

2008 Minerals Yearbook

ALUMINUM

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During 2008, domestic primary smelters produced 2.66 million metric tons (Mt) of aluminum metal, 4% more than that in 2007, valued at \$7.06 billion, 3% greater than the value of the production in the prior year. At yearend, 6 companies were operating 13 domestic primary aluminum smelters in 10 States. Smelters east of the Mississippi River accounted for about 70% of the production. At yearend, an additional five were idle, including one that was closed during the year. Early in 2009, plans to close two additional smelters were announced. At yearend 2008, about 34% [1.23 million metric tons per year (Mt/yr)] of domestic primary aluminum smelting capacity, including idle potlines at operating smelters, was not being utilized.

Aluminum recovered from purchased scrap decreased to 3.32 Mt. Of this recovered metal, 60% came from new (manufacturing) scrap, and 40% came from old (discarded aluminum products) scrap. Aluminum used beverage cans (UBCs) accounted for 51% of the reported old scrap consumed in 2008.

The transportation and the container and packaging industries remained the leading markets for aluminum products in Canada and the United States in 2008. The transportation industry accounted for 33.0% of United States and Canadian metal shipments; containers and packaging, 26.1%; building and construction, 13.7%; electrical, 8.2%; machinery and equipment, 8.0%; consumer durables, 7.1%; and other uses, 3.9%.

The 2008 annual average U.S. market price of primary aluminum ingot decreased slightly to \$1.205 per pound from \$1.222 per pound in 2007. The monthly average price was \$1.136 per pound in January and rose steadily until it peaked in July at \$1.426 per pound, then declined sharply to \$0.715 per pound in December.

At the end of 2008, total world inventories of aluminum, as reported by the International Aluminium Institute (IAI) (2009), were 4% higher than those at yearend 2007. Combined inventories of aluminum metal and alloys held by the London Metal Exchange Ltd. (LME) increased by 148%.

Primary aluminum was produced in 42 countries in 2008. China, Russia, Canada, and the United States, in decreasing order of metal produced, accounted for almost 60% of total world production. World primary metal production increased by 3% compared with that of 2007, primarily owing to a 600,000-metric-ton (t) increase in production in China and a 400,000-t increase in production in Iceland.

Production

Primary.—In response to tightened credit conditions in the latter part of 2008, Alcoa Inc. (Pittsburgh, PA) announced it would stop all noncritical capital spending to conserve cash during the adverse economic environment. All projects were

under review and would be decided upon on a case-by-case basis (Alcoa Inc., 2008g).

In September, Alcoa announced it would close the remaining capacity at its 267,000-metric-ton-per-year (t/yr) smelter at Rockdale, TX, owing to continued high electricity prices and low aluminum prices (Alcoa Inc., 2008j). In June, Alcoa had closed 120,000 t/yr of capacity as a result of the inability to get reliable power at competitive prices.

Alcoa partially shut down potlines at the 278,000t/yr Ferndale, WA, smelter in November in response to low aluminum prices. The specific amount of production capacity affected was not disclosed (Alcoa Inc., 2008i). Alcoa signed a memorandum of understanding (MOU) with the Bonneville Power Administration (BPA) to obtain power sufficient to operate the Ferndale smelter at 50% capacity from 2011 through 2028. Alcoa also planned to upgrade equipment to reduce emissions as part of the agreement (Alcoa Inc., 2008h).

Alcoa announced a contract for the Chelan County Public Utility District to supply power to the 184,000-t/yr smelter at Wenatchee, WA. The 17-year contract will start in 2011 and enable the restart of a third potline in 2012, bringing production to approximately 142,000 t/yr from 100,000 t/yr (Alcoa Inc., 2008e).

Glencore International AG announced that its Columbia Falls, MT, smelter would shut all production by the end of February 2009. In addition to low aluminum prices, the company cited a court ruling nullifying a low-cost power contract with the BPA as a reason for the closure. The smelter had been operating at only 25% of its 168,000-t/yr capacity since shutting two potlines in July. A subsequent deal with the BPA enabled the smelter to operate at 10% capacity until July 2009 (Platts Metals Week, 2008b; Flathead Beacon, 2009).

In December, Century Aluminum Co. announced that it was immediately closing a 42,500-t/yr potline at its primary smelter in Ravenswood, WV. The company also announced that it would close the entire 170,000-t/yr smelter in February 2009 (Century Aluminum Co., 2008d).

Secondary.—Arkansas Aluminum Alloys Inc. closed its secondary smelter in Hot Springs, AR, at the end of November. A dramatic decline in demand for diecast aluminum alloys used in automobiles was the reason cited for the decision. No reopening date was projected (American Metal Market, 2008).

Aleris International Inc. closed its secondary smelter at Tipton, IN, in March and later announced that the closure would be permanent (Aleris International Inc., 2008b). Aleris also permanently closed its secondary smelter in Shelbyville, TN, in the second quarter of 2008 (Aleris International Inc., 2008a).

In November, Alexin LLC opened a greenfield extrusion billet casthouse in Bluffton, IN. The company planned to use 80% scrap to produce up to 98,000 t/yr of billet (Alexin LLC, 2008).

The Ohio Valley Aluminum Co. secondary smelter and billet casthouse in Boonville, IN, was closed in October owing to decreased orders from suppliers to the home construction and automobile manufacturing industries (Platts Metals Week, 2008d).

Logan Aluminum Inc. (a joint venture between Arco Aluminum Inc. and Novelis Inc.) commissioned a new furnace to recycle UBCs at its smelter and rolling mill in Russellville, KY. The new furnace has a stated capacity of 68,000 t/yr and is designed to not produce salt cake, a waste product commonly generated by scrap melting. The additional recycling capacity will replace deliveries of molten aluminum from an Aleris smelter at Morgantown, KY (Schaffer, 2008b).

The recycling rate of aluminum beverage cans in California increased to 85% in the first half of 2008 compared with 83% in the same period of 2007continuing the increasing trend from a rate of 77% in the first 6 months of 2006. The increased recycling rate of UBCs was attributed to an increase in the deposit for beverage containers effective January 1, 2007 (Schaffer, 2008a).

Consumption

Apparent consumption of aluminum in the United States declined by 14% in 2008 compared with that in 2007. Shipments of aluminum by United States and Canadian producers to their combined domestic markets declined by 13% in 2008 compared with the amount shipped in 2007. Shipments of aluminum for containers and packaging in 2008 were unchanged from those in 2007, but shipments to all other major end use categories declined. Shipments fell to the transportation sector by 21%, building and construction by 16%, consumer durables by 9%, electrical by 8%, and the machinery sector by 7%.

The decline in shipments of aluminum to the transportation sector resulted primarily from a reduction in automobile production. Automobile manufacturing in North America declined by 16.1% in 2008 compared with production in 2007. Production in all months declined compared with production in the same month of the prior year, with production in the fourth quarter declining significantly (25.8%) compared with production in the fourth quarter of 2007 (Wards Automotive Inc., 2009).

Reduced aircraft production also accounted for part of the decline in aluminum shipments for use in transportation. The Boeing Co. (Chicago, IL) reported that deliveries of commercial aircraft were 15% lower than those in the previous year. A 2-month strike by the International Association of Machinists Union was cited as the reason for the decline in production and delivery of commercial aircraft (Boeing Co., The, 2009).

The decline in aluminum shipments for use in building and construction was mainly a result of reduced home construction. The U.S. Census Bureau and the U.S. Department of Housing and Urban Development jointly reported that housing starts were down by 36.2% in 2008 compared with starts in 2007. The number of houses completed during 2008 was 25.7% less than the number completed the prior year (U.S. Census Bureau, 2009b). These declines were partially offset by an 11.8% increase in spending on nonresidential construction during 2008

compared with this type of spending in the prior year (U.S. Census Bureau, 2009a).

General Motors Corp. announced that it would use aluminum instead of cast iron and steel for engine blocks, heads, wheels, and other parts in its light trucks and sport utility vehicles starting with the 2009 models. The changes would reduce the total vehicle weight by approximately 69 kilograms (153 pounds) and are intended to increase fuel efficiency (Cowden, 2008; General Motors Corp., 2008).

Stocks

According to data reported by the Aluminum Association, United States and Canadian producers' combined inventories of aluminum ingot, mill products, and scrap declined by 13% to 1.22 Mt at yearend 2008 from 1.40 Mt at yearend 2007 (Aluminum Association Inc., 2009). The LME reported that primary aluminum metal ingot stocks at its U.S. warehouses nearly tripled to 1.05 Mt at yearend 2008 from 354,000 t at yearend 2007. At yearend 2008, LME warehouses in the United States also held about 104,000 t of North American special aluminum alloy contract (NASAAC) metal ingot, a 4% decrease from the 108,000 t held at yearend 2007 (London Metal Exchange Ltd., 2008). Primary smelters increased shipments to LME warehouses and shortened customer payment terms to 5 days from 30 days after delivery in response to concerns over customer's ability to finance purchases (Jennemann, 2008b).

Prices

The monthly average U.S. market price of primary aluminum metal, as reported by Platts Metals Week, increased from \$1.107 per pound in December 2007 to a peak of \$1.426 per pound in July. The monthly average price declined over the next several months and finished 2008 at \$0.715 per pound. The annual average price in 2008 decreased to \$1.205 per pound from \$1.222 per pound in 2007.

The LME and COMEX (COMEX division of the New York Mercantile Exchange, Inc.) average monthly cash prices for primary aluminum ingot followed the same general trend as the U.S. market price. The average monthly COMEX spot settlement price decreased to \$0.711 per pound in December 2008 from \$1.079 per pound in December 2007 and averaged \$1.183 per pound for the year compared with \$1.176 per pound in 2007. The 2008 average annual LME cash price for highgrade primary aluminum ingot decreased to \$1.167 per pound from \$1.194 per pound in 2007.

The purchase prices for aluminum scrap, as quoted by American Metal Market, generally followed the same trend as primary ingot and were down by more than 50% at yearend 2008 from prices at yearend 2007. The 2008 yearend price ranges for selected types of aluminum scrap were mixed lowcopper-content aluminum clips, 38 to 39 cents per pound; old sheet and cast aluminum, 34 to 35 cents per pound; and clean, dry aluminum turnings, 33 to 34 cents per pound. The aluminum producers' buying price range for processed and delivered UBCs, as quoted by American Metal Market, began the year at 81 to 83 cents per pound and closed the year at 44 to 46 cents per pound, averaging 83.5 cents per pound in 2008 compared with 85.6 cents per pound in 2007.

The indicator prices for selected secondary aluminum ingots, as published in American Metal Market, followed the same trend as primary ingot. The yearend prices for 2008 were alloy A380 (3% zinc content), \$0.665 per pound; alloy B380 (1% zinc content), \$0.678 per pound; alloy A360 (0.6% copper content), \$0.715 per pound; alloy A413 (0.6% copper content), \$0.715 per pound; and alloy A319 (3% copper content), \$0.725 per pound. Platts Metals Week published an annual average U.S. price of \$1.123 per pound for A380 alloy (3% zinc content). The average annual LME cash price for a similar A380 alloy was \$1.021 per pound, and the annual average LME NASAAC spot price was \$1.024 per pound.

Foreign Trade

In 2008, total net imports of aluminum-base materials declined by 40% compared with net imports in 2007. Imports for consumption of crude aluminum decreased by 5%, and imports of semifabricated aluminum materials decreased by 15% compared with those of 2007. Canada remained the leading source country accounting for 64% of the total imports in 2008, and Russia continued to be the second ranked supplier, accounting for 8% of total imports of aluminum (table 11).

Exports of crude aluminum decreased by 12% and exports of semifabricated aluminum materials (plates, sheet, and bars) increased by 5% compared with those of 2007. Net exports of 1.49 Mt of scrap increased by 38% compared with the amount in 2007. About 65% of total U.S. exports (crude, semifabricated, and scrap) in 2008 was shipped to China, Canada, and Mexico. Ninety-five percent of the aluminum shipped to China was scrap (table 9).

World Industry Structure

Production.—World primary aluminum production increased by 3% in 2008 compared with that of 2007, corresponding to an increase in smelter capacity. China, Russia, Canada, and the United States, in decreasing order of production, accounted for 58% of total world primary aluminum production.

Stocks.—Owing to the collapse of demand in the second half of the year, yearend global inventories of crude aluminum increased by 65% from the yearend 2007 level. Unwrought aluminum inventories held by member producers of the IAI increased by 8% to 1.68 Mt at yearend 2008 from 1.55 Mt at yearend 2007. Unwrought aluminum is defined by the IAI as aluminum in its basic form made from primary metal or from scrap and that is unworked in the metallurgical sense. Total IAI aluminum inventories increased by 4% to 2.96 Mt at yearend 2008 from 2.85 Mt at yearend 2007. Total aluminum includes unwrought aluminum plus unprocessed scrap, metal in process, and finished semifabricated (mill) products (International Aluminium Institute, 2009).

Yearend 2008 inventories of primary aluminum metal held by the LME increased by 152% to 2.34 Mt from 929,000 t at yearend 2007; aluminum alloy inventories increased by 127% to 104,000 t from 45,800 t; and NASAAC ingot inventories increased by 127% to 245,000 t from 108,000 t (London Metal Exchange Ltd., 2008). *Mergers, Acquisitions, and Restructuring.*—In November 2007, BHP Billiton Ltd. (Melbourne, Australia) approached Rio Tinto plc (London, United Kingdom) with a takeover offer that was rejected by Rio Tinto's board of directors. BHP Billiton then made a public offer to the shareholders of Rio Tinto. In November 2008, BHP Billiton withdrew its offer to purchase Rio Tinto, citing the debt of Rio Tinto as unacceptable in light of the credit crisis developing during the fourth quarter (BHP Billiton Ltd., 2008b, c). Alcoa and the Aluminum Corp. of China (Chinalco) jointly acquired 12% of Rio Tinto's stock in February (Alcoa Inc., 2008d).

Alcoa and its joint-venture partner Orkla ASA (Oslo, Norway) agreed to transfer full ownership of their primary smelters at Lista and Mosjoen, Norway, to Alcoa. In exchange, Alcoa transferred its share of Sapa Extrusions Inc. to Orkla. The smelters have a combined capacity of 282,000 t/yr. The exchange of assets was to be completed in the first quarter of 2009 (Alcoa Inc., 2008b).

In November, Corus Group plc (London, United Kingdom) announced plans to sell its smelters at Delfzijil, Netherlands, and Voerde, Germany, to Klesch & Co. Ltd. (London), pending board review and regulatory approval. Each smelter has a capacity of 100,000 t/yr (Corus Group plc, 2008).

World Review

Argentina.—Aluminio Argentino S.A.I.C. continued an expansion project started in 2007 on its smelter at Puerto Madryn. The project would increase the smelting capacity to 460,000 t/yr from 410,000 t/yr when completed (scheduled for the third quarter of 2009). An additional expansion was planned that would increase capacity to 515,000 t/yr, but a construction schedule had not been determined (Aluminio Argentino S.A.I.C., 2008).

Australia.—The Government of Australia proposed a capand-trade plan in an effort to reduce emissions of carbon dioxide and other greenhouse gases. Because aluminum smelters and alumina refineries are energy intensive and produce carbon dioxide and fluoride compounds, costs to the industry could be higher than for many other industries. However, the proposal included provisions for the aluminum industry to mitigate these cost increases during the first several years if it is enacted (Australian Department of Climate Change, 2008).

Azerbaijan.—Construction started on a 100,000-t/yr smelter owned by Detal Group (Baku). Completion of the project was expected by May 2009 (CRU Aluminium Monitor, 2008a).

Brazil.—Companhia Brasileira de Aluminio Ltd. (Sao Paulo, Brazil) was constructing an expansion to the Aluminio smelter in Sorocaba. The smelting capacity would increase to 570,000 t/yr from 475,000 t/yr by 2011 (CRU Aluminium Monitor, 2008c).

In October, Companhia Vale do Rio Doce Ltd. (Rio de Janeiro, Brazil) shut down 38,000 t/yr of capacity at its 95,000-t/yr Valesul smelter in Santa Cruz as a result of decreased demand and lower aluminum prices (Companhia Vale do Rio Doce Ltd., 2008).

In May, Novelis Inc. (Atlanta, GA) announced an 18-month investment plan that included an increase in aluminum recycling

capacity at the Pindamonhangaba secondary smelter to 150,000 t/yr from 80,000 t/yr (Novelis Inc., 2008).

In 2007, Brazil recycled 96.5% of all aluminum beverage cans sold during the year. Brazil collected and recycled 160,600 t of UBCs, the equivalent of 11.9 billion aluminum cans. The recycling rate was slightly higher than the rate of 94.4% in 2006 and was the highest rate on record. Brazil remained the world leader in aluminum can recycling rates among countries that do not have mandatory recycling laws for the seventh consecutive year (Associacao Brasileira do Aluminio, 2008).

Brunei.—Alcoa signed an MOU with the Brunei Economic Development Board for a study to construct an aluminum smelter and natural-gas-fired powerplant in Brunei. The initial capacity of the smelter would be 360,000 t/yr, but expansions could increase capacity to 700,000 t/yr. No schedule for completion was projected (Alcoa Inc., 2008a).

Canada.—Alcoa and Hydro Quebec signed power contracts for Hydro Quebec to produce 2,100 megawatts per year until 2040 to supply Alcoa's three smelters at Baie Comeau, Becancour, and Deschambault in Quebec. Alcoa will also make upgrades to the Baie Comeau smelter that were expected to reduce emissions and increase capacity to 550,000 t/yr from 440,000 t/yr by 2014 (Alcoa Inc., 2008c). In order to complete the upgrades at Baie Comeau, the smelter was partially shut down in November; this move was also in response to declining aluminum prices (Alcoa Inc., 2008i).

In April, Rio Tinto Alcan Inc. announced that it would conduct a feasibility study for an expansion to the smelter in Alma, Quebec. The proposed project would increase capacity to 570,000 t/yr from 400,000 t/yr (Rio Tinto Alcan Inc., 2008h, p. 3).

Rio Tinto Alcan announced it would conduct a prefeasibility study for a pilot plant using a newly designed smelting pot at Saguenay, Quebec. The pilot smelter would have an initial capacity of 60,000 t/yr, with later expansion to 140,000 t/yr. A second study would consider the feasibility of expanding the smelter to 400,000 t/yr. The completion schedule was not announced (Rio Tinto Alcan Inc., 2008f).

In June, Rio Tinto Alcan commissioned a pilot plant for treating spent potlinings at Saguenay, Quebec. The facility has the capacity to treat 80,000 t/yr of spent potlinings (Rio Tinto Alcan Inc., 2008e).

Rio Tinto Alcan started modernization and expansion of the Kitimat, British Columbia, smelter after it secured all necessary environmental permits, labor contracts, and power supply agreements. The project would increase capacity to 400,000 t/yr from 245,000 t/yr with commissioning expected by 2011 (Rio Tinto Alcan Inc., 2008g).

China.—In February, the Government of China announced that it was eliminating preferential pricing of electricity to aluminum smelters and alumina refineries in response to electricity shortages (Interactive Investor, 2008). Snowstorms cut power to the Guizhou and Zunyi smelters in January. Production was restarted in February at the 400,000-t/yr Guizhou smelter, but the 110,000-t/yr Zunyi smelter was not able to restart until later (Platts Metals Week, 2008c). Production was reduced at the Sichuan Meishan smelter during the first quarter of 2008 owing to power shortages, but full

production resumed in May (CRU Aluminium Monitor, 2008b). Several smelters cut production in July and August to reduce electricity demand and pollution prior to the Olympic Games hosted by China. The cuts reduced production by about 83,000 metric tons per month (Alumina and Aluminium, 2008). In December, China's State Reserve Bureau reportedly purchased 300,000 t of aluminum from Chinalco in an effort to remove surplus metal from the market and stabilize prices (Mason, 2008).

An earthquake in Sichuan Province on May 12 reportedly caused damage to the 100,000-t/yr Aba smelter, causing production capacity to be reduced to 50,000 t/yr. The Sichuan Guangyuan smelter reported that it lost power for several hours after the earthquake and that 5% of its 120,000-t/yr capacity was damaged by the power failure. Although little or no damage was reported at other smelters, concerns about damage to railroads that deliver alumina to the smelters and haul ingot to customers resulted in a spike in prices in Chinese markets and on the LME (CRU Aluminium Monitor, 2008b; Platts Metals Week, 2008a).

France.—Rio Tinto Alcan permanently closed its 50,000-t/yr Lannenmezan smelter in the first quarter of 2008 (Rio Tinto Alcan Inc., 2008h, p. 3).

Germany.—Norsk Hydro ASA (Oslo, Norway) and Novelis announced plans to construct a secondary aluminum smelter adjacent to the Alunorf rolling mill in Neuss. The smelter would have a production capacity of 50,000 t/yr and was expected to start up in 2010 (Norsk Hydro ASA, 2008c).

Ghana.—Alcoa sold its 10% share of the 200,000-t/yr Volta Aluminum Co. (VALCO) smelter to the Government of Ghana in June. The smelter had been closed since March 2007 owing to low water levels at the Volta Dam, the power source for the smelter (Kpodo and Thomson, 2008). The Government planned to restart the smelter using power generated by the Volta Dam and a powerplant using natural gas from Nigeria. The Government also planned to construct a bauxite mine and alumina refinery to supply the smelter in the future; however, no construction plans were detailed (Mineprocessing, 2008).

Greenland.—Studies by Alcoa on the construction of a 340,000-t/yr smelter at Maniitsoq and a hydroelectric power station progressed. Pending final approval by the Government, the smelter could be in production by 2014 or 2015 (Alcoa Inc., 2008k).

Iceland.—Alcoa's 346,000-t/yr smelter at Fjardaal, which opened in April 2007, reached full production in the second quarter of 2008. Alcoa and the national power company, Landsvirkjun, were conducting a study on the geothermal potential for a powerplant. Alcoa proposed constructing a 250,000-t/yr smelter near Bakki if the geothermal powerplant proved to be feasible (Alcoa Inc., 2008f; Jennemann, 2008a).

Century started construction of a 250,000-t/yr smelter at Helguvik in March. The first 150,000 t/yr of capacity was expected to be operational by late 2010 (Century Aluminum Co., 2008a). In October, the company stated that the collapse of Iceland's banking system would not affect the financing of the project, but construction was nearly halted during the fourth quarter as Century was reportedly conserving cash (Century Aluminum Co., 2008b, c). *India.*—Capacity at the National Aluminum Co. of India Ltd. (Nalco) Angul smelter was expanded to 460,000 t/yr from 345,000 t/yr, and production from the new capacity was expected in early 2009. Nalco planned for another expansion project to increase capacity to 580,000 t/yr, but no project schedule was announced. Nalco also planned to construct a 500,000-t/yr smelter with a captive powerplant in Jharsuguda. A project schedule was not announced (National Aluminum Co. of India Ltd., 2008b).

Hindalco Industries Inc. moved forward with expansion plans on several projects. Expansion of the Hirakud smelter to 143,000 t/yr from 100,000 t/yr was completed in August. Further expansion to increase capacity to 151,000 t/yr was underway and scheduled for completion by August 2009. Work progressed on the Mahan smelter and captive powerplant, with production from the 359,000-t/yr smelter anticipated by July 2011. Work progressed on the Aditya aluminum complex that included an alumina refinery with a capacity of 1 to 1.5 Mt/yr, an aluminum smelter with a capacity of 260,000 to 359,000 t/yr, and a captive powerplant. Initial smelter production was scheduled for October 2011, and initial production from the refinery was expected by January 2013. Planning for the Jharkhand smelter and captive powerplant continued. The proposed capacity of the smelter would be 359,000 t/yr, with initial production planned for June 2012 (Hindalco Industries Ltd., 2008).

Vedanta Resources plc began production at the 250,000t/yr Jharsuguda smelter at midyear. An additional 250,000 t/yr of capacity was under construction, although a completion date was not available (Vedanta Resources plc, 2008, p. 27).

Indonesia.—Nalco and the Government of Indonesia signed an MOU to construct a smelter and captive powerplant. Rak Minerals and Metals Investments Ltd. would also be a partner in the project, which would have an initial capacity of 250,000 t/yr, and a second phase would increase capacity to 500,000 t/yr. No projected completion date was announced (National Aluminum Co. of India Ltd., 2008a).

Iran.—Nalco and a consortium lead by Kerman Development Organization signed an MOU to construct a smelter and captive powerplant. The project would have a capacity of 330,000 t/yr. No projected completion date was announced (National Aluminum Co. of India Ltd., 2008b).

Kazakhstan.—Eurasian Natural Resource Corp. attained full production from the 125,000-t/yr Pavlodar smelter in the second quarter of the year. Further expansion was underway that would bring capacity to 250,000 t/yr in 2010 (Eurasian Natural Resource Corp., 2009).

Libya.—United Company RUSAL (Rusal) signed an MOU with the Libyan State Economic and Social Development Fund to develop an aluminum smelter and natural-gas-fired powerplant. The proposed smelter would have a capacity of 600,000 t/yr, and construction would begin in 2010 if proven to be feasible (United Company RUSAL, 2008d).

Klesch signed an agreement with Libya Africa Investment Portfolio to build a 725,000-t/yr smelter to be completed by 2011. The site of the smelter was not detailed (Klesch & Co. Ltd., 2008). *Malaysia.*—Rio Tinto Alcan and partner Cahya Mata Sarawak Berhad received a permit to build a 550,000-t/yr smelter in Sarawak with expansion potential to 1.5 Mt/yr. A construction schedule was not announced (Rio Tinto Alcan Inc., 2008b).

Mozambique.—In March, BHP Billiton announced that the production rate was reduced at its 265,000-t/yr Mozal smelter by approximately 12,000 t/yr because of power shortages (BHP Billiton Ltd., 2008a).

New Zealand.—Production in 2008 declined by about 38,000 t principally because low rainfall forced Rio Tinto Alcan to cut production at the Tiwai Point smelter by about 10% for much of the year. The 281,000-t/yr smelter is powered by a hydroelectric powerplant (Rio Tinto Alcan Inc., 2008i, p. 5).

Nigeria.—Rusal restarted production at the Alscon smelter in February, although production was halted in October owing to a power failure. The 197,000-t/yr smelter had been closed since 1999. A modernization project to increase efficiency and restore full production was expected to be completed in 2010 (Helmer, 2008; United Company RUSAL, 2008b).

Norway.—Norsk Hydro closed 24,000 t/yr of capacity from Soderberg pots at the Karmoy smelter in November and announced that the remaining 96,000 t/yr of Soderberg pots would be closed permanently by the end of the first quarter of 2009. Low aluminum prices were cited as the reason for the closure, although all Soderberg pots had been scheduled for permanent closure by yearend 2009 to comply with environmental regulations (Norsk Hydro ASA, 2008b, d). Norsk Hydro said that proposed legislation to transfer ownership of hydroelectric generation from the company to the Government would make it unlikely that the Soderberg pots would be replaced as Norsk Hydro could not be assured of stable and competitively priced electricity (Norsk Hydro ASA, 2008a).

Oman.—Rio Tinto Alcan and its partners, Oman Oil Company S.A.O.C. and the Abu Dhabi Water and Electricity Authority, completed construction of the 360,000-t/yr Sohar smelter and started production in June (Rio Tinto Alcan Inc., 2008h, p. 4).

Qatar.—Construction of the 585,000-t/yr Qatalum smelter at Mesaieed was progressing to the scheduled startup by early 2010. Norsk Hydro and Qatar Petroleum Co. Ltd. were partners in the smelter (Norsk Hydro ASA, 2008e, 2009).

Romania.—Vimetco NV announced it would close 65,000 t/yr of capacity at the 270,000-t/yr Arlo Slatina smelter in November owing to high electricity costs and low aluminum prices (Vimetco VN, 2008).

Russia.—In February, Rusal completed an expansion to the Irkutsk smelter, increasing capacity to 460,000 t/yr from 290,000 t/yr (United Company RUSAL, 2008c).

Work progressed on Rusal's 750,000-t/yr Taishet and 600,000-t/yr Boguchansky smelters. Initial production at Taishet was planned by yearend 2009, and full production by yearend 2011; initial production at Boguchansky was planned by yearend 2010, and full production, in 2012 (United Company RUSAL, 2008a, e).

Saudi Arabia.—Rio Tinto Alcan withdrew its plan to invest in a joint venture with Saudi Arabian Mining Co. to build an aluminum complex that included a 3-Mt/yr bauxite mine, a 1.6-Mt/yr alumina refinery, and a 720,000-t/yr smelter at Az Zabirah. Plans for the complex were being revised in light of global economic conditions, with completion projected for 2012 (Rio Tinto Alcan Inc., 2008c).

South Africa.—Power shortages in the country led to BHP Billiton closing 92,000 t/yr of aluminum capacity at the 194,000-t/yr Bayside smelter and 12,000 t/yr at the 704,000-t/yr Hillside smelter (BHP Billiton Ltd., 2008a).

Rio Tinto Alcan was in discussions with the South African Government and state power company Eskom on the timing of construction of the proposed Coega smelter. The smelter, to be built in two phases, would have a capacity of 720,000 t/yr when completed. A feasibility study was underway with a revised construction schedule to be announced pending the outcome of the discussions (Rio Tinto Alcan Inc., 2008d).

Trinidad and Tobago.—Construction began on a smelter near Pitch Lake with funding from a Chinese company and was to be completed by 2011. Power for the smelter would come from natural gas produced in Trinidad and Tobago. Initial capacity would be 125,000 t/yr, with the option to expand capacity to 250,000 t/yr (Fraser, 2008; Gumbs-Sandiford, 2008).

United Arab Emirates.—An expansion of Dubai Aluminium Co. Ltd.'s (Dubal) Jebel Ali smelter to increase capacity to 950,000 t/yr from 910,000 t/yr was commissioned in February (Dubai Aluminium Co. Ltd., 2008a).

Construction on Dubal's Emirates Aluminum smelter progressed on schedule toward completion of the first phase with a capacity of 700,000 t/yr; initial production was scheduled to begin in 2011. An additional 700,000 t/yr of capacity would be constructed at a later date. The project is a joint venture between Dubal and Mubadala Development Co. (Dubai Aluminium Co. Ltd., 2008b).

Rio Tinto Alcan announced that it would put on hold plans to build a 700,000-t/yr smelter in Abu Dhabi after the Government of the United Arab Emirates declined a request for a contract for natural gas. The Government stated that it would prefer to use the gas for more profitable uses, such as chemicals, fertilizer, or export in liquefied form, rather than sell it to generate electricity for aluminum smelters (Jennemann, 2008c).

United Kingdom.—In June, a fire resulted in a power loss at the 150,000-t/yr Anglesey smelter, and two of the three potlines were shut down. One of the potlines was restarted in July, and the other potline restarted in August, with full production achieved by the end of 2008. The smelter, jointly owned by Rio Tinto Alcan and Kaiser Aluminum Ltd. (Foothill Ranch, CA), was scheduled to close permanently in September 2009 with the expiration of its power contract (Kaiser Aluminum Ltd., 2008; Rio Tinto Alcan Inc., 2008i, p. 5).

Rio Tinto Alcan announced that modernization of the hydroelectric powerplant supplying power to its Lochaber, Scotland, United Kingdom, smelter would enable smelting capacity to be increased to 50,000 t/yr from 43,000 t/yr. The powerplant was constructed in 1929 and has been in continuous use to power the smelter (Rio Tinto Alcan Inc., 2008a).

Venezuela.—Alcasa was planning an expansion to its smelter at Puerto Ordaz that would increase capacity to 450,000 t/yr from 240,000 t/yr. Construction would take about 3 years, but a schedule had not been determined (Beltran, 2008).

During the fourth quarter of 2008 and early in 2009, numerous smelter closures were announced as aluminum prices continued to decline. By June 1, 2009, about 54% (1.94 Mt/yr) of domestic primary aluminum smelting capacity was not being used. World demand for aluminum in 2009 was expected to remain at levels lower than in prior years owing to declines in automobile manufacturing and home construction. Consumer credit issues in the United States and Western Europe were expected to continue for the coming year. Decreased consumption of aluminum in developed economies resulting from the economic events of 2008 could keep aluminum production below the 2008 production rate for the next several years. The impact of the global recession was also expected to reduce demand for aluminum in emerging economies as manufacturers that sell goods to the United States and other developed economies reduce output. Credit constraints on construction in emerging economies also threaten to reduce consumption of aluminum for infrastructure projects. Lack of credit to aluminum companies was expected to cause delays in expansion projects in many parts of the world, although projects in places with low power costs were still expected to move forward. Relatively higher electricity prices in the United States compared with power prices in other nations diminished the likelihood of domestic smelters reopening in the near-term. New smelters constructed where power costs are relatively low were expected to replace production at high-cost smelters in the United States and other locations.

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TABLE 1 SALIENT ALUMINUM STATISTICS¹

		2004	2005	2006	2007	2008
United States:						
Primary production:						
Quantity	thousand metric tons	2,516	2,481	2,284	2,554	2,658
Value	millions	\$4,660	\$4,980	\$6,110	\$6,880	\$7,060
Price, average, U.S. market, spot	cents per pound	84.0	91.0	121.4	122.2	120.5
Inventories (December 31):						
Aluminum industry ²	thousand metric tons	1,470	1,430	1,410	1,400	1,220
London Metal Exchange, U.S. w	arehouses ³ do.	116	209	228	463	1,290
Secondary recovery: ⁴						
New scrap	do.	1,870	1,950	2,280 r	2,220 r	1,980
Old scrap	do.	1,160	1,080	1,250 r	1,530 ^r	1,340
Total	do.	3,030	3,030	3,540 ^r	3,750 ^r	3,320
Exports, crude and semicrude	do.	1,820	2,370	2,820	2,840	3,280
Imports for consumption, crude an	d semicrude do.	4,720	5,330	5,180	4,490	4,200
Supply, apparent ⁵	do.	8,440 ^r	8,480	8,180 ^r	7,950 ^r	6,900
Consumption, apparent ⁶	do.	6,570 ^r	6,530	5,900 ^r	5,730 ^r	4,920
World, production	do.	29,900	31,900	33,900	38,000 ^r	39,000 ^e

eEstimated. Revised. do. Ditto.

¹Data are rounded to no more than three significant digits except "Primary production: Quantity" and "Price, average, U.S. market, spot." ²Data from the Aluminum Association Inc.; includes ingot, semifabricated material, and scrap. Includes inventory levels for both United States and Canadian producers.

³Includes aluminum alloyed material.

⁴Metallic recovery from purchased, tolled, or imported new and old scrap expanded for full industry coverage.

⁵Defined as domestic primary metal production plus secondary recovery plus imports minus exports plus adjustments for government and industry stock changes.

⁶Apparent supply less recovery from purchased new scrap.

	Yearend ca (thousand me	1 2	
Company and location	2007	2008	Ownership in 2008
Alcoa Inc.:			
Alcoa, TN	215	215	Alcoa Inc., 100%.
Badin, NC	120	120	Do.
Evansville, IN (Warrick)	309	309	Do.
Ferndale, WA (Intalco)	278	278	Do.
Frederick, MD (Eastalco)	195	195	Do.
Massena, NY (St. Lawrence)	125	125	Do.
Massena, NY	130	130	Do.
Mount Holly, SC	224	224	Alcoa Inc., 50.3%; Century Aluminum Co., 49.7%.
Rockdale, TX	267	267	Alcoa Inc., 100%.
Wenatchee, WA	184	184	Do.
Total	2,050	2,050	
Century Aluminum Co.:			
Hawesville, KY	244	244	Century Aluminum Co., 100%.
Ravenswood, WV	170	170	Do.
Total	414	414	
Columbia Falls Aluminum Co., Columbia Falls, MT	168	168	Glencore International AG, 100%.
Goldendale Aluminum Co., Goldendale, WA	160	160	Private interest, 60%; employees, 40%.
Noranda Aluminum Inc., New Madrid, MO	250	250	Apollo Managment LP, 100%.
Ormet Primary Aluminum Corp., Hannibal, OH	265	265	Ormet Corp., 100%.
Rio Tinto Alcan Ltd., Sebree, KY	196	196	Rio Tinto Alcan Ltd., 100%.
Vanalco Inc., Vancouver, WA	116	116	Glencore International AG, 100%.
Grand total	3,620	3,620	

TABLE 2 PRIMARY ANNUAL ALUMINUM PRODUCTION CAPACITY IN THE UNITED STATES, BY COMPANY¹

Do. Ditto.

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

TABLE 3U.S. CONSUMPTION OF AND RECOVERY FROM PURCHASEDNEW AND OLD ALUMINUM SCRAP, BY CLASS^{1, 2}

(Metric tons)

		Calculated	l recovery
Class	Consumption	Aluminum	Metallic
2007:			
Secondary smelters ^r	1,770,000	1,210,000	1,290,000
Independent mill fabricators ³	2,400,000	2,000,000	2,120,000
Foundries	79,000	64,900	69,400
Other consumers	7,950	6,890	6,920
Total ^r	4,250,000	3,270,000	3,480,000
Estimated full industry coverage ^r	4,580,000	3,520,000	3,750,000
2008:			
Secondary smelters	1,580,000	1,030,000	1,100,000
Independent mill fabricators ³	2,180,000	1,800,000	1,910,000
Foundries	77,300	63,300	67,700
Other consumers	8,760	7,770	7,800
Total	3,850,000	2,900,000	3,090,000
Estimated full industry coverage	4,140,000	3,120,000	3,320,000

^rRevised.

¹Excludes recovery from other than aluminum-base scrap.

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

³Includes plants previously categorized as "Integrated aluminum companies."

TABLE 4 U.S. STOCKS, RECEIPTS, AND CONSUMPTION OF PURCHASED NEW AND OLD ALUMINUM SCRAP AND SWEATED PIG IN $2008^{1,2}$

(Metric tons)

	Stocks,	Net		Stocks,
Class of consumer and type of scrap	January 1	receipts ³	Consumption	December 31
Secondary smelters:				
New scrap:	_			
Extrusion	18,200 ^r	352,000	354,000	16,600
Can stock clippings	2,370 ^r	87,300	86,900	2,800
Other wrought sheet and clippings	1,260 r	139,000	139,000	1,340
Casting	1,060 r	33,600	34,000	711
Borings and turnings	2,420 r	103,000	105,000	1,180
Dross and skimmings	1,290	534,000	535,000	667
Other		7,380	7,380	
Total	26,600 r	1,260,000	1,260,000	23,300
Old scrap:				
Castings	2,670 r	50,000	51,000	1,720
Extrusion	1,880 ^r	45,700	45,800	1,820
Aluminum cans ⁴	68 ^r	41,000	41,100	
Other wrought products	1,590 ^r	82,800	82,700	1,650
Auto shredder scrap	2,570 r	70,800	72,300	1,010
Other		20,400	20,400	
Total	8,780 ^r	311,000	313,000	6,200
Sweated pig	96	1,720	1,820	1
Grand total secondary smelters	35,500 r	1,570,000	1,580,000	29,500
Integrated aluminum companies, foundries, independent mill		, ,	, ,	,
fabricators, other consumers:				
New scrap:				
Extrusion	6,230 ^r	599,000	599,000	7,100
Can stock clippings	2,700 ^r	156,000	158,000	982
Other wrought sheet and clippings	3,230 r	170,000	169,000	4,620
Casting	512 ^r	34,000	34,300	243
Borings and turnings	903 r	31,300	31,800	473
Dross and skimmings	5,510 r	131,000	135,000	1,670
Total	19,100	1,120,000	1,130,000	15,100
Old scrap:	19,100	1,120,000	1,150,000	10,100
Castings	2,710 r	128,000	121,000	8,780
Extrusion	1,240 r	32,200	31,900	1,530
Aluminum cans ⁴	8,150 ^r	704,000	704,000	8,150
	,	,	<i>,</i>	,
Other wrought products	5,370 r	160,000	162,000	3,590
Auto shredder scrap	82 ^r	593	593	82
Other		124,000	124,000	
Total	17,600 ^r	1,150,000	1,140,000	22,100
Sweated pig				
Grand total integrated aluminum companies, etc.	36,600	2,270,000	2,270,000	37,200
All scrap consumed:				
New scrap:	r			
Extrusion	24,400 r	951,000	952,000	23,700
Can stock clippings	5,070 ^r	243,000	245,000	3,780
Other wrought sheet and clippings	4,490 r	310,000	308,000	5,960
Casting	1,580 ^r	67,700	68,300	954
Borings and turnings	3,320 ^r	135,000	136,000	1,660
Dross and skimmings	6,800 ^r	665,000	670,000	2,340
Other		7,380	7,380	
Total See footnotes at end of table	45,700 ^r	2,380,000	2,390,000	38,400

See footnotes at end of table.

TABLE 4—Continued U.S. STOCKS, RECEIPTS, AND CONSUMPTION OF PURCHASED NEW AND OLD ALUMINUM SCRAP AND SWEATED PIG IN 2008^{1, 2}

(Metric tons)

	Stocks,	Net		Stocks,
Class of consumer and type of scrap	January 1	receipts ³	Consumption	December 31
All scrap consumed—Continued:				
Old scrap:				
Castings	5,380 ^r	178,000	172,000	10,500
Extrusion	3,120 ^r	77,900	77,700	3,350
Aluminum cans	8,220 r	745,000	745,000	8,150
Other wrought products	6,970 ^r	243,000	244,000	5,230
Auto shredder scrap	2,650 r	71,400	72,900	1,090
Other		144,000	144,000	
Total	26,300 r	1,460,000	1,460,000	28,300
Sweated pig	96 ^r	1,720	1,820	1
Grand total of all scrap consumed	72,100 ^r	3,840,000	3,850,000	66,700

^rRevised. -- Zero.

¹Includes imported scrap. According to reporting companies, 6.44% of total receipts of aluminum-base scrap, or 249,000 metric tons, was received on toll arrangements.

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

³Includes inventory adjustment.

⁴Used beverage cans toll treated for primary producers are included in secondary smelter tabulation.

TABLE 5 PRODUCTION AND SHIPMENTS OF SECONDARY ALUMINUM ALLOYS BY INDEPENDENT SMELTERS IN THE UNITED STATES¹

(Metric tons)

	20	07	2008	
		Net		Net
	Production	shipments ²	Production	shipments ²
Diecast alloys:				
13% Si, 360, etc. (0.6% Cu, maximum)	26,000	26,400	23,200	23,500
380 and variations	224,000 r	227,000 r	209,000	212,000
Sand and permanent mold:				
95/5 Al-Si, 356, etc. (0.6% Cu, maximum)	32,900	33,000 r	29,500	29,100
No. 12 and variations	2,270	2,270	2,020	2,020
No. 319 and variations	74,900	76,000 ^r	66,600	66,700
F-132 alloy and variations	20,000	20,200	19,000	18,700
Al-Mg alloys	9,940	9,740 ^r	8,850	8,980
Al-Zn alloys	1,720	1,760 ^r	1,650	1,560
Al-Si alloys (0.6% to 2.0% Cu)	20,000	20,000	17,800	17,700
Al-Cu alloys (1.5% Si, maximum)	399	456	521	484
Al-Si-Cu-Ni alloys	9,680	9,940	8,610	8,050
Other	401	401	162	205
Wrought alloys, extrusion billets	703,000	702,000	662,000	661,000
Miscellaneous:				
Steel deoxidation	42,900	42,900	39,900	39,900
Pure (97.0% Al)	W	W	W	W
Aluminum-base hardeners	W	W	W	W
Other ³	60,500 ^r	59,800 ^r	53,900	50,400
Total	1,230,000 r	1,230,000 r	1,140,000	1,140,000
Less consumption of materials other than scrap:				
Primary aluminum	302,000 r	XX	230,000	XX
Primary silicon	29,500 r	XX	9,720	XX
Other	15,000 r	XX	7,310	XX
Net metallic recovery from aluminum scrap and sweated				
pig consumed in production of secondary aluminum ingot ⁴	882,000 ^r	XX	916,000	XX

^rRevised. W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous, other." XX Not applicable. ¹Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes inventory adjustment.

³Includes other diecast alloys.

⁴No allowance made for melt loss of primary aluminum and alloying ingredients.

TABLE 6

DISTRIBUTION OF END-USE SHIPMENTS OF ALUMINUM PRODUCTS IN THE UNITED STATES AND CANADA, BY INDUSTRY¹

	20	07	20	08 ^p
	Quantity		Quantity	
	(thousand	Percentage	(thousand	Percentage
Industry	metric tons)	of grand total	metric tons)	of grand total
Containers and packaging	2,230 ^r	19.9	2,230	22.2
Building and construction	1,410	12.6	1,180	11.7
Transportation	3,580	32.0	2,830	28.1
Electrical	762 ^r	6.8 ^r	700	7.0
Consumer durables	664 ^r	5.9 ^r	607	6.0
Machinery and equipment	736	6.6	688	6.9
Other markets	359	3.2	334	3.3
Total	9,730 ^r	87.0	8,560	85.2
Exports ^e	1,450	13.0	1,490	14.8
Grand total	11,200	100.0	10,000	100.0

^eEstimated. ^pPreliminary. ^rRevised.

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

Source: The Aluminum Association Inc.

TABLE 7 U.S. NET SHIPMENTS OF ALUMINUM WROUGHT AND CAST PRODUCTS, BY PRODUCERS^{1, 2, 3}

	2006	2007	2008 ^p
Wrought products:			
Sheet, plate, foil	4,690 r	4,420 r	4,250
Pipe, tube, extruded shapes	1,920 ^r	1,640 ^r	1,430
Rod, bar, wire, cable	420 ^r	401 ^r	350
Forgings (including impacts)	134	126	97
Powder, flake, paste	54 ^r	56 ^r	49
Total	7,220 ^r	6,640 ^r	6,180
Castings:			
Sand	335	315	254
Permanent and semipermanent mold	754	615	570
Die	1,170	1,260	1,030
Other	53	35	44
Total	2,310	2,230	1,900
Grand total	9,530 ^r	8,860 r	8,070

(Thousand metric tons)

^pPreliminary. ^rRevised.

¹Net shipments derived by subtracting the sum of producers' domestic receipts of each mill shape from the domestic industry's gross shipments of that shape.

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

³Wrought products data series includes net shipments in the United States and Canada.

Source: The Aluminum Association Inc.

	200)7	200	08
	Quantity	Value	Quantity	Value
Class	(metric tons)	(thousands)	(metric tons)	(thousands)
Crude and semicrude:				
Metals and alloys, crude	349,000	\$953,000	308,000	\$890,000
Scrap	1,550,000	3,050,000	1,980,000	3,420,000
Plates, sheets, bars, strip, etc.	887,000	3,730,000	929,000	4,020,000
Castings and forgings	21,100	263,000	24,400	304,000
Semifabricated forms, n.e.c.	39,200	287,000	39,500	385,000
Total	2,840,000	8,280,000	3,280,000	9,020,000
Manufactures:				
Foil and leaf	88,700	408,000	89,700	436,000
Powders and flakes	6,600	36,600	7,840	39,600
Wire and cable	45,700	179,000	52,900	207,000
Total	141,000	623,000 ^r	150,000	683,000
Grand total	2,980,000	8,910,000	3,430,000	9,710,000

TABLE 8 U.S. EXPORTS OF ALUMINUM, BY CLASS¹

^rRevised.

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

TABLE 9
U.S. EXPORTS OF ALUMINUM, BY COUNTRY ¹

	Metals and a		Plates, sheets	s, bars, etc. ²	Scr		Tot	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Country	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)
2007:								
Brazil	1,930	\$4,270	12,200	\$70,800	4,690	\$19,100	18,800	\$94,100
Canada	116,000	315,000	422,000	1,660,000	158,000	327,000	696,000	2,310,000
China	1,310	3,660	23,900	157,000	803,000	1,590,000	828,000	1,750,000
France	869	3,590	10,800	85,600	203	563	11,800	89,800
Germany	2,810	10,900	9,820	73,300	1,200	3,060	13,800	87,200
Hong Kong	668	1,560	20,400	101,000	39,900	92,500	61,000	195,000
Italy	5,800	5,890	3,850	39,400	3,570	18,500	13,200	63,800
Japan	15,000	37,600	19,100	191,000	45,900	111,000	80,000	340,000
Korea, Republic of	565	2,470	18,400	111,000	198,000	384,000	217,000	497,000
Mexico	190,000	516,000	247,000	988,000	82,400	166,000	519,000	1,670,000
Netherlands	1,680	5,650	1,730	12,700	1,390	2,750	4,800	21,100
Russia	516	2,350	1,790	6,720	139	254	2,450	9,330
Saudi Arabia	18	136	29,900	108,000			29,900	108,000
Singapore	352	1,260	2,760	22,900	329	592	3,440	24,800
Taiwan	356	1,630	6,310	33,600	134,000	212,000	141,000	247,000
Thailand	526	514	12,200	47,700	24,800	38,900	37,600	87,100
Ukraine	573	4,830	322	1,310			895	6,140
United Kingdom	234	2,240	21,000	147,000	1,820	4,100	23,000	153,000
Venezuela	113	350	3,050	14,400	80	127	3,250	14,900
Other	9,550	33,300	80,700 ^r	404,000 r	45,900	76,900	136,000 r	515,000
Total	349,000	953,000	947,000	4,280,000	1,550,000	3,050,000	2,840,000	8,280,000
2008:	,ź	<i>,</i>	<i></i>	<i>.</i>	· · ·			
Brazil	400	1,120	9,820	63,800	4,300	10,200	14,500	75,100
Canada	103,000	287,000	413,000	1,680,000	161,000	336,000	678,000	2,300,000
China	1,020	2,450	41,300	302,000	893,000	1,740,000	936,000	2,050,000
France	749	3,140	10,900	99,000	113	500	11,800	103,000
Germany	2,780	12,100	10,700	74,400	1,210	2,890	14,700	89,300
Hong Kong	203	736	17,000	79,200	94,700	195,000	112,000	275,000
Italy	36	160	3,320	42,400	429	950	3,780	43,500
Japan	9,360	34,600	20,300	182,000	59,100	130,000	88,700	346,000
Korea, Republic of	865	2,160	16,300	115,000	223,000	387,000	240,000	505,000
Mexico	178,000	507,000	266,000	1,080,000	85,800	185,000	530,000	1,770,000
Netherlands	421	1,750	1,860	20,100	1,320	2,990	3,600	24,900
Saudi Arabia	264	519	43,400	193,000	18	8	43,700	194,000
Singapore	313	1,050	1,450	15,300	691	942	2,450	17,300
Taiwan	84	592	8,360	48,700	321,000	277,000	330,000	327,000
Thailand	256	383	12,100	47,600	72,800	63,800	85,200	112,000
United Kingdom	1,100	5,710	24,300	175,000	849	2,580	26,300	183,000
Venezuela	42	182	772	4,450	502	769	1,320	5,410
Other	8,830	29,600	91,900	489,000	61,700	86,100	162,000	605,000
Total	308,000	890,000	993,000	4,710,000	1,980,000	3,420,000	3,280,000	9,020,000

^rRevised. -- Zero.

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

²Includes castings, forgings, and unclassified semifabricated forms.

TABLE 10

U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY CLASS¹

	20)07	200	08
	Quantity	Value	Quantity	Value
Class	(metric tons)	(thousands)	(metric tons)	(thousands)
Crude and semicrude:	· · · ·		· · ·	· · ·
Metals and alloys, crude	2,950,000	\$8,290,000	2,790,000	\$7,810,000
Plates, sheets, strip, etc., n.e.c. ²	801,000	3,070,000	693,000	2,770,000
Pipes, tubes, etc.	34,300	254,000	34,200	271,000
Rods and bars	235,000	985,000	186,000	825,000
Scrap	471,000	803,000	494,000	853,000
Total	4,490,000	13,400,000	4,200,000	12,500,000
Manufactures:				
Foil and leaf ³	127,000	586,000	130,000	590,000
Powders and flakes	9,480	42,600	9,150	43,000
Wire	194,000	598,000	185,000	574,000
Total	330,000	1,230,000	325,000	1,210,000
Grand total	4,820,000	14,600,000	4,530,000	13,700,000

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

²Includes circles, disks, plates, and sheets.

³Excludes etched capacitor foil.

 TABLE 11

 U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY COUNTRY¹

	Metals and alloys, crude		Plates, sheets, bars, etc. ²		Scrap		Total	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Country	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)
2007:								
Argentina	55,300	\$158,000	56	\$638			55,400	\$159,000
Australia	55,700	159,000	98	903	2,730	\$7,380	58,500	167,000
Bahrain	36,100	106,000	18,100	62,800			54,200	169,000
Belgium	94	370	11,700	63,700	14	25	11,800	64,100
Brazil	80,100	225,000	26,500	89,900	1	4	107,000	314,000
Canada	1,930,000	5,390,000	443,000	1,650,000	320,000	541,000	2,690,000	7,580,000
China	37,700	107,000	166,000	605,000	58	205	204,000	712,000
France	435	7,470	3,580	28,800	44	96	4,060	36,300
Germany	2,620	8,060	98,700	485,000	465	727	102,000	493,000
Italy	513	2,360	7,250	44,700	77	119	7,840	47,200
Japan	239	894	14,400	79,800	703	3,800	15,300	84,500
Korea, Republic of	2,510	7,910	2,940	14,200	69	182	5,510	22,300
Mexico	22,100	105,000	19,600	95,300	105,000	174,000	146,000	375,000
Netherlands	841	3,140	2,930	18,300	143	306	3,920	21,700
Norway	4,940	16,600	140	725			5,080	17,300
Panama	20	38	10	42	3,450	6,850	3,480	6,930
Russia	434,000	1,200,000	55,900	241,000	1,660	3,900	492,000	1,440,000
Slovenia			3,940	18,700			3,940	18,700
South Africa	62,500	164,000	47,800	176,000			110,000	339,000
Spain	107	466	502	3,300	19	39	628	3,810
United Arab Emirates	108,000	317,000			18	90	108,000	317,000
United Kingdom	3,990	11,300	5,870	43,700	1,110	1,970	11,000	57,000
Venezuela	63,800	162,000	8,770	26,500	486	1,270	73,000	189,000
Other	48,600	140,000	132,000	569,000	34,800	60,700	215,000	770,000
Total	2,950,000	8,290,000	1,070,000	4,310,000 r	471,000	803,000	4,490,000	13,400,000
2008:		0,220,000	-,-,-,	.,,	.,.,	,	.,.,.,	,,
Argentina	90,000	259,000					90,000	259,000
Australia	39,900	117,000	120	1,350	109	240	40,100	119,000
Bahrain	8,930	26,700	18,200	63,400			27,100	90,100
Belgium	87	468	4,790	24,700			4,880	25,100
Brazil	82,500	226,000	13,800	45,900	367	650	96,700	273,000
Canada	1,990,000	5,510,000	379,000	1,450,000	330,000	558,000	2,700,000	7,520,000
China	21,900	63,200	151,000	567,000	33	70	173,000	630,000
France	511	8,500	4,140	35,700	799	1,180	5,450	45,400
Germany	2,460	7,320	88,500	488,000	386	1,180	91,300	496,000
Italy	32	171	6,120	38,000	18	32	6,170	38,200
Japan	1,030	2,180	10,700	61,300	818	4,960	12,500	68,400
Korea, Republic of	909	2,180	2,010	10,400	184	4,960	3,100	13,900
		,	,	· ·			,	405,000
Mexico	23,900	109,000	17,800	99,000 16,500	114,000	196,000	155,000	
Netherlands	1,130	3,560	2,330	16,500	191	421	3,650	20,500
Norway	2,710	8,750	14	172			2,720	8,920
Panama	151	384			2,410	4,860	2,570	5,250
Russia	288,000	795,000	45,900	202,000	1,490	4,380	335,000	1,000,000
Slovenia			3,550	18,000			3,550	18,000
South Africa	9,440	23,700	40,100	156,000	500	190	50,000	180,000
Spain	161	715	149	1,310	8	31	318	2,060
Tajikstan	2,780	7,020					2,780	7,020
United Arab Emirates	80,300	241,000	19	73	278	518	80,600	241,000
United Kingdom	1,760	3,930	7,930	46,600	6,460	12,900	16,200	63,400
Venezuela	103,000	282,000	3,690	10,700	2,500	5,420	110,000	298,000
Other	38,000	108,000	114,000	531,000	33,500	60,900	185,000	700,000
Total	2,790,000	7,810,000	914,000	3,860,000	494,000	853,000	4,200,000	12,500,000

^rRevised. -- Zero.

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

²Includes circles, disks, pipes, rods, tubes, etc.

TABLE 12

ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY^{1, 2}

(Thousand metric tons)

Country	2004	2005	2006	2007	2008 ^e
Argentina	272	271	273	271 ^r	343 ³
Australia	1,890	1,900	1,930	1,960 r	1,970 ³
Azerbaijan	30	32	32	39	40
Bahrain	532	751	872	865 r	865
Bosnia and Herzegovina ⁴	121	131	136	122 ^r	123
Brazil	1,460	1,500	1,610 ^r	1,660 r	1,660 ^{p, 3}
Cameroon	86	90	88 ^{r, e}	87 ^r	91 ³
Canada	2,590	2,890	3,050	3,080	3,120 ^{p, 3}
China ^e	6,670	7,800	9,360	12,600	13,200
Egypt	216	244	252	258	260
France	451	442	442	428	389
Germany	668	648	516	551	550
Ghana	^e	13	8 r	r	
Greece	167	165	163	166	160
Hungary ^e	34	31	34		
Iceland ⁵	271	272	320	398	787 ³
India ⁶	861 ^r	942	1,110 ^r	1,220 r	1,310 ³
Indonesia ⁶	241 ^r	252	250	242	243 ³
Iran ^e	213 3	220	205	204	210
Italy	195	193	194	183	183 ³
Japan ⁷	6	7	7	7 °	7 ³
Kazakhstan					104
Montenegro	115 8	117 8	122	135 ^r	120
Mozambique	549	555	564	564 °	536 ³
Netherlands	326	325	312	301	301
New Zealand	350	351	337	353 ^r	316 ³
Nigeria					20
Norway	1,320	1,370	1,330	1,360 ^r	1,360 ³
Oman					49
Poland ⁹	46	55	58	59 ^r	58
Romania ¹⁰	222	244	258	286	290
Russia	3,590	3,650	3,720	3,960	3,800
Slovakia ⁶	175	158	180	190 ^r	190
Slovenia ⁴	175	138	118 ^r	111 r	110
South Africa	866	846	931 ^r	914 ^r	811
Spain	398	394	349 ^r	350 °	350
Sweden	101	102	101	98	95
Switzerland	45	45	12		
Tajikistan	358	380	414	419	339 ³
	60	60	60	65 r	65
Turkey ^e	113	114	113	113	113 ³
Ukraine ¹⁰		114 722 °			
United Arab Emirates	683		861 ^r	890 265	910 326 ³
United Kingdom	360	369	360	365	
United States Venezuela	2,516 624	2,481 615	2,284 610 ^e	2,554 610 °	2,658 ³ 610
		015	010 *	010 -	610

^eEstimated. ^pPreliminary. ^rRevised. -- Zero.

¹World totals and estimated data are rounded to no more than three significant digits; may not add to totals shown. ²Primary aluminum is defined as "The weight of liquid aluminum as tapped from pots, excluding the weight of any alloying materials as well that of any metal produced from either returned scrap or remelted materials." International reporting practices vary from country to country, some nations conforming to the foregoing definition and others using different definitions. For those countries for which a different definition is given specifically in the source publication, that definition is provided in this table by footnote. Table includes data available through May 13, 2009.

³Reported figure.

⁴Primary ingot plus secondary ingot.

⁵Ingot and rolling billet production.

TABLE 12—Continued ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY^{1, 2}

⁶Primary ingot.

⁷Excludes high purity aluminum containing 99.995% or more as follows, in metric tons: 2004—55,400; 2005—45,400; 2006—49,700; 2007—55,000 (estimated); and 2008—52,000 (estimated).

⁸Montenegro and Serbia formally declared independence in June 2006, from each other and dissolved their union.
⁹Primary unalloyed ingot plus secondary unalloyed ingot.

¹⁰Primary unalloyed metal plus primary alloyed metal, thus including weight of alloying material.