



2015 Minerals Yearbook

BAUXITE AND ALUMINA [ADVANCE RELEASE]

BAUXITE AND ALUMINA

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In 2015, almost all of the 9.68 million metric tons (Mt) of bauxite consumed in the United States was imported. World production of bauxite was estimated to be 299 Mt (tables 1, 11); the leading producing countries were, in descending order of production, Australia, China, Brazil, Malaysia, India, Guinea, and Jamaica. U.S. production and shipments of alumina (calcined equivalent) were 4.55 Mt and 4.49 Mt, respectively. An estimated 83% of domestic shipments were used for metal production. World production of alumina (calcined equivalent) was estimated to be 120 Mt (tables 2, 12). The leading producing countries were China, Australia, Brazil, India, and the United States.

Production

Bauxite.—Domestic mines operated by five companies supplied less than 5% of the U.S. requirement for bauxite, and all of the bauxite that the United States required for alumina production was imported. All domestic production was used in nonmetallurgical products, such as abrasives, cement, chemicals, proppants, and refractories.

Alumina.—U.S. production of alumina (calcined equivalent), which was derived exclusively from imported metallurgical-grade bauxite, increased slightly in 2015 from that in 2014 (table 2). A lockout of 450 employees represented by the United Steelworkers (USW) union that started on October 11, 2014, by Sherwin Alumina Co. LLC (a subsidiary of Glencore International Ltd.) in Gregory, TX, continued through 2015. Production at the 1.65-million-metric-ton-per-year (Mt/yr) alumina refinery was continued by management employees and temporary workers. The unionized employees rejected a contract offer the day before the lockout started. In May 2015, the regional director of the National Labor Relations Board upheld the legality of the lockout, but the USW filed an appeal in June. Sherwin and the USW resumed negotiations on September 14, 2015, but no agreement was reached. Issues in the contract dispute included health care contributions, pay for unscheduled work, and wages (Fitzgerald, 2015; Laliberte, 2014; Lim, 2014; Matyi, 2014, 2015a, b; United Steelworkers, 2015).

In November, Alcoa Inc. announced that by the end of March 2016 it would temporarily shut down 1.2 Mt/yr of capacity at the 2.3-Mt/yr alumina refinery at Point Comfort, TX. Alcoa cited the need to close unprofitable capacity in order to improve the cost position of its upstream portfolio despite lower aluminum prices. At yearend, 375,000 metric tons per year (t/yr) of capacity was shut down (Alcoa Inc., 2015c; 2016, p. 11).

Consumption

Bauxite.—Domestic production and consumption data for bauxite and alumina were obtained by the U.S. Geological Survey from three separate voluntary surveys. The “Bauxite Consumption” survey was sent to 30 operations, 24 of which responded, representing approximately 89% of the bauxite consumed for uses other than cement listed in table 4.

Total domestic consumption of bauxite decreased slightly compared with that of 2014. In 2015, 97% of the bauxite consumed in the United States was refined to alumina [an estimated 2.06 metric tons (t) of dried bauxite was required to produce 1 t of alumina]; the remaining 3% was consumed in nonmetallurgical applications (table 4).

Alumina.—The “Alumina Production” survey was sent to all four domestic alumina refineries, two of which responded, and the other two reported alumina production in public reports. Alumina production was 4.55 Mt in 2015, slightly more than that in 2014 (table 2). Alumina consumption by domestic primary aluminum smelters was estimated from the responses to the “Aluminum” survey, which was received from all three companies that operated eight primary aluminum smelters. An estimated 83% of domestic alumina consumption (net alumina imports and domestic alumina shipments by U.S. alumina refineries) was for metal production at primary aluminum smelters. In 2015, eight domestic primary aluminum smelters consumed 3.17 Mt of alumina, 7% less than the amount of alumina consumed in 2014. The remainder of U.S. consumption of various forms of alumina was by abrasives, chemicals, refractories, and other specialty industries.

Prices

Most metallurgical-grade bauxite was purchased under long-term contracts, and contract terms normally were not made public. Spot prices for metallurgical-grade alumina and specialty forms of bauxite and alumina for nonmetallurgical applications, however, were published in trade journals.

The annual average delivered value of U.S. imports of metallurgical-grade bauxite decreased by 4% in 2015 compared with that of 2014 (table 5). In 2015, the average value of U.S. imports of calcined alumina, including cost, insurance, and freight at U.S. ports, was slightly lower at \$433 per metric ton (table 6). Yearend price ranges, as quoted in Industrial Minerals (2015, 2016), for refractory-grade bauxite exported from China were unchanged to slightly lower than those at yearend 2014 (table 7).

World Industry Structure

Bauxite.—In 2015, world production of bauxite was 15% more than that of 2014 (table 11). Total mine production of 299 Mt was reported from 30 countries. The leading producers of bauxite were, in decreasing order of tonnage mined, Australia, China, Brazil, Malaysia, India, Guinea, and Jamaica. These countries accounted for 91% of total world production; Australia and China together accounted for 49% of the world's production. In 2014, Malaysia accounted for only 1% of total world production of bauxite, but it increased production in 2015 by more than 850% (31.3 Mt) and was the fourth leading producer (12%).

Alumina.—World output of alumina increased by 12% in 2015 compared with that of 2014, attributed to a 25% increase in production in China (table 12). Although 27 countries reported production, the 5 leading producing countries, in descending order of quantity of alumina produced—China, Australia, Brazil, India, and the United States—accounted for 83% of world production; China and Australia accounted for 49% and 17%, respectively.

Mergers, Acquisitions, and Divestitures.—Alcoa announced that it would split into two separate companies in a transaction expected to be completed in the second half of 2016. One company, to retain the Alcoa name, would include the bauxite mines, alumina refineries, aluminum smelters, casthouses, and powerplants. The other company would receive downstream assets focused on value-added products for the aerospace and automobile industries, including rolling mills and specialty metal assets such as production capacity for aluminum-lithium alloys, nickel alloys, and titanium. During the past several years, Alcoa had been preparing for this restructuring by shutting down or selling high-cost upstream assets and investing in assets that produce value-added products (Alcoa Inc., 2015d).

In July, BHP Billiton Ltd. (Australia) completed the spinoff of its alumina, aluminum, bauxite, coal, lead, manganese, nickel, silver, and zinc assets to create a new company named South32 Ltd., headquartered in Perth, Western Australia, Australia. Bauxite and alumina assets of South32 included 86% of the 4.6-Mt/yr Worsley alumina refinery and an adjacent bauxite mine in Boddington, Western Australia, Australia, as well as 36% of the 3.5-Mt/yr Alumar alumina refinery and 40% of the adjacent 447,000-t/yr Alumar aluminum smelter in Sao Luis, Brazil. Other aluminum assets included 47.1% of the 565,000-t/yr Mozal smelter in Mozambique and the 715,000-t/yr Hillside smelter in South Africa (BHP Billiton Ltd., 2014a, b, 2015; South32 Ltd., 2015).

Almatis GmbH was sold by Dubai International Capital to OYAK, Turkey's largest private pension fund. Almatis owned the 500,000-t/yr Burnside, LA, alumina refinery that produces specialty alumina for the ceramic, polishing, and refractory industries (Almatis GmbH, 2015).

World Review

Australia.—Bauxite production increased by 3% (2.28 Mt) but alumina production decreased slightly (378,000 t) compared with that in 2014. Rio Tinto plc (United Kingdom) expanded bauxite capacity of the Gove Mine in the Northern Territory

to 8 Mt/yr from 6 Mt/yr, and production increased by 15% (969,000 t) compared with production in 2014. Bauxite from the Gove Mine was sold to third party customers since the 3.8-Mt/yr Gove alumina refinery was temporarily shut down in May 2014. Bauxite production from the Weipa Mine increased by 5% (1.4 Mt) compared with that in 2014 as Rio Tinto increased alumina production at the Yarwun refinery in Queensland. Rio Tinto completed ramping up new capacity at the Yarwun refinery, and production increased to 2.86 Mt, a 7% increase from that in 2014. The refinery capacity had been expanded to 3.4 Mt/yr in 2012 from 1.4 Mt/yr. Production from the 3.85-Mt/yr Queensland alumina refinery in Gladstone, Queensland, was 5% more than that in 2014 (Rio Tinto plc, 2014, p. 4; 2016, p. 3, 16–18).

Australian Bauxite Ltd. completed construction of the Bald Hill Mine in Tasmania and started bauxite production in December. The mine was expected to ramp up to 1.5 Mt/yr by mid-2017 (Lee, 2016; Lim, 2015b).

Rio Tinto was planning to construct a 22.8-Mt/yr bauxite mine in Queensland. Bauxite produced at the Amrun Mine would be shipped through the port of Cape York. Completion of the project was expected in 2019 (Rio Tinto plc, 2015).

Canada.—Orbite Technologies Inc. continued construction on a 1,100-t/yr refinery to produce high-purity (99.99%) alumina from high-alumina clay at Cap-Chat, Quebec. A dispute with a contractor and construction difficulties were cited for delaying completion from yearend 2015 to mid-2016. In addition to high-purity alumina, Orbite's plant would produce gallium, iron oxide, rare-earth elements, and high-purity silica (Maltais, 2015; Orbite Technologies Inc., 2016).

China.—Bauxite production was estimated to be 65 Mt, 10% more than the revised amount in 2014. Bauxite imports were 55.9 Mt, 54% more than the 36.3 Mt imported in 2014. The leading sources of bauxite imports, in descending order, were Malaysia (43%), Australia (35%), and India (14%). Although Indonesia had been a major supplier of bauxite to China prior to banning exports of unprocessed mineral ores in January 2014, refineries were able to maintain production in 2014 with stockpiled bauxite, increased domestic production, and imports from other sources. With stockpiles diminishing, refineries were more reliant upon increased imports in 2015. Alumina production was 59 Mt, a 25% increase compared with the revised amount in 2014 as new capacity ramped up during the year. Alumina imports in 2015 were 4.65 Mt, a decrease of 12% compared with those in 2014, and accounted for about 4% of China's consumption. Alumina capacity at yearend 2015 was estimated to be 69 Mt/yr, an 11% increase from 62 Mt/yr estimated at yearend 2014, and an additional 7 Mt/yr was expected to be completed in 2016. In November and December, alumina refineries in China shut down 9.1 Mt/yr of capacity citing low alumina prices and demand, as aluminum smelters in China were reported to have shut down 4.5 Mt/yr of primary aluminum capacity (China Metal Market—Alumina and Aluminum, 2014, 2016b; Leung, 2016a, b; Poole, 2015).

Results of exploration projects completed in 2014 were announced, including the discovery of 210 Mt of bauxite reserves. Two of the deposits discovered were in Guizhou Province. The Hongguangbe deposit contained 21 Mt, and the

Dazhuyuan deposit contained 33 Mt (China Metal Market—Alumina and Aluminum, 2015b, e).

Guizhou Province.—In April, Aluminum Corp. of China (Chinalco) started production from the first phase of the Qingzhen alumina refinery. The second phase was started in the third quarter of the year. Total capacity of the refinery was 1.6 Mt/yr. Chinalco completed the 1.2-Mt/yr Maochang Mine at yearend and would begin production in early 2016 to supply the Qingzhen refinery (China Metal Market—Alumina and Aluminum, 2016a; Leung, 2015a, b).

China Power Investment Corp. (CPI) continued construction of an 800,000-t/yr alumina refinery in Wuchuan County. Construction started in early 2014, and completion was expected in mid-2016. The refinery would be supplied with bauxite from the 1-Mt/yr Dazhuyuan Mine and the 1-Mt/yr Wachangping Mine, which were completed during the year (China Metal Market—Alumina and Aluminum, 2015d).

Hebei Province.—Chinalco, Shenhua Group Ltd., and the Hebei Provincial government signed an agreement for the construction of a 4-Mt/yr alumina refinery in Cangzhou. A construction schedule was not available (China Metal Market—Alumina and Aluminum, 2015e).

Henan Province.—Chinalco completed repairs at the 2.4-Mt/yr Zhengzhou alumina refinery that sustained damage to its red mud impound in September 2014. Production was halted temporarily because of the incident but was restarted in October 2014, and by February 2015 it was producing at a rate of 1.9 Mt/yr, the rate before the shutdown (Mok, 2015a). Chinalco signed an agreement with the municipal government to replace two production lines at the Zhengzhou alumina refinery with a combined capacity of 1.6 Mt/yr. The modernization project would not change the capacity of the refinery but would reduce pollution and energy consumption. A project schedule was not available. Chinalco expanded its Zhongzhou alumina refinery in Jiaozuo to 2.25 Mt/yr from 1.75 Mt/yr. Production from the new capacity started in October. Xiangjiang Wanji Aluminum Co. Ltd. was planning to expand its alumina refinery in Luoyang to 2 Mt/yr from 1.4 Mt/yr. A construction schedule was not available (China Metal Market—Alumina and Aluminum, 2015a, e).

Shanxi Province.—East Hope Group Ltd. started construction of an alumina refinery in Lingshi County. The first phase, with 500,000 t/yr of capacity, would be completed in April 2016 and the second phase, with 500,000 t/yr of capacity, would be completed by yearend 2016 (China Metal Market—Alumina and Aluminum, 2015d).

Chinalco Xinghua Science and Technology Co. Ltd. completed construction of a 350,000-t/yr aluminum hydroxide refinery, which started production in April. The aluminum hydroxide would be used for aluminum-based chemicals and other nonmetallurgical products (China Metal Market—Alumina and Aluminum, 2015c).

Yunnan Province.—Yunnan Aluminum Co. Ltd. continued expanding its alumina refinery in Wenshan to 1.4 Mt/yr from 800,000 t/yr. The project started in June 2014 but a completion date was not available. The refinery used bauxite from an adjacent bauxite deposit (Lee, 2015b).

Fiji.—Xinfa Aurum Bauxite Ltd. was planning to mine bauxite at Votua in addition to its mine in Nawailevu. Xinfa was granted a mining lease for the new site in 2014 (CRU Alumina Monitor, 2015a).

Guinea.—United Company RUSAL Plc continued construction of the Dian-Dian Mine, which would have a capacity of 3 Mt/yr. The bauxite mine would be completed in 2016 and bauxite would be shipped by rail to a port for export (Smart, 2015).

Alufer Mining Ltd. continued preparation work to construct the 4.8-Mt/yr Bel Air Mine. Construction would take about a year to complete. Expansion of the mine to 10.3 Mt/yr was planned (Blamey, 2015a).

Hongqiao Group Ltd. completed its 5-Mt/yr bauxite mine in the Boke region and began shipments to its refinery in China in September. Two 5-Mt/yr expansions are planned but a schedule was not available (Leung, 2015c).

Guyana.—In March, production started at the Kurubuka-22 Mine owned by Bauxite Company of Guyana Inc. (BCGI), a joint venture of RUSAL (90%) and Government of Guyana (10%). Total capacity of BCGI's mines was 2.3 Mt/yr (United Company RUSAL Plc, 2015a, b).

India.—Production of alumina and bauxite increased by 9% and 20%, respectively, owing to the rampup of capacity at three refineries and a bauxite mine that started previously. National Aluminum Co. Ltd. of India (Bhubaneswar) continued to ramp up the expansion of the Panchpatmali Mine, which was expanded to 6.83 Mt/yr from 6.3 Mt/yr, and of the alumina refinery in Damanjodi, Odisha State, which was expanded to 2.28 Mt/yr from 2.1 Mt/yr (National Aluminium Co. Ltd., 2014, 2016).

Emergency repairs interrupted production in March at the 1.5-Mt/yr Utkal alumina refinery, which Hindalco Industries Ltd. (Mumbai) commissioned in October 2013. However, production reached full capacity by yearend (Hindalco Industries Ltd., 2013, p. 4; 2016, p. 5; Lim, 2015c).

In the fourth quarter, Vedanta Resources plc reduced production at the 1-Mt/yr Lanjigarh alumina refinery to 800,000 t/yr to reduce costs. The refinery had ramped up an expansion to full capacity during the first quarter of 2014. Vedanta received permits to expand capacity of the refinery to 6 Mt/yr but was awaiting a reliable source of bauxite before starting the expansion (Vedanta Resources plc, 2016, p. 9).

Anrak Aluminium Ltd. (Visakhapatnam) continued to delay the startup of its 1.5-Mt/yr alumina refinery in Rachapalle, Andhra Pradesh State, as it awaited permits to mine bauxite from a nearby deposit. Anrak received approval from the State government to start up the refinery that was completed in the fourth quarter of 2013 (Bayya, 2014; CRU Alumina Monitor, 2015e).

Indonesia.—Bauxite production in Indonesia was 202,000 t compared with 2.56 Mt in 2014 and 57 Mt in 2013, as mines that had exported bauxite closed after a ban on exporting bauxite and other unprocessed mineral ores took effect on January 12, 2014. The export ban was part of the 2009 Mining Law and was intended to increase economic development in the country through investment in mineral processing facilities.

Several companies have invested in alumina refineries in Indonesia (Yee, 2014).

PT Indonesia Chemical Alumina, a joint venture between PT Indonesia Aneka Tambang Ltd. (Antam) (80%) and Japan-based Showa Denko K.K. (20%) commenced commercial production at the 300,000-t/yr Tayan refinery. The refinery produced chemical-grade alumina using bauxite from a nearby deposit in West Kalimantan (PT Aneka Tambang Tbk, 2016, p. 25–26).

Construction of a 1-Mt/yr alumina refinery in Ketapang, West Kalimantan, continued and was expected to be completed in early 2016. Expansion to 2 Mt/yr was expected to be completed by yearend 2016. The project was a joint venture among Chinese companies Hongqiao (60%) and Winning Investment Co. Ltd. (10%) and Indonesian companies Harita Group Ltd. (25%) and PT Danpac (5%) (Leung, 2015c; Winning International Group Ltd., 2016).

Antam planned to build a 1-Mt/yr alumina refinery in Mempawah, West Kalimantan, with Chinalco and PT Indonesia Asahan Aluminium Ltd. (Inalum). Construction was expected to begin in 2016 and be completed in 2019. Expansion to 2 Mt/yr was planned to begin after production of the first phase was ramped up. The refinery would supply Inalum's aluminum smelter in Asahan, North Sumatra, which Inalum planned to expand to 500,000 t/yr from 250,000 t/yr by 2020 (Lee, 2015a; PT Aneka Tambang Tbk, 2016, p. 109).

Jamaica.—The Government of Jamaica and Noranda Aluminum Holding Corp. settled a dispute concerning payments of levies for bauxite produced at the 5.4-Mt/yr St. Ann Mine in order to continue exports (Blamey, 2015b). Noranda completed an expansion project at Port Rhoades in Discovery Bay to enable ships with greater capacity to ship bauxite from its St. Ann Mine (CRU Alumina Monitor, 2015b).

Laos.—Sino-Lao Aluminium Co. Ltd. was developing a 1-Mt/yr alumina refinery that would use bauxite from a 3-Mt/yr mine being planned at Champasak. The mine and refinery was scheduled to be completed by yearend 2016. Yunnan Aluminum Ltd. was acquiring a 51% share of the project (Leung, 2015d).

Malaysia.—Bauxite production in Malaysia increased to 35 Mt in 2015 from 3.67 Mt in 2014 as mines increased production to supply alumina refineries in China after Indonesia implemented an export ban on unprocessed mineral ores, including bauxite, in 2014 (China Metal Market—Alumina and Aluminum, 2016c).

Altech Chemicals Ltd. (Australia) tested its process to produce high-purity (99.99%) alumina from a high-alumina clay deposit in Western Australia. Altech was conducting a feasibility study for a refinery to be built in Johor Bahru. Altech planned to sell the high-purity alumina for use in electronics and other high-tech products. A completion schedule of the 4,000-t/yr refinery was not announced (Altech Chemicals Ltd., 2015).

Romania.—Alumina production increased by 12% compared with that in 2014. Vimetco N.V. completed a modernization project in the first quarter of 2014 at the 600,000-t/yr alumina refinery in Tulcea and completed ramping up to 415,000 t/yr, the production rate prior to the project, at the start of 2015 (Vimetco N.V., 2015, p. 5; 2016, p. 14).

Russia.—Production started at the Cheryomukhovskaya-Glubokaya section of the North Urals Mine. Further expansion

was expected to be completed in 2016, and a third expansion would be completed in 2017, increasing capacity of the mine to 4.6 Mt/yr from 3.4 Mt/yr (Blamey 2015c). In April, RUSAL started an expansion project at the Ural alumina refinery in Kamensk-Uralsky. The project would increase capacity to 900,000 t/yr from 770,000 t/yr when completed at yearend 2016 (Mok, 2015b). RUSAL was developing a process to recover alumina from clay and other nonbauxite materials. A pilot plant in Siberia would be completed in early 2016 and, if proven feasible, a commercial-scale refinery would be constructed (United Company RUSAL Plc, 2015c).

Saudi Arabia.—Alcoa and Saudi Arabian Mining Co. (Ma'aden) continued ramping up their joint-venture alumina refinery at Ras Al-Khair that started production in December 2014. Full production was expected to be reached in mid-2016 from the 1.8-Mt/yr refinery, which used bauxite from the 4-Mt/yr Al Ba'itha Mine that was also completed in 2014. Alumina from the refinery would supply an adjacent 740,000-t/yr smelter that was completed in 2013. Ma'aden owned 74.9% of the joint venture, and Alcoa owned 25.1% (Alcoa Inc., 2014; Lim, 2015d).

Sierra Leone.—Bauxite production increased by 15% in 2015 compared with the amount produced in 2014 after Vimetco completed equipment upgrades in 2014 (Vimetco N.V., 2015, p. 5, 15; 2016, p. 14–15).

Solomon Islands.—Asia Pacific Investment Development started commercial production of bauxite on Rennell Island in 2015 and exported 270,000 t to China (China Metal Market—Alumina and Aluminum, 2016c; CRU Alumina Monitor, 2015c).

Spain.—In February, Alcoa completed a modernization project of the 1.5-Mt/yr San Ciprian refinery that converted its fuel source to natural gas from fuel oil. The conversion to natural gas would reduce emissions of carbon dioxide and sulfur dioxide and decrease alumina production costs by approximately \$20 per metric ton (Alcoa Inc., 2015b).

Suriname.—Alumina and bauxite production decreased by 35% and 41%, respectively, compared with the revised amounts in 2014. In April, Alcoa shut down 443,000 t/yr of capacity at the 2.2-Mt/yr alumina refinery in Paranam. After the shutdown, 886,000 t/yr of capacity was still operating, but in November this capacity was also shut down. Limited energy supplies, declining bauxite reserves, and low alumina prices were cited for the shutdown. Bauxite production from the mines supplying the Paranam refinery was permanently shut down in the fourth quarter when reserves were exhausted (Alcoa Inc., 2015a; 2016, p. 5–6, 11; Lim, 2015a).

Vietnam.—State-owned Vietnam National Coal and Mineral Industries Group (Vinacomin) completed ramping up production at the alumina refinery in Tan Rai, Lam Dong Province. The 600,000-t/yr refinery was started up in 2014. Vinacomin and Alcoa were discussing a cooperation agreement to improve the operational and technical performance of the refinery (Alcoa Inc., 2016, p. 12). Vinacomin continued construction of the 650,000-t/yr Nhan Co alumina refinery in Dak Nong Province, which was nearly complete at yearend 2015. Reportedly, startup was not expected until alumina prices increased to over \$250 per metric ton (Lim, 2016).

Outlook

Consumption of bauxite and alumina is expected to closely follow the trend of aluminum production. Aluminum prices, which generally decreased throughout 2015, stabilized in 2016. World demand for aluminum in 2016 is expected to only increase slightly from that in 2015 because the rate of economic expansion in China was slower than in prior years and aluminum consumption in Europe continued to stagnate. World consumption of alumina for nonmetallurgical uses is expected to increase slightly, attributable to continued growth in consumption of aluminum-hydroxide-based fire retardant materials and other alumina-based chemicals. Demand for high-purity alumina for devices such as smart phones, laptops, and tablets is expected to continue to increase, although the effect on total demand for bauxite and alumina would be nominal because of the limited volume of this market relative to aluminum smelting. Also, new entrants to the high-purity alumina market are expected to use high-alumina clay instead of bauxite as the raw material for their processes, as higher purity levels can be obtained using high-alumina clay.

Indonesia's restriction of exports of mineral resources is expected to be modified for companies constructing new alumina refineries (Jakarta Post, The, 2016). The ability of alumina refineries in China to obtain bauxite from other sources calls into question the effectiveness of Indonesia's export ban. Although some alumina refineries have been completed and others are under construction in Indonesia, lower alumina prices have cast doubt on the economic feasibility of additional alumina capacity in Indonesia. Although Malaysia increased bauxite production significantly in 2015 to supply demand in China, concerns about environmental impacts lead the Government of Malaysia to halt bauxite mining in early 2016 (Mok, 2016). The policy of China's Government that encouraged companies to make investments in power-intensive industries in other countries is also expected to continue to affect the location of new alumina refineries, and fewer expansions of alumina refineries in China are expected. Chinese refineries are expected to continue to source more bauxite from Australia and countries in West Africa. Access barriers to bauxite deposits in India, which currently restrain the startup of new alumina capacity, are expected to be resolved in the long run, but the history of slow mine permitting is expected to deter expansion projects in India. India plans to auction mining permits for bauxite deposits, which is expected to enable refineries to produce at full capacity without importing bauxite (CRU Alumina Monitor, 2015d). Shutdowns of capacity in the United States announced for 2016 are expected to last until aluminum prices are significantly higher for a sustained period of time.

References Cited

Alcoa Inc., 2014, Refinery at Ma'aden-Alcoa joint venture produces first alumina from Saudi bauxite: New York, NY, Alcoa Inc. press release, December 21. (Accessed November 25, 2016, at <http://news.alcoa.com/press-release/refinery-maaden-alcoa-joint-venture-produces-first-alumina-saudi-bauxite>.)

Alcoa Inc., 2015a, Alcoa achieves strong first quarter profits: New York, NY, Alcoa Inc. press release, April 8. (Accessed November 25, 2016, at

<http://news.alcoa.com/press-release/alcoa-achieves-strong-first-quarter-profits-0>.)

Alcoa Inc., 2015b, Alcoa converts San Ciprian alumina refinery to natural gas, improving global competitiveness: New York, NY, Alcoa Inc. press release, February 9. (Accessed November 25, 2016, at <http://news.alcoa.com/press-release/alcoa-converts-san-ciprian-alumina-refinery-natural-gas-improving-global>.)

Alcoa Inc., 2015c, Alcoa to curtail smelting and refining capacity to further drive upstream competitiveness: New York, NY, Alcoa Inc. press release, November 2. (Accessed November 25, 2016, at <http://news.alcoa.com/press-release/alcoa-curtail-smelting-and-refining-capacity-further-drive-upstream-competitiveness>.)

Alcoa Inc., 2015d, Alcoa to separate into two industry-leading public companies, completing successful multi-year transformation: New York, NY, Alcoa Inc. press release, September 28. (Accessed November 25, 2016, at <http://news.alcoa.com/press-release/alcoa-separate-two-industry-leading-public-companies-completing-successful-multi-year>.)

Alcoa Inc., 2016, Annual report 2015: New York, NY, Alcoa Inc., 196 p. (Accessed December 1, 2016, at <http://www.asx.com.au/asxpdf/20160329/pdf/4363s45gbb1p3j.pdf>.)

Almatis GmbH, 2015, DIC completes sale of Almatis to OYAK: Frankfurt, Germany, Almatis GmbH press release, September 1. (Accessed September 2, 2015, at <http://www.almatis.com/news/press-releases/2015/dic-completes-sale-of-almatis-to-oyak/>.)

Altech Chemicals Ltd., 2015, Altech produces competitive high purity alumina (HPA) results: Subiaco, Western Australia, Australia, Altech Chemicals Ltd. media release, February 20, 4 p. (Accessed February 20, 2015, at <http://www.altechchemicals.com/sites/altechchemicals.com/files/asx-announcements/ASX%20ATC%20Produces%20Competitive%20High%20Purity%20Alumina%20Results%20%283%29.pdf>.)

Bayya, Venkatesh, 2014, Here's the refinery, where's the bauxite?: The Times of India, January 18. (Accessed December 11, 2014, at <http://timesofindia.indiatimes.com/city/visakhapatnam/Heres-the-refinery-wheres-the-bauxite/articleshow/28983130.cms>.)

BHP Billiton Ltd., 2014a, Creation of new global metals and mining company to accelerate portfolio simplification: Melbourne, Victoria, Australia, BHP Billiton Ltd. news release, August 19. (Accessed March 18, 2015, at http://www.csrwire.com/press_releases/37382-Creation-of-New-Global-Metals-and-Mining-Company-to-Accelerate-Portfolio-Simplification.)

BHP Billiton Ltd., 2014b, New company to be named South32: Melbourne, Victoria, Australia, BHP Billiton Ltd. news release, December 8. (Accessed March 18, 2015, at <http://www.bhpbilliton.com/media-and-insights/news-releases/2014/12/new-company-to-be-named-south32>.)

BHP Billiton Ltd., 2015, Demerger of South32 completion of the sale facility: Melbourne, Victoria, Australia, BHP Billiton Ltd. news release, July 7. (Accessed March 29, 2016, at <http://www.bhpbilliton.com/media-and-insights/news-releases/2015/07/demerger-of-south32-completion-of-the-sale-facility>.)

Blamey, Andy, 2015a, Alufer gets \$10-mil bridge loan for Guinea bauxite project: Platts Metals Daily, v. 4, no. 111, June 9, p. 4.

Blamey, Andy, 2015b, Noranda Aluminum reaches bauxite deal with Jamaica: Platts Metals Daily, v. 4, no. 113, June 11, p. 3-4.

Blamey, Andy, 2015c, Rusal starts first phase of North Urals bauxite mine: Platts Metals Daily, v. 4, no. 70, April 10, p. 7.

China Metal Market—Alumina and Aluminum, 2014, Bauxite and alumina: China Metal Market—Alumina and Aluminum, no. 216, December 1, p. 20.

China Metal Market—Alumina and Aluminum, 2015a, Bauxite and alumina: China Metal Market—Alumina and Aluminum, no. 219, March 1, p. 15-16.

China Metal Market—Alumina and Aluminum, 2015b, Bauxite and alumina: China Metal Market—Alumina and Aluminum, no. 223, July 1, p. 20.

China Metal Market—Alumina and Aluminum, 2015c, Bauxite and alumina: China Metal Market—Alumina and Aluminum, no. 224, August 1, p. 21.

China Metal Market—Alumina and Aluminum, 2015d, Bauxite and alumina: China Metal Market—Alumina and Aluminum, no. 226, October 1, p. 20-21.

China Metal Market—Alumina and Aluminum, 2015e, Bauxite and alumina: China Metal Market—Alumina and Aluminum, no. 228, December 1, p. 21-23.

China Metal Market—Alumina and Aluminum, 2016a, Bauxite and alumina: China Metal Market—Alumina and Aluminum, no. 229, January 1, p. 20.

China Metal Market—Alumina and Aluminum, 2016b, Bauxite and alumina: China Metal Market—Alumina and Aluminum, no. 230, February 1, p. 22-24.

- China Metal Market—Alumina and Aluminum, 2016c, Import and export: China Metal Market—Alumina and Aluminum, no. 230, February 1, p. 10.
- CRU Alumina Monitor, 2015a, Industry news: CRU Alumina Monitor, February 12, p. 11.
- CRU Alumina Monitor, 2015b, Industry news: CRU Alumina Monitor, March 12, p. 11.
- CRU Alumina Monitor, 2015c, Industry news: CRU Alumina Monitor, May 14, p. 11.
- CRU Alumina Monitor, 2015d, Industry news: CRU Alumina Monitor, August 12, p. 10.
- CRU Alumina Monitor, 2015e, Industry news: CRU Alumina Monitor, September 10, p. 10.
- Fitzgerald, Daniel, 2015, Safety remains a core value at Texas plant, Sherwin says: American Metal Market, v. 123, no. 7–3, February 19, p. 6.
- Hindalco Industries Ltd., 2013, Investor presentation Q1 FY14: Mumbai, India, Hindalco Industries Ltd. financial results presentation, August 13, 26 p. (Accessed November 26, 2014, at http://www.hindalco.com/upload/pdf/Hindalco_Q1FY13-14_presentation.pdf.)
- Hindalco Industries Ltd., 2016, Annual report 2015–16: Mumbai, India, Hindalco Industries Ltd., 187 p. (Accessed November 22, 2016, at <http://www.hindalco.com/upload/pdf/Hindalco-full-annual-report-2015-16.pdf>.)
- Industrial Minerals, 2015, IM January price movements: Industrial Minerals, January 5. (Accessed January 31, 2016 via <http://www.indmin.com/MonthlyPrices.html>.)
- Industrial Minerals, 2016, IM January price movements: Industrial Minerals, January 4. (Accessed January 31, 2016 via <http://www.indmin.com/MonthlyPrices.html>.)
- Jakarta Post, The, 2016, Govt to allow nickel ore, bauxite exports under new rules: The Jakarta [Indonesia] Post, October 26. (Accessed October 26, 2016, at <http://www.thejakartapost.com/news/2016/10/26/govt-to-allow-nickel-ore-bauxite-exports-under-new-rules.html>.)
- Laliberte, Nathan, 2014, Sherwin locks out workers after talks fail: American Metal Market, v. 122, no. 42–3, October 15, p. 5.
- Lee, Winnie, 2015a, Chinalco joins Antam, Inalum in W. Kalimantan alumina project: Platts Metals Daily, v. 4, no. 248, December 17, p. 2–3.
- Lee, Winnie, 2015b, Yunnan Aluminium raises H1 alumina output 39%: Platts Metals Daily, v. 4, no. 168, August 27, p. 4.
- Lee, Winnie, 2016, Australian Bauxite to halt Bald Hill output until buyers emerge for maiden shipment: Platts Metals Daily, v. 5, no. 9, January 14, p. 1–2.
- Leung, Joshua, 2015a, Chalco eyes June start for its Maochang bauxite mine: Platts Metals Daily, v. 4, no. 80, April 24, p. 6–7.
- Leung, Joshua, 2015b, Chalco eyes Q3 start for new 800k mt/year alumina line: Platts Metals Daily, v. 4, no. 169, August 28, p. 3.
- Leung, Joshua, 2015c, Hongqiao to start 2nd-phase alumina line in Indonesia: Platts Metals Daily, v. 4, no. 224, November 13, p. 7–8.
- Leung, Joshua, 2015d, Yunnan Aluminium seeks funds for Laos alumina acquisition: Platts Metals Daily, v. 4, no. 189, September 25, p. 6.
- Leung, Joshua, 2016a, China shuts 9.1 mil mt/year alumina capacity since November: Platts Metals Daily, v. 5, no. 11, January 18, p. 4.
- Leung, Joshua, 2016b, China to use 6.5 mil mt/year of new Al capacity in 2016: Platts Metals Daily, v. 5, no. 20, January 29, p. 7–8.
- Lim, Joanna, 2014, Sherwin Alumina still operating despite lockout—Sources: Platts Metals Daily, v. 3, no. 209, October 23, p. 1–2.
- Lim, Joanna, 2015a, Alcoa to cut Suriname alumina refining capacity by April 30: Platts Metals Daily, v. 4, no. 54, March 18, p. 4–5.
- Lim, Joanna, 2015b, Australia's ABX defers bauxite exports as prices fall: Platts Metals Daily, v. 4, no. 240, December 7, p. 6.
- Lim, Joanna, 2015c, Hindalco withdrawals alumina sale on emergency repairs: Platts Metals Daily, v. 4, no. 48, March 10, p. 5.
- Lim, Joanna, 2015d, Ma'aden-Alcoa alumina refinery at below 50% capacity: Platts Metals Daily, v. 4, no. 90, May 8, p. 7.
- Lim, Joanna, 2016, Vietnam's Vinaomin delays second alumina refinery startup: Platts Metals Daily, v. 5, no. 19, January 28, p. 1–2.
- Maltais, Kirk, 2015, Orbite to delay plant start to next year: American Metal Market, v. 123, no. 50–4, December 17, p. 9.
- Matyi, Bob, 2014, No new talks scheduled in Sherwin Alumina lockout: Platts Metals Daily, v. 3, no. 207, October 21, p. 2–3.
- Matyi, Bob, 2015a, Sherwin, USW resume talks Sep 14 in hopes of ending lockout: Platts Metals Daily, v. 4, no. 173, September 3, p. 2.
- Matyi, Bob, 2015b, USW to appeal NLRB ruling on Sherwin Alumina lockout: Platts Metals Daily, v. 4, no. 116, June 16, p. 4–5.
- Mok, Yuencheng, 2015a, Chalco says Henan alumina refinery fully repaired: Platts Metals Daily, v. 4, no. 169, February 4, p. 3.
- Mok, Yuencheng, 2015b, Rusal to hike Urals Al smelter capacity to 900,000 mt/year: Platts Metals Daily, v. 4, no. 67, April 7, p. 2.
- Mok, Yuencheng, 2016, Malaysia bans bauxite mining in Pahang from Jan 15 for 3 months: Platts Metals Daily, v. 5, no. 4, January 7, p. 3.
- National Aluminium Co. Ltd., 2014, Nalco announces dividend of Rs. 387 Crore for 2013–14: Bhubaneswar, India, National Aluminium Co. Ltd. press release, September 27. (Accessed November 30, 2015, at <http://www.nalcoindia.com/Press-Brief-archiv.aspx>.)
- National Aluminium Co. Ltd., 2016, Nalco announces 40% dividend amounting to Rs. 467 Crore for 2015–16: Bhubaneswar, India, National Aluminium Co. Ltd. press release, October 1. (Accessed November 22, 2016, at <http://www.nalcoindia.com/Press-Brief.aspx>.)
- Orbite Technologies Inc., 2016, Orbite announces fourth quarter and full year 2015 results: Montreal, Quebec, Canada, Orbite Technologies Inc. press release, March 31, 8 p. (Accessed November 15, 2016, at http://s2.q4cdn.com/622589029/files/doc_news/2016/mar/2016_03_31_ORT_PR_Q4_and_Year_End_2015.pdf.)
- Poole, Anthony, 2015, Indonesia's bauxite ban 'fails'; China maintains double-digit metal output growth—Tumazos: Platts Metals Daily, v. 4, no. 131, July 7, p. 1–3.
- PT Aneka Tambang Tbk, 2016, 2015 Annual report: Jakarta, Indonesia, PT Aneka Tambang Tbk, 690 p. (Accessed November 15, 2016, at http://www.antam.com/images/stories/joget/file/annual/2015/ar_antam_2015.pdf.)
- Rio Tinto plc, 2014, Rio Tinto delivers very strong first half production: London, United Kingdom, Rio Tinto plc media release, July 16, 26 p. (Accessed September 11, 2014, at <http://www.riotinto.com/documents/140716%20RT%20delivers%20strong%20first%20half%20production.pdf>.)
- Rio Tinto plc, 2015, Rio Tinto approves US\$1.9 billion Amrun (South of Embley) bauxite project: London, United Kingdom, Rio Tinto plc media release, November 17, 3 p. (Accessed November 16, 2016, at [http://www.riotinto.com/documents/151127_Rio_Tinto_approves_US_1.9_billion_Amrun_\(South_of_Embley\)_bauxite_project.pdf](http://www.riotinto.com/documents/151127_Rio_Tinto_approves_US_1.9_billion_Amrun_(South_of_Embley)_bauxite_project.pdf).)
- Rio Tinto plc, 2016, Rio Tinto releases solid fourth quarter production results: Melbourne, Victoria, Australia, Rio Tinto plc media release, January 19, 26 p. (Accessed March 17, 2016, at http://www.riotinto.com/documents/160119_Rio%20Tinto%20releases%20solid%20fourth%20quarter%20production%20results.pdf.)
- Smart, Greg, 2015, Rusal signs multilateral rail transport deal with Guinea: Platts Metals Daily, v. 4, no. 123, June 25, p. 3.
- South32 Ltd., 2015, Quarterly report September 2015: Perth, Western Australia, Australia, South32 Ltd. news release, October 22, 8 p. (Accessed December 1, 2016, at <https://www.south32.net/CMSPages/GetFile.aspx?guid=c95e77d4-aff-44dd-9f87-5195fdd4a132>.)
- United Company RUSAL Plc, 2015a, Bauxite Company of Guyana: Moscow, Russia, United Company RUSAL Plc website. (Accessed November 27, 2015, at <http://www.rusal.ru/en/about/11.aspx>.)
- United Company RUSAL Plc, 2015b, UC RUSAL starts bauxite mining at Kurubuka-22 in Guyana: Moscow, Russia, United Company RUSAL Plc press release, March 12. (Accessed March 13, 2015, at <http://www.rusal.ru/en/press-center/press-releases/9547/>.)
- United Company RUSAL Plc, 2015c, UC RUSAL to produce alumina from Siberian clay: Moscow, Russia, United Company RUSAL Plc press release, October 14. (Accessed October 27, 2015, at <http://www.rusal.ru/en/press-center/press-releases/9530/>.)
- United Steelworkers, 2015, USW will appeal NLRB regional director's decision: United Steelworkers press release, May 12. (Accessed September 2, 2015, at <http://www.usw.org/news/media-center/articles/2015/usw-will-appeal-nlr-regional-directors-decision>.)
- Vedanta Resources plc, 2016, Production release for the third quarter ended 31 December 2015: London, United Kingdom, Vedanta Resources plc news release, January 29, 18 p. (Accessed November 22, 2016, at http://www.vedantaresources.com/media/194131/vedanta_plc_q3_production_release_final.pdf.)
- Vimetco N.V., 2015, Annual report 2014: Amsterdam, Netherlands, Vimetco N.V., 140 p. (Accessed December 1, 2015, at <http://www.vimetco.com/sites/default/files/vimetco/Annual%20Report%202014.pdf>.)
- Vimetco N.V., 2016, Annual report 2015: Amsterdam, Netherlands, Vimetco N.V., 144 p. (Accessed October 7, 2016, at <http://www.vimetco.com/sites/default/files/vimetco/Vimetco%20Annual%20Report%202015.pdf>.)

Winning International Group Ltd., 2016, China's first overseas alumina production line has been completed: Singapore, Singapore, Winning International Group Ltd. news release, May 23. (Accessed November 7, 2016, at <http://www.winninggroup.com.sg/chinas-first-overseas-alumina-production-line-has-been-completed/?lang=en>.)

Yee, Alvin, 2014, Indonesia to slash 2014 bauxite output by 98% to 1 mil mt: *Platts Metals Daily*, v. 3, no. 87, May 5, p. 2–3.

GENERAL SOURCES OF INFORMATION

U.S. Geological Survey Publications

Aluminum. Ch. in *Mineral Commodity Summaries*, annual.

Aluminum. *Mineral Industry Surveys*, monthly.

Aluminum (Al). Ch. in *Metal Prices in the United States Through 2010*, Scientific Investigations Report 2012–5188, 2013.

Aluminum and Bauxite. Ch. in *United States Mineral Resources*, Professional Paper 820, 1973.

Bauxite and Alumina. Ch. in *Mineral Commodity Summaries*, annual.

Bauxite and Alumina. *Mineral Industry Surveys*, quarterly.

Historical Statistics for Mineral and Material Commodities in the United States. Data Series 140.

World Bauxite Resources. Professional Paper 1076–B, 1986.

World Nonbauxite Aluminum Resources—Alunite. Professional Paper 1076–A, 1978.

World Nonbauxite Aluminum Resources Excluding Alunite. Professional Paper 1076–C, 1990.

Other

Alumina Monitor. CRU Group, monthly.

Aluminum. Ch. in *Mineral Facts and Problems*, U.S. Bureau of Mines Bulletin 675, 1985.

TABLE 1
SALIENT BAUXITE STATISTICS¹

(Thousand metric tons)

	2011	2012	2013	2014	2015
United States:					
Exports, as shipped:					
Crude and dried	22	11	4	3	4
Calcined	31	18	10	7	9
Imports for consumption, as shipped:					
Crude and dried	9,540	10,300	9,830	10,800	10,700
Calcined	353	406	582	601	526
Consumption, dry equivalent	8,820	9,560	10,200	9,840 ^r	9,680
World, production	254,000	257,000 ^r	296,000 ^r	259,000 ^r	299,000 ^e

^eEstimated. ^rRevised.

¹Data are rounded to no more than three significant digits.

TABLE 2
SALIENT ALUMINA STATISTICS¹

(Thousand metric tons)

	2011	2012	2013	2014	2015
United States:					
Production:					
Calcined alumina	3,740	3,960	4,250 ^r	4,200 ^r	4,130
Other alumina ²	543	645	582 ^r	635 ^r	615
Total:					
As produced or shipped ³	4,280	4,610	4,830 ^r	4,830 ^r	4,750
Calcined equivalent	3,790	4,370	4,320 ^r	4,460 ^r	4,550
Shipments:					
Calcined alumina	3,730	3,990	4,260 ^r	4,150 ^r	4,070
Other alumina ²	551	641	580 ^r	637 ^r	614
Total:					
As produced or shipped ³	4,280	4,630	4,840 ^r	4,790 ^r	4,690
Calcined equivalent	3,790	4,400	4,330 ^r	4,410 ^r	4,490
Stocks, yearend ^{4,5}	961	363	280	276 ^r	274
Imports for consumption ⁵	2,160	1,900	2,050	1,630	1,570
Exports ⁵	1,660	1,720	2,250	2,130	2,220
Consumption, apparent ^{5,6}	3,710	5,140 ^r	4,210 ^r	3,970 ^r	3,900
World, production ⁵	93,100 ^r	98,100 ^r	104,000	107,000 ^r	120,000

^rRevised.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Trihydrate, activated, tabular, and other aluminas. Excludes calcium and sodium aluminates.

³Includes only the end product if one type of alumina was produced and used to make another type of alumina.

⁴Excludes consumers stocks other than those at primary aluminum plants.

⁵Calcined equivalent.

⁶Defined as domestic production plus imports minus exports plus adjustments for industry stock changes.

TABLE 3
CAPACITIES OF DOMESTIC ALUMINA PLANTS, DECEMBER 31^{1,2}

(Thousand metric tons per year)

Company and plant	2014	2015
Alcoa Inc., Point Comfort, TX	2,300	2,300
Noranda Alumina LLC, Gramercy, LA	1,200	1,200
Almatis Inc., Burnside, LA	500	500
Sherwin Alumina Co., Corpus Christi, TX ³	1,650 ^r	1,650 ^r
Total	5,650 ^r	5,650 ^r

^rRevised.

¹Capacity may vary depending on the bauxite used.

²Data are rounded to no more than three significant digits; may not add to totals shown.

³Owned by Glencore International AG.

TABLE 4
U.S. CONSUMPTION OF BAUXITE, BY INDUSTRY¹

(Thousand metric tons, dry equivalent)

Industry	2014	2015
Alumina	9,600 ^r	9,350
Other ²	247	324
Total	9,840 ^r	9,680

^rRevised.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes abrasive, chemical, and refractory uses.

TABLE 5
AVERAGE VALUE OF U.S. IMPORTS OF CRUDE AND DRIED BAUXITE¹

(Dollars per metric ton)

Country	2014		2015	
	Port of shipment	Delivered to U.S. ports	Port of shipment	Delivered to U.S. ports
	f.a.s. ²	c.i.f. ³	f.a.s. ²	c.i.f. ³
Brazil	32.67	45.75	34.27	43.28
Guinea	30.44	43.49	30.07	41.21
Jamaica ⁴	21.07	29.78	21.57	28.66
Weighted average ⁵	26.72	37.79	27.62	36.28

¹Computed from quantity and value data reported to U.S. Customs Service and compiled by the U.S. Census Bureau. Not adjusted for moisture content of bauxite or differences in methods used by importers to determine value of individual shipments.

²Free alongside ship valuation.

³Cost, insurance, and freight valuation.

⁴Based on quantity reported by the Jamaica Bauxite Institute.

⁵Weighted average of major suppliers.

TABLE 6
AVERAGE VALUE OF
U.S. IMPORTS OF ALUMINA¹

(Dollars per metric ton)

	2014 ^r	2015
January	378	423
February	416	402
March	399	470
April	407	429
May	430	563
June	557	440
July	462	407
August	386	423
September	516	417
October	380	431
November	404	387
December	556	398
Average	441	433

^rRevised.

¹Metallurgical grade; cost, insurance, and freight valuation. Computed from quantity and value data reported to U.S. Customs Service and compiled by the U.S. Census Bureau.

TABLE 7
REFRACTORY GRADE BAUXITE PRICES¹

(Dollars per metric ton)

Material	2014	2015
China:		
Shanxi Province, rotary kiln, lump 86% Al ₂ O ₃	385–395	380–390
Shanxi Province, round kiln, lump 87% Al ₂ O ₃	375–385	375–385
Guyana, rotary kiln, lump	460–510	NA

NA Not available.

¹Port of shipment, free-on-board ship valuation, yearend.

Source: Industrial Minerals.

TABLE 8
U.S. EXPORTS AND IMPORTS FOR CONSUMPTION
OF BAUXITE, CRUDE AND DRIED, BY COUNTRY¹

(Thousand metric tons)

Country	2014	2015
Exports:		
Canada	2	3
Other	1	1
Total	3	4
Imports:		
Brazil	3,030	3,480
Guinea	2,590	2,480
Jamaica ²	4,810	4,560
Other	329	156
Total	10,800	10,700

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Data from the Jamaica Bauxite Institute.

Note: Total U.S. imports of crude and dried bauxite as reported by the U.S. Census Bureau were as follows:
2014—7.32 million metric tons (Mt) and 2015—6.94 Mt.

Source: U.S. Census Bureau.

TABLE 9
U.S. EXPORTS AND IMPORTS FOR CONSUMPTION OF CALCINED BAUXITE, BY COUNTRY¹

(Thousand metric tons and thousand dollars)

Country	2014				2015			
	Refractory grade		Other grade		Refractory grade		Other grade	
	Quantity	Value ²	Quantity	Value ²	Quantity	Value ²	Quantity	Value ²
Exports:								
Canada	5	517	--	--	6	517	--	--
Mexico	1	230	1	556	(3)	230	1	556
Other	1	395	(3)	40	3	395	(3)	40
Total	7	1,140	1	596	9	1,140	1	596
Imports:								
Australia	--	--	178	5,740	--	--	117	4,880
Brazil	--	--	45	2,300	--	--	--	--
China	78	30,700	15	6,510	56	21,200	15	5,840
Greece	--	--	24	1,360	--	--	26	870
Guyana	29	11,700	203	11,300	35	13,700	260	10,100
Other	28	1,310	1	655	16	661	1	543
Total	135	43,800	466	27,900	107	35,500	419	22,300

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Value at foreign port of shipment as reported to U.S. Customs Service.

³Less than ½ unit.

Source: U.S. Census Bureau; data adjusted by U.S. Geological Survey.

TABLE 10
U.S. EXPORTS AND IMPORTS FOR CONSUMPTION OF ALUMINA,
BY COUNTRY¹

(Thousand metric tons, calcined equivalent, and thousand dollars)

Country	2014		2015	
	Quantity	Value ²	Quantity	Value ²
Exports:				
Canada	607	212,000	809	260,000
Egypt	400	129,000	422	129,000
Georgia	86	27,800	--	--
Iceland	273	86,000	121	41,600
Mexico	102	62,400	87	55,300
Netherlands	82	52,200	98	57,400
Norway	357	96,700	367	89,400
Russia	87	30,700	--	--
Other	137	265,000	319	285,000
Total	2,130	961,000	2,220	918,000
Imports:				
Australia	617	184,000	672	209,000
Brazil	216	67,000	401	137,000
Canada	75	41,500	58	43,500
France	19	36,500	16	33,600
Germany	29	87,100	31	89,400
Jamaica ³	11	4,100	38	2,700
Suriname	536	161,000	244	75,900
Other	130	146,000	112	113,000
Total	1,630	727,000	1,570	705,000

-- Zero.

¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Value at foreign port of shipment as reported to U.S. Customs Service.

³Data from the Jamaica Bauxite Institute.

Source: U.S. Census Bureau.

TABLE 11
BAUXITE: WORLD PRODUCTION, BY COUNTRY^{1,2}

(Thousand metric tons)

Country	2011	2012	2013	2014	2015
Australia	69,976	76,282	81,109	78,633	80,910
Bosnia and Herzegovina	686 ^r	800	657 ^r	605 ^r	787
Brazil	33,625	34,988 ^r	33,896 ^r	36,308 ^r	37,057
China ^c	45,000	47,000	50,400 ^r	59,200 ^r	65,000
Dominican Republic	--	11	770	1,446 ^r	1,724
Fiji	50	300	460	376	250 ^e
Ghana	236 ^r	710 ^r	817 ^r	906 ^r	1,026
Greece	2,324	1,816	1,844 ^r	1,873 ^r	1,832
Guinea ⁴	15,696	16,041	16,887 ^r	17,258 ^r	16,303
Guyana ⁴	1,818	2,210	1,649	1,602	1,500 ^e
Hungary	155 ^r	144 ^r	94 ^r	14 ^r	8
India	13,000 ^r	15,300 ^r	20,420 ^r	22,580 ^r	27,064
Indonesia	40,644	31,443	57,024 ^r	2,555	202
Iran	847 ^r	892 ^r	789 ^r	931 ^r	900 ^e
Jamaica ^{4,5}	10,189	9,339	9,435	9,677	9,629
Kazakhstan	5,495	5,170	5,192	4,516 ^r	4,683
Malaysia	183 ^r	122	209	3,665 ^r	35,000 ^e
Mexico ⁶	14	96	--	--	-- ^e
Montenegro	159 ^r	--	61 ^r	155 ^r	50
Mozambique	10	8	7 ^r	3 ^r	5 ^e
Pakistan ^e	9 ^r	30 ³	27 ^{r,3}	30	31
Russia	5,943	5,700 ^r	6,028 ^r	6,293 ^r	5,900
Saudi Arabia ⁶	206 ^r	760 ^r	1,044 ^r	1,965 ^r	2,397
Sierra Leone	1,300	776	616	1,161	1,334
Solomon Islands	--	--	--	--	270
Suriname	3,236	2,873 ^r	2,706 ^r	2,708 ^r	1,600
Tanzania	38	59 ^r	33 ^r	26 ^r	26 ^e
Turkey	1,025	1,521 ^r	796 ^r	1,091 ^r	1,100 ^e
United States	W	W	W	W	W
Venezuela	2,455	2,286	2,341 ^r	2,346 ^r	992
Vietnam ^c	100	100	482 ³	1,090 ³	1,150
Total	254,000	257,000 ^r	296,000 ^r	259,000 ^r	299,000 ^e

^eEstimated. ^rRevised. W Withheld to avoid disclosing company proprietary data; not included in total. -- Zero.

¹World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Includes data available through May 12, 2017.

³Reported figure.

⁴Dry bauxite equivalent of crude ore.

⁵Bauxite processed for conversion to alumina in Jamaica plus kiln-dried ore prepared for export.

⁶Includes low-grade bauxite consumed for nonmetallurgical uses.

TABLE 12
ALUMINA: WORLD PRODUCTION, BY COUNTRY^{1,2,3}

(Thousand metric tons)

Country	2011	2012	2013	2014	2015
Australia	19,399	21,357	21,528	20,475	20,097
Azerbaijan	6	102	--	--	--
Bosnia and Herzegovina	262	202	176 ^r	171 ^r	251
Brazil	10,306 ^r	10,321	9,942 ^r	10,404 ^r	10,451
Canada	1,471 ^r	1,498 ^r	1,542 ^r	1,552 ^r	1,559
China ^e	34,100	37,700	44,400	47,100 ^{r,4}	58,978 ⁴
France	524	430 ^{r,e}	315 ^r	300 ^r	300 ^e
Germany	2,355 ^r	2,331 ^r	2,360 ^r	2,400 ^{r,e}	2,400 ^e
Greece	810	784	812	812 ^r	807
Guinea	574	150 ^e	--	--	--
Hungary	165 ^r	110 ^r	81 ^r	61 ^r	50 ^e
India	3,880	4,347	4,040	5,060	5,512
Indonesia	--	--	--	-- ^r	70
Iran	233 ^r	227 ^r	245 ^r	252 ^r	300 ^e
Ireland	1,927	1,926	1,935	1,951	1,983
Jamaica	1,960	1,758	1,855	1,851	1,865
Japan ^{e,5}	280	250	250	100 ^r	15
Kazakhstan	1,670	1,760 ^r	1,590 ^r	1,419 ^r	1,448
Romania	484 ^r	414	391	363	405
Russia	2,825	2,719	2,659	2,572	2,593
Saudi Arabia	--	--	--	23 ^r	846
Slovakia	163	161	163	168 ^r	170 ^e
Spain	1,500 ^e	1,500 ^e	1,573 ^r	1,517 ^r	1,633
Suriname	1,421	1,203 ^r	1,150 ^r	1,150 ^r	748
Turkey	160 ^r	200 ^r	105 ^r	144 ^r	150 ^e
Ukraine	1,601	1,429	1,494	1,455	1,481
United States	3,790	4,370	4,320 ^r	4,460 ^r	4,550
Venezuela	1,266	808	580 ^r	660 ^r	465
Vietnam	--	--	214	485	484
Total	93,100 ^r	98,100 ^r	104,000	107,000 ^r	120,000

^eEstimated. ^rRevised. -- Zero.

¹Figures represent calcined alumina or the total of calcined alumina plus the calcined equivalent of hydrate when available; exceptions, if known, are noted.

²World totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

³Includes data available through June 7, 2017.

⁴Reported figure.

⁵Data represent alumina principally for specialty applications. Information on aluminum hydrate for all uses is inadequate to formulate estimates of production levels.