



2010 Minerals Yearbook

ALUMINUM

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During 2010, domestic primary smelters produced 1.73 million metric tons (Mt) of aluminum metal, the same as in 2009, valued at \$3.98 billion, 31% more than the value of the production in 2009. At yearend, five companies were operating nine primary aluminum smelters in seven States. Smelters east of the Mississippi River accounted for about 71% of the production. An additional five smelters were temporarily idle. Two other smelters that had been temporarily idle were permanently closed. About 56% [1.78 million metric tons per year (Mt/yr)] of domestic primary aluminum smelting capacity (table 2), including idle potlines at operating smelters, was not being used.

Aluminum recovered from purchased scrap was essentially unchanged at 2.8 Mt. Of this recovered metal, 55% came from new (manufacturing) scrap, and 45% came from old (discarded aluminum products) scrap. Aluminum used beverage cans (UBCs) accounted for 48% of the reported old scrap consumed in 2010 and 21% of total scrap consumed.

Apparent consumption of aluminum increased by 4% compared with that in 2009. The United States and Canadian transportation industry accounted for 28.6% of metal shipments by United States and Canadian producers; containers and packaging, 22.4%; building and construction, 10.2%; electrical, 7.1%; machinery and equipment, 7.1%; consumer durables, 6.1%; and other uses, 3.1%. Exports accounted for 15.4% of shipments from producers in Canada and the United States in 2010 (table 6).

The 2010 annual average U.S. market price of primary aluminum ingot increased by 31% to \$1.044 per pound from \$0.794 per pound in 2009. The monthly average price fluctuated between \$0.934 per pound and \$1.109 per pound during the first 9 months of 2010, before stabilizing at about \$1.12 per pound during the fourth quarter of the year.

At yearend 2010, total (unwrought, scrap, in process metal, and semifabricated) world inventories of aluminum, as reported by the International Aluminium Institute (IAI) (2011), were 13% higher than those at yearend 2009. Combined inventories of aluminum metal and alloys held by the London Metal Exchange Ltd. (LME) (2009; 2010), however, decreased by 8%.

Primary aluminum was produced in 42 countries in 2010. China, Russia, Canada, and Australia, in decreasing order of metal produced, accounted for 61% of total world production. World primary metal production increased by 11% compared with that of 2009 owing to increased production in China (3.3 Mt), the United Arab Emirates [390,000 metric tons (t)], Qatar (180,000 t), Russia (132,000 t), Germany (102,000 t), Kazakhstan (100,000 t), New Zealand (73,000 t), and several other nations. Commissioning of new smelters and brownfield expansions, as well as restarted capacity closed during the financial crisis, accounted for the increased production. These increases were partially offset by decreased production of

330,000 t in Norway, 75,000 t in Venezuela, 67,000 t in Canada, and 67,000 t in the United Kingdom, as older smelters were closed, and droughts limited hydroelectric power in some locations. The United States remained the 5th leading producer of primary aluminum.

Production

Primary.—In June, Alcoa Inc. (Pittsburgh, PA) and workers represented by the United Steelworkers (USW) union ratified a 4-year contract that addressed issues such as health care, pay increases, and workplace flexibility. The contract covered 5,400 hourly workers at 10 locations in the United States, including 6 primary smelters at Alcoa, TN; Massena, NY (2); Rockdale, TX; Wenatchee, WA; and Warrick, IN. The previous 4-year contract had expired May 31, and work had continued without interruption at all locations during the negotiations (Alcoa Inc., 2010b).

In April, Alcoa announced that the temporary closures of the Badin, NC, and Frederick, MD, smelters would be made permanent, and the sites would be remediated. The Badin smelter was first opened in 1916 and last operated in August 2002. It had a capacity of 120,000 metric tons per year (t/yr) of aluminum. The Frederick smelter, which began production in 1970, had a capacity of 195,000 t/yr when it closed in December 2005. High power prices were cited as reasons for initial closure of both smelters, and subsequent efforts to obtain long-term power contracts at competitive prices were unsuccessful (Alcoa Inc., 2010c).

A 5-year labor contract between Century Aluminum Co. (Monterey, CA) and more than 540 hourly employees represented by the USW at the 244,000-t/yr smelter in Hawesville, KY, was ratified on December 23 (Century Aluminum Co., 2010c). Production had continued since the previous contract expired on March 31. Prior to the contract ratification, Century announced that it would restart a potline that was closed in March 2009 when prices and demand for aluminum had declined. The restart was to be completed by the end of March 2011 and would restore full production at the smelter (Century Aluminum Co., 2010a).

Ormet Corp. restarted two potlines at its 265,000-t/yr smelter in Hannibal, OH, at the end of November. The restart of the potlines was expected to be completed in the first quarter of 2011 and bring production at the smelter to full capacity (Ormet Corp., 2010). One of the potlines was shut down in May 2009, and the other was shut down in August as a result of a disputed alumina supply agreement with its previous supplier, Glencore International AG.

Noranda Aluminum Holding Corp. (Franklin, TN) returned the New Madrid, MO, smelter to full capacity in March after it shut down during a power failure caused by a storm in January

2009. About 75% of the smelter's capacity was shut down, and restart of the potlines began in early 2009 and continued through the first quarter of 2010 (Noranda Aluminum Holding Corp., 2010b).

A project to expand the New Madrid smelter capacity to 266,000 t/yr from 250,000 t/yr resumed in September. The project, which had initially started in mid-2008 but was put on hold in early 2009 during the financial crisis, was expected to be completed by the beginning of 2013 (Noranda Aluminum Holding Corp., 2010a).

Secondary.—In March, Alcoa completed a 50% expansion of its UBC recycling facility in Alcoa, TN. The project, which included a new crusher, delacquering furnace, and emissions control systems, was part of Alcoa's efforts to increase recycling of UBCs in the United States (Alcoa Inc., 2010a). Work on the project started in December 2007 and had been originally planned for completion in 2009, but construction was slowed during the global financial crisis.

In September, a fire at Alcoa's Knoxville, TN, plant forced a several-week shutdown of its rolling mill. The rolling mill had a capacity of 500,000 t/yr and produced mostly can sheet. Other parts of the plant were not affected and continued production (American Metal Market, 2010b).

In July, Aleris International Inc. restarted production at its Coldwater South secondary smelter in Coldwater, MI. The smelter had a capacity of approximately 130,000 t/yr of alloys commonly used for manufacturing automotive parts. The smelter had shut down in May 2009 owing to a cutback in automobile manufacturing (Platts Metals Week, 2010c).

Bermco Aluminum Co. (Birmingham, AL) announced plans to relocate its secondary smelter from Birmingham, AL, to Lincoln, AL. The new smelter would have a capacity of 110,000 t/yr compared with the current location's capacity of 55,000 t/yr. The smelter produced diecast and foundry alloys used by automobile parts manufacturers and other consumers. Construction was planned to start in mid-2011, and full production was expected by mid-2012 (Platts Metals Week, 2010e).

Logan Aluminum Inc. (a joint venture between Arco Aluminum Inc. and Novelis Inc.) installed support equipment for a furnace at its UBC recycling facility and rolling mill in Russelville, KY. Briquetters to compress shredded UBCs were installed to increase the operational efficiency of the furnace that was started up in 2008, which produced approximately 65,000 t/yr of metal from UBCs and other scrap without generating salt cake (Light Metal Age, 2010).

Sapa Extrusions Ltd. planned to build a billet casting facility at its Cressona, PA, extrusion plant by September 2011. The casting pit would have a capacity of 545,000 t/yr of billet, produced mainly from scrap. Increasing demand for extruded aluminum products and tight supplies of extrusion billet were cited as reasons for the expansion (Platts Metals Week, 2010g).

Skana Aluminum Co. (Manitowoc, WI) reopened a rolling mill with two rebuilt furnaces in July. The plant, formerly owned by Koenig and Vits Inc., shut down in May 2009 amid financial troubles leading to an asset sale in bankruptcy. At capacity, the plant was expected to produce 30,000 t/yr of sheet for cookware and automotive parts manufactured from scrap (Mason, 2010).

Spectro Alloys Corp. (Rochester, MN) replaced a damaged 65,000-t/yr furnace that was taken out of service early in the year. The new furnace had a capacity of approximately 52,000 t/yr and was put into operation in July. The secondary smelter produced alloys used by the automobile industry and other consumers (American Metal Market, 2010c).

Consumption

Apparent consumption of aluminum in the United States increased by 4% in 2010 compared with that in 2009. Shipments of aluminum by United States and Canadian producers to their combined domestic markets increased by 22% in 2010 compared with the amount shipped in 2009. Shipments of aluminum for containers and packaging in 2010 increased slightly compared with those in 2009. Shipments to the transportation sector increased by 46%, building and construction by 4%, consumer durables by 31%, electrical by 18%, and the machinery sector by 47%.

The increase in shipments of aluminum to the transportation sector resulted primarily from an expansion of automobile production. Manufacturing of light vehicles in North America increased by 39% in 2010 compared with production in 2009, and in the United States, increased by 35% to 7.58 million units from 5.61 million units. Production in the first half of 2009 had been significantly reduced by extended shutdowns as a result of the bankruptcies of General Motors Co. and Chrysler Group LLC (CSM Worldwide Inc., 2010; IHS Automotive Inc., 2011).

The Boeing Co. (Chicago, IL) reported that its deliveries of commercial aircraft were 4% lower than in 2009 owing to a decline in deliveries of wide-body models. Deliveries of the single-aisle 737 aircraft increased slightly as airlines continued to replace older aircraft with more fuel efficient models (Boeing Co., The, 2011, p. 24).

The decrease in aluminum shipments for use in building and construction was a result of reduced nonresidential and residential construction. The U.S. Census Bureau and the U.S. Department of Housing and Urban Development jointly reported that housing starts were up by 6.1% in 2010 compared with starts in 2009. The number of houses completed, however, was 17.7% fewer than in 2009 (U.S. Census Bureau, 2011b). Spending on nonresidential construction during 2010 decreased by 13.9% compared with that in 2009. Total construction spending during 2010 was down 10.3% compared with that in 2009 (U.S. Census Bureau, 2011a).

Stocks

According to data reported by the Aluminum Association Inc. (2011), United States and Canadian producers' combined inventories of aluminum ingot, mill products, and scrap increased by 8% to 1.01 Mt at yearend 2010 from 937,000 t at yearend 2009. The LME reported that primary aluminum metal ingot stocks at its U.S. warehouses increased by 3% to 2.09 Mt at yearend 2010 from 2.02 Mt at yearend 2009. At yearend 2010, LME warehouses in the United States also held about 70,000 t of North American special aluminum alloy contract (NASAAC) metal ingot, a 61% decrease from the 180,000 t held at yearend 2009 (London Metal Exchange Ltd., 2009, 2010).

Prices

The monthly average U.S. market price of primary aluminum metal, as reported by Platts Metals Week, started the year at \$1.069 per pound of aluminum and fluctuated between \$0.934 per pound and \$1.109 per pound until October. The monthly average price was about \$1.12 per pound in each of the past 3 months of the year. The annual average price in 2010 increased to \$1.044 per pound from \$0.794 per pound in 2009. The LME monthly average cash prices for primary aluminum ingot followed the same general trend as the U.S. market price, and the 2010 annual average LME cash price increased to \$0.986 per pound from \$0.755 per pound in 2009. The indicator prices for selected secondary aluminum ingots and scrap, as published in American Metal Market, followed the same trend as primary ingot prices (table 8).

Foreign Trade

In 2010, total net imports of aluminum-base materials decreased by 20% compared with net imports in 2009 (tables 9 and 11). Imports for consumption of crude aluminum decreased by 9%, while imports of semifabricated aluminum materials (plates, sheet, and bars) increased by 23%, and scrap imports increased by 16% compared with those of 2009. Canada remained the leading source country, accounting for 63% of the total (crude, semifabricated, and scrap) imports in 2010, while China (7%) and Russia (5%) were the second and third ranked suppliers (table 12).

Exports of crude aluminum (metal and alloys) increased by 8% and exports of semifabricated aluminum materials increased by 7% compared with those of 2009. Net exports of 1.41 Mt of scrap increased by 15% compared with the amount in 2009. About 79% of total U.S. exports of unmanufactured aluminum (crude, semifabricated, and scrap) in 2010 was collectively shipped to China, Canada, and Mexico. The aluminum shipped to China was 97% scrap (table 10).

Mergers and Acquisitions

Norsk Hydro ASA (Oslo, Norway) and Vale SA (Rio de Janeiro, Brazil) announced a deal in May in which Norsk Hydro would purchase Vale's bauxite, alumina, and aluminum assets in Brazil in exchange for \$1.1 billion in cash plus \$3.8 billion in stock of Norsk Hydro. As a result of the transaction, Vale would own 22% of Norsk Hydro; Norsk Hydro would own 51% of the 460,000-t/yr Albras smelter; and Norsk Hydro would increase its share of the 6.3-Mt/yr Alunorte refinery to 91% from 34% and of the 1.86-Mt/yr Companhia de Alumina do Para refinery project to 81% from 20%. Norsk Hydro would also gain ownership of 60% of the Paragominas bauxite mine (9.9 Mt/yr capacity) with an option to purchase the remaining 40% of the mine by yearend 2015 (Norsk Hydro ASA, 2010d; Platts Metals Week, 2010f). The companies had planned to complete the transaction by yearend but closing was delayed until early in 2011 awaiting regulatory approval (Norsk Hydro ASA, 2010g). In a separate transaction, Norsk Hydro acquired full control of a secondary smelter in Taiwan when it acquired Formosa Alloy Materials Co.'s 15.1% share. The 75,000-t/yr smelter produced extrusion billet sold mostly in Asia, but also exported billet to

Norsk Hydro customers in the United States (Norsk Hydro ASA, 2010c). Aleris emerged from chapter 11 bankruptcy on June 1. The secondary smelter and rolling mill company had filed for bankruptcy protection February 12, 2009, citing financial pressures and declining demand and prices for its products amid the global financial crisis. A consortium of creditors, led by private equity firms Apollo Management, L.P., Oaktree Capital Management, L.P., and Sankaty Advisors, LLC, took ownership of the company (Aleris International Inc., 2010). The company continued to operate during the bankruptcy proceedings under terms of a debtor-in-possession financing agreement approved in 2009.

World Industry Structure

Production.—World primary aluminum production increased by 11% in 2010 compared with that of 2009 owing to smelter reopenings and expansions as prices recovered from the lows during the financial crisis. China was the leading producer and accounted for 40% of global production. China, Russia, Canada, and Australia, in decreasing order of production, accounted for 61% of total world primary aluminum production.

During the fourth quarter of 2008 and early 2009, many primary smelters announced shutdowns in response to declining prices, as demand for aluminum receded in the face of the financial crisis. Throughout 2010, most of these shutdowns were continued, although several restarts were announced in the second half of the year.

Stocks.—As aluminum demand increased and prices recovered from the lows during the financial crisis in 2009, aluminum inventories stabilized during the fourth quarter of 2010. Unwrought aluminum inventories held by member producers of the IAI increased by 16% to 1.40 Mt at yearend 2010 from 1.21 Mt at yearend 2009. Unwrought aluminum is defined by the IAI as aluminum in its basic form made from primary metal or from scrap and that is metallurgically unworked. Total IAI aluminum inventories increased by 13% to 2.52 Mt at yearend 2010 from 2.23 Mt at yearend 2009. Total aluminum includes unwrought aluminum plus unprocessed scrap, metal in process, and finished semifabricated (mill) products (International Aluminium Institute, 2011).

Yearend 2010 inventories of primary aluminum metal held by the LME decreased by 8% to 4.27 Mt from 4.62 Mt at yearend 2009, aluminum alloy inventories decreased by 17% to 70,000 t from 84,500 t, and NASAAC ingot inventories decreased by 26% to 134,000 t from 180,000 t (London Metal Exchange Ltd., 2009, 2010).

Primary aluminum metal ingot stocks at U.S. LME warehouses increased by 3% to 2.09 Mt at yearend 2010 from 2.02 Mt at yearend 2009. At yearend 2010, LME warehouses in the United States also held about 134,000 t of NASAAC metal ingot, a 26% decrease from the 180,000 t held at yearend 2009 (London Metal Exchange Ltd., 2009, 2010).

World Review

Argentina.—Aluminio Argentino S.A.I.C. (Aluar) started production in July from 24 new pots that were part of an expansion of its smelter. A total of 72 new pots were included in

the expansion and would bring smelting capacity to 425,000 t/yr from 410,000 t/yr by 2011 (Platts Metals Week, 2010d).

Australia.—The Australian Government announced it was deferring implementation of a cap-and-trade program aimed at reducing greenhouse gas emissions. The proposal was withdrawn in April because of a lack of agreement in Parliament (Australian Department of Climate Change, 2010). The proposal would have included provisions for the aluminum industry and other emission-intensive industries to mitigate the costs during the first several years of implementation.

A power supply contract was reached in November between Tomago Aluminium Co. Pty. Ltd. and Macquarie Generation Pty. Ltd. The new contract would start when the current contract expires in 2017 and last until 2028. The Tomago smelter was a joint venture between Rio Tinto (52%), Gove Aluminium Finance Ltd. (36%), and Norsk Hydro (12%) and had a capacity of 528,000 t/yr. The smelter operator was discussing opportunities to sell molten aluminum to manufacturers considering building facilities near the smelter (Norsk Hydro ASA, 2010j).

Alcoa of Australia Ltd. and Loy Yang Power Ltd. signed long-term power contracts for the Point Henry and Portland smelters. A total of 820 megawatts (MW) would be provided to the two smelters through 2036. The contract for the Point Henry smelter would start in 2014 and the contract for the Portland smelter would start in 2016, when the current contracts expire. The Point Henry smelter had a capacity of 190,000 t/yr, and the capacity of the Portland smelter was 358,000 t/yr. The contracts provided for increased power supplies in the event of expansion of the smelters (Alcoa Inc., 2010f).

Bahrain.—Aluminum Bahrain Ltd. (Alba) was planning to expand production capacity by adding more pots to two of its five potlines and optimizing the power efficiency of those potlines. The project would increase capacity of the smelter to 970,000 t/yr from 870,000 t/yr. The project would be completed by yearend 2012, although specific plans were not released. Alba also was planning an additional potline for completion by yearend 2014. The capacity of the proposed new potline would be 400,000 t/yr and would bring total capacity of the smelter to 1.37 Mt/yr when completed (Platts Metals Week, 2010a).

Bosnia and Herzegovina.—Aluminij d.d. Mostar restarted approximately 35,000 t/yr of capacity at its 135,000-t/yr smelter during the first quarter. The smelter had shut down the capacity in early 2009 in response to falling demand and prices for aluminum (CRU Aluminium Monitor, 2010b).

Brazil.—Novelis Inc. (a subsidiary of Hindalco Industries Ltd.) closed its 60,000-t/yr primary smelter at Aratu at yearend. Novelis cited low prices, high operating costs from logistical issues with the smelter's location, high-priced power, outdated technology, and its small size as reasons for closing (Novelis Inc., 2010).

Brazil recycled 98.2% of all aluminum beverage cans sold in the country during 2009. Brazil collected and recycled 198,800 t of UBCs, the equivalent of 14.7 billion aluminum cans. For the ninth consecutive year, Brazil had the highest aluminum can recycling rate among countries that do not have mandatory recycling laws. Sales of aluminum beverage cans increased by 12% during 2010 compared with the number sold during

2009, and the volume of UBCs collected increased by 19.9% compared with that of 2009 (Associação Brasileira do Alumínio, 2010).

Canada.—One-half of the 235,000-t/yr smelter in Laterriere, Quebec, was shut down from July through September after the failure of two electrical transformers in July (Rio Tinto plc, 2010a).

Rio Tinto was moving forward with construction of a new smelter in Saguenay, Quebec, although progress had been slowed during the financial crisis. The first phase of smelter operation would be in early 2013, with a capacity of 60,000 t/yr. Additional potlines were planned that would bring total capacity of the smelter to 460,000 t/yr, although a project schedule was not available (Rio Tinto plc, 2010b).

The Kitimat smelter modernization project that was delayed during the financial crisis was also progressing. When completed, the capacity of the Kitimat smelter would increase to 420,000 t/yr from 277,000 t/yr. New prebaked pots would replace the Soderberg pots to increase efficiency and reduce emissions (Rio Tinto plc, 2010b). In preparation for expansion of the smelter, two potlines with a combined capacity of 67,000 t/yr were permanently shut down, and demolition begun in August (Riley, 2010b; Rio Tinto plc, 2010c, p. 7, 15).

China.—Primary aluminum production in China increased by 26% compared with that in 2009. Capacity expansions and restarts of temporary closures outweighed closures of inefficient smelters and from reduced output during power reductions at others (table 13).

The Government ordered that preferential power rates be discontinued to energy-intensive sectors including primary aluminum smelters in several provinces by mid-June. The Government also ordered highly polluting or inefficient smelters to be shut down. The policy was aimed at reducing energy consumption and pollution in fast growing provinces of China. Other industries affected by the order included ferroalloys, magnesium, silicon, and titanium (Wong, 2010).

The Ministry of Industry and Information Technology announced that obsolete potlines, having a combined capacity of 422,000 t/yr, at 15 smelters would be permanently closed by the end of September. In Shanxi Province the affected smelters were Shanxi Zhenxing Aluminum Co. Ltd. (20,000 t/yr), Taiyuan East Aluminum Co. Ltd. (15,000 t/yr), Hanzhou Zinc Industrial Special Material Co. Ltd. (7,210 t/yr), and Shanxi Jinxin Aluminum Co. Ltd. (7,000 t/yr). In Shandong Province, affected smelters were Shandong Aluminum Co. Ltd. (20,000 t/yr) and Zibo Aluminum Co. Ltd. (10,000 t/yr). In Henan Province, the policy applied to Chinalco Henan Branch (60,000 t/yr), Sanmenxia Tianyuan Aluminum Co. Ltd. (30,000 t/yr), Qin'ao Aluminum Co. Ltd. (20,000 t/yr), and Western Aluminum Co. Ltd. (2,500 t/yr). In Hunan Province, 60,000 t/yr of capacity at the Hunan Maoerkou Aluminum Smelter Co. Ltd. was closed. Affected smelters in Guizhou Province were the Shuangpai Aluminum Co. Ltd. (50,000 t/yr) and the Guiyang Jinyuan Aluminum Co. Ltd. (30,000 t/yr). Chinalco's Liancheng branch closed 40,000 t/yr of capacity in Gansu Province. In Qinghai Province, Qinghai Products and Industry Investment Co. Ltd. closed 50,000 t/yr of capacity. The pots closed had amperages of 100 kilo amps (KA) or less, considered to be less efficient than newer potline designs that have amperages of 300 KA or greater.

The potlines included Soderberg and prebaked pot designs, and many of the potlines were shutdown prior to the policy being announced (China Metal Market—Alumina & Aluminum, 2010b).

In September, the government of Guangxi Zhuang Autonomous Region announced strict regulations on expansion of energy- and emissions-intensive industries, including primary aluminum smelting. Other industries included were copper, lead, iron and steel, and zinc. Power supplies to these industries were also cut at the beginning of September, resulting in some production cuts. New smelters would not be approved for at least 1 year (China Metal Market—Alumina & Aluminum, 2010h, i). The provincial government of Inner Mongolia also announced similar policies, including the closure of 800,000 t/yr of capacity at smelters with outdated or inefficient technology. A moratorium on new smelter construction until 2011 was part of the policy (CRU Aluminium Monitor, 2010b). Hebei, Jiangsu, Shandong, Shanxi, and Zhejiang Provinces were also implementing power restrictions to aluminum smelters and other power intensive industries starting in July (China Metal Market—Alumina & Aluminum, 2010l).

In order to decrease energy consumption, the Henan Provincial government ordered smelters to shut down outdated and inefficient capacity. A total of 720,000 t/yr of capacity was affected by the ordered shutdown. All pots using less than 160 kilo amps (KA) were to be shut down. Thirty percent of the pots in the Province with amperage of 180 to 300 KA were to be shut down on a rotational basis. Other industries including calcium carbide, caustic soda, ferroalloys, iron and steel, and polycrystalline silicon were also affected by the policy to reduce power consumption (China Metal Market—Alumina & Aluminum, 2010k). In Qinghai Province, the continuation of a similar policy shut down 50,000 t/yr of obsolete potlines during the year. Since 2006, 165,000 t/yr of capacity had been shut down because of the policy. Other potlines were being evaluated to determine if they would be forced to shut down (China Metal Market—Alumina & Aluminum, 2010n). Zunyi, Guizhou Province, cut power supplies by one-half to three smelters in the city at the end of August because of power shortages and to decrease pollution. The smelters were owned by Zunyi Aluminum Co. Ltd., Zunyi Yulong Aluminum Co. Ltd., and Zunyi Weiming Aluminum Co. Ltd., which had a combined capacity of 420,000 t/yr (China Metal Market—Alumina & Aluminum, 2010j). Chiping Xinfu Aluminum Co. Ltd. was ordered to shut down approximately 200,000 t/yr of aluminum capacity and 320,000 t/yr of alumina capacity at its smelter and refinery, respectively, in Liaochen, Shandong Province. The order was issued in July, and the closures were implemented during the third quarter (China Metal Market—Alumina & Aluminum, 2010f).

By early January, Aluminum Corp. of China (Chinalco) restarted all capacity at its primary smelters that had been shut down during fourth quarter of 2008 and first quarter of 2009 (CRU Aluminium Monitor, 2010a). Chinalco also announced it would phase out inefficient capacity of aluminum smelters and alumina refineries by 2011. The permanent closures would involve more than 330,000 t/yr of smelting capacity (CRU Aluminium Monitor, 2010e).

Among the outdated pots being decommissioned by Chinalco was 20,000 t/yr of capacity at the 100,000-t/yr Shandong smelter. Dismantling of the pots started in September (CRU Aluminium Monitor, 2010f). Chinalco also shut down a 176-potline at its Liancheng smelter in Liancheng, Gansu Province in October because its outdated technology was not profitable. The smelter had been commissioned in 2005 (China Metal Market—Alumina & Aluminum, 2010e). In the fourth quarter, Sichuan Meishan Aostar Aluminum Co. Ltd. shut down 50 pots, accounting for about 38,000 t/yr of capacity of the 250,000-t/yr smelter. Increasing prices for power and declining aluminum prices were cited for the closure. Earlier in the year, the smelter had restarted some capacity that had been shut down in late 2008 and early 2009 (China Metal Market—Alumina & Aluminum, 2010p, q).

A transformer fire at the 270,000-t/yr Yichuan Ningdong smelter in Ningxia Autonomous Region in November forced a shutdown. A restart was not expected until early to mid-2011 (CRU Aluminium Monitor, 2010g).

Qinao Aluminum Co. Ltd. (a subsidiary of Shenhua Group) commissioned a 160,000-t/yr smelter in Qinyang, Henan Province (China Metal Market—Alumina & Aluminum, 2010o). During the first quarter of the year, Meishan Aluminium Co. restarted all capacity that had been shut down during the fourth quarter of 2008. Higher prices and increasing demand enabled the restart (CRU Aluminium Monitor, 2010c).

Chinalco was progressing on several expansions that would add 850,000 t/yr of smelter capacity. Construction of an expansion to 550,000 t/yr from 150,000 t/yr at the Guangxi smelter in Pingguo began in November. The project included an expansion of the adjacent alumina refinery that would increase capacity to 2.5 Mt/yr from 2 Mt/yr. The refinery would also attempt to recover iron oxide from the red mud, with an expected 220,000 t/yr of iron oxides to be recovered (China Metal Market—Alumina and Aluminum, 2010c). Expansion of the Liancheng smelter, expected to be completed in 2011, would add 380,000 t/yr of capacity, and at the Gansu Hualu smelter, 70,000 t/yr of capacity and an upgrade to the carbon anode furnace were expected to be completed in 2011 (China Metal Market—Alumina & Aluminum, 2010d).

In May, Sichuan Aba Aluminum Smelter Co. Ltd. (a subsidiary of Chongqing Bosai Mining Group) started production from an expansion project in Wenchuan, Sichuan Province, that increased capacity to 200,000 t/yr from 110,000 t/yr. Bosai was also constructing an extrusion plant near the smelter to produce value-added products (China Metal Market—Alumina & Aluminum, 2010a). Vimetco NV commissioned the first two phases of the 250,000-t/yr Linfeng smelter during 2010 and had completed the third phase by yearend. The third phase, with a capacity of 80,000 t/yr, was expected to start production in early 2011 (Vimetco NV, 2011). Kaiman Aluminum Co. started production from a new 350,000-t/yr smelter in August. The company, previously known as Coalmine Aluminum Co., operated a 1.8-Mt/yr alumina refinery (Platts Metals Daily, 2010).

Dongyuan Qujing Aluminum Co. Ltd. completed two expansions to its smelter in Qujing, Yunnan Province, during the year that increased the smelter's capacity to 380,000 t/yr from 230,000 t/yr (China Metal Market—Alumina & Aluminum,

2010g). In the western part of China, Xinjiang Wujiaqu Coal & Power Co. Ltd. (a subsidiary of Shandong Chiping Xinfu Group) completed a new smelter with a capacity of 370,000 t/yr and started production in July. A plan to increase capacity of the smelter to 1.6 Mt/yr was being studied. The project also included a captive powerplant using coal mined near the smelter (China Metal Market—Alumina & Aluminum, 2010r). Jinning Aluminum Magnesium New Type Material Co. Ltd. started production from its new smelter in June. The smelter had a capacity of 350,000 t/yr and was located in Zhongning county, Ningxia Hui Autonomous Region. Expansion of the smelter to 1.2 Mt/yr was planned (China Metal Market—Alumina & Aluminum, 2010m).

Germany.—During the first half of the year, Trimet Aluminium AG restarted 15,000 t/yr of capacity at its 170,000-t/yr Essen smelter and 40,000 t/yr of capacity at the 132,000-t/yr Hamburg smelter that had closed in early 2009. Trimet had closed 50,000 t/yr of capacity at the Essen smelter but then restarted 35,000 t/yr of capacity in late 2009. The restarts brought production at both smelters back to full capacity (Trimet Aluminium AG, 2010).

Iceland.—Rio Tinto announced plans to modernize and expand capacity of the ISAL smelter in Straumsvik. The capacity of the smelter would increase to 230,000 t/yr from 190,000 t/yr. The project was expected to be started in April 2012 and be completed by July 2014. The expansion plan was made in conjunction with a long-term power agreement (October 2010 through 2036) with the utility, Landsvirjun (Rio Tinto Alcan Inc., 2010).

Century anticipated restarting construction on the Helguvik smelter by mid-2011 and was awaiting final permits. The project was delayed during the financial crisis in late 2008. Once completed, the smelter would have a production capacity of 360,000 t/yr (Century Aluminum Co., 2010b).

India.—Vedanta Resources plc completed expansion of the Jharsuguda I smelter to 500,000 t/yr from 250,000 t/yr. A power failure in April damaged 171 pots, which were repaired during the year (Vedanta Resources plc, 2010b).

Because of delays in obtaining a mining permit at the Niyamgri bauxite mine, construction of two smelters was temporarily delayed. The 325,000-t/yr Korba III smelter had been progressing towards initial production in the first quarter of 2011 and completion in September 2011. The 125,000-t/yr Jharsuguda II smelter would have been completed in September 2012. Revised completion dates for both projects were not announced (Vedanta Resources plc, 2010a, p. 31, 39; 2010c).

A power failure caused by lightning shut down production at Hindalco's Hirakud smelter in early July. Full production was expected to be restored during the first quarter of 2011. Expansion of the smelter to 161,000 t/yr from 155,000 t/yr was expected to be completed in early 2011. Another expansion to increase capacity to 213,000 t/yr was expected to be completed in March 2012, and a further expansion to 360,000 t/yr was being considered. Construction of the 359,000-t/yr Mahan smelter and 900-MW captive powerplant was expected to be completed in September 2011. Completion of the 359,000-t/yr Aditya smelter and 900-MW captive powerplant was projected for October 2011. Acquisition of land and environmental

permits for the proposed 359,000-t/yr Jharkhand smelter and 900-MW captive powerplant was progressing again after having been deferred in 2009. Completion of the project was planned for 2013 (Hindalco Industries Ltd., 2010).

Iran.—Hormzal Aluminum Ltd. commissioned a 147,000-t/yr smelter in Bandar Abbas during the first quarter of the year (CRU Aluminium Monitor, 2010c).

Italy.—Alcoa temporarily closed the Fusina smelter in May. Plans to close the 44,000-t/yr smelter and the 150,000-t/yr Portovesme smelter were announced in November 2009 in response to a ruling by the European Commission that power contracts between Alcoa and the Italian Government were out of compliance with European Union regulations. Alcoa delayed the closures while the ruling was being appealed and negotiations for power contracts were being made with the Italian Government. The Portovesme smelter was continuing to operate (Alcoa Inc., 2010d, p. 2; Kovalyova, 2010).

Kazakhstan.—Construction on an expansion to increase capacity to 250,000 t/yr from 125,000 t/yr at the Pavlodar smelter was completed in May, and all of the new pots were producing by midyear. An anode plant was also under construction, with completion expected in 2011 (CRU Aluminium Monitor, 2010d; Eurasian Natural Resources Group Inc., 2010).

Montenegro.—Central European Aluminum Co. continued with a modernization project of the Podgorica smelter and alumina refinery. Although originally planned for completion by yearend, some work was delayed for completion to early 2011. Capacity of the smelter would increase to 156,000 t/yr from 120,000 t/yr, and capacity of the alumina refinery would increase to 400,000 t/yr from 280,000 t/yr. During the year, about 100 pots which had been shut down because of the price decline during 2008 and 2009 were restarted. These pots accounted for approximately 40,000 t/yr of capacity and bring operating capacity to 130,000 t/yr (Central European Aluminum Co., 2010a; b).

New Zealand.—In December, Rio Tinto cut production at its 350,000-t/yr Tiwai Point smelter by 18,000 t/yr because of rising spot market prices for electricity (10% of the smelter's power was purchased on the spot market). Shipments of billet to the United States were not expected to be affected. Earlier in the year, Rio Tinto had increased billet production to supply customers on the west coast of the United States because of strong demand by extruders (American Metal Market, 2010d; Riley, 2010a).

Norway.—Norsk Hydro announced plans to construct a recycling plant at Karmoy, on the site of the Soderberg potline, which had been decommissioned in March 2009. Two furnaces would be built, each with a capacity of 35,000 t/yr. Casting of the molten metal would take place in the casthouse used by the primary smelter. Construction of the first furnace was expected to begin in early 2011, with operation starting in summer 2012 (Norsk Hydro ASA, 2010e).

Norsk Hydro was planning to make investments to modernize and expand production of hydroelectric power in Norway. Norsk Hydro had ownership in five primary aluminum smelters in Norway, with a combined capacity of almost 950,000 t/yr, that were powered by its system of hydroelectric powerplants.

Construction began on an expansion project at the Holsbru powerplant in August that would increase capacity by 84 gigawatts (GW). Other projects included expansion of the Ilvatn powerplant by 113 GW (2012 to 2015), construction of a 98-GW powerplant at Oyane (2012 to 2014), and modernization projects of five powerplants in the Rjukan region (2011 to 2015) (Norsk Hydro ASA, 2010a, b, f).

Qatar.—A power failure on August 9 forced the shutdown of 444 pots at the Qatar Aluminium Ltd. (Qatalum) smelter in Qatar. The 585,000-t/yr smelter, which was commissioned in December 2009, was still in the ramp-up process at the time of the shutdown. The smelter was expected to reach full production by the end of March 2011. Qatalum was a joint venture between Qatar Petroleum Ltd. (Doha, Qatar) and Norsk Hydro (Norsk Hydro ASA, 2010h, i).

Romania.—Vimetco restarted 35,000 t/yr of 60,000 t/yr of capacity idled in early 2009 at the 300,000-t/yr Slatina smelter. The restart of the pots brought operating capacity to 275,000 t/yr (Vimetco NV, 2011).

Russia.—United Company Rusal restarted an idle potline at the 318,000-t/yr Novokuznetsk smelter in the first quarter of the year. Approximately one-quarter of the smelting capacity was shut down in March 2009 (United Company RUSAL, 2010a). Rusal also increased production from 950,000 t/yr to 980,000 t/yr, at the 1-Mt/yr Krasnoyarsk smelter. Minor increases in production at the Kandalaksha, Nadvoitsy, Sayanogorsk, Volgograd, and Volkhov smelters also took place during the year (United Company RUSAL, 2011a, p. 16 and 32).

Rusal commissioned a new potline at the Irkutsk smelter in April that increased capacity to 460,000 t/yr from 300,000 t/yr. Other investments at the smelter included a new casthouse and an emissions control system (United Company RUSAL, 2010b). Rusal obtained financing and planned to resume construction of the Boguchanskaya smelter and hydroelectric powerplant in early 2011, with completion expected sometime in 2013. When completed, the smelter was expected to have a capacity of 600,000 t/yr. Construction of the 750,000-t/yr Taishet smelter was scheduled to resume in 2011 after being put on hold in 2009 (United Company RUSAL, 2011b).

Saudi Arabia.—In October, Saudi Arabian Mining Co. (Ma'aden) and Alcoa began construction of the 740,000-t/yr Raz as Zawr smelter and 380,000 t/yr rolling mill. The project, expected to be completed in 2013, also included a 4-Mt/yr bauxite mine at Al Ba'itha and 1.8-Mt/yr alumina refinery in Raz as Zawr that were expected to be completed in 2014. Ma'aden owned 74.9% of the joint venture and Alcoa owned 25.1% (Alcoa Inc., 2010e).

Spain.—Alcoa's 93,000-t/yr Aviles smelter was shut down in June as a result of flooding caused by heavy rains (Alcoa Inc., 2010g). The smelter was operating at full capacity by yearend (Alcoa Inc., 2011).

Sweden.—Rusal increased production at the 128,000-t/yr Kubal smelter to 93,000 t/yr. Production from the smelter had been cut to 70,000 t/yr in 2009 as Rusal temporarily shut high-cost capacity (United Company RUSAL, 2011a, p. 16, 32).

United Arab Emirates.—Emirates Aluminium Ltd. (EMAL) announced that the last of the 756 pots at the 700,000-t/yr smelter started production in December. Production from the

first pots started in December 2009. EMAL was a partnership between Dubai Aluminium Co. Ltd. and Mubadala Development Co. (Emirates Aluminium Ltd., 2011).

United Kingdom.—In July, Rio Tinto restarted full production at its 44,000-t/yr smelter in Lochaber, Scotland, and its 169,000-t/yr smelter in Lynemouth, England. The smelters had reduced production in the early part of 2009, but by yearend 2009, production was gradually being restored (Rio Tinto plc, 2010c, p. 15).

Venezuela.—At the beginning of the year, Venalum shut down 145,000 t/yr of capacity at the 430,000-t/yr smelter owing to a power shortage caused by low water levels at the Guri Dam and to low prices for aluminum. Starting in August, Venalum restarted production from 145 of the 394 pots that had been shut down. The company imported aluminum to fill domestic customer orders and reduced exports because of the shutdown (Platts Metals Week, 2010h, i). Alcasa also shut down 115,000 t/yr of its 210,000-t/yr smelter in January as a result of power shortages, including two potlines (50,000 t/yr of capacity) that were permanently shut down because of outdated technology and low productivity. Despite increased power supplies, restart of the temporarily closed pots was delayed as a result of financial issues (Platts Metals Week, 2010b).

Outlook

Aluminum prices generally continued their upward trend in the first quarter of 2011, exceeding the price range of 2006 through mid-2008, but remained volatile. At the end of 2010 and early in 2011, five domestic smelters announced restarts of capacity shut down during the fourth quarter of 2008 and first quarter of 2009. These restarts were generally attributed to new low-cost power contracts combined with recovering aluminum prices. Other domestic capacity that closed during the financial crisis was not expected to restart until producers were more confident in a sustained recovery and could also obtain low-cost power contracts. As of June 1, 2011, about 40% (1.23 Mt/yr) of domestic primary aluminum smelting capacity was not being used. World demand for aluminum in 2011 was expected to remain at levels lower than in 2008 owing to depressed levels in automobile manufacturing and home construction.

Consumer credit issues in the United States and Western Europe were expected to continue through 2011. The continuing uncertainty of the impact of sovereign debt issues in Europe also raised concerns about consumer demand. Global production and consumption had recovered from the decline during the crisis because of the strength of demand in emerging markets, offsetting weakness in developed markets. Decreased demand for aluminum in developed economies still recovering from the economic events of 2008 was expected to continue for several years. Demand for aluminum in emerging economies was expected to increase as these economies continue to improve and recover from the effects of the global recession. However, policies aimed at slowing growth in China may slow the rate of growth of demand for aluminum in that nation.

Easing of credit to aluminum companies was expected to enable more expansion projects to resume progress in many parts of the world, following the lead of projects in regions with low power costs already moving forward. Relatively

high electricity prices in parts of the United States diminished the likelihood of some domestic smelters reopening in the near-term. New smelters constructed where power costs are relatively low were expected to continue to replace production at high-cost smelters in the United States and other locations.

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TABLE 1
SALIENT ALUMINUM STATISTICS¹

(Thousand metric tons unless otherwise specified)

	2006	2007	2008	2009	2010
United States:					
Primary production:					
Quantity	2,284	2,554	2,658	1,727	1,726
Value	millions \$6,110	\$6,880	\$7,060	\$3,030	\$3,980
Price, average, U.S. market, spot	cents per pound 121.4	122.2	120.5	79.4	104.4
Inventories (December 31):					
Aluminum industry ²	1,410	1,400	1,220	937	1,010
London Metal Exchange, U.S. warehouses ³	228	463	1,290	2,200	2,230
Secondary recovery: ⁴					
New scrap	2,800 ^r	2,450 ^r	2,130 ^r	1,570 ^r	1,550
Old scrap	1,580 ^r	1,660 ^r	1,500 ^r	1,260 ^r	1,250
Total	4,380 ^r	4,120 ^r	3,630 ^r	2,820 ^r	2,800
Exports, crude and semicrude	2,820	2,840	3,280	2,710	3,040
Imports for consumption, crude and semicrude	4,660	4,020	3,710	3,680	3,610
Supply, apparent ⁵	8,500 ^r	7,620 ^r	6,070 ^r	4,890 ^r	5,000
Consumption, apparent ⁶	5,700 ^r	5,170 ^r	3,940 ^r	3,320 ^r	3,460
World, production	33,900	38,000 ^r	39,600	36,900 ^r	40,800 ^e

^eEstimated. ^rRevised.

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 inventory levels for 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 (excluding scrap) minus exports plus adjustments for London Metal Exchange (U.S. warehouses) and industry stock changes.

⁶Apparent supply less recovery from purchased new scrap.

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

Company and location	Yearend capacity (thousand metric tons)		Ownership in 2010
	2009	2010	
Alcoa Inc.:			
Alcoa, TN ²	215	215	Alcoa Inc., 100%.
Badin, NC ³	60 ^r	--	Do.
Evansville, IN (Warrick)	309	309	Do.
Ferndale, WA (Intalco)	279 ^r	279	Do.
Frederick, MD (Eastalco) ³	195	--	Do.
Massena, NY (St. Lawrence) ²	125	125	Do.
Massena, NY	130	130	Do.
Mount Holly, SC	229 ^r	229	Alcoa Inc., 50.3%; Century Aluminum Co., 49.7%.
Rockdale, TX ²	267	267	Alcoa Inc., 100%.
Wenatchee, WA	184	184	Do.
Total	1,990 ^r	1,740	
Century Aluminum Co.:			
Hawesville, KY	244	244	Century Aluminum Co., 100%.
Ravenswood, WV ²	170	170	Do.
Total	414	414	Do.
Columbia Falls Aluminum Co., Columbia Falls, MT ²	168	168	Glencore International AG, 100%.
Goldendale Aluminum Co., Goldendale, WA ²	160	160	Private interest, 60%; employees, 40%.
Noranda Aluminum Holding Corp., New Madrid, MO	250	263	Noranda Aluminum Holding Corp., 100%.
Ormet Primary Aluminum Corp., Hannibal, OH	265	265	Ormet Corp., 100%.
Rio Tinto Alcan Inc., Seabee, KY	196	196	Rio Tinto Alcan Inc., 100%.
Grand total	3,450 ^r	3,200	

^rRevised. Do. Ditto. -- Zero.

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

²Temporarily idle.

³Smelter facilities have been permanently idled. This capacity is no longer reflected in Alcoa's portfolio.

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

(Metric tons)

Class	Consumption	Calculated recovery	
		Aluminum	Metallic
2009:			
Secondary smelters	1,450,000 ^r	1,020,000 ^r	1,090,000 ^r
Independent mill fabricators ³	1,620,000 ^r	1,390,000 ^r	1,470,000 ^r
Foundries	74,800	61,200	65,400
Other consumers	6,870	6,330	6,350
Total	3,160,000 ^r	2,470,000 ^r	2,630,000 ^r
Estimated full industry coverage	3,390,000 ^r	2,650,000 ^r	2,820,000 ^r
2010:			
Secondary smelters	1,610,000	1,150,000	1,230,000
Independent mill fabricators ³	1,450,000	1,240,000	1,320,000
Foundries	50,700	41,400	44,200
Other consumers	6,290	6,290	6,290
Total	3,120,000	2,430,000	2,590,000
Estimated full industry coverage	3,370,000	2,620,000	2,800,000

^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 2010^{1,2}

(Metric tons)

Class of consumer and type of scrap	Stocks, January 1	Net receipts ³	Consumption	Stocks, December 31
Secondary smelters:				
New scrap:				
Extrusions	15,700	296,000	295,000	16,200
Can stock clippings	2,960 ^f	72,800	71,200	4,520
Other wrought sheet and clippings	1,800 ^f	196,000	195,000	2,510
Casting	594 ^f	61,100	60,400	1,350
Borings and turnings	2,040 ^f	84,300	84,100	2,260
Dross and skimmings	7,020 ^f	407,000	407,000	6,890
Total	<u>30,100^f</u>	<u>1,120,000</u>	<u>1,110,000</u>	<u>33,800</u>
Old scrap:				
Castings	3,610 ^f	137,000	137,000	4,040
Extrusion	3,320 ^f	95,800	96,100	2,970
Aluminum cans ⁴	8,740	116,000	118,000	7,060
Other wrought products	6,740 ^f	73,200	75,800	4,080
Auto shredder scrap	938 ^f	67,600	67,500	1,010
Total	<u>23,300^f</u>	<u>490,000</u>	<u>494,000</u>	<u>19,200</u>
Sweated pig	106	1,750	1,770	89
Grand total secondary smelters	<u>53,500^f</u>	<u>1,610,000</u>	<u>1,610,000</u>	<u>53,000</u>
Integrated aluminum companies, foundries, independent mill fabricators, other consumers:				
New scrap:				
Extrusion	14,600 ^f	251,000	263,000	3,020
Can stock clippings	608	187,000	186,000	1,530
Other wrought sheet and clippings	3,610 ^f	182,000	182,000	3,950
Casting	243	17,100	17,100	243
Borings and turnings	367	11,900	11,900	367
Dross and skimmings	452	4,370	4,360	462
Total	<u>19,900^f</u>	<u>654,000</u>	<u>664,000</u>	<u>9,570</u>
Old scrap:				
Castings	2,620	130,000	127,000	5,570
Extrusion	17	8,120	8,120	17
Aluminum cans ⁴	3,050	533,000	522,000	13,700
Other wrought products	381	139,000	139,000	381
Auto shredder scrap	82	454	454	82
Other	--	46,300	46,300	--
Total	<u>6,150</u>	<u>857,000</u>	<u>843,000</u>	<u>19,700</u>
Grand total integrated aluminum companies, etc.	<u>26,100^f</u>	<u>1,510,000</u>	<u>1,510,000</u>	<u>29,300</u>
All scrap consumed:				
New scrap:				
Extrusion	30,300 ^f	547,000	558,000	19,200
Can stock clippings	3,560	260,000	258,000	6,050
Other wrought sheet and clippings	5,410 ^f	378,000	377,000	6,460
Casting	836	78,300	77,500	1,600
Borings and turnings	2,400	96,200	96,000	2,630
Dross and skimmings	7,470	412,000	412,000	7,350
Total	<u>50,000^f</u>	<u>1,770,000</u>	<u>1,780,000</u>	<u>43,300</u>
Old scrap:				
Castings	6,230	267,000	264,000	9,620
Extrusion	3,330	104,000	104,000	2,990
Aluminum cans ⁴	11,800	649,000	640,000	20,700
Other wrought products	7,120	212,000	215,000	4,460
Auto shredder scrap	1,020	68,000	68,000	1,090

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 2010^{1, 2}

(Metric tons)

Class of consumer and type of scrap	Stocks, January 1	Net receipts ³	Consumption	Stocks, December 31
Old scrap—Continued:				
Other	--	46,300	46,300	--
Total	29,500	1,350,000	1,340,000	38,900
Sweated pig	106	1,750	1,770	89
Grand total of all scrap consumed	79,600 ^r	3,120,000	3,120,000	82,300

^rRevised. -- Zero.

¹Includes imported scrap. According to reporting companies, 5.60% of total receipts of aluminum-base scrap, or 172,000 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)

	2009		2010	
	Production	Net shipments ²	Production	Net shipments ²
Diecast alloys:				
13% Si, 360, etc. (0.6% Cu, maximum)	38,200 ^r	38,200 ^r	37,500	37,100
380 and variations	114,000 ^r	114,000 ^r	214,000	215,000
Sand and permanent mold:				
95/5 Al-Si, 356, etc. (0.6% Cu, maximum)	36,200 ^r	35,500 ^r	39,100	39,200
No. 12 and variations	953 ^r	953 ^r	943	943
No. 319 and variations	37,300 ^r	36,000 ^r	80,600	81,100
F-132 alloy and variations	7,420 ^r	7,390 ^r	9,380	8,880
Al-Mg alloys	7,240 ^r	7,200 ^r	7,240	7,240
Al-Zn alloys	1,660 ^r	1,680 ^r	1,650	1,650
Al-Si alloys (0.6% to 2.0% Cu)	3,230 ^r	3,090 ^r	3,190	3,190
Al-Cu alloys (1.5% Si, maximum)	513 ^r	513 ^r	445	445
Al-Si-Cu-Ni alloys	5,920 ^r	5,920 ^r	6,620	6,620
Other	136	136	136	136
Wrought alloys, extrusion billets	372,000	379,000 ^r	491,000	489,000
Miscellaneous:				
Steel deoxidation	31,900 ^r	31,900 ^r	22,300	22,100
Pure (97.0% Al)	W	W	W	W
Aluminum-base hardeners	W	W	W	W
Other ³	51,500	48,800	38,400	38,700
Total	708,000 ^r	710,000 ^r	953,000	951,000
Less consumption of materials other than scrap:				
Primary aluminum	98,800 ^r	XX	153,000	XX
Primary silicon	14,100 ^r	XX	20,800	XX
Other	9,300 ^r	XX	12,700	XX
Net metallic recovery from aluminum scrap and sweated pig consumed in production of secondary aluminum ingot ⁴	586,000 ^r	XX	766,000	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

Industry	2009		2010 ^p	
	Quantity (thousand metric tons)	Percentage of grand total	Quantity (thousand metric tons)	Percentage of grand total
Containers and packaging	2,150	26.5	2,200	22.4
Building and construction	964	11.9	1,000	10.2
Transportation	1,910	23.7	2,800	28.6
Electrical	593	7.3	700	7.1
Consumer durables	458	5.7	600	6.1
Machinery and equipment	475	5.9	700	7.1
Other markets	254	3.1	300	3.1
Total	6,810	84.1	8,300	84.7
Exports ^c	1,280	15.9	1,500	15.3
Grand total	8,090	100.0	9,800	100.0

^cEstimated. ^pPreliminary.

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}

(Thousand metric tons)

	2008	2009	2010 ^p
Wrought products: ³			
Sheet, plate, foil	4,770	4,050	4,700
Pipe, tube, extruded shapes	1,380	1,070	1,400
Rod, bar, wire, cable	626	514	600
Forgings (including impacts)	102	73	100
Powder, flake, paste	61	45	60
Total	6,940	5,750	6,860
Castings:			
Sand	255	160	250
Permanent and semipermanent mold	570	371	570
Die	1,030	691	1,000
Other	44	6	40
Total	1,900	1,230	1,860
Grand total	8,830	6,980	8,720

^pPreliminary.

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 both the United States and Canada.

Source: The Aluminum Association Inc.

TABLE 8
ALUMINUM PRICES

(Dollars per pound)

Material	2009	2010
Primary aluminum, average:¹		
U.S. market	0.794	1.044
LME cash price	0.755	0.986
NASAAC cash price, average	0.653 [†]	0.949
Secondary alloy, yearend:²		
A319 (3% Cu)	1.055	1.170
A380 (3% Zu)	1.055 [†]	1.115
A360 (0.6% Cu)	1.065	1.210
A413 (0.6% Cu)	1.065	1.210
Scrap, yearend:²		
Clean, dry turnings	0.60–0.61	0.70–0.72
Mixed low-copper-content clips	0.67–0.68	0.78–0.81
Old sheet and castings	0.62–0.63	0.72–0.76
Used beverages cans	0.71–0.73	0.83–0.86

[†]Revised.

¹Source: Platts Metals Week.

²Source: American Metal Market.

TABLE 9
U.S. EXPORTS OF ALUMINUM, BY CLASS¹

Class	2009		2010	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Crude and semicrude:				
Metals and alloys, crude	262,000	\$514,000	284,000	\$709,000
Scrap	1,660,000	2,120,000	1,910,000	3,190,000
Plates, sheets, bars, strip, etc.	739,000	2,830,000	786,000	3,230,000
Castings and forgings	18,900	218,000	20,000	250,000
Semifabricated forms, n.e.c.	31,100	226,000	36,200	269,000
Total	2,710,000	5,910,000	3,040,000	7,650,000
Manufactures:				
Foil and leaf	72,000	323,000	79,600	376,000
Powders and flakes	4,470	24,100	5,520	31,400
Wire and cable	45,900	132,000	43,200	163,000
Total	122,000	479,000	128,000	570,000
Grand total	2,830,000	6,390,000	3,170,000	8,220,000

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

Source: U.S. Census Bureau.

TABLE 10
U.S. EXPORTS OF ALUMINUM, BY COUNTRY¹

Country	Metals and alloys, crude		Plates, sheets, bars, etc. ²		Scrap		Total	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2009:								
Brazil	59	\$449	11,900	\$66,500	5,360	\$7,130	17,300	\$74,100
Canada	69,600	135,000	300,000	1,010,000	107,000	169,000	476,000	1,310,000
China	21,600	31,900	38,400	215,000	1,010,000	1,260,000	1,070,000	1,510,000
France	710	2,830	9,240	63,100	3	11	9,950	66,000
Germany	4,860	12,800	9,820	72,000	326	743	15,000	85,500
Hong Kong	1,620	3,880	9,090	36,600	76,800	111,000	87,500	151,000
Italy	1,170	4,320	2,370	26,100	--	--	3,540	30,400
Japan	10,500	19,600	8,650	95,500	21,100	31,800	40,200	147,000
Kazakhstan	--	--	27	276	--	--	27	276
Korea, Republic of	1,870	3,930	10,900	80,800	160,000	197,000	173,000	282,000
Mexico	123,000	243,000	249,000	915,000	91,600	148,000	464,000	1,310,000
Netherlands	97	599	711	9,890	315	407	1,120	10,900
Philippines	3	19	282	3,350	--	--	284	3,370
Russia	3	36	113	993	--	--	116	1,030
Saudi Arabia	238	606	26,100	123,000	--	--	26,400	124,000
Singapore	16,500	32,400	1,440	13,300	421	586	18,400	46,300
South Africa	12	43	147	2,200	--	--	159	2,250
Taiwan	2,460	4,240	2,910	20,400	100,000	103,000	106,000	128,000
Thailand	115	234	7,990	28,900	5,940	7,890	14,000	37,000
Ukraine	--	--	6	59	22	13	27	72
United Kingdom	769	3,440	10,000	93,000	572	1,720	11,400	98,100
Venezuela	41	546	361	2,270	718	1,000	1,120	3,820
Other	6,430 [†]	14,800	90,100 [†]	394,000 [†]	80,300	82,300	177,000	491,000 [†]
Total	262,000	514,000	789,000	3,270,000	1,660,000	2,120,000	2,710,000	5,910,000
2010:								
Brazil	1,080	2,830	14,300	79,600	4,890	9,060	20,300	91,500
Canada	88,800	217,000	361,000	1,360,000	125,000	233,000	575,000	1,810,000
China	3,910	8,590	32,600	200,000	1,220,000	2,030,000	1,250,000	2,240,000
France	1,480	5,180	11,200	80,300	932	1,840	13,600	87,300
Germany	3,170	8,780	9,680	70,600	498	1,600	13,300	81,000
Hong Kong	109	311	10,800	47,900	53,000	83,000	63,800	131,000
Italy	36	261	2,490	28,600	19	66	2,540	28,900
Japan	1,810	7,430	8,730	106,000	23,800	49,100	34,300	162,000
Kazakhstan	--	--	6	279	--	--	6	279
Korea, Republic of	454	2,140	15,100	107,000	155,000	230,000	171,000	339,000
Mexico	174,000	425,000	258,000	1,040,000	153,000	323,000	586,000	1,790,000
Netherlands	190	629	733	8,680	448	838	1,370	10,200
Philippines	3	25	336	4,760	--	--	339	4,780
Russia	1	8	90	900	--	--	91	908
Saudi Arabia	9	49	16,800	60,100	9	17	16,900	60,100
Singapore	726	2,790	2,820	26,700	426	629	3,970	30,100
South Africa	9	80	346	2,750	--	--	356	2,820
Taiwan	2,080	5,400	5,960	32,400	107,000	125,000	115,000	163,000
Thailand	30	214	1,390	13,000	5,070	8,380	6,490	21,600
Ukraine	--	--	(3)	6	--	--	(3)	6
United Kingdom	639	2,370	9,780	89,000	598	1,260	11,000	92,600
Venezuela	6	74	547	4,600	--	--	553	4,670
Other	5,270	19,600	78,900	393,000	66,700	90,900	151,000	504,000
Total	284,000	709,000	842,000	3,750,000	1,910,000	3,190,000	3,040,000	7,650,000

[†]Revised. -- Zero.

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

²Includes castings, forgings, and unclassified semifabricated forms.

³Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 11
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY CLASS¹

Class	2009		2010	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Crude and semicrude:				
Metals and alloys, crude	2,900,000	\$4,960,000	2,650,000	\$6,110,000
Plates, sheets, strip, etc., n.e.c. ²	499,000	1,550,000	666,000	2,270,000
Pipes, tubes, etc.	33,400	190,000	27,500	210,000
Rods and bars	254,000	783,000	274,000	899,000
Scrap	433,000	503,000	504,000	763,000
Total	4,110,000	7,980,000	4,120,000	10,300,000
Manufactures:				
Foil and leaf ³	102,000	389,000	126,000	497,000
Powders and flakes	5,710	22,200	10,100	45,100
Wire	156,000	321,000	145,000	387,000
Total	264,000	732,000	281,000	930,000
Grand total	4,380,000	8,710,000	4,400,000	11,200,000

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.

Source: U.S. Census Bureau.

TABLE 12
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY COUNTRY¹

Country	Metals and alloys, crude		Plates, sheets, bars, etc. ²		Scrap		Total	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2009:								
Argentina	164,000	\$269,000	2	\$32	--	--	164,000	\$269,000
Australia	7,500	13,600	44	581	--	--	7,550	14,200
Bahrain	1,690	4,400	9,860	28,100	--	--	11,600	32,500
Belgium	178	685	2,180	9,540	26	\$56	2,380	10,300
Brazil	106,000	183,000	15,000	33,500	--	--	121,000	216,000
Canada	2,020,000	3,490,000	261,000	772,000	293,000	328,000	2,570,000	4,590,000
China	1,890	3,570	250,000	668,000	9	39	252,000	672,000
France	1,520	8,970	1,710	17,800	35	335	3,260	27,100
Germany	579	2,270	61,200	309,000	413	883	62,200	312,000
Italy	(3)	23	3,540	21,300	97	79	3,630	21,400
Japan	492	1,210	8,900	42,900	414	1,340	9,800	45,400
Korea, Republic of	2,330	4,000	1,580	7,430	105	157	4,010	11,600
Mexico	18,400	68,800	13,400	63,000	95,700	120,000	128,000	252,000
Netherlands	210	859	1,560	9,780	2,150	2,800	3,920	13,400
Norway	442	926	14	412	--	--	457	1,340
Panama	197	298	--	--	1,640	1,830	1,840	2,120
Russia	353,000	548,000	16,700	67,300	1,740	2,970	371,000	618,000
South Africa	52,900	76,000	37,800	97,700	27	28	90,700	174,000
Tajikistan	6,690	8,260	--	--	--	--	6,690	8,260
United Arab Emirates	48,300	93,800	--	--	16	18	48,300	93,900
United Kingdom	355	1,290	4,760	24,000	8,840	9,280	14,000	34,600
Venezuela	84,400	131,000	6,250	10,700	8,390	12,700	99,100	155,000
Other	23,800 ^r	43,200 ^r	90,100 ^r	336,000 ^r	20,300	22,200	134,000 ^r	401,000 ^r
Total	2,900,000	4,960,000	786,000	2,520,000	433,000	503,000	4,110,000	7,980,000
2010:								
Argentina	138,000	288,000	3	38	--	--	138,000	288,000
Australia	28,400	68,600	119	1,040	103	141	28,600	69,800
Bahrain	--	--	16,600	47,400	6	3	16,600	47,400
Belgium	102	379	2,000	9,820	1	5	2,110	10,200
Brazil	57,300	131,000	14,200	38,700	282	506	71,800	171,000
Canada	1,920,000	4,490,000	316,000	1,010,000	343,000	519,000	2,580,000	6,110,000
China	1,220	3,680	272,000	782,000	77	248	273,000	786,000
France	1,610	9,740	2,940	25,900	53	392	4,590	36,000
Germany	970	3,710	68,600	331,000	231	862	69,800	336,000
Italy	199	427	3,560	24,500	227	169	3,980	25,100
Japan	901	2,000	7,110	44,800	693	1,520	8,710	48,300
Korea, Republic of	2,490	6,840	2,240	11,500	143	385	4,870	18,700
Mexico	24,100	84,000	22,000	110,000	107,000	156,000	153,000	351,000
Netherlands	390	1,490	1,920	12,900	553	885	2,870	15,300
Norway	2,100	4,750	80	457	128	223	2,300	5,430
Panama	502	1,010	14	50	2,320	3,890	2,840	4,950
Russia	203,000	449,000	14,700	68,800	--	--	218,000	518,000
South Africa	14,300	29,500	49,000	158,000	--	--	63,300	187,000
United Arab Emirates	81,700	195,000	5	20	71	125	81,800	195,000
United Kingdom	437	1,940	7,250	32,400	7,890	13,400	15,600	47,700
Venezuela	123,000	251,000	2,480	5,230	1,940	3,340	127,000	260,000
Other	41,700	88,700	161,000	566,000	40,100	62,400	243,000	717,000
Total	2,650,000	6,110,000	967,000	3,380,000	504,000	763,000	4,120,000	10,300,000

^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.

³Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 13
ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY^{1,2}

(Thousand metric tons)

Country	2006	2007	2008	2009	2010 ^e
Argentina	273	271	394	410 ^r	415
Australia	1,932	1,957	1,974	1,943	1,928 ³
Azerbaijan	32	39	40	30	30
Bahrain	872	865	872	848 ^r	870
Bosnia and Herzegovina ⁴	121 ^r	122	123 ^e	96	118
Brazil	1,605	1,655	1,661	1,536	1,536 ^{p,3}
Cameroon	88 ^e	87	91	73	76 ³
Canada	3,051	3,083	3,120	3,030	2,963 ³
China ^e	9,360	12,600	13,200	12,900	16,200
Egypt	252	258	260	265	266
France	442	428	389	345	356 ³
Germany	516	551	606	292	394
Ghana	8	--	--	--	--
Greece	163	166	160	130 ^r	130
Hungary ^e	34	--	--	--	--
Iceland ⁵	320	398	787	785	780
India ⁶	1,105	1,222	1,308	1,400	1,450
Indonesia ⁶	250	242	243	250	252
Iran ^e	205	216	248	250	250
Italy	194	183	180 ^e	171 ^r	168
Japan ⁷	7	7 ^e	7	7	6
Kazakhstan	--	12 ^r	106	127	227 ³
Montenegro	122	124	107	64	80
Mozambique	564	564	536	545	557 ³
Netherlands	312	301	301 ^e	300	300
New Zealand	337	353	316	271	344 ³
Nigeria	--	--	11	13	21 ³
Norway	1,331	1,357	1,358	1,130	800
Oman	--	--	49	351	367 ³
Poland ⁸	58	54 ^r	48	-- ^r	--
Qatar	--	--	--	10	190
Romania ⁹	256	283	265	201 ^r	207 ³
Russia	3,718	3,955	4,190	3,815	3,947 ³
Slovakia ⁶	158	160	163	150	163
Slovenia ⁴	118	111	83	35 ^r	40 ³
South Africa	895 ^r	899 ^r	811	809	807 ³
Spain	349	408	408 ^e	360 ^r	340
Sweden	101	98	112	70	93 ³
Switzerland	12	--	--	--	--
Tajikistan	414	419	339	359	349 ³
Turkey ^e	60	65	65	35 ^{r,e}	60
Ukraine ⁹	113	113	113	50	25
United Arab Emirates	861	890	948	1,010	1,400
United Kingdom	360	365	326	253	186 ³
United States	2,284	2,554	2,658	1,727	1,726 ³
Venezuela ^e	610	610	610	410 ^r	335
Total	33,900	38,000 ^r	39,600	36,900 ^r	40,800

See footnotes at end of table.

TABLE 13
ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY^{1,2}

^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 as that of any metal produced from either returned scrap of remelted material." 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 24, 2011.

³Reported figure.

⁴Primary ingot plus secondary ingot.

⁵Ingot and rolling billet production.

⁶Primary ingot.

⁷Excludes high purity aluminum containing 99.995% or more as follows, in metric tons: 2006—49,667; 2007—50,777; 2008—52,000 (revised); 2009—33,000 (revised); and 2010—45,000 (estimated).

⁸Primary unalloyed ingot plus secondary unalloyed ingot.

⁹Primary unalloyed metal plus primary alloyed metal, thus including weight of alloying material.