



# 2010 Minerals Yearbook

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## 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 Liaocheng, 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 Helgukvikk 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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- Aluminum Statistical Review. The Aluminum Association Inc., annual.

TABLE 1  
SALIENT ALUMINUM STATISTICS<sup>1</sup>

(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 <sup>2</sup>                      | 1,410                 | 1,400               | 1,220              | 937                 | 1,010               |
| London Metal Exchange, U.S. warehouses <sup>3</sup> | 228                   | 463                 | 1,290              | 2,200               | 2,230               |
| Secondary recovery: <sup>4</sup>                    |                       |                     |                    |                     |                     |
| New scrap   | 2,800 <sup>r</sup>    | 2,450 <sup>r</sup>  | 2,130 <sup>r</sup> | 1,570 <sup>r</sup>  | 1,550               |
| Old scrap   | 1,580 <sup>r</sup>    | 1,660 <sup>r</sup>  | 1,500 <sup>r</sup> | 1,260 <sup>r</sup>  | 1,250               |
| Total   | 4,380 <sup>r</sup>    | 4,120 <sup>r</sup>  | 3,630 <sup>r</sup> | 2,820 <sup>r</sup>  | 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 <sup>5</sup>                       | 8,500 <sup>r</sup>    | 7,620 <sup>r</sup>  | 6,070 <sup>r</sup> | 4,890 <sup>r</sup>  | 5,000               |
| Consumption, apparent <sup>6</sup>                  | 5,700 <sup>r</sup>    | 5,170 <sup>r</sup>  | 3,940 <sup>r</sup> | 3,320 <sup>r</sup>  | 3,460               |
| World, production                                   | 33,900                | 38,000 <sup>r</sup> | 39,600             | 36,900 <sup>r</sup> | 40,800 <sup>e</sup> |

<sup>e</sup>Estimated. <sup>r</sup>Revised.

<sup>1</sup>Data are rounded to no more than three significant digits except "Primary production: Quantity" and "Price, average, U.S. market, spot."

<sup>2</sup>Data from the Aluminum Association Inc.; includes ingot, semifabricated material, and scrap inventory levels for United States and Canadian producers.

<sup>3</sup>Includes aluminum alloyed material.

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

<sup>5</sup>Defined 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.

<sup>6</sup>Apparent supply less recovery from purchased new scrap.

TABLE 2  
PRIMARY ANNUAL ALUMINUM PRODUCTION CAPACITY IN THE UNITED STATES, BY COMPANY<sup>1</sup>

| Company and location   | Yearend capacity<br>(thousand metric tons) |       | Ownership in 2010                               |
|--|--|-------|---|
|  | 2009                                       | 2010  |   |
| <b>Alcoa Inc.:</b>   |  |       |   |
| Alcoa, TN <sup>2</sup>                                       | 215  | 215   | Alcoa Inc., 100%.                               |
| Badin, NC <sup>3</sup>                                       | 60 <sup>r</sup>                            | --    | Do.   |
| Evansville, IN (Warrick)                                     | 309  | 309   | Do.   |
| Ferndale, WA (Intalco)                                       | 279 <sup>r</sup>                           | 279   | Do.   |
| Frederick, MD (Eastalco) <sup>3</sup>                        | 195  | --    | Do.   |
| Massena, NY (St. Lawrence) <sup>2</sup>                      | 125  | 125   | Do.   |
| Massena, NY  | 130  | 130   | Do.   |
| Mount Holly, SC  | 229 <sup>r</sup>                           | 229   | Alcoa Inc., 50.3%; Century Aluminum Co., 49.7%. |
| Rockdale, TX <sup>2</sup>                                    | 267  | 267   | Alcoa Inc., 100%.                               |
| Wenatchee, WA  | 184  | 184   | Do.   |
| Total  | 1,990 <sup>r</sup>                         | 1,740 |   |
| <b>Century Aluminum Co.:</b>                                 |  |       |   |
| Hawesville, KY   | 244  | 244   | Century Aluminum Co., 100%.                     |
| Ravenswood, WV <sup>2</sup>                                  | 170  | 170   | Do.   |
| Total  | 414  | 414   | Do.   |
| Columbia Falls Aluminum Co., Columbia Falls, MT <sup>2</sup> | 168  | 168   | Glencore International AG, 100%.                |
| Goldendale Aluminum Co., Goldendale, WA <sup>2</sup>         | 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 <sup>r</sup>                         | 3,200 |   |

<sup>r</sup>Revised. Do. Ditto. -- Zero.

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

<sup>2</sup>Temporarily idle.

<sup>3</sup>Smelter 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<sup>1,2</sup>

(Metric tons)

| Class                                     | Consumption            | Calculated recovery    |                        |
|---|------------------------|------------------------|------------------------|
|   |                        | Aluminum               | Metallic               |
| <b>2009:</b>                              |                        |                        |                        |
| Secondary smelters                        | 1,450,000 <sup>r</sup> | 1,020,000 <sup>r</sup> | 1,090,000 <sup>r</sup> |
| Independent mill fabricators <sup>3</sup> | 1,620,000 <sup>r</sup> | 1,390,000 <sup>r</sup> | 1,470,000 <sup>r</sup> |
| Foundries                                 | 74,800                 | 61,200                 | 65,400                 |
| Other consumers                           | 6,870                  | 6,330                  | 6,350                  |
| Total                                     | 3,160,000 <sup>r</sup> | 2,470,000 <sup>r</sup> | 2,630,000 <sup>r</sup> |
| Estimated full industry coverage          | 3,390,000 <sup>r</sup> | 2,650,000 <sup>r</sup> | 2,820,000 <sup>r</sup> |
| <b>2010:</b>                              |                        |                        |                        |
| Secondary smelters                        | 1,610,000              | 1,150,000              | 1,230,000              |
| Independent mill fabricators <sup>3</sup> | 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              |

<sup>r</sup>Revised.

<sup>1</sup>Excludes recovery from other than aluminum-base scrap.

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

<sup>3</sup>Includes 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<sup>1,2</sup>

(Metric tons)

| Class of consumer and type of scrap   | Stocks,<br>January 1      | Net<br>receipts <sup>3</sup> | Consumption      | Stocks,<br>December 31 |
|---|---------------------------|------------------------------|------------------|------------------------|
| <b>Secondary smelters:</b>  |                           |                              |                  |                        |
| <b>New scrap:</b>   |                           |                              |                  |                        |
| Extrusions  | 15,700                    | 296,000                      | 295,000          | 16,200                 |
| Can stock clippings   | 2,960 <sup>f</sup>        | 72,800                       | 71,200           | 4,520                  |
| Other wrought sheet and clippings   | 1,800 <sup>f</sup>        | 196,000                      | 195,000          | 2,510                  |
| Casting   | 594 <sup>f</sup>          | 61,100                       | 60,400           | 1,350                  |
| Borings and turnings  | 2,040 <sup>f</sup>        | 84,300                       | 84,100           | 2,260                  |
| Dross and skimmings   | 7,020 <sup>f</sup>        | 407,000                      | 407,000          | 6,890                  |
| Total   | <u>30,100<sup>f</sup></u> | <u>1,120,000</u>             | <u>1,110,000</u> | <u>33,800</u>          |
| <b>Old scrap:</b>   |                           |                              |                  |                        |
| Castings  | 3,610 <sup>f</sup>        | 137,000                      | 137,000          | 4,040                  |
| Extrusion   | 3,320 <sup>f</sup>        | 95,800                       | 96,100           | 2,970                  |
| Aluminum cans <sup>4</sup>  | 8,740                     | 116,000                      | 118,000          | 7,060                  |
| Other wrought products  | 6,740 <sup>f</sup>        | 73,200                       | 75,800           | 4,080                  |
| Auto shredder scrap   | 938 <sup>f</sup>          | 67,600                       | 67,500           | 1,010                  |
| Total   | <u>23,300<sup>f</sup></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<sup>f</sup></u> | <u>1,610,000</u>             | <u>1,610,000</u> | <u>53,000</u>          |
| <b>Integrated aluminum companies, foundries, independent mill fabricators, other consumers:</b> |                           |                              |                  |                        |
| <b>New scrap:</b>   |                           |                              |                  |                        |
| Extrusion   | 14,600 <sup>f</sup>       | 251,000                      | 263,000          | 3,020                  |
| Can stock clippings   | 608                       | 187,000                      | 186,000          | 1,530                  |
| Other wrought sheet and clippings   | 3,610 <sup>f</sup>        | 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<sup>f</sup></u> | <u>654,000</u>               | <u>664,000</u>   | <u>9,570</u>           |
| <b>Old scrap:</b>   |                           |                              |                  |                        |
| Castings  | 2,620                     | 130,000                      | 127,000          | 5,570                  |
| Extrusion   | 17                        | 8,120                        | 8,120            | 17                     |
| Aluminum cans <sup>4</sup>  | 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<sup>f</sup></u> | <u>1,510,000</u>             | <u>1,510,000</u> | <u>29,300</u>          |
| <b>All scrap consumed:</b>  |                           |                              |                  |                        |
| <b>New scrap:</b>   |                           |                              |                  |                        |
| Extrusion   | 30,300 <sup>f</sup>       | 547,000                      | 558,000          | 19,200                 |
| Can stock clippings   | 3,560                     | 260,000                      | 258,000          | 6,050                  |
| Other wrought sheet and clippings   | 5,410 <sup>f</sup>        | 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<sup>f</sup></u> | <u>1,770,000</u>             | <u>1,780,000</u> | <u>43,300</u>          |
| <b>Old scrap:</b>   |                           |                              |                  |                        |
| Castings  | 6,230                     | 267,000                      | 264,000          | 9,620                  |
| Extrusion   | 3,330                     | 104,000                      | 104,000          | 2,990                  |
| Aluminum cans <sup>4</sup>  | 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<sup>1, 2</sup>

(Metric tons)

| Class of consumer and type of scrap | Stocks,<br>January 1 | Net<br>receipts <sup>3</sup> | Consumption | Stocks,<br>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 <sup>r</sup>  | 3,120,000                    | 3,120,000   | 82,300                 |

<sup>r</sup>Revised. -- Zero.

<sup>1</sup>Includes 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.

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

<sup>3</sup>Includes inventory adjustment.

<sup>4</sup>Used 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 STATES<sup>1</sup>

(Metric tons)

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

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous, other." XX Not applicable.

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

<sup>2</sup>Includes inventory adjustment.

<sup>3</sup>Includes other diecast alloys.

<sup>4</sup>No 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 INDUSTRY<sup>1</sup>

| Industry                  | 2009                                  |                              | 2010 <sup>p</sup>                     |                              |
|---------------------------|---------------------------------------|------------------------------|---------------------------------------|------------------------------|
|                           | Quantity<br>(thousand<br>metric tons) | Percentage<br>of grand total | Quantity<br>(thousand<br>metric tons) | Percentage<br>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 <sup>c</sup>      | 1,280                                 | 15.9                         | 1,500                                 | 15.3                         |
| Grand total               | 8,090                                 | 100.0                        | 9,800                                 | 100.0                        |

<sup>c</sup>Estimated. <sup>p</sup>Preliminary.

<sup>1</sup>Data 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<sup>1, 2</sup>

(Thousand metric tons)

|                                  | 2008  | 2009  | 2010 <sup>p</sup> |
|----------------------------------|-------|-------|-------------------|
| Wrought products: <sup>3</sup>   |       |       |                   |
| 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             |

<sup>p</sup>Preliminary.

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

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

<sup>3</sup>Wrought 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      |
|---|--------------------|-----------|
| <b>Primary aluminum, average:<sup>1</sup></b> |                    |           |
| U.S. market                                   | 0.794              | 1.044     |
| LME cash price                                | 0.755              | 0.986     |
| NASAAC cash price, average                    | 0.653 <sup>†</sup> | 0.949     |
| <b>Secondary alloy, yearend:<sup>2</sup></b>  |                    |           |
| A319 (3% Cu)                                  | 1.055              | 1.170     |
| A380 (3% Zu)                                  | 1.055 <sup>†</sup> | 1.115     |
| A360 (0.6% Cu)                                | 1.065              | 1.210     |
| A413 (0.6% Cu)                                | 1.065              | 1.210     |
| <b>Scrap, yearend:<sup>2</sup></b>            |                    |           |
| 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 |

<sup>†</sup>Revised.

<sup>1</sup>Source: Platts Metals Week.

<sup>2</sup>Source: American Metal Market.

TABLE 9  
U.S. EXPORTS OF ALUMINUM, BY CLASS<sup>1</sup>

| Class                             | 2009                      |                      | 2010                      |                      |
|-----------------------------------|---------------------------|----------------------|---------------------------|----------------------|
|                                   | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) |
| <b>Crude and semicrude:</b>       |                           |                      |                           |                      |
| 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            |
| <b>Manufactures:</b>              |                           |                      |                           |                      |
| 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            |

<sup>1</sup>Data 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 COUNTRY<sup>1</sup>

| Country            | Metals and alloys, crude  |                      | Plates, sheets, bars, etc. <sup>2</sup> |                      | Scrap                     |                      | Total                     |                      |
|--------------------|---------------------------|----------------------|---|----------------------|---------------------------|----------------------|---------------------------|----------------------|
|                    | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons)               | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(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 <sup>†</sup>        | 14,800               | 90,100 <sup>†</sup>                     | 394,000 <sup>†</sup> | 80,300                    | 82,300               | 177,000                   | 491,000 <sup>†</sup> |
| 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            |

<sup>†</sup>Revised. -- Zero.

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

<sup>2</sup>Includes castings, forgings, and unclassified semifabricated forms.

<sup>3</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 11  
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY CLASS<sup>1</sup>

| Class  | 2009                      |                      | 2010                      |                      |
|--|---------------------------|----------------------|---------------------------|----------------------|
|  | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) |
| <b>Crude and semicrude:</b>                      |                           |                      |                           |                      |
| Metals and alloys, crude                         | 2,900,000                 | \$4,960,000          | 2,650,000                 | \$6,110,000          |
| Plates, sheets, strip, etc., n.e.c. <sup>2</sup> | 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           |
| <b>Manufactures:</b>                             |                           |                      |                           |                      |
| Foil and leaf <sup>3</sup>                       | 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           |

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

<sup>2</sup>Includes circles, disks, plates, and sheets.

<sup>3</sup>Excludes etched capacitor foil.

Source: U.S. Census Bureau.

TABLE 12  
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY COUNTRY<sup>1</sup>

| Country              | Metals and alloys, crude  |                      | Plates, sheets, bars, etc. <sup>2</sup> |                      | Scrap                     |                      | Total                     |                      |
|----------------------|---------------------------|----------------------|---|----------------------|---------------------------|----------------------|---------------------------|----------------------|
|                      | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons)               | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(thousands) | Quantity<br>(metric tons) | Value<br>(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 <sup>r</sup>       | 43,200 <sup>r</sup>  | 90,100 <sup>r</sup>                     | 336,000 <sup>r</sup> | 20,300                    | 22,200               | 134,000 <sup>r</sup>      | 401,000 <sup>r</sup> |
| 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           |

<sup>r</sup>Revised. -- Zero.

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

<sup>2</sup>Includes circles, disks, pipes, rods, tubes, etc.

<sup>3</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 13  
ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY<sup>1,2</sup>

(Thousand metric tons)

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

See footnotes at end of table.

TABLE 13  
ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY<sup>1,2</sup>

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<sup>e</sup>Estimated. <sup>p</sup>Preliminary. <sup>r</sup>Revised. -- Zero.

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

<sup>2</sup>Primary 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.

<sup>3</sup>Reported figure.

<sup>4</sup>Primary ingot plus secondary ingot.

<sup>5</sup>Ingot and rolling billet production.

<sup>6</sup>Primary ingot.

<sup>7</sup>Excludes 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).

<sup>8</sup>Primary unalloyed ingot plus secondary unalloyed ingot.

<sup>9</sup>Primary unalloyed metal plus primary alloyed metal, thus including weight of alloying material.