



2006 Minerals Yearbook

BAUXITE AND ALUMINA

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In 2006, almost all of the 12.3 million metric tons (Mt) of bauxite used in the United States was imported. World production totaled 178 Mt; Australia, Brazil, and China were the leading producing countries. U.S. production of alumina was estimated to be 4.7 Mt of calcined equivalent. Of the 5.2 Mt shipped in 2006, 87% was used for metal production. World production of alumina was estimated to be 69.2 Mt; Australia and China were the leading producing countries.

Bauxite is a naturally occurring, heterogeneous material comprised primarily of one or more aluminum hydroxide minerals plus various mixtures of silica (SiO_2), iron oxide (Fe_2O_3), titania (TiO_2), aluminosilicates (clay, etc.), and other impurities in trace amounts. The principal aluminum hydroxide minerals found in varying proportions within bauxite are gibbsite [$\text{Al}(\text{OH})_3$] and the polymorphs, boehmite and diasporite [both $\text{AlO}(\text{OH})$].

Legislation and Government Programs

In November, the Defense Logistics Agency released its revised Annual Materials Plan (AMP) for the National Defense Stockpile for fiscal year 2007, which provided for the sale of up to 43,700 metric tons (t) (43,000 long tons) of calcined refractory-grade bauxite in fiscal year 2007. The AMP also included the authority to sell 2.03 Mt (2.0 million long tons) of Jamaica-type metallurgical-grade bauxite and 406,000 t (400,000 long tons) of Suriname-type metallurgical-grade bauxite. This represented inventory that had been sold previously, but not yet shipped (Defense Logistics Agency, 2006).

At yearend 2006, the uncommitted inventories for metallurgical-grade bauxite and calcined refractory-grade bauxite were depleted (Defense Logistics Agency, 2007).

Production

Bauxite.—For many years, domestic mines have supplied less than 1% of the U.S. requirement for bauxite. Essentially all the domestic bauxite production was used in nonmetallurgical products, such as abrasives, chemicals, proppants, and refractories. Thus, the United States imported almost all the bauxite, especially the metallurgical grade, that it required.

Alumina.—U.S. production of alumina (calcined equivalent), which is derived almost exclusively from imported metallurgical-grade bauxite, declined by 10% compared with that of 2005 (table 2).

An explosion in one of the digesters at Alcoa Inc.'s 2.3 million-metric ton-per-year (Mt/yr) Point Comfort, TX, refinery reduced production for about 2 weeks in January, but the company was able to make all deliveries (CRU Alumina Monitor, 2006h).

In July, workers at Ormet Inc.'s Burnside, LA, 600,000-metric-ton-per-year (t/yr) alumina refinery ratified a 3-year contract. The employees had continued to work under the terms of the previous contract, which had expired in September 2005 (Ormet Inc., 2006b). In October, Ormet announced that it would temporarily close the refinery at yearend 2006 (Ormet Inc., 2006a). The closure of the refinery and reduced production at other U.S. refineries in the second half of the year owing to lower alumina prices accounted for much of the decline in alumina production in 2006.

Consumption

Bauxite.—Domestic production and consumption data for bauxite and alumina were obtained by the U.S. Geological Survey from three voluntary surveys of U.S. operations. The "Bauxite Consumption" survey was sent to 31 operations, 24 of which responded, representing 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 2005. In 2006, 96% of the bauxite consumed in the United States was refined to alumina (an estimated 2.5 t of dried bauxite was required to produce 1 t of alumina); the remaining 4% was consumed in nonmetallurgical applications (table 4).

Alumina.—An estimated 87% of the alumina shipped by U.S. alumina plants went to primary aluminum smelters for metal production. In 2006, 14 domestic primary aluminum smelters consumed 4.32 Mt of alumina. Consumption of various forms of alumina by the abrasives, chemicals, refractories, and specialties industries accounted for the remainder of U.S. alumina use.

Prices

Most metallurgical-grade bauxite and alumina were purchased under long-term contracts. Contract terms for these commodities 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.

Industrial Minerals (2006) quoted yearend prices for several types of imported refractory-grade bauxite from China and Guyana. The price quotes for Chinese refractory-grade bauxite, 88% Al_2O_3 free on board (f.o.b.) Chinese ports, were as follows: Shanxi, round kiln, lump, \$150 to \$160 per metric ton; Shanxi, rotary kiln, lump, \$150 to \$160 per ton; and Guizhou, rotary kiln, lump, \$135 to \$140 per ton. The price range for Guyanese refractory-grade bauxite was \$205 to \$210 per ton, cost, insurance, and freight (c.i.f.) Rotterdam, Netherlands. The 2006 annual average values of U.S. imports of metallurgical-grade bauxite are listed in table 7.

During the first quarter of 2006, the market or spot prices for alumina continued the upward trend started in 2005 owing to continuing tight global supply and strong demand from China. According to Metal Bulletin, metallurgical-grade alumina spot prices on international markets began 2006 at \$580 to \$590 per ton. The price peaked at \$620 to \$635 per ton in late March and early April before gradually declining during the second quarter to \$530 to \$550 per ton. In July, the price declined precipitously, falling to \$250 to \$300 per ton by the middle of August. Prices were basically flat from mid-August until early November before declining to a range of \$200 to \$210 per ton. Trade data released by the U.S. Census Bureau indicated that the 2006 annual average value of U.S. imports of calcined alumina was \$397 per ton, c.i.f. U.S. ports.

Foreign Trade

Crude and dried bauxite, calcined bauxite, and alumina imports and exports are listed in tables 8-10. In addition, 15,300 t of aluminum oxide abrasives; 40,400 t of aluminate compounds, including fluoroaluminates; 18,400 t of fluoride-base compounds of aluminum, including synthetic cryolite and aluminum fluoride; 15,200 t of aluminum chloride; and 10,400 t of aluminum sulfate were exported, and 168,000 t of aluminum oxide abrasives; 16,400 t of aluminum sulfate; 14,100 t of aluminate compounds, including fluoroaluminates; 7,950 t of fluoride-base aluminum compounds; 1,120 t of aluminum chloride; and 893 t of aluminum phosphate were imported.

World Industry Structure

Production.—In 2006, world production of bauxite increased by 4% compared with that of 2005 (table 11). Mine production of 178 Mt was reported in 22 countries. The leading producers of bauxite were, in decreasing order of tonnage mined, Australia, Brazil, China, Guinea, and Jamaica, and accounted for three-fourths of total world production.

World output of alumina increased by 9% in 2006 compared with that of 2005 (table 12). The five principal producing countries were, in descending order of quantity of alumina produced, Australia, China, Brazil, the United States, and Jamaica, which accounted for about two-thirds of the world's production; Australia alone accounted for 26%.

Industry Mergers and Acquisitions.—BPU Associates LLC (Gregory, TX) sold its 49% stake in the alumina refinery at Corpus Christi, TX, to Houshang LLC (China). The other 51% interest in the 1.6-Mt/yr refinery remained with Minmetals Co. Ltd. (China) (CRU Alumina Monitor, 2006g).

In August, Xstrata plc became a part owner in the alumina refinery at Gramercy, LA, when it acquired Noranda Aluminum Inc. (Franklin, TN) [a subsidiary of Falconbridge Ltd. (Toronto, Ontario, Canada)] (Xstrata plc, 2006).

In October, a deal was announced to combine RUSAL (Moscow, Russia), SUAL Group (Moscow), and the alumina assets of Glencore International AG (Baar, Switzerland) into a single company. The combined company will be known as United Company RUSAL and will be headquartered in Moscow. It will have the world's largest capacity for alumina

and aluminum production, with operations in 17 nations on 5 continents. Total alumina capacity was expected to be 11 Mt/yr, and primary aluminum capacity was expected to be 4 Mt/yr (RUSAL, 2006c).

World Review

Australia.—Alcoa received the environmental permit necessary from the government of Western Australia to build an expansion of the Wagerup refinery. The project will increase alumina capacity to 4.7 Mt/yr from 2.6 Mt/yr. A construction schedule was not announced (Alcoa Inc., 2006b).

Alcoa started production from a newly completed upgrade at the Pinjarra alumina refinery. The project increased energy efficiency at the refinery and added 657,000 t/yr of capacity, bringing total alumina refining capacity to 4.2 Mt/yr (Alcoa Inc., 2007, p. 18).

In the first quarter of 2006, BHP Billiton Ltd. (Melbourne, Australia) commissioned a 250,000-t/yr expansion at the Worsely alumina refinery, which will bring total capacity to 3.5 Mt/yr. The company was studying the feasibility of expanding the refinery capacity by another 900,000 t/yr with a decision to be made by yearend 2007 (BHP Billiton Ltd., 2006).

Production of alumina at the Gove refinery owned by Alcan Inc. (Montreal, Quebec, Canada) was cut by about 200,000 t owing to power outages, maintenance work, and a cyclone in April (Alcan Inc., 2006f). Expansion of the Gove refinery continued, with completion expected in early 2007, and would increase capacity to 3.8 Mt/yr from 2 Mt/yr (Alcan Inc., 2006d).

In September, Alcan received approval to start mining bauxite from the Ely deposit near Weipa, Queensland. The mine was to be operated by Rio Tinto plc in a joint-venture agreement. Production was expected to be approximately 2 Mt/yr for 25 years (Alcan Inc., 2006b).

Aluminum Corporation of China Ltd. (Chalco) was granted exclusive rights to develop bauxite at the Aurukun deposit in Queensland. Chalco planned to conduct a feasibility study and seek land-use agreements with indigenous groups before making a final decision on development of the deposit (CRU Alumina Monitor, 2006a).

Azerbaijan.—The Government of Azerbaijan seized control of Azeral from Netherlands-based Fondel Metal Participants BV. Assets taken by the Government included the Zaglik alunite mine, the Ganja alumina refinery, and the Sumgait smelter. The Government and Fondel had a 25-year agreement for the company to invest \$1 billion to modernize the nation's aluminum industry. The investment plan projected increasing the smelter capacity to 100,000 t/yr from 30,000 t/yr. The Government claimed that Fondel had not made required investments and that terms of the contract were unfavorable to the nation (Interfax Mining and Metals Report, 2006a).

Bosnia and Herzegovina.—Alumina Factory Birac Jsc was planning to expand alumina capacity to 750,000 t/yr by 2008 at its refinery in Zvornik (CRU Alumina Monitor, 2006c).

Brazil.—Work progressed on the expansion of the Alumar refinery in Sao Luis. The 2-Mt/yr addition was expected to be completed in 2009 and would bring alumina production capacity to 3.5 Mt/yr at the refinery, which is jointly owned by Alcoa,

Alcan, and BHP Billiton. Work also progressed on the Juruti bauxite mine. The mine was projected to be operational in 2008, with capacity of 2.6 Mt/yr of bauxite (Alcoa Inc., 2007, p. 10-11).

Companhia Vale do Rio Doce Ltd. completed an expansion project at the Alunorte alumina refinery, increasing capacity to 4.4 Mt/yr from 2.5 Mt/yr. Another phase of expansion was started that would bring the refinery's capacity to 6.26 Mt/yr when completed in early 2008. Additional bauxite for the increased alumina production was to come from the Paragominas Mine where an expansion project was expected to be completed in early 2007 (Companhia Vale do Rio Doce Ltd., 2006).

Canada.—Alcan stopped making specialty calcined alumina at its refinery in Jonquiere, Quebec, at the end of 2006. Future production from the plant will be solely metallurgical-grade alumina. Orders for specialty grade material were to be filled with production from their refinery in Gardanne, France (Alcan Inc., 2006e).

China.—In response to high alumina prices at the beginning of the year, at least 17 smelting companies agreed to cut production of primary aluminum by 10% for a total of 335,000 t (Platts Metals Week, 2006). State-controlled Chalco, the nation's leading smelter and the world's second ranked refiner of alumina, however, did not cut its production. By April, alumina prices for some smelters had declined owing to long-term contracts and increased domestic alumina production, and production at the smelters returned to normal levels (Mok, 2006).

Refining capacity in China increased by 5.2 Mt/yr in 2006 and was projected to increase by 2.5 Mt in 2007.

Chalco increased alumina capacity at its Shandong refinery to 1.5 Mt/yr from 1 Mt/yr (Aluminum Corporation of China Ltd., 2007, p. 33). Chalco and Guizhou Wujiang Electric Power Corp. created a joint venture to develop bauxite resources in Zunyi Province. The partnership included construction of an 800,000-t/yr alumina refinery, which was projected to be completed by the end of 2007 (Aluminum Corporation of China Ltd., 2007, p. 15). In addition to the Guizhou alumina refinery, Chalco started construction on two other 800,000-t/yr alumina refinery projects. One is in Nanchuan, Chongqing Province, and the other is the phase 3 expansion of the Guangxi complex (Aluminum Corporation of China Ltd., 2006, p. 36).

Kaiman Aluminum Ltd. announced plans to expand its alumina refinery capacity to 800,000 t/yr from 400,000 t/yr by yearend 2006 (CRU Alumina Monitor, 2006b).

Yangquan Coal Corp. was constructing a 1.2-Mt/yr refinery in Shanxi Province. The first 400,000 t/yr of capacity was projected to be completed by the end of 2006. Shanxi Tongde Ltd. announced that it would construct a 1-Mt/yr alumina refinery in Baode, Shanxi Province. Completion of construction and start of production were projected for 2007. Early in the year, Henan Huiyuan Chemical Co. was ordered to cease production from its 300,000-t/yr alumina refinery for not complying with environmental regulations (CRU Alumina Monitor, 2006h).

Shanxi Wusheng Aluminum Ltd. began construction of an alumina refinery in Pinglu, Shanxi Province. The refinery

was expected to have a production capacity of 300,000 t/yr of alumina and was expected to be completed in early 2007 (CRU Alumina Monitor, 2006i).

Yunnan Aluminium Ltd. started construction on an 800,000-t/yr refinery in Wenshan. The first half of the project was expected to be operational in early 2008. Progress continued on the refinery being built by Nanshan Group Ltd. in Shandong Province. The refinery would have a capacity of 400,000 t/yr and may expand capacity to 800,000 t/yr. Zhongmei Aluminium Industry Ltd. started construction of a 400,000-t/yr refinery in Henan Province (CRU Alumina Monitor, 2006c).

The Luneng Jinbei Aluminum Co. Ltd. alumina refinery located in Shanxi Province started production in May. Capacity was 1 Mt/yr using bauxite from local sources, and construction of an expansion to add another 1 Mt/yr alumina capacity had begun. Jiaokou Aluminum Co. Ltd. started construction on a 400,000-t/yr alumina refinery in Shanxi Province. Completion was projected for mid-2007 (CRU Alumina Monitor, 2006d).

Alumina production started at the refinery in Shandong Province owned by Weiqiao Aluminum Co. Ltd. The refinery has a capacity of 500,000 t/yr. Luoyang Wanji Xiangjiang Aluminum Co. completed construction of a 400,000-t/yr alumina refinery in Henan Province. Expansions to add 800,000 t/yr capacity were planned, but a timetable for construction had not been announced (CRU Alumina Monitor, 2006e).

Guangxiangjia Aluminum Ltd. started production of alumina at a newly completed refinery with a capacity of 90,000 t/yr (CRU Alumina Monitor, 2006f).

East Hope Group Ltd. started production at the first phase of its new alumina refinery in Henan Province. The refinery was constructed with a capacity of 400,000 t/yr of alumina, and plans were announced to expand the refinery capacity to 1.1 Mt/yr (East Hope Group Ltd., 2006).

Xinfa Aluminum Electricity Group doubled alumina capacity to 3 Mt/yr at its refinery in Shandong Province (Standard, The, 2006).

Ghana.—Alcan and the Government of Ghana signed a memorandum of understanding (MOU) to create a joint venture to study the feasibility of developing the Nyinahin bauxite deposit and construct an alumina refinery. Alcan would own 51% of the joint venture, with the Government owning 49% (Alcan Inc., 2006a).

Greece.—Mytilineos Holdings SA continued expansion of capacity of the Distomon alumina refinery to 1.1 Mt/yr from 850,000 t/yr. The project was expected to be completed by the end of 2007 (CRU Alumina Monitor, 2006h).

Guinea.—Alcan and Alcoa received Government approval to conduct a feasibility study for construction of a 1.5-Mt/yr alumina refinery. If the feasibility study is favorable, construction of the refinery could start in 2007 and be completed in about 3 years (Alcan Inc., 2006c).

RUSAL acquired sole ownership of the Friguia alumina and bauxite complex in a move by the Government to privatize the industry. Terms of the agreement included a commitment of RUSAL to double alumina capacity to 1.2 Mt/yr (RUSAL, 2006a).

Global Alumina Ltd. (Toronto) continued to make progress on an alumina refinery in Boke. The projected capacity was

increased to 3 Mt/yr from the originally planned 2.8 Mt/yr, and construction was on schedule for completion in 2009 (Global Alumina Ltd., 2006).

Guyana.—RUSAL acquired 90% ownership of state-owned Aroaima Mining Co. As part of the investment, RUSAL would expand bauxite production in Guyana to 2.5 Mt/yr from 1.3 Mt/yr. Exploration work was also conducted on the Moblissa-Bamia bauxite deposit, and a feasibility study for a 1.5-Mt/yr alumina refinery based on the exploration results was being considered (RUSAL, 2006b).

Hungary.—Magyar Aluminium Ltd. stopped producing smelter-grade alumina at the Ajka refinery owing to the closure of the Intoa aluminum smelter. The refinery continued to produce alumina for nonmetallurgical uses (Magyar Aluminium Ltd., 2006).

India.—Ashapura Minechem Ltd. and Qingtongxia Aluminum Group Ltd. of China were jointly building an alumina refinery in the State of Gujarat with a projected capacity of 1 Mt/yr. The projected completion date was not available (Ashapura Minechem Ltd., 2006).

National Aluminum Co. Ltd. (Nalco) continued to progress on expanding the capacity of the Panchpatmali bauxite mine to 6.3 Mt/yr from 4.8 Mt/yr. The production capacity of the Damanjodi alumina refinery was being expanded to 2.1 Mt/yr from 1.6 Mt/yr, and the Angul smelter would increase aluminum production capacity to 460,000 t/yr from 345,000 t/yr. The expansion project was projected to be completed in 2008 (National Aluminum Company Ltd., 2006). Nalco announced plans to build a greenfield refinery and smelter in Orissa State. The refinery would have a production capacity of 1.5 Mt/yr of alumina, and the smelter would have a capacity of 300,000 t/yr of aluminum (Metal Bulletin, 2006).

Jindal South West Group Ltd. announced plans to enter the aluminum industry by constructing a 1.4-Mt/yr alumina refinery and a 250,000-t/yr aluminum smelter in Vishakhapatnam. Construction was expected to begin in 2007 pending financing, and initial production from the project was expected in 2010 (Hindu Business Line, The, 2006).

Vedanta Resources plc was in the final stage of constructing a 1.4-Mt/yr alumina refinery in Lanjigarh, Orissa. Production was anticipated to begin by the end of March 2007. Bauxite from the Gujarat region would supply the refinery, and alumina production would be used in the Korba smelter and at a smelter being planned for Jharsguda, Orissa (Vedanta Resources plc, 2006, p. 6-7).

Hindalco Industries Ltd. reported that expansion of the Hirakud alumina refinery to 450,000 t/yr from 110,000 t/yr was progressing towards completion by early 2007. Hindalco also progressed on plans for the Aditya alumina refining and smelting complex. The bauxite mine to supply the refinery had been permitted. The project was slated to have 1.5 Mt/yr of alumina capacity and 325,000 t/yr of aluminum production capacity (Hindalco Industries Ltd., 2006).

Indonesia.—PT Aneka Tambang Tbk announced plans for a 300,000-t/yr refinery to be built in Tayan, West Kalimantan, for producing chemical-grade alumina. Construction was expected to start in 2007 with completion and initial production projected for 2010 (PT Aneka Tambang Tbk, 2006).

Jamaica.—Century Aluminum Co. (Monterey, CA) and Minmetals were conducting a prefeasibility study for construction of a 1.5-Mt/yr-alumina refinery in St. Ann. Completion of the study was expected by early 2008 (Century Aluminum Co., 2006).

Work progressed on an expansion at the Clarendon alumina refinery. Alcoa planned to have the project completed early in 2007, which would increase alumina capacity by 150,000 t/yr to 1.42 Mt/yr (Alcoa Inc., 2007, p. 12).

Kazakhstan.—Kazakhstan Aluminium Ltd. was developing the East Ayatsk bauxite deposit, with production expected to start in 2009 (CRU Alumina Monitor, 2006i).

Madagascar.—Alcan and Access Madagascar Sarl signed an MOU to study the potential to mine bauxite and construct an alumina refinery in the southeastern region of the nation. Initial studies were expected to be completed in early 2007, and a feasibility study would be conducted if the findings of the concept study are favorable (Alcan Inc., 2006g).

Romania.—Improved efficiencies at Marco Group Ltd.'s Tulca alumina refinery increased production capacity to 600,000 t/yr. Marco Group also planned to increase capacity in 2007 by as much as 800,000 t/yr at its alumina refinery (CRU Alumina Monitor, 2006d).

Russia.—RUSAL moved forward with its investment in the Komi Aluminium joint venture with SUAL. The project included expanding bauxite production to 6 Mt/yr from 1.8 Mt/yr by 2008, when a 1.4-Mt/yr alumina refinery was scheduled for completion in Sosnogorsk (RUSAL, 2006d).

Saudi Arabia.—Saudi Arabian Mining Co. was developing the Az Zabirah aluminum project. The project was to consist of a 3.3-Mt/yr bauxite mine at Az Zabirah to feed an alumina refinery with a capacity of 1.4 Mt/yr at Ras Az Zawr and a primary aluminum smelter, also at Ras Az Zawr, capable of producing 620,000 t/yr. The project would also include an oil-fueled powerplant and desalinization facility. Initial production was anticipated in 2008 (Saudi Arabian Mining Co., 2006).

Sierra Leone.—In January, Titanium Resources Group Ltd. restarted production at the SML bauxite mine. The mine, with a production capacity of 1.2 Mt/yr of bauxite, had been closed since 1995 because of a civil war (Titanium Resources Group Ltd., 2006).

Ukraine.—Progress on an expansion project at RUSAL's Nikolaev alumina refinery continued, with the completion of a new calcination furnace. The furnace has a processing capacity of 1,500 metric tons per day. When the expansion is completed in 2009, alumina capacity would be 1.6 Mt/yr (Interfax Mining and Metals Report, 2006b).

Vietnam.—Chalco signed an agreement with Vietnam National Coal-Mineral Industries Group (Vinacomin) to invest in a project to develop bauxite deposits in Dak Nong Province and to construct a 1.9-Mt/yr alumina refinery (Aluminum Corporation of China Ltd., 2007, p. 24).

Alcoa World Alumina and Chemicals signed an MOU with Vinacomin to conduct a feasibility study to develop a refinery that would produce 1 to 1.5 Mt/yr of alumina using bauxite from the Gia Nghia deposit in Dak Nong Province (Alcoa Inc., 2006a).

Vinacomin announced plans to start construction on a 1.7-Mt/yr bauxite mine and accompanying alumina refinery with a capacity

of 600,000 t/yr in Lam Dong Province. Construction was to begin in early 2007, and completion was projected by 2010 (Vietnam National Coal-Mineral Industries Group Ltd., 2006).

Outlook

Significant additional alumina refinery capacity was expected to be available in each of the next 2 years. Alumina shortages, which led to a rapid increase in price in 2005 lasting into the middle of 2006, began to ease in 2007, and prices moderated. Demand for aluminum metal was expected to continue to increase during the next few years but at a slightly slower pace than that of the past year or two. As a result of increased production and slowed demand growth, bauxite and alumina production were expected to be adequate to meet the near-term needs of the aluminum industry.

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TABLE 1
SALIENT BAUXITE STATISTICS¹

(Thousand metric tons)

	2002	2003	2004	2005	2006
United States:					
Production, crude ore, dry equivalent:					
Quantity	NA	NA	NA	NA	NA
Value	NA	NA	NA	NA	NA
Exports, as shipped:					
Crude and dried	27	55	42	34	20
Calcined	15	22	21	18	14
Imports for consumption, as shipped:					
Crude and dried	7,340	8,390	10,000	11,800 ^r	11,600
Calcined	237	307	341	818 ^r	752
Consumption, dry equivalent	9,980	11,300	13,600	12,400 ^r	12,300
World, production	144,000	153,000	161,000 ^r	172,000 ^r	178,000 ^e

^eEstimated. ^rRevised. NA Not available.

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

TABLE 2
ESTIMATED PRODUCTION AND SHIPMENTS OF ALUMINA
IN THE UNITED STATES¹

(Thousand metric tons)

Year	Calcined alumina	Other alumina ²	Total	
			As produced or shipped ³	Calcined equivalent
Production:				
2005	4,750	708	5,460	5,220
2006	4,610	618	5,230	4,700
Shipments:				
2005	4,760	658	5,420	5,190
2006	4,580	564	5,150	4,670

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

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.

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

(Thousand metric tons per year)

Company and plant	2005	2006
Alcoa Inc., Point Comfort, TX	2,300	2,300
Gramercy Alumina LLC, Gramercy, LA ³	1,250	1,250
Ormet Corp., Burnside, LA	600	600
Sherwin Alumina Co., Corpus Christi, TX ⁴	1,600	1,600
Total	5,750	5,750

¹Capacity may vary depending on the bauxite used.

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

³Jointly owned by Century Aluminum Co. and Xstrata plc.

⁴Jointly owned by Houshang LLC and Minmetals Co. Ltd. during 2006. Sold to Glencore International AG in 2007.

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

(Thousand metric tons, dry equivalent)

Industry	2005	2006
Abrasive	W	W
Alumina	11,900 ^r	11,800
Cement ²	-- ^r	--
Chemical	W	W
Refractory	W	W
Other ³	-- ^r	--
Total	12,400 ^r	12,300

¹Revised. W Withheld to avoid disclosing company proprietary data, included in "Total." -- Zero.

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

²Data from the D15-Cement annual survey form, U.S. Geological Survey Form 9-4041-A.

³Includes municipal water works, oil, and steel and ferroalloys.

TABLE 5
STOCKS OF BAUXITE IN THE UNITED STATES,
DECEMBER 31^{1,2}

(Thousand metric tons, dry equivalent)

Sector	2005	2006
Producers, processors, consumers	W	W
Government	--	--

W Withheld to avoid disclosing company proprietary data. -- Zero.

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

²Domestic and foreign bauxite; crude, dried, calcined, activated, all grades.

TABLE 6
STOCKS OF ALUMINA IN THE UNITED STATES,
DECEMBER 31^{1,2}

(Thousand metric tons, calcined equivalent)

Sector	2005	2006
Producers	W	W
Primary aluminum plants	W	W
Total	834 ^r	907

^rRevised. W Withheld to avoid disclosing company proprietary data, included in "Total."

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

²Excludes consumers stocks other than those at primary aluminum plants.

TABLE 7
AVERAGE VALUE OF U.S. IMPORTS OF CRUDE AND DRIED BAUXITE¹

(Dollars per metric ton)

Country	2005		2006	
	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
Australia	17.77 ^r	23.57 ^r	13.95	19.99
Brazil	25.73 ^r	39.11 ^r	30.35	42.83
Guinea	24.36	30.31	27.15	35.14
Guyana	35.72 ^r	42.27 ^r	47.29	56.36
Jamaica	19.69	23.02	21.77	25.95
Weighted average	24.65 ^r	31.66 ^r	28.10	36.05

^rRevised.

¹Computed from quantity and value data reported to U.S. Customs Service and compiled by the U.S. Census Bureau, Department of Commerce. 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.

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

(Thousand metric tons)

Country	2005	2006
Imports:		
Australia	156 ^r	272
Brazil	3,150 ^r	1,640
Guinea	2,460	2,610
Guyana	1,060 ^r	918
Jamaica ²	4,060 ^r	4,540
Other	868 ^r	1,660
Total	11,800 ^r	11,600
Exports:		
Canada	27	16
Mexico	1	1
Other	5	4
Total	34	20

^rRevised.

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

²In 2005, exports to the United States; data 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: 2005—9.45 Mt and 2006—9.24 Mt.

Sources: U.S. Census Bureau and the Jamaica Bauxite Institute.

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

(Thousand metric tons and thousand dollars)

Country	2005				2006			
	Refractory grade		Other grade		Refractory grade		Other grade	
	Quantity	Value ²	Quantity	Value ²	Quantity	Value ²	Quantity	Value ²
Imports:								
Australia	--	--	165 ^r	11,000 ^r	--	--	191	14,100
Brazil	55 ^r	1,270 ^r	85 ^r	30,200 ^r	30	12,400	118	26,100
China	99 ^r	14,100 ^r	45 ^r	5,530 ^r	121	15,900	43	5,390
Guyana	38	4,790	225 ^r	6,900 ^r	24	3,840	72	3,500
Other	36 ^r	1,120 ^r	69 ^r	1,750 ^r	60	1,960	94	3,170
Total	229 ^r	21,200 ^r	589 ^r	55,400 ^r	235	34,100	518	52,300
Exports:								
Canada	8	809	4	242	4	507	(³)	33
Mexico	(³)	124	5	776	1	263	4	801
Other	(³)	117	1	258	2	433	1	356
Total	8	1,050	10	1,280	7	1,200	6	1,190

^rRevised. -- 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.

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

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

Country	2005		2006	
	Quantity	Value ²	Quantity	Value ²
Imports:				
Australia	932	231,000	895	287,000
Brazil	17	4,260	94	28,100
Canada	103	75,100	103	86,100
China	10	5,570	--	--
France	16	25,400	14	26,000
Germany	49	75,200	87	101,000
Jamaica	116	36,400	149	60,300
Japan	5	13,200	7	19,000
Suriname	560	139,000	424	136,000
Venezuela	27	6,360	5	2,420
Other	31	27,900	79	44,700
Total	1,860	639,000	1,860	791,000
Exports:				
Brazil	3	4,260	2	3,430
Canada	407	215,000	577	253,000
China	366	125,000	--	--
Finland	⁽³⁾	231	⁽³⁾	624
Mexico	69	39,700	58	42,100
Netherlands	20	18,800	3	8,310
Norway	104	25,600	145	51,400
Russia	⁽³⁾	1,440	--	--
Sweden	1	1,760	2	1,650
Other	234	199,000	751	451,000
Total	1,210	631,000	1,540	811,000

-- 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.

³Less than ½ unit.

Source: U.S. Census Bureau.

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

(Thousand metric tons)

Country	2002	2003	2004	2005	2006 ^c
Australia	54,135	55,602	56,593	59,959	62,307 ³
Bosnia and Herzegovina ^c	113	573	480	1,032 ^{r,3}	1,000
Brazil	13,260	17,363	20,914 ^r	21,000 ^{r,p}	21,000 ^p
China ^c	12,000	13,000	15,000	18,000	21,000
Ghana	684	495	498	726 ^r	886 ^p
Greece	2,492	2,418	2,444	2,450 ^c	2,450
Guinea ^{c,4}	15,300	15,000	15,254 ^{r,3}	15,200 ^{r,c}	15,200
Guyana ⁴	1,690	1,846 ^r	1,506 ^r	1,405 ^r	1,400
Hungary	720	666	647	511 ^c	500 ³
India	9,647	10,414	11,285	12,385 ^r	12,732 ³
Indonesia	1,283	1,263	1,331	1,442 ^r	1,502 ³
Iran	57	366	420	500 ^c	500
Jamaica ^{4,5}	13,120	13,444	13,296	14,118	14,851 ³
Kazakhstan	4,377	4,737	4,706	4,800 ^c	4,800
Malaysia	40	6	2	5 ^r	5
Mozambique	9	12	7	10	12
Pakistan	12 ^r	4 ^r	5 ^r	7 ^r	7
Russia ^c	4,500	5,500	6,000	6,400	6,600
Serbia and Montenegro ⁶	612	540	486	610	550 ³
Suriname	4,002	4,215	4,052	4,757 ^r	4,750
Turkey ⁷	287	364	366 ^r	475 ^r	500
United States	NA	NA	NA	NA	NA
Venezuela	5,191	5,446	5,842	5,900	5,500
Total	144,000	153,000	161,000 ^r	172,000 ^r	178,000

^cEstimated. ^pPreliminary. ^rRevised. NA Not available.

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

²Table includes data available through August 3, 2007.

³Reported figure.

⁴Dry bauxite equivalent of crude ore.

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

⁶In June 2006, Montenegro and Serbia formally declared independence from each other and dissolved their union. Mineral production data for 2006, however, still reflect the unified country.

⁷Public-sector production only.

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

(Thousand metric tons)

Country	2002	2003	2004	2005	2006
Australia	16,382	16,529	16,700	17,704	18,312
Azerbaijan	91	180	232	315	363
Bosnia and Herzegovina ^c	50	50	50	50	450
Brazil	3,962	5,111	5,300 ^r	5,300 ^r	5,300 ^p
Canada	1,125	1,109	1,170	1,214	1,220 ^p
China ^c	5,450	6,110	6,990 ⁴	8,610	13,700
France ^c	150	150	100	100	100
Germany ^c	720	830	835 ⁴	840	800
Greece	750	750	750 ^e	750 ^e	750 ^e
Guinea	724	738	887 ^r	740 ^r	740 ^e
Hungary ^c	294	300	300	300	300
India ^c	2,800	2,500	2,600	2,700	2,800
Iran	101	102	137	150 ^e	150
Ireland ^c	1,100	1,100	1,100	1,100	1,100
Italy	1,010 ^r	1,021 ^r	1,064 ^r	1,109 ^r	1,100
Jamaica	3,631	3,844	4,023	4,086	4,099
Japan ⁵	333	363	340 ^e	330 ^e	340
Kazakhstan	1,386	1,419	1,468	1,505	1,515
Romania	361	333	560 ^r	689 ^r	670
Russia	3,131	3,230	3,269	3,259	3,265
Serbia and Montenegro ⁶	237	225	245	235	250
Slovakia ^c	112	132	130	135	135
Slovenia ^c	30	30	30	30	30
Spain ^{c,6}	1,350 ^r	1,380 ^r	1,400 ^r	1,400 ^r	1,400
Suriname	1,900 ^e	2,004	2,039	1,944 ^r	1,900
Turkey	152	162	170 ^e	113 ^r	150
Ukraine	1,351	1,434	1,563	1,632	1,672
United Kingdom	74	--	-- ^e	-- ^e	--
United States	4,340	4,860	5,350	5,220	4,700
Venezuela	1,901	1,882	1,900 ^e	1,920	1,900
Total	55,000 ^r	57,900 ^r	60,700 ^r	63,500 ^r	69,200

^cEstimated. ^pPreliminary. ^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.

³Table includes data available through July 25, 2007.

⁴Reported figure.

⁵Data presented are for alumina used principally for specialty applications. Information on aluminum hydrate for all uses is not adequate to formulate estimates of production levels. Production of aluminum hydroxide, in metric tons: 2002—724,000; 2003—740,000; 2004—730,000 (estimated); 2005—740,000 (estimated); and 2006—750,000.

⁶In June 2006, Montenegro and Serbia formally declared independence from each other and dissolved their union. Minera⁷ production data for 2006, however, still reflect the unified country.

⁷Hydrate.