BAUXITE AND ALUMINA[1]

(Data in thousand metric dry tons unless otherwise noted)

Domestic Production and Use: In 2021, the reported quantity of bauxite consumed was estimated to be 3.6 million tons, 8% more than that reported in 2020, with an estimated value of about $115 million. About 70% of the bauxite was refined by the Bayer process for alumina or aluminum hydroxide, and the remainder went to products such as abrasives, cement, chemicals, proppants, and refractories, and as a slag adjuster in steel mills. Alumina production was estimated to be 1 million tons, 25% less than that in 2020. One domestic alumina refinery with production capacity of 1.2 million tons per year accounted for all the production in 2021. Another alumina refinery with 500,000 tons per year of capacity was on care-and-maintenance status the entire year. About 55% 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:	2017	2018	2019	2020	2021[e]
Bauxite:					
Production, mine	W	W	W	W	W
Imports for consumption[2]	4,350	3,980	4,620	3,760	3,600
Exports[2]	29	16	15	15	12
Stocks, industry, yearend[e, 2]	880	600	300	250	200
Consumption:					
Apparent[3]	W	W	W	W	W
Reported	4,330	4,460	3,680	3,330	3,600
Price, average value of imports, free alongside ship (f.a.s.), dollars per ton	31	31	32	26	32
Net import reliance[4] as a percentage of apparent consumption	>75	>75	>75	>75	>75
Alumina:					
Production, refinery[5]	1,430	1,570	1,410	1,340	1,000
Imports for consumption[5]	1,330	1,530	1,930	1,340	1,500
Exports[5]	481	288	200	162	190
Stocks, industry, yearend[5]	264	275	275	234	150
Consumption, apparent[3]	2,340	2,800	3,140	2,560	2,400
Price, average value of imports, f.a.s., dollars per ton	486	592	480	412	450
Net import reliance[4] as a percentage of apparent consumption	39	44	55	48	58

Recycling: None.

Import Sources (2017–20): Bauxite:[2] Jamaica, 62%; Brazil, 13%; Guyana, 8%; Australia, 6%; and other, 11%. Alumina:[5] Brazil, 54%; Australia, 20%; Jamaica, 12%; Canada, 5%; and other, 9%.

Tariff: Item	Number	Normal Trade Relations 12–31–21
Bauxite, calcined (refractory grade)	2606.00.0030	Free.
Bauxite, calcined (other)	2606.00.0060	Free.
Bauxite, crude dry (metallurgical grade)	2606.00.0090	Free.
Aluminum oxide (alumina)	2818.20.0000	Free.
Aluminum hydroxide	2818.30.0000	Free.

Depletion Allowance: 22% (domestic), 14% (foreign).

Government Stockpile: None.

Events, Trends, and Issues: In 2021, one domestic alumina refinery produced alumina from imported bauxite. A 1.2-million-ton-per-year alumina refinery in Gramercy, LA, produced alumina for aluminum smelting and specialty-grade alumina. The Gramercy alumina refinery stopped production for about 1 week at the end of August as a precaution when Hurricane Ida approached the region, but restarted production soon afterwards. A 500,000-ton-per-year alumina refinery in Burnside, LA, was temporarily shut down in August 2020, and no plans have been announced regarding reopening. The average prices, f.a.s., for U.S. imports for consumption of crude dry bauxite and metallurgical-grade alumina during the first 9 months of 2021 were $32 per ton, 19% more than that in the same period in 2020, and $450 per ton, 18% more than that in the same period of 2020, respectively.

Prepared by **E. Lee Bray [(703) 648–4979, lbray@usgs.gov]**

BAUXITE AND ALUMINA[1]

In April 2021, a 2.8-million-ton-per-year alumina refinery in Shanxi Province, China, restarted production after being shut down in May 2019 after a spill from its red mud disposal impoundment. Flooding in Henan Province, China, was cited for several alumina refineries shutting down production for about 2 weeks in July. Environmental and safety audits were cited for several alumina refineries and bauxite mines shutting down production in several locations in China throughout the year, and production was not expected to restart at some locations until 2022. In Indonesia, a new 1-million-ton-per-year alumina refinery started production and shipped its first product in July. In July, a 3.5-million-ton-per-year alumina refinery in Brazil temporarily shut down about one-third of its capacity citing damage to equipment used to unload bauxite, but production was restarted in early October. In August, a 1.42-million-ton-per-year alumina refinery in Jamaica temporarily shut down after a fire caused major damage to its powerhouse.

World Alumina Refinery and Bauxite Mine Production and Bauxite Reserves: Reserves for Australia, Saudi Arabia, Vietnam, and some listed in "Other countries" were revised based on information from Government and other sources.

	Refinery and mine production				Bauxite reserves[6]
	Alumina[5]		Bauxite		
	2020	2021[e]	2020	2021[e]	
United States	1,340	1,000	W	W	20,000
Australia	20,800	21,000	104,000	110,000	[7]5,300,000
Brazil	10,300	11,000	31,000	32,000	2,700,000
Canada	1,520	1,500	—	—	—
China	73,100	74,000	92,700	86,000	1,000,000
Germany	1,900	1,900	—	—	—
Guinea	439	400	86,000	85,000	7,400,000
India	6,560	6,800	20,200	22,000	660,000
Indonesia	1,200	1,500	20,800	18,000	1,200,000
Ireland	1,880	1,900	—	—	—
Jamaica	1,620	1,200	7,550	5,800	2,000,000
Kazakhstan	1,400	1,500	5,000	5,200	160,000
Russia	2,870	3,100	5,570	6,200	500,000
Saudi Arabia	1,810	1,800	4,310	4,300	180,000
Spain	1,550	1,600	—	—	—
Ukraine	1,730	1,700	—	—	—
United Arab Emirates	1,920	2,000	—	—	—
Vietnam	1,400	1,400	3,500	3,500	5,800,000
Other countries	2,700	3,000	10,500	12,000	5,100,000
World total (rounded)	136,000	140,000	[8]391,000	[8]390,000	32,000,000

World Resources:[6] Bauxite resources are estimated to be between 55 billion and 75 billion tons, distributed 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 resources of clay are technically feasible sources of alumina. Other raw materials, such as alunite, anorthosite, coal wastes, and oil shales, offer additional potential alumina sources. Synthetic mullite, produced from kaolin, bauxitic kaolin, kyanite, and sillimanite, substitutes for bauxite-based refractories. Silicon carbide and alumina zirconia can substitute for alumina and bauxite in abrasives but cost more.

[e]Estimated. W Withheld to avoid disclosing company proprietary data. — 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]Defined as production + imports – exports + adjustments for industry stock changes.

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

[5]Calcined equivalent weights.

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

[7]For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were 2.0 billion tons.

[8]Excludes U.S. production.