

2013 Minerals Yearbook

ALUMINUM [ADVANCE RELEASE]

ALUMINUM

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During 2013, total aluminum production in the United States decreased by 6%, but consumption increased by 15% compared with that of the prior year. Net imports of crude metal and semifabricated aluminum products increased by 14% compared with those in 2012 to meet the increased demand. Prices decreased 7% in 2013 owing to continued high inventory levels and new smelting capacity ramping up production while older capacity continued to produce.

Domestic primary smelters produced 1.95 million metric tons (Mt) of aluminum metal valued at \$4.04 billion, 6% less than the quantity and 12% less than the value in 2012. At yearend, three companies were operating nine primary aluminum smelters in six States. An additional four smelters were temporarily idle. During the year, citing low prices and high power costs, one smelter was temporarily idled and capacity at another smelter was permanently shut down. About 30% [800,000 metric tons per year (t/yr)] of domestic primary aluminum smelting capacity (table 2), including idle potlines at operating smelters, was idle at yearend. The 2013 annual average U.S. market price of primary aluminum ingot decreased by 7% to \$0.942 per pound from \$1.010 per pound in 2012 and was 19% lower than the 2011 price of \$1.161 per pound, but was still 19% above the price in 2009 of \$0.794 per pound (table 1).

Despite temporary closures at secondary smelters in the first half of 2013, aluminum recovered from purchased and tolled scrap increased by 6% to 3.48 Mt (table 1). Of this recovered metal, 53% came from new (manufacturing) scrap, and 47% came from old (obsolete aluminum products) scrap. Aluminum used beverage cans (UBCs) accounted for 46% of the reported old scrap consumed in 2013 and 20% of total scrap consumed.

Apparent consumption of aluminum in the United States increased by 15% compared with that in 2012. Owing to lower domestic primary production and increased demand, the U.S. import dependence for unwrought aluminum products as a percentage of apparent demand increased to 21% in 2013 from 3% in 2011, and was at its highest level since 2006. Combined shipments reported by producers in the United States and Canada indicate that they shipped 85.2% of their aluminum products to markets in the United States and Canada, of which the transportation industry accounted for 30.6%; containers and packaging, 19.4%; building and construction, 11.1%; electrical, 8.1%; machinery and equipment, 6.6%; consumer durables, 6.3%; and other uses, 3.1%. Exports accounted for 14.8% of shipments from producers in Canada and the United States in 2013 (table 6).

Primary aluminum was produced in 43 countries in 2013. China, Russia, Canada, and the United States, in decreasing order of metal produced, accounted for 65% of primary world production (table 13). World primary metal production increased by 4% compared with that of 2012 owing to increased production in Canada, China, Germany, Iran, Malaysia, Saudi Arabia, South Africa, and the United Arab Emirates. Commissioning of new smelters, brownfield expansions, as well as restarted capacity at smelters closed during recent years accounted for the increased production. These increases were partially offset by decreased production in Australia, Brazil, Italy, the Netherlands, Nigeria, Russia, Tajikistan, and Venezuela. Cashflow issues, currency valuations, obsolete equipment, low aluminum prices, and high power prices were cited for shutdowns of smelters in these countries.

According to CRU Group, global production of primary aluminum was slightly higher than consumption, and the market has been in surplus since 2007. Combined inventories of aluminum metal and alloys held by the London Metal Exchange Ltd. (LME), increased by 3% to almost 6 Mt and were more than five times greater than those held at yearend 2007. However, at yearend 2013, world inventories of unwrought aluminum as reported by the International Aluminium Institute (IAI), were 1.17 Mt, 7% less than those at yearend 2012 (CRU Aluminum Monitor, 2014; International Aluminium Institute, 2013, 2014; London Metal Exchange Ltd., 2012, 2013a).

Legislation and Government Programs

Acting on complaints that long load-out times from LMEregistered warehouses were distorting the aluminum market, the LME adopted new rules that would take effect April 1, 2014. The new rules would reduce waiting times to less than 50 days; prior to the new rules, wait times were longer than 300 days at some LME-registered warehouses. Long wait times developed after LME inventories increased in the wake of the financial crisis of 2008-09 when producers increased delivery of primary aluminum to the LME while decreasing deliveries to manufacturers that used aluminum. Investors, who were able to borrow money at low interest rates and were offered low rental rates by owners of LME-registered warehouses, were encouraged to use aluminum in long-term financing deals. Inventories of primary aluminum at LME-registered warehouses, which were about 930,000 metric tons (t) at yearend 2007, more than doubled to 2.34 Mt by yearend 2008, nearly doubled again to 4.62 Mt by yearend 2009, and continued on an upward trend to 5.45 Mt at yearend 2013. Daily limits on delivering metal from LME-registered warehouses caused wait times approaching 1 year at Detroit, MI, and Vlissingen, Netherlands. Manufacturers wanting to take delivery of aluminum from LME-registered warehouses complained that the long wait times and daily delivery limits inflated the price of aluminum, and Government regulators in Europe and the United States investigated the complaints. The LME responded by lifting daily load-out limits to ensure wait times were less than 50 days, although prior to the financial crisis, wait times were

usually less than 30 days (CRU Aluminum Monitor, 2013a, e; London Metal Exchange Ltd., 2007, 2008, 2009, 2013a, b). On March 27, 2014, however, the High Court of Justice of England and Wales found that the market consultation conducted by the LME did not satisfy legal requirements and ordered that the proposed rules not be implemented as scheduled. The LME said that it would consider its legal options and seek to make changes to its rules in a way that complied with legal requirements (Blamey and Cooke, 2014).

Primary Production

Ormet Corp. (Hannibal, OH) filed for Chapter 11 bankruptcy protection on February 25, citing low aluminium prices, high power costs, high debt levels, and legacy costs (Ormet Corp., 2013b). In an effort to reduce costs at Ormet's 271,000-t/yr Hannibal smelter, employees represented by the United Steelworkers (USW) union ratified a new contract on March 28 that replaced the defined benefit pension plan with a defined contribution retirement plan and retained the same expiration date of June 1, 2016, as the contract it replaced (Cowden, 2013e).

In August, Ormet shut down two potlines with a combined capacity of 90,000 t/yr, and in mid-October, shut down the final two potlines with a combined capacity of 90,000 t/yr, two other potlines having been shut down during 2012. A decision by the Public Utilities Commission of Ohio denying a request for lower power rates was cited for the final shutdown (Cowden, 2013d; Ormet Corp., 2013a, c).

In August, Alcoa Inc. (Pittsburgh, PA) permanently shut down a 40,000-t/yr potline at the 125,000-t/yr Massena (NY) East smelter citing low aluminum prices (Alcoa Inc., 2013e). In January 2014, Alcoa announced it would permanently shut down the two remaining potlines with a combined capacity of 84,000 t/yr at the Massena East smelter in the first quarter of 2014, citing high operating costs. A modernization plan to construct new potlines at the smelter was put on hold pending better market conditions, but a project to clean up the Grasse River downstream of the smelter that started in July would continue (Alcoa Inc., 2014b; Cowden, 2013a).

Century Aluminum Co. (Chicago, IL) purchased the 205,000-t/yr aluminum smelter in Sebree, KY, from Rio Tinto plc (London, United Kingdom) on June 3 (Century Aluminum Co., 2013a). The Kentucky Public Service Commission (KPSC) approved an agreement reached in April and effective in August between Century, Big Rivers Electric Corp., and Kenergy Corp. enabling Century to purchase power at spot-market rates. Power purchased on the open market by Big Rivers and Kenergy would be resold to Century for use at the 252,000-t/yr Hawesville, KY, smelter. A similar agreement between Century, Big Rivers, and Kenergy to replace the power supply contract for the Sebree smelter that expired January 31, 2014, was approved by the KPSC in January 2014 (Century Aluminum Co., 2013b, 2014).

Noranda Aluminum Holding Corp. (Franklin, TN) continued to expand its primary aluminum smelter in New Madrid, MO, but delayed completion to 2016 citing low aluminum prices. The project would increase smelting capacity to 298,000 t/yr from 263,000 t/yr (Matyi, 2013b).

Secondary Production

During the first half of the year, several secondary smelters temporarily shut down capacity citing high prices for scrap while aluminum alloy ingot prices remained unchanged. In April, Beck Aluminum Alloys Inc. (Lebanon, PA) shut down one of its two 73,000-t/yr furnaces in Racine, WI. Bermco Aluminum Co. (Birmingham, AL), Spectro Alloys (Rosemount, MN), and two other smelters shut down an undisclosed amount of capacity at their secondary smelters (Baltic, 2013b).

In March, Aleris International Inc. (Cleveland, OH) shut down the 45,000-t/yr Bens Run secondary smelter in Friendly, WV, citing unprofitability. Aleris filled customer orders for deoxidation aluminum and secondary ingot from its other smelters (Fitzgerald, 2012). Aleris also shut down its secondary smelter in Hammond, IN, in July and increased production at its secondary smelter in Elyria, OH. Both smelters supplied deoxidation aluminum to the steel industry. Streamlining operations and better meeting of customer needs were cited for the actions (Cowden, 2013b). At yearend, Aleris also shut down its secondary smelter in Saginaw, MI, owing to a change in customer demand. The smelter had supplied molten aluminum alloys to nearby customers in the automobile industry since 2000 (Cowden, 2013c).

In June, Pennex Aluminum Co. [a subsidiary of Metal Exchange Corp. (St. Louis, MO)] restarted a 45,000-t/yr secondary smelter in Greenville, PA, to produce extrusion billet. Pennex leased the smelter from ILSCO Extrusions Inc. [a subsidiary of ILSCO Corp. (Cincinnati, OH)]. The smelter had been idle since ILSCO acquired it in 2010 after the prior owner, Signature Aluminum Co., filed for bankruptcy in 2009 (American Metal Market, 2013; ILSCO Extrusions Inc., 2013).

Owl's Head Alloys Inc. (Bowling Green, KY) expanded its secondary smelter by adding an ingot casting line to its existing sow casting line. The expansion, completed by mid-year, added an estimated 16,000 t/yr of capacity (Fitzgerald, 2013).

In May, Alcoa completed an expansion and modernization of its secondary smelter at Baberton, OH. The secondary smelter produced billet which was used to forge wheels and had a capacity to consume 45,000 t/yr of aluminum scrap. Construction of the project started in 2011 (Alcoa Inc., 2013g; Baltic, 2013a).

Nanshan America Advanced Aluminum Technologies LLC (Lafayette, IN) was constructing a casthouse adjacent to its extrusion plant in Lafayette, IN. The 136,000-t/yr casthouse was expected to start producing billet in early 2014 that would be used to make extruded products for customers in the electrical and transportation industries (Matyi, 2013a).

Consumption

Apparent consumption of aluminum in the United States increased to 4.5 Mt in 2013, 15% more than that in 2012, and has risen every year since 2009, but has not reached the 2006 consumption level of 6.0 Mt. Shipments of aluminum by producers in the United States and Canada to their combined domestic markets increased by 2% in 2013 compared with the amount shipped in 2012, but net imports of crude aluminum

and semifabricated products from Canada increased by 26% compared with imports in 2012. Shipments of aluminum to the building and construction and electrical products sectors increased slightly, while shipments to the consumer durables, machinery, and transportation sectors increased by 4%, 4%, and 5%, respectively, compared with those in 2012. Shipments to the containers and packaging sector decreased slightly and those to other sectors decreased by 3% (table 6).

The increase in aluminum shipments for use in transportation was mostly attributed to increased automobile production and sales. Domestic sales of new passenger cars and light trucks in 2013 increased by 7.6% compared with sales in 2012 (Petry, 2014).

Part of the increase in shipments of aluminum to the transportation sector was attributed to increased deliveries of commercial aircraft. The Boeing Co. (Chicago, IL) reported that its deliveries of commercial aircraft increased by 8% compared with deliveries in 2012. Although a significant portion of the increased deliveries was 787 Dreamliners, an aircraft with a fuselage and wings made from composite materials instead of aluminum, deliveries of Boeing's other commercial aircraft increased by 5% compared with deliveries in 2012 (Boeing Co., The, 2014, p. 25).

The increase in aluminum shipments for use in building and construction and consumer durables resulted from increased residential construction. Sales of new homes were 16.6% higher in 2013 than in 2012 (U.S. Census Bureau, 2014c). The U.S. Census Bureau and the U.S. Department of Housing and Urban Development jointly reported that housing starts increased by 18.7% in 2013 compared with starts in 2012. The number of houses completed was 17.9% more than in 2012 (U.S. Census Bureau, 2014b). Total construction spending during 2013 increased by 4.8% compared with that in 2012, which was attributed to a 17.5% increase in spending on residential construction, offset by a slight decrease in spending on the more aluminum-intensive nonresidential construction (U.S. Census Bureau, 2014a).

To serve anticipated consumption of customers in the aerospace industry, Alcoa completed a project expanding the aluminum-lithium alloy capacity of its facility in Upper Burrell, PA, during the first half of the year. Alcoa also continued construction of a 20,000-t/yr casthouse adjacent to its Lafayette, IN, smelter to produce aluminum-lithium alloy billet for use in the aerospace industry. The project was scheduled for completion by yearend 2014 (Alcoa Inc., 2013b).

In anticipation of increased consumption of aluminum sheet by automobile manufacturers, several companies were expanding rolling mill capacity. Alcoa completed expanding its rolling mill at Davenport, IA, and started production in December. In August, Alcoa started an expansion of its rolling mill in Alcoa, TN, which was expected to be completed by midyear 2015, that also includes auto sheet capacity (Alcoa Inc., 2013a; 2014c, p. 14).

Novelis Inc. [a subsidiary of Hindalco Industries Ltd. (Mumbai, India)] was expanding its rolling mill in Oswego, NY, to supply automobile manufactures. In October, an expansion of its rolling mill to 280,000 t/yr from 40,000 t/yr was completed. Further expansion to 360,000 t/yr was started in December and was to be completed in 2015 (Novelis Inc., 2013a, e).

In Europe and the Republic of Korea, companies were also expanding rolling capacity to meet expected automotive demand. Norsk Hydro ASA (Oslo, Norway) was expanding rolling capacity at its rolling mill in Grevenbroich, Germany, to 50,000 t/yr when completed in 2014 (Norsk Hydro ASA, 2013a). Aleris expanded its Duffel, Belgium, rolling mill in March to serve customers in the automotive industry (Aleris International Inc., 2013). In October, Novelis completed expansions at its rolling mill in Ulsan to supply sheet to automobile manufactures (Novelis Inc., 2013d).

Stocks

According to data reported by The Aluminum Association Inc. (2013, 2014), producers in the United States and Canada had combined inventories of aluminum ingot, mill products, and scrap that decreased slightly to 1.13 Mt at yearend 2013 from 1.14 Mt at yearend 2012. The LME reported that primary aluminum metal ingot stocks in its U.S. warehouses decreased by 5% to 1.86 Mt at yearend 2013 from 1.97 Mt at yearend 2012. At yearend 2013, LME warehouses in the United States also held 84,800 t of North American special aluminum alloy contract (NASAAC) metal ingot, a 42% decrease from the 147,000 t held at yearend 2012 (London Metal Exchange Ltd., 2012, 2013a).

Prices

The monthly average U.S. market price of primary aluminum metal, as reported by Platts Metals Week, started the year at \$1.031 per pound in January and generally declined throughout the year. After rising to \$1.039 per pound in February, the monthly average price declined to \$0.976 per pound in March and was at \$0.894 per pound in December. The annual average price in 2013 decreased to \$0.942 per pound from \$1.010 per pound in 2012. The LME monthly average cash prices for primary aluminum ingot followed the same general trend as the U.S. market price, and the 2013 annual average LME cash price decreased to \$0.837 per pound from \$0.916 per pound in 2012. 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 2013, total net imports of aluminum-base materials increased by 53% compared with net imports in 2012 (tables 11, 12). Imports for consumption of crude aluminum increased by 14%, while imports of semifabricated aluminum materials (plates, sheet, and bars) decreased slightly, and scrap imports decreased by 4%. Canada remained the leading source country, accounting for 64% of the total (crude, semifabricated, and scrap) imports in 2013; no other nation accounted for more than 10% of total aluminum imports. Imports of crude metal and alloys from Canada accounted for 52% of all aluminum imports during 2013 (table 12).

Total exports of aluminum decreased by 3% during 2013 compared with those of 2012 (tables 9, 10). Exports of crude aluminum (metal and alloys) increased slightly and exports of semifabricated aluminum materials increased by 7%, but exports of scrap decreased by 8%. About 78% of total U.S. exports of unmanufactured aluminum (crude, semifabricated, and scrap) in 2013 were shipped to Canada, China, or Mexico. The aluminum shipped to China was 97% scrap and scrap shipped to China accounted for 37% of all U.S. aluminum exports during 2013 (table 10).

World Industry Structure

Production.—World primary aluminum production increased by 4% in 2013 compared with that of 2012 owing to new smelters and smelter expansions in China, Iran, Malaysia, Saudi Arabia, and the United Arab Emirates and restarts of capacity in Canada, Germany, and South Africa. These gains were partially offset by smelter closures in several countries as a result of lower aluminum prices, high power costs, financial challenges, labor disputes, and technical issues. China, Russia, Canada, and the United States, in decreasing order of production, accounted for 65% of total world primary aluminum production. China was the leading producer and accounted for 46% of global production (table 13).

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 continued, although several restarts were announced in the second half of the year. In 2011, more restarts were announced as prices and demand for aluminum increased. Although new capacity ramped up in 2012 and 2013, price declines and other factors resulted in the permanent shutdown of older, higher cost smelters. In 2013, world production was 19% more than the prerecession level of 2008 as demand for aluminum increased.

Stocks.—Low aluminum prices led many smelters to shut down during 2013, and smelters continued the destocking trend started during the financial crisis in 2008–09. At yearend 2013, combined IAI-reported and LME inventories of primary and alloyed aluminum were slightly higher than those at yearend 2012. Significant decreases in aluminum alloy inventories were offset by increased primary aluminum inventories as speculators continued to prefer primary aluminum to alloyed aluminum. Yearend 2013 inventories of unalloyed aluminum metal held by the LME increased by 5% to 5.45 Mt from 5.21 Mt at yearend 2012, and aluminum alloy inventories decreased by 36% to 56,400 t from 87,700 t (London Metal Exchange Ltd., 2012, 2013a).

The increased inventories at LME warehouses were offset by decreases in IAI-reported total aluminum inventories, which decreased by 4% to 2.17 Mt at yearend 2013 from 2.27 Mt at yearend 2012. Total aluminum includes unwrought aluminum plus unprocessed scrap, metal in process, and finished semifabricated (mill) products. Unwrought aluminum inventories held by IAI member producers decreased by 7% to 1.17 Mt at yearend 2013 from 1.26 Mt at yearend 2012. 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 (International Aluminium Institute, 2013, 2014).

Mergers and Acquisitions.—Emirates Aluminium Co. Ltd. (EMAL) and Dubai Aluminium Co. Ltd. (Dubal) merged to form Emirates Global Aluminium Co. Ltd. The capacity of Dubal's smelter at Taweelah was 1 million metric tons per year (Mt/yr). EMAL had an 800,000-t/yr smelter at Jebel Ali, which had a 500,000-t/yr expansion under construction. The new company also included interests in exploration and development projects for bauxite and alumina in Cameroon and Guinea (Guerra, 2013).

Norsk Hydro combined its extruded products division with Sapa Holdings HB [a subsidiary of Orkla ASA (Oslo)] in a joint venture owned equally by both companies. The new company known as Sapa had fabrication facilities throughout Europe and North America, as well as in Argentina, Brazil, China, India, and Vietnam. The merger was announced in October 2012 and was completed in September 2013 (Norsk Hydro ASA, 2013b).

In December, Rio Tinto sold the St. Jean-de-Maurienne smelter and Castelsarrasin casthouse in France to Trimet Aluminum S.E. (Essen, Germany). The smelter capacity was 138,000 t/yr, and the casthouse capacity was 8,000 t/yr (Rio Tinto Alcan Inc., 2013b; Rio Tinto plc, 2014a, p. 14). Rio Tinto also sold the 205,000-t/yr Sebree, KY, smelter to Century in June (Century Aluminum Co., 2013a). Rio Tinto divested these properties as part of its restructuring strategy announced in 2011. However, Rio Tinto announced in August 2013, after not being able to find a buyer, that it no longer planned to divest its alumina refineries, bauxite mines, and smelters in Australia and New Zealand (Rio Tinto plc, 2013a, p. 2).

The Government of Indonesia purchased the 58.9% share of the Inalum smelter owned by Nippon Asahan Ltd., a consortium of 11 Japanese companies, when the ownership agreement expired at the end of October. As the sole owner, the Government would sell all the aluminum produced at the 250,000-t/yr smelter to domestic manufactures instead of exporting it to Japan as the partners of Nippon Asahan previously had done with their share of production. This action was part of Indonesia's domestic economic strategy to reduce exports of raw materials in favor of processing mineral resources and increasing manufacturing domestically (Watanabe, 2013).

World Review

Australia.—Aluminum production in Australia declined by 5% (86,000 t) in 2013 compared with production in 2012 owing to the shutdown of Norsk Hydro's 180,000-t/yr Kurri Kurri smelter in New South Wales during 2013. Low prices and a decrease in domestic demand for aluminum, as well as unfavorable currency valuations, were cited for the shutdown (Norsk Hydro ASA, 2012a, b).

Bosnia and Herzegovina.—Aluminij d.d. Mostar signed a power supply contract with Slovenian utility GEN-I, to replace a contract with Croatian utility HEP. Compliance with requirements of Croatia's accession to the European Union was cited by HEP for canceling the contract with Mostar. Mostar would receive 100 megawatthours (MWh) per year from August through yearend 2013 from GEN-I. Mostar would purchase 125 MWh from Elektrorivreda, a Bosnian utility, under an existing contract. The new contract enabled the 130,000-t/yr Mostar smelter to avoid a planned shutdown in June. The smelter was producing at 87.5% of its capacity after shutting down 12.5% of its capacity in August 2012 (Blamey, 2013b, c).

Brazil.—Primary aluminum production decreased by 9% compared with that in 2012 (Associação Brasileira do Alumínio, 2014). In September, Alcoa and BHP Billiton Ltd. (Melbourne, Victoria, Australia) temporarily shut down 142,000 t/yr of capacity at the 447,000-t/yr Alumar smelter in Sao Luis. Alcoa also temporarily shut down 34,000 t/yr of capacity at the 96,000-t/yr Pocos de Calda smelter. Low aluminum prices and high power prices were cited for the shutdowns (Alcoa Inc., 2013e, 2014a; Sharma, 2014).

In July, Novelis completed expanding its rolling mill in Pindamonhangaba to 600,000 t/yr from 400,000 t/yr. The project also included a new ingot casthouse. The mill supplies aluminum sheet to makers of beverage can and other packaging (Novelis Inc., 2013f).

Brazil reportedly recycled 97.9% of all aluminum beverage cans sold in the country during 2012, a slight decrease from 98.3% in 2011. Brazil collected and recycled 267,100 t of UBCs, the equivalent of 19.8 billion aluminum cans. Since 2001, Brazil has had the highest aluminum can recycling rate among countries that do not have mandatory recycling laws (Associação Brasileira do Alumínio, 2013).

Canada.-Rio Tinto shut down 50,000 t/yr of capacity at the 100,000-t/yr Shawinigan, Quebec, smelter in August and shut down the remaining capacity in November. Low aluminum prices and obsolete technology were cited for the permanent shutdown of the smelter, which was commissioned in 1942 (Rio Tinto Alcan Inc., 2013c; Rio Tinto plc, 2013b, p. 5). In September, Rio Tinto started production from the new Arvida aluminum smelter in Saguenay-Lac-Saint-Jean, Quebec. The 60,000-t/yr smelter uses the new AP60 pot design which would increase production by 40% compared with that of prior smelting pots, reduce emissions, and increase energy efficiency. Production reached full capacity in December (Rio Tinto Alcan Inc., 2013a; Rio Tinto plc, 2014b, p. 4). Rio Tinto continued to modernize and expand the Kitimat, British Columbia, smelter. When completed at yearend 2014, the smelter's capacity would increase to 420,000 t/yr from 277,000 t/yr (Rio Tinto plc, 2013a, p. 6, 27).

In August, Alcoa permanently shut down two potlines with 105,000 t/yr of total capacity at the 385,000-t/yr Baie-Comeau, Quebec, smelter. High operating costs of the obsolete Soderberg potlines were cited for the closure (Alcoa Inc., 2013c).

China.—Primary aluminum production in 2013 increased by 9% compared with that in 2012, to 22.1 Mt from 20.3 Mt. Production in Xinjiang Uyghur Autonomous Region, in the northwest part of China, increased by 1.53 Mt. Other Provinces in the northwest part of the country accounted for most of the rest of the increased production of aluminum. However, these increases were partially offset by declines in production in some of the eastern and central Provinces such as Henan Province where production decreased by about 520,000 t. The shift in production locations was attributed to the ramp up of new smelters in the northwest Provinces with abundant lowcost power and the shutdown of older, less efficient smelters in Provinces with increasing power costs (China Metal Market— Alumina and Aluminum, 2014). Primary aluminum smelting capacity increased to 32 Mt/yr at yearend 2013 from about 28 Mt/yr at yearend 2012 (Leung, 2014). Much of the increased capacity was from new smelters built in the northwestern part of the country. Smelting capacity in Xinjiang Uyghur Autonomous Region increased to about 3.7 Mt/yr at yearend, from about 1.8 Mt/yr at yearend 2012 (China Metal Market—Alumina and Aluminum, 2013b).

Government policies continued to encourage the permanent shutdown of inefficient, older, smaller smelters that were mostly located in the eastern and southern parts of the country. The Government also issued policies prohibiting the construction of new smelters that have not been approved, including a halt to construction of smelters being built without approval. Approved new smelters and existing smelters must comply with standards set for access to power supplies, capacity, energy efficiency, environmental emissions, and technology by yearend 2015 (China Metal Market—Alumina and Aluminum, 2013e, f).

The Government of China announced that new primary aluminum smelters would not be permitted in Inner Mongolia Autonomous Region and Shandong and Shanxi Provinces, citing pollution concerns. Several Government agencies announced policies intended to encourage consolidation of the aluminum industry. The stated goals included having 90% of primary aluminum production from 10 companies and to establish 3 to 5 large companies with global reach by yearend 2015. The policies also encouraged further vertical integration of companies in the aluminum industry, so that each company would have bauxite mines, alumina refineries, smelters, rolling mills, extrusion plants, and power supplies. The Government also was encouraging Chinese companies to make investments in power-intensive industries in other countries to limit power consumption and to reduce pollution (China Metal Market-Alumina and Aluminum, 2013c, d, g).

The government of Qinghai Province announced that unauthorized aluminum smelters and other power-intensive industries would not receive power. Approved smelters would be charged a higher price for power consumed in excess of quotas. Preventing power shortages and controlling pollution were cited as reasons for the policies (China Metal Market— Alumina and Aluminum, 2013a).

Germany.—Novelis continued constructing a recycling center and casthouse adjacent to its rolling mill in Nachterstedt. The 400,000-t/yr facility would supply rolling ingot to the adjacent rolling mill when completed in July 2014. The rolling mill was also being expanded to supply customers in the automotive industry. The project would increase rolling capacity to 350,000 t/yr from 230,000 t/yr when completed in 2015 (Novelis Inc., 2013a, b).

India.—Hindalco expanded the Hirakud smelter to 213,000 t/yr from 161,000 t/yr and commissioned the new capacity in the first quarter of the year. Construction of the 360,000-t/yr Mahan smelter and an adjacent 900-megawatt (MW) powerplant was completed and production started in the first quarter of 2013, with ramp up continuing throughout the year. Construction of the 360,000-t/yr Aditya

smelter and an adjacent 900-MW powerplant was completed by yearend and production started in January 2014 (Hindalco Industries Inc., 2013a, b; 2014, p. 15, 51). Vedanta Resources plc (London, United Kingdom) continued work on the 325,000-t/yr Korba III smelter, with completion planned in mid-2015 (Vedanta Resources plc, 2014). The National Aluminum Co. Ltd. (Nalco) (Bhubaneswar) shut down 115,000 t/yr of its 460,000-t/yr Angul smelter from May through August. A shortage of coal for its captive powerplant was cited as a reason for the shutdown (McBeth, 2013).

Italy.—Alcoa announced that the temporary closure of the 44,000-t/yr Fusina smelter would be made permanent. Alcoa shut down the smelter in 2010 citing high power costs and determined that it was unlikely to be able to obtain power at competitive rates in the future. An adjacent rolling mill was not affected by the decision to shut down the smelter (Alcoa Inc., 2013d).

In May, Novelis commissioned its recycling center and continuous casting line at the Pieve Emanuele facility in Milan to supply sheet products to customers in several industries (Novelis Inc., 2013g).

Korea, Republic of.—In October, Novelis completed expansions at its rolling mills in Ulsan and Yeongju. The rolling mills would supply sheet to automobile manufactures and beverage can makers (Novelis Inc., 2013d).

Malaysia.—Press Metal Berhad's 240,000-t/yr Samalaju smelter ramped up to full capacity in July. Expansion of the smelter to 360,000 t/yr was expected to be completed in early 2014 (CRU Aluminum Monitor, 2013b; Press Metal Berhad, 2013). Press Metal Berhad's 120,000-t/yr Mukah smelter was temporarily shut down from June through November due to a power failure (CRU Aluminum Monitor, 2013c).

Montenegro.—Although it continued to operate throughout the year, Kombinat Aluminujuma Podgorica (KAP) filed for bankruptcy protection in July citing low aluminum prices, debt, and high power prices for its 120,000-t/yr smelter in Podgorica. KAP was owned by Central European Aluminum Co. (29.4%), the Government of Montenegro (29.4%), and other investors (40.2%) (Platts Metals Daily, 2013).

New Zealand.—Rio Tinto shut down approximately 20,000 t/yr of capacity at the 350,000-t/yr Tiwai Point smelter in the first quarter of the year, citing high power prices attributed to low water levels in reservoirs (CRU Aluminum Monitor 2013d).

Nigeria.—United Company RUSAL plc (Moscow, Russia) temporarily suspended operations at the 96,000-t/yr Alscon smelter in Ikot Abasi, citing an ownership dispute, unreliable gas supplies for the captive powerplant, and low aluminum prices. The smelter had been producing at about one-quarter of its capacity prior to the shutdown. The Supreme Court of Nigeria overturned the sale of 77.5% of the Government's 92.5% share of the smelter to RUSAL, ruling that it violated Nigeria's privatization law because BFI Group Corp. (Los Angeles, CA) had offered a higher bid for the smelter (Kolyandr, 2013; United Company RUSAL plc, 2013b, 2013d).

Russia.—During the year, RUSAL decreased production from its least efficient smelters in Russia, citing high costs. The Ural, Volgograd, and Volkhov smelters were shut down and four potlines at the Bogoslovsk smelter, two potlines at the Nadvoitsy smelter, and one potline at the Novokuznetsk smelter were shut down. Incremental measures such as reducing pot amperage at four other smelters in Russia also contributed to production in Russia declining by 7% compared with production in 2012 (United Company RUSAL plc, 2013c, 2014).

RUSAL was progressing on the Boguchansky smelter, but delayed the start of production from the first 150,000-t/yr potline until yearend 2014. When completed in 2016, the smelter would have a capacity of 600,000 t/yr. The smelter would be powered by the 3,000-MW Boguchanskaya hydroelectric powerplant on the Angara River that started producing power from the fourth of its nine turbines in January. The Boguchanskaya hydroelectric powerplant was a joint venture between RUSAL and RusHydro (United Company RUSAL plc, 2013a). RUSAL also delayed the start of construction of the 750,000-t/yr Taishet smelter until at least 2014, citing economic conditions (Hotter, 2013).

Saudi Arabia.—In October, Alcoa (25.1%) and its partner Saudi Arabian Mining Co. (Riyadh) (74.9%) temporarily shut down production from one of the two potlines at their 740,000-t/yr smelter in Ras al Khair. Potline instability was cited as the reason for the shutdown. Production was restarted from the potline in December and production was expected to reach full capacity during the second quarter of 2014. Ramp up of the other potline was accelerated while use of the first potline was being restored. Construction continued on an adjacent rolling mill that would produce sheet for automotive and construction markets, containers and packaging, and foil stock when completed in 2014 (Al Arabiya News, 2013; Alcoa Inc., 2013f).

Spain.—In February, Alcoa restarted a combined 25,000 t/yr of capacity at the Aviles and La Coruna smelters. In 2011, 46,000 t/yr of the 93,000-t/yr Aviles smelter had been shut down and 44,000 t/yr of the 87,000-t/yr La Coruna smelter had been shut down. Low aluminum prices and high power costs were cited for the shutdowns. A change in the power supply agreement for the smelters enabled the restart of about 80 smelting pots (Blamey, 2013a).

United Arab Emirates.—In September, EMAL started production from new capacity at its smelter in Al Taweelah. EMAL was expanding capacity of the smelter to 1.3 Mt/yr from 800,000 t/yr. The expansion was expected to be completed in early 2014 and would be ramped up as pots became ready (Emirates Aluminium Ltd., 2013).

United Kingdom.—In June, Alcoa completed an expansion of its aluminum-lithium alloy plant in Kitts Green. The plant was to supply aerospace companies with lightweight aluminum-lithium alloys designed to be lighter and hence more fuel efficient than other aluminum alloys and cost less than composite materials (Alcoa Inc., 2013b). In November, Novelis completed expanding its recycling center and casthouse in Latchford to 220,000 t/yr from 160,000 t/yr. The casthouse would supply rolling ingot to produce automotive sheet (Novelis Inc., 2013c).

Anglesey Aluminum Metal Ltd. (AMM) shut down its secondary smelter at Anglesey in April citing high costs of raw materials and low demand for its products. Secondary aluminum had been produced in the casthouse since 2009 when the primary smelter was permanently shut down after the license for the nuclear powerplant supplying it with power expired. AMM was a joint venture between Rio Tinto and Kaiser Aluminum Corp. (Blamey, 2013d).

Venezuela.—Primary aluminum production decreased by 20% compared with that in 2012. The Government of Venezuela negotiated a \$5 billion investment by the Government of China to fund modernization of the State-owned aluminum industry in Venezuela. Of the investment, \$490 million would be used to restore production from the 430,000-t/yr Venalum smelter to full capacity. The smelter shut down about 45% of its capacity in 2010, citing power shortages. Continuing power shortages were cited for low production levels in 2013, as the nation's power capacity utilization was about 75% throughout the year. Financial problems resulting in shortages of raw materials such as aluminum fluoride, cryolite, and petroleum coke were also cited for production from CVG's Venalum and Alcasa smelters being at 30% of capacity (Soules, 2013a, b, c; Soules and Mogollon, 2013).

Outlook

World demand for aluminum in 2014 is expected to increase modestly from that in 2013 as economic expansion in most nations steadily continues. Consumption in Europe is expected to increase modestly as the economy recovers from the impact of the debt crisis in several countries. A resolution to the complaints about long load-out times at LME-registered warehouses might cause regional premiums to decline, especially in the United States.

Some U.S. smelters are expected to remain shut down or to be permanently closed owing to high power prices and obsolete technology. In January 2014, Alcoa announced that the remaining capacity at the Massena (NY) East smelter would be shut down permanently during the first quarter of the year. As of June 1, 2014, about 34% (890,000 t/yr) of domestic primary aluminum smelting capacity was idled. The global trend of older smelters being permanently shut down or modernized to replace obsolete technology in order to comply with environmental regulations, increase efficiency, and reduce costs is expected to continue. New smelter construction where power costs are relatively low is expected to continue to replace production at high-cost smelters in several parts of the world.

Aluminum consumption by the domestic automobile industry is expected to grow as automobile manufacturers increase the amount of aluminum per vehicle in response to increasing fuel efficiency standards and more vehicles are manufactured to satisfy pent-up demand as the economy improves. The substitution of aluminum sheet for steel in certain truck models is also expected to increase domestic consumption of aluminum in 2014. In Europe, demographic trends suggested that automobile sales may stay at the 2012 levels or decline further even after Europe's economy recovers (Curtin, 2013), limiting consumption of aluminum in Europe. Aluminum consumption by U.S. and European aircraft manufacturers is expected to increase as airlines continue to replace older aircraft with newer, more fuel efficient models. Competition by carbon composites, magnesium, and high-strength steel is expected to continue as the transportation sector seeks lightweight materials to improve

fuel efficiency, with the aluminum industry developing new aluminum alloys to meet customer needs.

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TABLE 1 SALIENT ALUMINUM STATISTICS¹

(Thousand metric tons unless otherwise specified)

	2009	2010	2011	2012	2013
United States:					
Primary production:					
Quantity	1,727	1,726	1,986	2,070	1,946
Value millions	\$3,025	\$3,975	\$5,083	\$4,608	\$4,042
Price, average, U.S. market, spot cents per pound	79.4	104.4	116.1	101.0	94.2
Inventories (December 31):					
Aluminum industry ²	937	1,010	1,060	1,140	1,130
London Metal Exchange, U.S. warehouses ³	2,200	2,230	2,360	2,120	1,950
Secondary recovery: ⁴					
New scrap	1,570	1,540	1,640	1,830	1,850
Old scrap	1,260	1,250	1,470	1,440	1,630
Total	2,820	2,790	3,120	3,270	3,480
Exports, crude, semicrude, and scrap	2,710	3,040	3,420	3,480	3,390
Imports for consumption, crude and semicrude ⁵	3,680	3,610	3,710	3,760	4,160
Supply, apparent ⁶	4,890	5,000	5,210	5,780	6,380
Consumption, apparent ⁷	3,320	3,460	3,570	3,950	4,530
World, production	37,200 ^r	41,200 ^r	44,400 r	45,800 ^r	47,600 ^e

^eEstimated. ^rRevised.

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

²Data from The Aluminum Association Inc.; includes ingot, semifabricated material, and scrap inventory levels for producers in the United States and Canada.

³Includes aluminum alloyed material.

⁴Metallic recovery from purchased, tolled, or imported new and old scrap expanded for full industry coverage. ⁵Excludes scrap.

⁶Defined 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.

⁷Apparent supply less recovery from purchased new scrap.

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

	Yearend ca	pacity	
	(thousand me	tric tons)	
Company and location	2012	2013	Ownership in 2013
Alcoa Inc.:			
Evansville, IN (Warrick)	269	269	Alcoa Inc., 100%.
Ferndale, WA (Intalco)	279	279	Do.
Massena, NY (St. Lawrence)	125	84	Do.
Massena, NY	130	130	Do.
Mount Holly, SC	229	229	Alcoa Inc., 50.3%; Century Aluminum Co., 49.7%.
Rockdale, TX	191 ²	191 ²	Alcoa Inc., 100%.
Wenatchee, WA	184	184	Do.
Total	1,410	1,370	
Century Aluminum Co.:			
Hawesville, KY	252 ^r	252	Century Aluminum Co., 100%.
Ravenswood, WV	170 ²	170^{-2}	Do.
Sebree, KY	196	205	Do.
Total	618	627	
Columbia Falls Aluminum Co., Columbia Falls, MT	168 ²	168 ²	Glencore International AG, 100%.
Noranda Aluminum Holding Corp., New Madrid, MO	263	263	Noranda Aluminum Holding Corp., 100%.
Ormet Primary Aluminum Corp., Hannibal, OH	271	271 2	Ormet Corp., 100%.
Grand total	2,730	2,700	

^rRevised. Do. Ditto.

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

²Temporarily idle at yearend.

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

(Metric tons)

		Calculated	d recovery
Class	Consumption	Aluminum	Metallic
2012:			
Secondary smelters	2,150,000 r	1,470,000	1,570,000
Independent mill fabricators ^r	1,510,000	1,280,000	1,360,000
Foundries	85,600	70,700	75,700
Other consumers	5,700	5,700	5,700
Total ^r	3,750,000	2,820,000	3,020,000
Estimated full industry coverage ^r	4,060,000	3,050,000	3,270,000
2013:			
Secondary smelters	2,130,000	1,470,000	1,570,000
Independent mill fabricators	1,580,000	1,340,000	1,430,000
Foundries	97,200	80,400	86,100
Other consumers	6,180	5,930	5,940
Total	3,810,000	2,890,000	3,090,000
Estimated full industry coverage	4,110,000	3,120,000	3,480,000

^rRevised.

¹Excludes recovery from other than aluminum-base scrap.

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

TABLE 4 U.S. STOCKS, RECEIPTS, AND CONSUMPTION OF PURCHASED NEW AND OLD ALUMINUM SCRAP AND SWEATED PIG IN 2013^{1, 2}

(Metric tons)

	Stocks,	Net		Stocks,
Class of consumer and type of scrap	January 1	receipts ³	Consumption	December 31
Secondary smelters:	Sundary 1	receipts	Consumption	December 51
New scrap:				
Extrusions	19,300	308,000	308,000	19,500
Can stock clippings	8,140	115,000	118,000	5,160
Other wrought sheet and clippings	5,030	220,000	222,000	3,040
Casting	1,800 r	44,900	45,400	1,300
Borings and turnings	4,250	118,000	119,000	3,380
Dross and skimmings	13,200	608,000	613,000	8,170
Total	51,700	1,420,000	1,430,000	40,500
Old scrap:	51,700	1,420,000	1,450,000	+0,500
Castings	3,300 ^r	106,000	107,000	2,700
Extrusion	7,360 ^r	146,000	146,000	7,480
Aluminum cans ⁴	28,600	140,000	186,000	26,700
Other wrought products	5,230 r	163,000	163,000	4,880
Auto shredder scrap	1,840 r	95,900	95,800	2,010
Total	46,300 r	695,000	698,000	43,800
	,		,	
Sweated pig	183 98,200 r	1,850	1,850 2,130,000	183 84,500
Grand total secondary smelters Integrated aluminum companies, foundries, independent	98,200	2,110,000	2,130,000	84,300
mill fabricators, other consumers:				
New scrap:	1.5(0.1	221 000	222.000	904
Extrusion	1,560 r	231,000 176,000	232,000	894
Can stock clippings	581	,	176,000	410
Other wrought sheet and clippings	6,210	256,000	254,000	8,140
Casting	243	17,100	17,100	243
Borings and turnings	476 ^r	13,800	13,800	521
Dross and skimmings	414 r	5,770	6,080	98
Total	9,480 ^r	700,000	699,000	10,300
Old scrap:	4.5.40	1 50 000	1 (0,000	2 000
Castings	4,540	159,000	160,000	3,800
Extrusion	1,010	70,900	71,000	831
Aluminum cans ⁴	2,360	584,000	585,000	1,730
Other wrought products	10,600	163,000	167,000	6,300
Auto shredder scrap	312	1,280	1,390	205
Total	18,800	979,000	984,000	12,900
Grand total integrated aluminum companies, etc.	28,300 ^r	1,680,000	1,680,000	23,200
All scrap consumed:				
New scrap:				
Extrusion	20,900 r	539,000	540,000	20,400
Can stock clippings	8,720	291,000	294,000	5,570
Other wrought sheet and clippings	11,200	476,000	476,000	11,200
Casting	2,040 r	62,100	62,600	1,550
Borings and turnings	4,730 ^r	132,000	132,000	3,900
Dross and skimmings	13,600	614,000	619,000	8,270
Total	61,100 ^r	2,110,000	2,120,000	50,800
Old scrap:				
Castings	7,850 ^r	265,000	266,000	6,500
Extrusion	8,380 ^r	217,000	217,000	8,320
Aluminum cans ⁴	30,900	769,000	771,000	28,400
Other wrought products	15,800 r	326,000	331,000	11,200
Auto shredder scrap	2,150 r	97,200	97,200	2,210
Total	65,100 ^r	1,670,000	1,680,000	56,600
Sweated pig	183	1,850	1,850	183
Grand total of all scrap consumed	126,000 r	3,790,000	3,810,000	108,000

^rRevised.

¹Includes imported scrap. According to reporting companies, 2.64% of total receipts of aluminum-base scrap, or 102,201 metric tons, was received on toll arrangements.

TABLE 4—Continued U.S. STOCKS, RECEIPTS, AND CONSUMPTION OF PURCHASED NEW AND OLD ALUMINUM SCRAP AND SWEATED PIG IN 2013^{1, 2}

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

³Includes inventory adjustment.

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

TABLE 5

PRODUCTION AND SHIPMENTS OF SECONDARY ALUMINUM ALLOYS BY INDEPENDENT SMELTERS IN THE UNITED STATES $^{\rm 1}$

(Metric tons)

	201	12	2013		
		Net		Net	
	Production	shipments ²	Production	shipments ²	
Diecast alloys:					
13% Si, 360, etc. (0.6% Cu, maximum)	44,800 r	45,400 ^r	44,500	44,100	
380 and variations	193,000 ^r	196,000	173,000	164,000	
Sand and permanent mold:					
95/5 Al-Si, 356, etc. (0.6% Cu, maximum)	57,800 ^r	58,100 ^r	57,800	57,800	
No. 12 and variations	998	998	998	998	
No. 319 and variations	80,200 ^r	81,100 ^r	80,800	80,900	
F-132 alloy and variations	4,780	4,620	4,780	4,780	
Al-Mg alloys	10,100	9,700	10,100	1,030	
Al-Zn alloys	2,290	2,080	2,290	2,290	
Al-Si alloys (0.6% to 2.0% Cu)	3,360	3,400	3,360	3,360	
Al-Cu alloys (1.5% Si, maximum)	1,600	1,750	1,600	1,600	
Al-Si-Cu-Ni alloys	1,850	1,870	1,850	1,850	
Other	154	98	154	154	
Wrought alloys, extrusion billets	527,000	525,000	519,000	519,000	
Miscellaneous:					
Steel deoxidation	32,700	32,700	26,200	26,200	
Pure (97.0% Al)	W	W	W	W	
Aluminum-base hardeners	W	W	W	W	
Other ³	41,100	36,600	33,700	46,800	
Total	1,000,000	1,000,000 r	961,000	954,000	
Less consumption of materials other than scrap:					
Primary aluminum	129,000	XX	110,000	XX	
Primary silicon	18,200 ^r	XX	16,600	XX	
Other	11,000 ^r	XX	8,540	XX	
Net metallic recovery from aluminum scrap and sweated					
pig consumed in production of secondary aluminum ingot ⁴	843,000 ^r	XX	825,000	XX	

^rRevised. W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous, other." XX Not applicable.

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

²Includes inventory adjustment.

³Includes other diecast alloys.

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

TABLE 6 DISTRIBUTION OF END-USE SHIPMENTS OF ALUMINUM PRODUCTS IN THE UNITED STATES AND CANADA, BY INDUSTRY¹

	20	12	20	13 ^p
	Quantity		Quantity	
	(thousand	Percent	(thousand	Percent
Industry	metric tons)	of grand total	metric tons)	of grand total
Containers and packaging	2,110	19.6	2,080	19.4
Building and construction	1,180 ^r	11.0	1,190	11.1
Transportation	3,220 ^r	29.9	3,370	30.6
Electrical	861 ^r	8.0	865	8.1
Consumer durables	672	6.2	699	6.3
Machinery and equipment	696 ^r	6.5	725	6.6
Other markets	343 ^r	3.1	331	3.1
Total	9,080 ^r	84.3	9,260	85.2
Exports	1,690 ^r	15.7	1,720	14.8
Grand total	10,800 r	100.0	11,000	100

^pPreliminary. ^rRevised.

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

Source: The Aluminum Association Inc.

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

(Thousand metric tons)

	2011	2012	2013 ^p
Wrought products: ³			
Sheet, plate, foil	4,000 ^r	4,100 ^r	4,080
Pipe, tube, extruded shapes	1,700 r	1,840 r	1,880
Rod, bar, wire, cable	369 ^r	401 ^r	397
Forgings (including impacts)	117 ^r	133 ^r	134
Powder, flake, paste	51 ^r	45 ^r	41
Total	6,240 r	6,520 r	6,540
Castings:			
Sand	178	127	132
Permanent and semipermanent mold	494	589	604
Die	1,010	1,110	1,240
Other	9	34	18
Total	1,690	1,860	2,000
Grand total	7,930 r	8,380 r	8,530

^pPreliminary. ^rRevised.

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

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

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

Source: The Aluminum Association Inc.

TABLE 8 ALUMINUM PRICES

(Dollars per pound)

Material	2012	2013
Primary aluminum, average: ¹		
U.S. market	1.010	0.942
London Metal Exchange cash price	0.916	0.837
NASAAC cash price, average ²	0.907	0.830
Secondary alloy, average: ³		
A319 (3% Cu)	1.100	1.084
A356 (0.2% Cu)	1.126	1.104
A360 (0.6% Cu)	1.116	1.095
A380 (3% Zn)	1.044	1.033
A413 (0.6% Cu)	1.117	1.098
Scrap, average: ³		
Clean, dry turnings	0.706	0.693
Mixed low-copper-content clips	0.748	0.731
Old cast	0.733 4	0.719
Old sheet	0.707^{-4}	0.692
Used beverage cans	0.755	0.731
¹ Source: Platta Matela Week		

¹Source: Platts Metals Week.

²North American Special Aluminum Alloy Contract.

³Source: American Metal Market.

⁴Average price for April–December; prices for January through March were not available.

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

	20	12	20	13
	Quantity	Value	Quantity	Value
Class	(metric tons)	(thousands)	(metric tons)	(thousands)
Crude and semicrude:				
Metals and alloys, crude	360,000	\$902,000	363,000	\$891,000
Scrap	2,040,000	3,490,000	1,870,000	3,290,000
Plates, sheets, bars, strip, etc.	1,010,000	4,390,000	1,090,000	4,620,000
Castings and forgings	23,400	335,000	20,200	344,000
Semifabricated forms, n.e.c. ²	47,000	365,000	47,000	390,000
Total	3,480,000	9,480,000	3,390,000	9,530,000
Manufactures:				
Foil and leaf	93,800	424,000	64,100	316,000
Powders and flakes	2,970	15,600	3,740	18,800
Wire and cable	42,800	154,000	45,900	159,000
Total	140,000	594,000	114,000	494,000
Grand total	3,620,000	10,100,000	3,500,000	10,000,000

¹Data are rounded to no more than three significant digits; may not add to totals shown. ²Not elsewhere classified.

 TABLE 10

 U.S. EXPORTS OF ALUMINUM, BY COUNTRY¹

	Metals and a	lloys, crude	Plates, sheets	s, bars, etc. ²	Scr	ар	To	tal
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Country	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)
2012:		· · · · · ·			· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · ·
Brazil	112	\$573	11,800	\$76,800	3,400	\$5,880	15,300	\$83,200
Canada	98,400	244,000	401,000	1,580,000	102,000	216,000	602,000	2,040,000
China	4,500	14,000	41,500	304,000	1,380,000	2,380,000	1,430,000	2,700,000
France	3,270	13,600	20,300	158,000	288	1,210	23,900	173,000
Germany	3,820	12,400	11,300	96,600	472	1,260	15,600	110,000
Hong Kong	152	1,120	2,040	14,600	30,100	47,700	32,300	63,400
Italy	32	290	3,680	43,800	20	32	3,740	44,100
Japan	948	3,780	17,400	210,000	9,690	25,300	28,100	239,000
Kazakhstan			4	33	42	68	46	101
Korea, Republic of	301	1,990	20,600	152,000	189,000	289,000	210,000	442,000
Mexico	236,000	572,000	337,000	1,380,000	130,000	266,000	702,000	2,210,000
Netherlands	46	428	912	14,000	709	1,750	1,670	16,200
Philippines	23	83	333	4,510	5	12	361	4,610
Russia		38	203	1,790			210	1,830
Saudi Arabia	63	159	64,800	220,000			64,800	220,000
Singapore	1,200	3,130	4,340	37,600	268	532	5,800	41,300
South Africa	22	181	480	4,920	19	30	521	5,130
Taiwan	2,700	7,340	10,700	61,900	73,600	88,600	87,000	158,000
Tajikistan	2,700				39	64	39	64
Thailand	9	27	1,820	12,700	6,380	8,220	8,200	20,900
Ukraine	2		(3)	12,700	0,580	8,220	(3)	20,900
United Kingdom	 987	4,860	17,500	155,000	700	1,030	19,200	161,000
Venezuela	26	4,800	969	6,520	700	1,050	995	6,610
Other	7,730	22,200	112,000	557,000	107,000	159,000	226,000	737,000
Total	360,000	902,000	1,080,000	5,090,000	2,040,000	3,490,000	3,480,000	9,480,000
2013:	500,000	902,000	1,000,000	5,070,000	2,040,000	5,470,000	5,400,000	7,400,000
Brazil	398	1,300	16,400	104,000	695	1,220	17,500	107,000
Canada	109,000	271,000	404,000	1,550,000	98,900	201,000	612,000	2,020,000
China	6,420	17,900	36,100	252,000	1,270,000	2,260,000	1,310,000	2,020,000
France	8,280	28,300	15,600	128,000	1,270,000	6,300	25,500	163,000
Germany	3,610	10,400	12,600	111,000	1,340	1,480	17,600	123,000
Hong Kong	256	1,640	12,000	14,000	35,600	59,100	37,800	74,700
Italy	13	1,040	4,110	,	121	211		51,000
y	1,390	6,550	4,110	50,700 218,000	15,400	33,100	4,240	,
Japan	<i>,</i>		19,800	218,000	· · · · · · · · · · · · · · · · · · ·	33,100	36,600 5	257,000 69
Kazakhstan						245.000		
Korea, Republic of	311	1,770 507,000	26,200	188,000	150,000	245,000 228,000	176,000 718,000	435,000 2,330,000
Mexico Netherlands	215,000 292	307,000 917	388,000 9,740	1,600,000	115,000 455	,	,	
			· · · · ·	65,500		1,780	10,500	68,200
Philippines	25	74	430	5,650	62	99	517	5,820
Russia	2	91	173	1,640			175	1,730
Saudi Arabia	112	292	68,200	234,000			68,300	234,000
Singapore	1,510	3,940	3,780	36,700	120	218	5,410	40,900
South Africa	19	158	107	1,340			126	1,500
Taiwan	4,340	11,400	5,620	44,500	73,400	98,100	83,400	154,000
Thailand	19	65	1,200	8,800	7,730	6,230	8,950	15,100
Ukraine			3	22			3	22
United Kingdom	1,060	3,840	14,400	141,000	1,070	1,630	16,500	146,000
Venezuela	10	90	1,080	8,420			1,090	8,510
Other	10,200	24,100	125,000	597,000	99,900	146,000	235,000	767,000
Total	363,000	891,000	1,150,000	5,360,000	1,870,000	3,290,000	3,390,000	9,530,000

⁻⁻ Zero.

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

²Includes castings, forgings, and unclassified semifabricated forms.

 3 Less than $\frac{1}{2}$ unit.

TABLE 11

U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY \mbox{CLASS}^1

	20	12	2013		
	Quantity	Value	Quantity	Value	
Class	(metric tons)	(thousands)	(metric tons)	(thousands)	
Crude and semicrude:					
Metals and alloys, crude	2,900,000	\$6,790,000	3,310,000	\$7,200,000	
Plates, sheets, strip, etc., n.e.c. ²	682,000	2,460,000	664,000	2,280,000	
Pipes, tubes, etc.	26,700	231,000	28,400	238,000	
Rods and bars	146,000	620,000	152,000	643,000	
Scrap	589,000	905,000	565,000	847,000	
Total	4,350,000	11,000,000	4,720,000	11,200,000	
Manufactures:					
Foil and leaf ³	130,000	517,000	145,000	626,000	
Powders and flakes	11,900	47,000	10,800	45,700	
Wire	232,000	644,000	225,000	583,000	
Total	374,000	1,210,000	381,000	1,250,000	
Grand total	4,720,000	12,200,000	5,100,000	12,500,000	

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

²Includes circles, disks, plates, and sheets; not elsewhere classified.

³Excludes etched capacitor foil.

TABLE 12 U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY COUNTRY $^{\rm 1}$

	Metals and a		Plates, sheets		Scr		Total		
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
Country 2012:	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)	(metric tons)	(thousands)	
Argentina	77,500	\$169,000	4	\$81			77,500	\$169,000	
Australia	26,400	63,100	47	650	40	\$59	26,500	63,800	
Bahrain	25,900	62,400	23,500	71,900	14	5	49,400	134,000	
Belgium	798	3,590	2,350	13,100	193	311	3,340	17,000	
Brazil	9,200	21,600	18,300	51,200	2,860	1,120	30,400	73,900	
Canada	1,910,000	4,390,000	293,000	1,060,000	350,000	531,000	2,550,000	5,970,000	
China	1,310	4,810	109,000	376,000	166	335	111,000	381,000	
France	3,670	11,400	4,190	38,500	38	145	7,890	50,000	
Germany	767	3,670	80,300	397,000	216	414	81,300	401,000	
Italy	5,940	12,300	5,620	35,900	774	809	12,300	49,000	
Japan	40	113	4,270	46,300	1,660	1,970	5,970	48,400	
Korea, Republic of	15,500	35,200	3,800	20,300	1,040	537	20,300	56,100	
Mexico	35,600	218,000	30,400	155,000	128,000	199,000	194,000	572,000	
Netherlands	1,300	5,050	1,160	7,550	552	791	3,000	13,400	
Norway	6,610	15,800	63	1,030			6,680	16,800	
Panama	790	1,430	158	605	3,340	5,370	4,290	7,400	
Russia	291,000	652,000	15,000	67,200			306,000	719,000	
Slovenia			3,350	17,000			3,350	17,000	
South Africa	4,580	21,600	59,200	197,000			63,800	218,000	
Spain	540	2,160	299	2,280	56	92	895	4,530	
Tajikistan	13,900	26,200		2,200			13,900	26,200	
Ukraine	5,310	10,400	1	21			5,310	10,400	
United Arab Emirates	254,000	602,000	13	204	1,170	1,840	256,000	604,000	
United Kingdom	654	2,780	11,800	50,300	7,060	11,200	19,500	64,200	
Venezuela	46,000	93,000	651	1,320	2,600	5,310	49,300	99,600	
Other	163,000	371,000	189,000	702,000	2,000 88,800	145,000	440,000	1,220,000	
Total	2,900,000	6,790,000	855,000	3,310,000	589,000	905,000	4,350,000	11,000,000	
2013:	2,900,000	0,790,000	855,000	3,310,000	589,000	905,000	4,550,000	11,000,000	
Argentina	97,300	212,000	31	368			97,300	213,000	
Australia	27,300	63,500	67	621			97,300 27,400	64,100	
Bahrain	29,300	68,300	25,400	75,100			54,700	143,000	
			2,730	17,100	 457	727	· · · · ·	25,500	
Belgium	1,310	7,700	,	· · · ·			4,490	,	
Brazil	33,900	64,400	8,240	23,100	710	1,160	42,900	88,600	
Canada	2,440,000	5,220,000	213,000	786,000	345,000	505,000	3,000,000	6,510,000	
China	10,400	24,600	194,000	584,000	967	1,370	205,000	610,000	
France	4,510	28,600	3,520	36,100	33	111	8,070	64,800	
Germany	1,290	3,810	80,600	384,000	281	503	82,200	388,000	
Italy	15	81	6,360	39,200	1,490	1,420	7,860	40,700	
Japan	213	822	5,210	48,400	868	1,170	6,290	50,400	
Korea, Republic of	14,800	32,500	4,650	22,600	176	312	19,600	55,400	
Mexico	8,180	14,600	33,500	164,000	129,000	194,000	170,000	372,000	
Netherlands	1,640	5,760	1,370	9,170	472	754	3,480	15,700	
Norway	17,800	43,100	49	1,040			17,800	44,200	
Panama	705	1,260	70	300	3,690	5,920	4,470	7,470	
Russia	190,000	429,000	15,400	64,900			205,000	494,000	
Slovenia			2,720	13,700			2,720	13,700	
South Africa	12,400	32,000	59,300	189,000	84	228	71,800	222,000	
Spain	543	2,090	813	5,270	1,640	2,760	3,000	10,100	
Ukraine	983	1,780	4	26	2,410	4,760	3,390	6,570	
United Arab Emirates	250,000	580,000	402	1,560	1,980	3,370	253,000	585,000	
United Kingdom	504	2,250	14,900	61,400	10,600	17,400	26,000	81,000	
Venezuela	49,400	102,000	2	4	1,740	3,390	51,100	105,000	
	115,000	254,000	173,000	638,000	64,500	104,000	352,000	995,000	
Other									

⁻⁻ Zero.

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

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

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

(Thousand metric tons)

Country	2009	2010	2011	2012	2013 ^e
Argentina	413 ^r	417 ^r	416 ^r	413	425
Australia	1,943	1,928	1,945	1,864	1,778 3
Azerbaijan			20 ^e	55 ^{r, e}	60
Bahrain	848	851	881	890	913 ³
Bosnia and Herzegovina ⁴	96	118 ^e	131	126 ^e	110
Brazil	1,536	1,536	1,440	1,436	1,304 3
Cameroon	73	76	69	69 ^{r, e}	75 ³
Canada	3,030	2,963	2,988 r	2,781	2,967 3
China ^e	12,900	16,200	18,100	20,300 e	22,100
Egypt ^e	265 ³	266	265	265	320
France	345	356	334	349 ^e	346
Germany	292	402	432	410	492
Ghana			35 °	40 r	40
Greece ^e	130 3	130	132	135	133
Iceland	805 ^r	806	781	820 ^e	800
India	1,598	1,607 ^r	1,667	1,700 ^e	1,703 3
Indonesia	258	253	244	248 r	250
Iran ^e	200 r	192	224 ^{r, 3}	230 r	300
Italy ^e	171 3	168	141 ^r	110	
Japan	39	54	47 ^r	31 ^r	33
Kazakhstan	127	226 r	249	249	250
Malaysia	15	60	80	120 e	270
Montenegro	64	82	93	90 r	80
Mozambique	545	557	562	564	570 ³
Netherlands ^e	300 ³	300	300	110 ^r	50
New Zealand	272	343	354	327	324 ³
Nigeria	13	21 r	18 ^r	26	2 ³
Norway	1,139	1,109	1,122	1,145	1,100
Oman	351	367	373	360 ^e	354
Qatar	10	126	450	604	600
Romania ⁵	201	241	261	249	250 ³
Russia	3,815	3,947	3,993 ^r	3,924 ^r	3.724 3
Saudi Arabia				5 °	190 ⁻³
Slovakia	150	163	163	181 ^r	160
Slovenia ^{e, 4}	35 ³	40 ³	40	40	40
South Africa	809	807	809	665	822 ³
Spain ^e	360 ³	340	365	230	235
Sweden	70 ^r	93	111	129 °	131 3
Tajikistan	359	349	278	273	216 ³
Turkey ^e	35	60	60	60	60
Ukraine ⁵	50	25	7 ^{r, 3}	r, 3	- 3
	1,010 ⁻³				1,864 ³
United Arab Emirates ^e		1,400	1,800	1,820	
United Kingdom	253	186	213	60 2.070	44 ³
United States	1,727	1,726	1,986	2,070	1,946 ³
Venezuela	561 27 200 r	335 41,200 r	380 44,400 r	200 °	160
Total *Estimated 'Revised Zero	37,200 ^r	41,200	44,400	45,800 ^r	47,600

^eEstimated. ^rRevised. -- Zero.

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

²Primary aluminum is defined as "The weight of liquid aluminum as tapped from pots, excluding the weight of any alloying materials as well as that of any metal produced from either returned scrap of remelted material." International reporting practices vary from country to country, some nations conforming to the foregoing definition and others using different definitions. For those countries for which a different definition is given specifically in the source publication, the definition is provided in a footnote. Includes data available through May 14, 2014.

³Reported figure.

⁴Primary ingot plus secondary ingot.

⁵Primary unalloyed metal plus primary alloyed metal, thus including weight of alloying material.