BAUXITE AND ALUMINA[1]

(Data in thousand metric dry tons unless otherwise noted)

Domestic Production and Use: In 2015, bauxite consumption was estimated to be 9.0 million tons, nearly all of which was imported, with an estimated value of $252 million. More than 95% of the bauxite was converted to alumina, and the remainder went to nonmetallurgical products, such as abrasives, chemicals, proppants, and refractories. Four domestic Bayer-process refineries had a combined alumina production capacity of 5.6 million tons per year. About 90% of the alumina produced went to primary aluminum smelters and the remainder went to nonmetallurgical products, such as abrasives, ceramics, chemicals, and refractories.

Salient Statistics—United States:	2011	2012	2013	2014	2015[e]
Bauxite:					
Production, mine	NA	NA	NA	NA	NA
Imports for consumption[2]	10,200	11,000	10,800	11,800	9,000
Exports[2]	76	42	21	15	20
Stocks, industry, yearend[2]	1,350	2,770	3,400	5,400	5,380
Consumption, apparent[3]	8,820	9,560	10,200	9,780	9,000
Price, average value, U.S. imports (f.a.s.), dollars per ton	30	28	27	27	28
Net import reliance,[4] as a percentage of apparent consumption	100	100	100	100	100
Alumina:					
Production, refinery	3,790	4,370	4,400	4,390	4,000
Imports for consumption[5]	2,160	1,900	2,050	1,630	1,700
Exports[5]	1,660	1,720	2,250	2,130	2,100
Stocks, industry, yearend[5]	961	363	280	277	300
Consumption, apparent[3]	3,710	5,170	4,280	3,900	3,580
Price, average value U.S. imports (f.a.s.) dollars per ton	413	374	368	394	410
Net import reliance,[4] as a percentage of apparent consumption	E	15	E	E	E

Recycling: None.

Import Sources (2011–14):[6] Bauxite: Jamaica, 44%; Guinea, 24%; Brazil, 23%; Guyana, 4%; and other, 5%. Alumina: Suriname, 35%; Australia, 34%; Brazil, 12%; Jamaica, 8%; and other, 11%. Total: Jamaica, 29%; Brazil, 19%; Guinea, 18%; Australia, 11%; and other, 23%.

Tariff: Item	Number	Normal Trade Relations 12–31–15
Bauxite, calcined (refractory grade)	2606.00.0030	Free.
Bauxite, calcined (other)	2606.00.0060	Free.
Bauxite, crude dry (metallurgical grade)	2606.00.0090	Free.
Alumina	2818.20.0000	Free.
Aluminum hydroxide	2818.30.0000	Free.

Depletion Allowance: 22% (Domestic), 14% (Foreign).

Government Stockpile: None

Events, Trends, and Issues: Global alumina and bauxite production increased by 9% and 12%, respectively, compared with that of 2014. Production of alumina in China, which accounted for nearly one-half of global production, increased by 19% as capacity increased to 66 million metric tons per year. However, several refineries in China announced shutdowns during the last quarter of the year, citing low prices for alumina. Following Indonesia's ban on the export of bauxite in January 2014, bauxite production in China increased, imports from countries other than Indonesia increased, and stocks of bauxite were drawn down. In 2015, Australia supplied 20 million tons of bauxite to China, 28% more than in 2014. Bauxite production in Malaysia increased to 21.2 million tons in 2015 from 3.26 million tons in 2014, and nearly all was exported to China in both years. In response to Indonesia's export ban on bauxite, one alumina refinery in Indonesia started production in 2014, and a second one was expected to be completed in 2016. Low alumina prices, China's ability to secure alternate sources of bauxite, and China's growth in alumina capacity could limit global demand for Indonesian alumina and discourage further refinery construction in Indonesia.

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At a 1,600,000-ton-per-year alumina refinery in Corpus Christi, TX, a shutdown of one potline, ahead of an employee lockout beginning in October 2014, reduced production by 25% during the first half of 2015. The owner of a 2.3-million-ton-per-year alumina refinery in Point Comfort, TX, announced that it would temporarily shut down 1.2 million tons per year of its alumina capacity starting in the fourth quarter of 2015, citing low prices for alumina and aluminum.

The estimated annual average price free alongside ship (f.a.s.) for U.S. imports for consumption of metallurgical-grade alumina was $410 per ton, ranging between $376 per ton and $528 per ton during the first 9 months of 2015. According to production data from the International Aluminium Institute, world alumina production through September 2015 increased by about 6% compared with that of the same period in 2014. For the first 9 months of 2015, the estimated average price (f.a.s.) for U.S. imports for consumption of crude-dry bauxite was $28 per ton, unchanged from that of the same period in 2014. A significant portion of bauxite consumed at alumina refineries in the United States came from mines owned by the same companies that owned the refineries.

World Alumina Refinery and Bauxite Mine Production and Bauxite Reserves: Reserves for Australia, Greece, and India were revised based on Government reports.

	Alumina		Bauxite		Reserves[7]
	2014	2015[e]	2014	2015[e]	
United States	4,390	4,000	NA	NA	20,000
Austraila	20,500	20,200	78,600	80,000	6,200,000
Brazil	10,600	10,300	34,800	35,000	2,600,000
China	47,800	57,000	55,000	60,000	830,000
Greece	800	800	1,900	1,900	250,000
Guinea	—	—	17,300	17,700	7,400,000
Guyana	—	—	1,600	1,700	850,000
India	5,060	5,470	16,500	19,200	590,000
Indonesia	240	300	2,550	1,000	1,000,000
Jamaica	1,850	1,950	9,680	10,700	2,000,000
Kazakhstan	1,600	1,600	5,200	5,200	160,000
Malaysia	—	—	3,260	21,200	40,000
Russia	2,570	2,580	5,590	6,600	200,000
Suriname	1,300	970	3,000	2,200	580,000
Venezuela	650	650	1,500	1,500	320,000
Vietnam	485	500	1,090	1,100	2,100,000
Other countries	10,600	11,400	7,200	8,500	2,400,000
World total (rounded)	108,000	118,000	245,000	274,000	28,000,000

World Resources: Bauxite resources are estimated to be 55 to 75 billion tons, in Africa (32%), Oceania (23%), South America and the Caribbean (21%), Asia (18%), and elsewhere (6%). Domestic resources of bauxite are inadequate to meet long-term U.S. demand, but the United States and most other major aluminum-producing countries have essentially inexhaustible subeconomic resources of aluminum in materials other than bauxite.

Substitutes: Bauxite is the only raw material used in the production of alumina on a commercial scale in the United States. Although currently not economically competitive with bauxite, vast U.S. and global resources of clay are technically feasible sources of alumina. Other domestic raw materials, such as alunite, anorthosite, coal wastes, and oil shales, offer additional potential alumina sources. Some refineries in China recover alumina from coal ash, and processes for recovering alumina from clay were being tested in Australia and Canada to determine if they would be economically competitive. Synthetic mullite, produced from kaolin, bauxitic kaolin, kyanite, and sillimanite, substitutes for bauxite-based refractories. Although more costly, silicon carbide and alumina-zirconia can substitute for bauxite-based abrasives.

[e]Estimated. E Net exporter. NA Not available. — Zero.

[1]See also Aluminum. As a general rule, 4 tons of dried bauxite is required to produce 2 tons of alumina, which, in turn, produces 1 ton of aluminum.

[2]Includes all forms of bauxite, expressed as dry equivalent weights.

[3]The sum of U.S. production and net import reliance.

[4]Defined as imports – exports + adjustments for industry stock changes.

[5]Calcined equivalent weights.

[6]Based on aluminum equivalents.

[7]See Appendix C for resource/reserve definitions and information concerning data sources.