metric tons	1,200 ^e	1,122	978	925	1,000 ^e
Silica:						
Sand	do.	2,856	3,078	3,003	2,877	2,856
Stone, quartzite	do.	9,189	9,159	9,543	9,306	9,290
Sodium compounds, n.e.s.: ^{e,7}						
Soda ash	400,000	410,000	430,000	450,000	450,000	
Sulfate, anhydrous	142,000	142,000	145,000	147,000	145,000	
Stone, crushed:						
Dolomite	thousand metric tons	3,122	3,438	3,492	3,361	3,493
Limestone	do.	132,350	133,974	134,176	140,038	148,066
Sulfur:						
Byproduct of metallurgy ^e	do.	1,350	1,400	1,450	1,500	1,500
Byproduct of petroleum	do.	1,864	1,892	1,755	1,747	1,779
Talc and related materials: ^c						
Talc	25,000	24,000	24,000	25,000	25,000	
Pyrophyllite	340,000	340,000	350,000	340,000	340,000	
Vermiculite ^c	6,000	6,000	6,200	6,200	6,200	
MINERAL FUELS AND RELATED MATERIALS						
Carbon black	thousand metric tons	575	729	681	638	650 ^e
Coal, bituminous ^c	do.	1,100	1,000	900	700	800
Coke, including breeze, metallurgical	do.	32,587	37,447	35,379	34,743	35,154
Gas, natural, gross	million cubic meters	3,539	3,396	3,298	3,276	2,995
Petroleum:						
Crude	thousand 42-gallon barrels	5,795	5,491	5,235	5,600 ^f	5,763
Refinery products: ^e						
Gasoline:						
Aviation	do.	50	50	50	60	60
Other	do.	362,000	360,000	355,000	350,000	350,000
Asphalt and bitumen	do.	32,000	31,000	30,000	30,000	30,000
Distillate fuel oil	do.	245,000	242,000	240,000	240,000	237,207 ²
Jet fuel	do.	78,000	76,000	75,000	80,000	92,518 ²
Kerosene	do.	165,000	166,000	165,000	165,000	113,551 ²
Liquefied petroleum gas	do.	56,000	55,000	55,000	60,000	28,536 ²
Lubricants	do.	16,000	14,000	15,000	15,000	15,173 ²
Naphtha	do.	136,000	135,000	130,000	135,000	128,706 ²
Paraffin, wax	do.	800	750	750	750	440 ²
Petroleum coke	do.	4,400	4,300	4,200	4,200	6,157 ²
Refinery fuel and losses	do.	150,000	150,000	150,000	160,000	160,000
Residual fuel oil	do.	300,000	320,000	350,000	355,000	266,666 ²
Unfinished oils	do.	50,000	50,000	50,000	55,000	50,000
Total	do.	1,600,000	1,600,000	1,620,000	1,650,000	1,480,000

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

¹Table includes data available through April 3, 2015.

²Reported figure.

³Includes alloyed and unalloyed aluminum ingot.

⁴Includes metal recovered from scrap and waste.

⁵Represents metal content of vanadium pentoxide recovered from petroleum residues, ashes, and spent catalysts.

⁶Includes oxide of cerium, europium, gadolinium, lanthanum, neodymium, praseodymium, samarium, terbium, and yttrium.

⁷Not elsewhere specified.

TABLE 2
JAPAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum	metric tons	Nippon Light Metal Holdings Co., Ltd.	Shizuoka, Shizuoka Prefecture	7,000
Cement		Aso Cement Co., Ltd.	Tagawa and Kanda, Fukuoka Prefecture	2,400
Do.		Daiichi Cement Co., Ltd.	Kawasaki, Kanagawa Prefecture	1,169
Do.		Denki Kagaku K.K.	Omi, Niigata Prefecture	2,762
Do.		Hachinohe Cement Co., Ltd.	Hachinohe, Aomori Prefecture	1,533
Do.		Hitachi Cement Co., Ltd.	Hitachi, Ibaraki Prefecture	941
Do.		Mitsubishi Materials Corp.	Higashidori, Shimokita-gun, Aomori Prefecture; Higashiyama, Higashiiwai-gun, Iwate Prefecture; Yokoze, Saitama Prefecture; Kurosaki, Kyushu, and Higashitani, Fukuoka Prefecture	13,467
Do.		Mitsui Mining Co. Ltd.	Togawa, Fukuoka Prefecture	2,075
Do.		Myojo Cement Co., Ltd.	Itoigawa, Niigata Prefecture	2,482
Do.		Nippon Steel Chemical Co., Ltd.	Tobata, Kitakyushu, Fukuoka Prefecture	855
Do.		Nittetsu Cement Co., Ltd.	Muroran, Hokkaido Prefecture	1,589
Do.		Ryukyu Cement Co. Ltd.	Yabu, Nago, Okinawa Prefecture	722
Do.		Sumitomo Osaka Cement Co. Ltd.	Tamura, Fukushima Prefecture; Aso, Tochigi Prefecture; Motosu, Gifu Prefecture; Sakata, Shiga Prefecture; Ako, Hyogo Prefecture; and Susaki, Kochi Prefecture	14,402
Do.		Taiheiyo Cement Corp.	Ofunato, Iwate Prefecture; Kumagaya and Saitama, Saitama Prefecture; Fujiwara, Mie Prefecture; Tsukumi, Oita Prefecture; and Kamiiso, Hokkaido Prefecture	28,800
Do.		Tokuyama Cement Co. Ltd.	Nanyo, Yamaguchi Prefecture	5,936
Do.		Tosoh Corp.	Shin Nanyo, Yamaguchi Prefecture	2,869
Do.		Tsuruga Cement Co. Ltd.	Tsuruga, Fukui Prefecture	1,710
Do.		Ube Industries Ltd.	Ube and Isa, Yamaguchi Prefecture, and Kanda, Fukuoka Prefecture	10,736
Coal		Kushiro Coal Mine Co. Ltd. ¹	Kushiro, Hokkaido Prefecture	750
Cobalt, refined	metric tons	Sumitomo Metal Mining Co. Ltd. (SMM)	Niihama, Ehime Prefecture	1,000
Copper, refined	do.	Mitsubishi Materials Corp.	Naoshima, Kagawa Prefecture	225,600
Do.	do.	Onahama Smelting and Refining Co. Ltd. (Mitsubishi Materials Corp., 50.45%; Dowa Mining Co. Ltd., 32.13%; Furukawa Co. Ltd., 7.98%; Furukawa Electric Co. Ltd. and Mitsubishi Cable Industries Ltd., 4.29% each; others, 0.85%)	Onahama, Fukushima Prefecture	250,000
Do.	do.	Pan Pacific Copper Co., Ltd. (JX Nippon Mining & Metals Co., Ltd., 66%, and Mitsui Mining and Smelting Co., Ltd., 34%)	Saganoseki, Oita Prefecture; Hitachi, Ibaraki Prefecture; and Tamano, Okayama Prefecture ²	710,000
Do.	do.	Kosaka Smelting and Refining Co. Ltd. (wholly owned subsidiary of Dowa Mining Co. Ltd.)	Kosaka, Akita Prefecture	72,000
Gold:				
In concentrate	kilograms	Sumitomo Metal Mining Co. Ltd. (SMM)	Hishikari, Kagoshima Prefecture	9,000
Refined	do.	Kosaka Smelting and Refining Co. Ltd. (wholly owned subsidiary of Dowa Mining Co. Ltd.)	Kosaka, Akita Prefecture	24,000
Do.	do.	Mitsui Mining and Smelting Co., Ltd.	Takehara, Hiroshima Prefecture	22,000
Do.	do.	Mitsubishi Materials Corp.	Naoshima, Kagawa Prefecture	60,000
Do.	do.	JX Nippon Mining & Metals Co., Ltd.	Hitachi, Ibaraki Prefecture	30,000
Do.	do.	Sumitomo Metal Mining Co. Ltd. (SMM)	Niihama, Ehime Prefecture	36,000

See footnotes at end of table.

TABLE 2—Continued
JAPAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iodine, crude	metric tons	Ise Chemical Industries Co. Ltd. (Asahi Glass Co. Ltd., 52.4%, and Mitsubishi Corp., 11.2%)	Oami-Shirasato, and Ichinomya, Chiba Prefecture; and Sadowara, Miyazaki Prefecture	3,600
Do.	do.	Godo Shigen Sangyo Co. Ltd. (Kanto Natural Gas Development Co. Ltd., 11%, and Mitsui & Co. Ltd., 10%)	Chosei, Chiba Prefecture	2,400
Do.	do.	Kanto Natural Gas Development Co. Ltd. (Mitsui Chemicals, Inc., 21.9%, and Godo Shigen Sangyo Co. Ltd., 14.3%)	Mobara, Chiba Prefecture	1,200
Do.	do.	Nihon Tennen Gas Co. Ltd. (Kanto Natural Gas Development Co. Ltd., 50%, and Tomen Corp., 41%)	Shirako and Yokoshiba, Chiba Prefecture	1,200
Do.	do.	Toho Earthtech, Inc. (Itochi Corp., 34.1%; Mitsubishi Gas Chemical Co. Ltd., 32.2%; Nippon Light Metal Co. Ltd., 31.1%)	Kurosaki, Niigata Prefecture	720
Do.	do.	Nippon Chemicals Co. Ltd. (Nippon Shokubai Co. Ltd., 17%; Takeda Chemical Industries Ltd., 16.4%; Chugai Boyeki Co. Ltd., 13.6%)	Isumi, Chiba Prefecture	720
Lead, refined	do.	Kamioka Mining and Smelting Co. Ltd.	Kamioka, Gifu Prefecture ³	33,600
Do.	do.	Mitsui Mining and Smelting Co., Ltd.	Takehara, Hiroshima Prefecture	43,800
Do.	do.	Toho Zinc Co. Ltd.	Chigirishima, Hiroshima Prefecture	120,000
Do.	do.	Sumitomo Metal Mining Co. Ltd. (SMM)	Harima, Hyogo Prefecture	30,000
Do.	do.	Kosaka Smelting and Refining Co. Ltd.	Kosaka, Akita Prefecture	25,200
Do.	do.	Hosokura Smelting and Refining Mining Co. Ltd. (wholly owned subsidiary of Mitsubishi Materials Corp.)	Hosokura, Miyagi Prefecture ³	22,200
Limestone		Mitsubishi Materials Corp.	Higashitani, Fukuoka Prefecture	10,000
Do.		Nittetsu Mining Co., Ltd.	Torigatayama, Kochi Prefecture; Oita, Oita Prefecture; and Shiriya, Aomori Prefecture	23,000
Do.		Sumikin Mining Co., Ltd.	Hachinohe Sekkai, Aomori Prefecture	5,500
Do.		Sumitomo-Osaka Cement Co. Ltd.	Ibuku, Shiga Prefecture, and Karazawa, Tochigi Prefecture	4,000
Do.		Shuho Mining Co., Ltd.	Sumitomo Cement Shuho, Yamaguchi Prefecture	8,200
Do.		Taiheiyo Cement Co. Ltd.	Ofunato, Iwate Prefecture; Ganji and Tsukumi, Oita Prefecture; Garo, Hokkaido Prefecture; Kawara, Fukuoka Prefecture, Tosayama, Kochi Prefecture; Taiheiyo Buko, Saitama Prefecture; and Shigeyasu, Yamaguchi Prefecture	46,000
Do.		Todaka Mining Co. Ltd.	Todaka-Tsukumi, Oita Prefecture	12,000
Do.		Ube Kosan Co. Ltd.	Ube Isa, Yamaguchi Prefecture	9,000
Manganese, electrolytic dioxide		Mitsui Mining and Smelting Co., Ltd.	Takehara, Hiroshima Prefecture	24
Do.		Tosoh Corp.	Hyuga, Miyazaki Prefecture	34
Nickel:				
In ferronickel	metric tons	Hyuga Smelting Co. Ltd. [wholly owned subsidiary of Sumitomo Metal Mining Co. Ltd. (SMM)]	do.	22,000
Do.	do.	Yakin Oheyama Co. Ltd.	Oheyama, Kyoto Prefecture	12,720
Do.	do.	Pacific Metals Co. Ltd.	Hachinohe, Aomori Prefecture	40,800
In oxide	do.	Tokyo Nickel Co. Ltd.	Matsuzaka, Mie Prefecture	60,000
Refined	do.	Sumitomo Metal Mining Co. Ltd. (SMM)	Niihama, Ehime Prefecture	36,000

See footnotes at end of table.

TABLE 2—Continued
JAPAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2013

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum refinery	thousand 42-gallon barrels	JX Nippon Oil & Energy Corp.	Mizushima, Marifu, Oita, Sendai, and Negishi refineries	1,058
Pyrophyllite		Goto Kozan Co. Ltd.	Goto, Nagasaki Prefecture	204
Do.		Ohira Kozan Co. Ltd.	Ohira, Okayama Prefecture	132
Do.		Sankin Kogyo Co. Ltd.	Otsue, Hiroshima Prefecture	72
Do.		Shinagawa Shirenga Co. Ltd.	Mitsuiishi, Okayama Prefecture	180
Do.		Shokozan Kogyosho Co. Ltd.	Yano-Shokozan, Hiroshima Prefecture	180
Do.		Showa Kogyo Co. Ltd.	Showa-Shokozan, Hiroshima Prefecture	60
Steel, crude		JFE Steel Corp. (wholly owned subsidiary of JFE Holdings Inc.)	Chiba, Chiba Prefecture; Kawasaki (Keihin), Kanagawa Prefecture; Nishinomiya, Hyogo Prefecture; Handa, Aichi Prefecture; Fukuyama, Hiroshima Prefecture; and Kurashiki, Okayama Prefecture	33,835
Do.		Kobe Steel Ltd.	Kakogawa and Kobe, Hyogo Prefecture	8,943
Do.		Nippon Steel & Sumitomo Metal Corp.	Oita, Oita Prefecture; Kawata, Fukuoka Prefecture; Kimitsu, Chiba Prefecture; and Nagoya, Aichi Prefecture	33,199
Do.		do.	Kashima, Ibaraki Prefecture; Kokura, Fukuoka Prefecture; and Wakayama, Wakayama Prefecture	12,820
Do.		Nisshin Steel Co. Ltd.	Kuri, Hiroshima Prefecture; Osaka City; Shunan, Yamaguchi Prefecture; and Toyo, Ehime Prefecture	4,000
Tantalum	metric tons	Japan New Metals Co. Ltd.	Akita, Akita Prefecture	95
Do.	do.	Mitsui Mining and Smelting Co. Ltd.	Miyama, Fukuoka Prefecture	NA
Titanium:				
In sponge metal		Sumitomo Titanium Corp. (Sumitomo Metal Industries, Ltd., 75.2%, and Kobe Steel Ltd., 24.8%)	Amagasaki, Hyogo Prefecture	24
Do.		Toho Titanium Co. Ltd. (JX Nippon Mining & Metals Co., Ltd., 47%; Mitsui & Co. Ltd., 20%; others, 33%)	Chigasaki, Kanagawa Prefecture	15
In dioxide	metric tons	Fuji Titanium Industry Co. Ltd. (Ishihara Sangyo Kaishia Ltd., 24.8%, and others, 75.2%)	Kobe, Hyogo Prefecture	17,400
Do.	do.	Ishihara Sangyo Kaisha Ltd.	Yokkaichi, Mie Prefecture	154,800
Do.	do.	Sakai Chemical Industries Co. Ltd.	Onahama, Fukushima Prefecture	60,000
Do.	do.	Tayca Corp.	Saidaiji, Okayama Prefecture	60,000
Do.	do.	Titan Kogyo Kabushiki Kaisha	Ube, Yamaguchi Prefecture	16,800
Zinc, refined	do.	Akita Smelting Co. Ltd. [Dowa Mining Co. Ltd., 57%; JX Nippon Mining & Metals Co., Ltd., 24%; Sumitomo Metal Mining Co. Ltd. (SMM), 14%; Mitsubishi Materials Corp., 5%]	Iijima, Akita Prefecture	200,400
Do.	do.	Hachinohe Smelting Co. Ltd. (Mitsui Mining and Smelting Co. Ltd., 57.7%; JX Nippon Mining & Metals Co., Ltd., 27.8%; Toho Zinc Co. Ltd. and Nisso Smelting Co. Ltd., 14.5%)	Hachinohe, Aomori Prefecture	117,600
Do.	do.	Hikoshima Smelting Co. Ltd.	Hikoshima, Yamaguchi Prefecture	84,000
Do.	do.	Kamioka Mining and Smelting Co. Ltd.	Kamioka, Gifu Prefecture	72,000
Do.	do.	Toho Zinc Co. Ltd.	Annaka, Gunma Prefecture	139,200
Do.	do.	Sumitomo Metal Mining Co. Ltd. (SMM)	Harima, Hyogo Prefecture	90,000

Do., do. Ditto. NA Not available.

¹Coal mining operations continued, but output has been in decline.

²Saganoseki Smelter and Refinery and Hitachi Refinery (Nikko Smelting & Refining Co. Ltd.) [450,000 metric tons per year (t/yr)] and Tamano Smelter and Refinery (Hibi Kyoto Smelting Co. Ltd.) (260,000 t/yr).

³Secondary lead smelter and refinery.

TABLE 3
JAPAN: SUPPLY AND DEMAND FOR SELECTED NONFERROUS METALS

(Metric tons unless otherwise specified)

	Refined copper			Refined lead		
	2011	2012	2013	2011	2012	2013
Stocks at the beginning of the year	110,279	124,578	145,938	16,521	15,168	19,558
Production	1,328,288	1,516,354	1,468,100	215,064	208,994	208,115
Imports	126,569	35,876	41,426	22,049	28,869	23,883
Total supply	1,565,136	1,676,808	1,655,464	253,634	253,031	251,556
Exports	437,247	545,908	572,140	33,367	20,708 ^r	8,621
Reported consumption	1,058,646	948,687 ^r	911,601	191,801	204,908 ^r	209,488
Total demand	1,495,893	1,494,595 ^r	1,483,741	225,168	225,616 ^r	218,109
Stocks at the end of the year	124,578	145,938 ^r	103,379	15,168	19,558 ^r	30,708
Apparent consumption ¹	1,003,311	984,962	979,945	205,099	212,765 ^r	212,227
	Refined zinc			Silver (kilograms)		
	2011	2012	2013	2011	2012	2013
Stocks at the beginning of the year	65,555	92,265	72,891	1,062,722	999,120	1,037,918
Production	544,674	571,312	587,291	1,724,218	1,764,533	1,731,478
Remelting	NA	NA	NA	325,373	348,620	267,977
Imports	77,881	23,960	21,816	1,929,204	1,698,639	1,778,354
Total supply	688,110	687,537	681,998	5,041,517	4,810,912	4,815,727
Exports	95,278	135,560	115,383	2,837,596	3,493,979 ^r	3,601,010
Reported consumption	351,848	356,811 ^r	383,614	1,737,564	1,089,298 ^r	1,048,790
Total demand	447,126	492,371 ^r	499,007	4,575,160	4,583,277 ^r	4,649,800
Stocks at the end of the year	92,265	72,891 ^r	68,932	999,120	1,037,918	964,059
Apparent consumption ¹	500,567	479,086 ^r	497,683	1,204,801	279,015 ^r	250,658

^rRevised. NA Not applicable.

¹Apparent consumption is total supply less exports and stocks at yearend.

Source: Japan Mining Industry Association, 2015.