

ALUMINUM

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In 2000, 12 domestic companies operated 23 primary aluminum reduction plants that produced almost 3.7 million metric tons (Mt) of metal. Montana, Oregon, and Washington accounted for 36% of the production; Maryland, New York, Ohio, and West Virginia, 22%; and other States, 42%. The value was estimated to be \$6 billion.

Increased energy costs, particularly in the Pacific Northwest, led several aluminum smelters to reduce production capacity during the latter half of the year. By yearend, a total of 729,000 tons per year (t/yr) of primary smelter capacity had been closed, about 45% of the 1.62 million tons per year (Mt/yr) of engineered capacity for the 10 smelters operating in the region.

Aluminum recovered from purchased scrap decreased by 7% to 3.45 Mt. Of this recovered metal, 60% came from new (manufacturing) scrap and 40% from old (discarded aluminum products) scrap. Aluminum used beverage can (UBC) scrap accounted for more than one-half of the reported old scrap consumption in 2000. The recycling rate for aluminum UBCs remained relatively stable at 62.1%.

The transportation and the container and packaging industries remained the largest domestic markets for aluminum products in 2000. The transportation industry accounted for 37% of domestic consumption; containers and packaging, 23%; building and construction, 15%; consumer durables, 8%; electrical, 8%; and other uses, 9%.

U.S. imports for consumption decreased in 2000 compared with those of 1999, reversing a 3-year upward trend that began in 1997. Canada remained the largest shipper of aluminum materials to the United States, followed by Russia. Total

exports from the United States increased 7% in 2000.

The price of primary ingot on the domestic and the international markets fluctuated during the year. The 2000 monthly average domestic price decreased by almost 6 cents per pound from January to December. The annual average, however, increased compared with that of the previous year.

At the end of 2000, world inventories, as reported by the International Aluminium Institute (IAI), decreased slightly compared with those of 1999. Inventories of primary metal held by the London Metal Exchange Ltd. (LME) decreased dramatically, whereas inventories of aluminum alloy increased.

Primary aluminum was produced in 43 countries in 2000. The United States remained the largest producer with 15% of the world total, followed by Russia with 14%, China with an estimated 11%, and Canada with 10%. World primary metal production increased by about 2% compared with that of 1999.

Production

Primary.—Domestic primary aluminum production, which totaled a reported 3,668,438 metric tons (t), decreased by 3% compared with that of 1999 (table 1). Production data were obtained from the 12 domestic producers, all of whom responded to the request from the U.S. Geological Survey (USGS) for data.

On May 3, 2000, Alcoa Inc. and Reynolds Metals Co. announced that the U.S. Department of Justice (DOJ) and the European Union (EU) had approved their proposed merger and that the merger had been completed. Reynolds shareholders had

Aluminum in the 20th Century

Aluminum is the second most abundant metallic element in the earth's crust after silicon, yet it is a comparatively new industrial metal that has been produced in commercial quantities for just over 100 years. In April 1886, a formal patent application was filed that permitted, for the first time, the mass commercial production of aluminum. In 1900, the Pittsburgh Reduction Company (Alcoa Inc.) was the sole domestic producer of primary aluminum metal, and production had grown to 3,244 metric tons (7.15 million pounds) from 83 pounds in 1883. World production in 1900 totaled 7,339 tons and took place at nine reduction plants owned by six companies in four countries. The United States was the leading producer, followed by Switzerland (2,500 tons), France (1,026 tons), and the United Kingdom (569 tons). The metal was used mainly as a substitute for copper in the transmission of electricity and for culinary articles, machinery parts, special alloys, explosives, paint, and as a substitute for stone and zinc in lithographic work.

In 2000, the United States remained the world's largest

producer and consumer of aluminum; however, its dominance in the industry had eroded over the last 40 years of the century. At the close of World War II, domestic primary aluminum production accounted for over 40% of the world's production. In 2000, primary aluminum was produced in 43 countries, and the United States accounted for only about 15% of the 24 million tons of production. Since the inception of the aluminum industry, metal has been recovered from scrap and its importance as a source of aluminum supply continues to grow. In 2000, metal recovered from scrap accounted for about 35% of the domestic supply of aluminum. Energy costs and concerns over waste management will continue to provide the impetus for increased recycling rates. Today, aluminum is used in a wide range of applications, such as automobiles, airplanes, buildings, tools, appliances, packaging, electrical systems, and countless other components of everyday life. Measured either in quantity or value, aluminum's use exceeds that of any other metal except steel, and it is important in virtually all segments of the world economy.

approved the merger on February 11. Under the terms of the consent decree entered into with the DOJ and an undertaking agreement with the EU, Alcoa was forced to sell a 25% interest in Reynolds' Longview, WA, smelter, as well as Reynolds' interests in three alumina refineries—Worsley, Australia (56%); Stade, Germany (50%); and Sherwin, TX (100%). As a result of the merger, each outstanding share of Reynolds common stock was converted into 1.06 shares of Alcoa common stock (Alcoa Inc., 2000g).

On June 1, Alcan Aluminium Ltd. and algroup, the aluminum division of Alusuisse Lonza Group Inc., announced that, following the approval of the DOJ and the EU, the companies had reached agreement on their merger plan (Alcan Aluminium Ltd., 2000a). The EU gave its approval subject to commitments made by the companies to alleviate the EU's competition concerns in the aluminum trihydrate (ATH) market. Among its commitments, Alcan proposed selling algroup's ATH facility in Martinswerk, Germany, and the algroup lithography operations in Bridgenorth, United Kingdom (Platt's Metals Week, 2000j). The merger, which involved the combination of a cash payment and the exchange of 17.1 Alcan common shares for every algroup share, was finalized on October 17 (Alcan Aluminium Ltd., 2000h).

Increased energy costs, particularly in the Pacific Northwest, led several aluminum smelters to reduce production capacity during the latter half of the year. By yearend, a total of 729,000 t/yr of primary smelter capacity had been closed, about 45% of the 1.62 Mt/yr of engineered capacity for the 10 smelters operating in the region. Columbia Falls Aluminum Co. had idled two and one-half of its five potlines at its 168,000-t/yr Columbia Falls, MT, smelter and temporarily reduced production capacity by 84,000 t/yr (Metal Bulletin, 2000i). Northwest Aluminum Corp. closed its 82,000-t/yr smelter in The Dalles, OR (Metal Bulletin, 2000j). Goldendale Aluminum Co. idled all but 25,000 t/yr of capacity at its 168,000-t/yr smelter in Goldendale, WA (Metal Bulletin, 2000j). Kaiser Aluminum & Chemical Corp. closed its 73,000-t/yr Tacoma, WA, smelter and idled 110,000 t/yr of capacity at its 200,000-t/yr smelter in Spokane (Mead), WA (Kaiser Aluminum & Chemical Corp., 2000b). Alcoa temporarily idled its 121,000-t/yr smelter in Troutdale, OR (Alcoa Inc., 2000j), and Vanalco Inc. idled its 116,000-t/yr smelter in Vancouver, WA (Metal Bulletin, 2000v).

In June, Ormet Primary Aluminum Corp. temporarily closed two potlines at its 257,000-t/yr smelter in Hannibal, OH, resulting in a loss of 7,000 metric tons per month (t/mo) of aluminum metal production. The decision to close was based on low aluminum prices, higher than usual alumina prices, and higher electrical energy prices in the peak summer months. During the closure, the company sold its excess alumina and electricity (Ormet Primary Aluminum Corp., 2000b). In August, Ormet announced the restart of the two idled potlines, which were back in operation by the end of September (Ormet Primary Aluminum Corp., 2000a).

Alcan restarted 60,000 t/yr of capacity at its 186,000-t/yr primary aluminum smelter in Sebree, KY, to meet increased customer demand and to compensate for smelter closures in Canada and the United Kingdom. The restart was completed by yearend (Alcan Aluminium Ltd., 2000f).

In January, Alcoa announced plans to restart 200,000 t/yr of primary aluminum smelter capacity by the end of the year. The restarts would be spread over the 450,000-t/yr of capacity that

had been idled since 1994 and was expected to involve low-cost, operating smelters in the United States and Australia (Alcoa Inc., 2000k).

Alcoa and Michigan Avenue Partners (MAP) announced that they had reached an agreement whereby MAP would acquire the 204,000-t/yr aluminum smelter in Longview, WA. Alcoa was required to sell 25% of Longview as a condition of the EU approval of the Alcoa/Reynolds merger, but Alcoa accepted MAP's offer to purchase the entire operation. MAP is a Chicago investment group. One of its affiliates, McCook Metals L.L.C. is the second largest aluminum plate company in North America and produces specialty products for aircraft, aerospace, and defense industries. The sale was contingent on financing and regulatory approval (Alcoa Inc., 2000m).

Century Aluminum Co. purchased Xstrata AG's 23% interest in the 215,000-t/yr Mount Holly, SC, primary aluminum smelter. The \$95 million purchase increased Century Aluminum's interest in the smelter to 49.67%. Alcoa, which owned 50.33% of the smelter, will continue to operate and manage the facility (Regan, 2000a).

Century Aluminum and Southwire Co. reached a definitive agreement for the purchase of Southwire's 237,000-t/yr smelter in Hawesville, KY. Completion of the \$468 million transaction was subject to the completion of a labor agreement, arrangement of financing, and the receipt of regulatory approvals (Southwire Co., 2000).

Noranda Aluminum Inc. commissioned its new single-piece anode process at its 222,000-t/yr aluminum smelter in New Madrid, MO. Completion of the \$72 million expansion, which was expected by mid-2002, will increase production capacity at the smelter by 15% to 253,000 t/yr (Platt's Metals Week, 2000o).

Alcan revealed plans for a \$22 million capital project to expand extrusion billet production at its Sebree, KY, aluminum smelter by 65,000 t/yr. The project, which was begun in August and would require approximately 20 months to complete, involved engineering work and construction of an ultrasonic billet inspection station, a new continuous homogenization furnace, as well as an automated billet sawing and stacking system (Alcan Aluminium Ltd., 2000c).

Ormet announced that it planned to curtail carbon anode operations at its Hannibal smelter by the end of September 2001. The company reported that the closure was primarily in response to the Maximum Achievable Control Technology requirements, as established under the provisions of the Clean Air Act, that were due to take effect at their smelter in October 2001. Ormet's decision not to modernize the facility to meet the new environmental standards was owing to the age and configuration of the facility and the potential development of advanced technology. The company was negotiating with outside suppliers for the purchase of its 170,000-t/yr carbon anode requirement. The purchased anodes, which would be larger than those produced by Ormet, reportedly would allow increased metal production without the consumption of additional power (Ormet Primary Aluminum Corp., 2000c).

In May, members of United Steelworkers of America (USWA) Local 5724, which represents 1,200 employees at Ormet's Hannibal, OH, smelter, ratified a new labor agreement. Terms of the contract, which was set to expire at the end of August 2003, were not disclosed (Regan, 2000b).

Century Aluminum and the USWA reached agreement on a new 5-year labor contract at the Hawesville, KY, primary

aluminum smelter. Terms of the agreement, which will become effective upon completion of the purchase of the smelter, were not disclosed (Metal Bulletin, 2000h).

A labor dispute between the USWA and Kaiser, which began in September 1998, officially ended on September 18 when an arbitration panel ruled on a half-dozen unresolved issues that were blocking completion of a new contract. The new contract runs through September 30, 2005, calls for a 2.6% average annual increase in the overall wage and benefit package, and reduces the total number of hourly jobs by approximately 19% at the five plants covered by the contract (Kaiser Aluminum & Chemical Corp., 2000a).

MAP and USWA ratified a new 5-year labor contract covering workers at the Scottsboro, AL, rolling mill. The contract included increases in wages, pensions, retiree medical benefits, and enhanced opportunities to share in productivity gains. The mill produces about 136,000 t/yr (300 million pounds per year) of mill-finished and painted sheet products (Metal Bulletin, 2000t).

Alcan announced that it was investing \$15 million at its Terre Haute, IN, light gauge rolling facility. The project, which ultimately would increase the plant's capacity by about 22,700 t/yr (50 million pounds per year), included a wide foil mill with doubling capability to complement existing rolling equipment. The facility produces light gauge aluminum fin and foil products (Alcan Aluminium Ltd., 2000g).

Kaiser completed the sale of its Micromill® assets and patented technology to Alcoa for an undisclosed price. The Micromill process is a continuous casting technology developed by Kaiser in the early 1990s, which was designed to convert molten metal into aluminum sheet in a single continuous step. The prototype plant built in Reno, NV, a key element of the sale to Alcoa along with all patent rights to the technology, was designed to produce 41,000 t/yr (90 million pounds per year) of flat rolled aluminum (Metal Bulletin, 2000c).

Commonwealth Industries Inc. announced that its subsidiary, Commonwealth Aluminum Corp., signed a 10-year guaranteed supply agreement with Glencore Ltd. for the purchase of primary aluminum. Commonwealth agreed to purchase a minimum of 544,000 t (1.2 billion pounds) of aluminum beginning January 1, 2001. This purchase will fill only part of Commonwealth's metal requirements for its fabrication facilities. Commonwealth Aluminum is a large recycler of aluminum, and more than one-half of its raw material comes from scrap (Commonwealth Industries Inc., 2000).

McCook Metals, a subsidiary of MAP, entered the aluminum extrusion market. The company began casting 2000, 6000, and 7000 series extrusion billets at its rolling mill in McCook, IL. Depending on the alloy, the plant uses scrap and/or primary metal to make the billets (Platt's Metals Week, 2000l).

Norsk Hydro ASA purchased Wells Aluminum Corp., a major U.S. extrusion company based in Baltimore, MD. The acquisition will increase Hydro's extrusion capacity by 75,000 t/yr and, according to the company, will make it the fourth largest extrusion company in the United States with a potential sales volume of 110,000 t/yr. Wells was a custom extruder, finisher, and fabricator of soft alloy aluminum products principally serving the building and construction, transportation, consumer durables, and electrical markets. Wells had a network of 7 facilities with 12 extrusion presses in 6 Midwestern and Southeastern States plus its own casting facility for extrusion billet (Norsk Hydro ASA, 2000b).

Alcoa purchased Excel Extrusions Inc., a subsidiary of Noranda Aluminum Inc. Excel's plant in Warren, OH, has the capacity to produce about 16,000 t/yr (35 million pounds per year) of soft alloy aluminum extrusions, which are used primarily in the building and construction industries. The plant also has a vertical paint line with a capacity to coat about 11,000 t/yr (24 million pounds per year) of extrusions (Alcoa Inc., 2000h).

Butler Manufacturing Co. announced plans to build a new aluminum extrusion and finishing plant in Greeneville, TN, for its Vistawall Architectural Products division, a manufacturer of engineered windows, curtain walls, storefront and skylight systems for the nonresidential building construction market (Butler Manufacturing Co., 2000). The plant initially will add 9,000 t/yr (20 million pounds per year) of capacity, increasing the company's extrusion capacity by 50% (Platt's Metals Week, 2000f).

Indalex Aluminum Solutions Group, a subsidiary of Caradon plc of the United Kingdom, underwent some major changes during the year. Indalex acquired the aluminum extrusion and billet casting operations of Columbia Pacific Aluminum Corp., a subsidiary of Columbia Ventures Corp. The purchase included casting plants in City of Industry, CA, and Rockwall, TX, as well as three extrusion plants in California—Modesto, Watsonville, and City of Industry (Platt's Metals Week, 2000h). Indalex closed two of its older extrusion facilities in Dolton, IL, and Winton, NC (Platt's Metals Week, 2000k). The company also launched several expansion plans. Indalex announced plans to build a new 79,000-t/yr (175-million-pound-per-year) casting facility in Toronto, Canada. The plant will become part of Indalloy, the casting division of Indalex (Indalex Aluminum Solutions Group, 2000b). Expansion plans for existing facilities were also announced. Indalex planned to invest \$42 million during 2001 to improve and expand its facilities in Gainesville, GA; Elkhart, IN; and Toronto, Canada (Indalex Aluminum Solutions Group, 2000a).

Quanex Corp. purchased Temroc Metals Inc., an aluminum extrusion and fabrication company based in Hamel, MN, which produced customized aluminum extrusions and fabricated metal products for recreational vehicles, architectural products, electronics, and other markets (American Metal Market, 2000f).

Alcoa announced plans to begin construction of a new cast aluminum rod production facility in early 2001. The facility will produce cast rod in sizes tailored to forged and impact-extruded applications in the automotive, industrial, and consumer markets, and will increase the availability of standard and special rod and bar, standard and custom profiles, seamless and structural pipe and tube, and drawn seamless tube (Alcoa Inc., 2000i).

Alcoa acquired Cordant Technologies Inc. Cordant was composed of three business units: Howmet Castings, a supplier of investment cast superalloy and titanium components used in jet aircraft and electrical power generation; Huck Fasteners, a designer and manufacturer of high-performance fasteners and fastening systems; and Thiokol Propulsions, a supplier of solid rocket propulsion systems. Cordant had approximately 17,000 employees worldwide at some 58 facilities in Canada, France, Japan, the United Kingdom, and the United States (Alcoa Inc., 2000e). With the purchase of Cordant, Alcoa acquired 84.7% of Howmet International Inc. By the end of June, Alcoa had purchased all of the outstanding shares of Howmet and became the company's sole owner (Alcoa Inc., 2000f).

Alcoa also purchased the assets of privately held C-KOE Aluminum Inc. of Dallas, TX. C-KOE Aluminum produced primary grade aluminum particle ingot for the chemicals and metals markets (Alcoa Inc., 2000b).

Secondary.—Metal recovered from new and old scrap decreased to 3.45 Mt in 2000 (table 3), according to data derived by the USGS from its “Aluminum Scrap” survey. Of the 78 companies and/or plants to which monthly or annual survey requests were sent, 57 responded, which represented 91% of the total scrap consumed, as listed in table 4.

According to figures released by the Aluminum Association Inc., the Can Manufacturers Institute and the Institute of Scrap Recycling Industries Inc., 62.6 billion aluminum UBCs were recycled in the United States in 2000, for a beverage can recycling rate of 62.1% or nearly two of every three aluminum cans shipped. Although the recycling rate was slightly lower than the 1999 rate of 62.5%, this was the 12th consecutive year that the U.S. recycling rate exceeded 60%. According to the organizations, the average aluminum beverage can produced domestically is comprised of more than 51% recycled content (Aluminum Association Inc., 2001a).

Superior Aluminum Alloys installed a third furnace at its New Haven, IN, facility increasing the plant’s capacity by 42%. The plant’s capacity will increase to about 8,000 t/mo (17 million to 18 million pounds per month) or more than 90,000 t/yr. The company also installed an automatic sow-casting system, which will enable it to pour up to one sow per minute (Platt’s Metals Week, 2000p).

Behr Metals, a subsidiary of Joseph Behr & Sons, also installed a new furnace at its facility that doubled the plant’s smelting capacity. A new 102-t (225,000-pound) furnace was installed at the company’s Rockford, IL, plant and was expected to produce about 3,000 t (7 million pounds) of metal per month (Metal Bulletin, 2000f).

Alcan’s extrusion scrap recycling facility in Sebree, KY, started up during the latter half of the year. The feed for this plant was expected to be new extrusion scrap, most of which would be generated by Alcan’s customers. The furnace has an capacity of 50,000 t/yr (Platt’s Metals Week, 2000b).

In October, Norsk Hydro’s new remelt plant in Henderson, KY, came on-stream with an initial capacity of 90,000 t/yr of extrusions. The plant will recycle aluminum scrap into primary quality aluminum extrusion billets (Norsk Hydro ASA, 2001a, p. 21).

Wabash Alloys LLC closed 25% of its capacity at its East Syracuse, NY, plant. Prior to the cutback, the plant had a capacity of about 7,000 t/mo (15 million pounds per month) (Worden, 2000c).

Huron Valley Steel Corp. closed its 27,000-t/yr (60-million-pound-per-year) River Rouge, MI, smelter. The facility, known as Fritz Products, produced specification ingot, such as A380.1, from shredded aluminum scrap provided by Huron Valley. In lieu of operating the smelter, the company will concentrate on improving the quality of and expanding the markets for shredded aluminum products based on recent improvement in their aluminum particle sorting technologies. Longer-term plans called for upgrading and reopening the River Rouge smelter (Worden, 2000c).

Keystone Aluminum Inc. reportedly closed its secondary smelter in Mars, PA. The plant produced aluminum deox for the steel industry (Worden, 2000a).

In December, Alchem Aluminum Inc., a wholly owned

subsidiary of IMCO Recycling Inc., began operations at its new 91,000-t/yr smelter in Saginaw County, MI, that will supply General Motors Corp. (GM) with more than 900,000 t (2 billion pounds) of specification aluminum alloys over a 13-year period. All of the production from this plant will be delivered in molten form to GM’s Saginaw metal casting operation to manufacture engine components (IMCO Recycling Inc., 2001a, p. 3, 6).

Quanex purchased a continuous cast rolling mill in Ft. Lupton, CO, from Alcoa. In August 1999, Alcoa purchased the Ft. Lupton and the San Antonio, TX, rolling mills from ACX Technologies Inc. Both of the plants converted UBCs to can sheet. Upon reviewing the Alcoa purchase, the DOJ determined that the acquisition of the Ft. Lupton facility would likely lessen competition in the manufacture and sale of can lid stock since Alcoa controlled 50% of the North American market and Ft. Lupton was one of only five other North American producers. Therefore, to avoid antitrust violations, Alcoa was required to sell the facility and upon its purchase, Quanex was required to continue to operate the plant in the manufacture and sale of can lid stock (Platt’s Metals Week, 2000m).

IMCO closed its Sikeston, MO, and Bedford, IN, aluminum recycling plants. The material processed at these plants will be handled at other IMCO facilities and most of the plants’ equipment will be sent to other plants (IMCO Recycling Inc., 2000). The closure of the Bedford and Sikeston plants reportedly reduced IMCO’s domestic annual capacity by about 10% or 122,000 t (270 million pounds) (IMCO Recycling Inc., 2001b). IMCO also temporarily closed its Wendover, UT, plant that normally recycled aluminum dross (IMCO Recycling Inc., 2001a, p. 8).

Consumption

In 2000, the transportation industry accounted for slightly more than 3.6 Mt of total U.S. shipments of aluminum products (table 6). Shipments to the container and packaging industry, which was the second largest domestic end-use market, continued to decline and was less than 2.3 Mt. Total shipments of aluminum products to domestic users in 2000 was at the same level as that of 1999.

The Partnership for a New Generation of Vehicles (PNGV), initiated in 1993, represents a historic and unprecedented collaboration among teams of scientists and engineers from the U.S. automotive industry, the Federal Government, and academia. One of the goals of the PNGV is the development of family car prototypes that will get nearly three times the Corporate Average Fuel Economy (CAFE) Federal regulatory requirement of 27.5 miles per gallon. At the North American International Auto Show, held in January, Ford Motor Co. and GM introduced their prototypes to the public. Both the GM Prodigy and the Ford Precept were reported to be aluminum intensive vehicles that would use aluminum for the frame and body panels (Wrigley, 2000d). Meanwhile, the use of aluminum in the typical family vehicle continued to grow from 75 kilograms (kg) (166 pounds) in 1991 to more than 111 kg (245 pounds) in 2000 (Wrigley, 2000f).

DaimlerChrysler Corp. announced that it planned to purchase the major components for its new cross-mounted V-6 engines from Nemak SA, Monterrey, Mexico. When engine production begins in 2002, the block and head castings are expected to use more than 14,000 t (31 million pounds) of recycled aluminum annually (Wrigley, 2000g). Later in the year, GM announced

that it would purchase, on an annual basis, aluminum cylinder head castings from Nematik for up to 350,000 of its Gen III Vortec V-8 truck engines. Nematik's 7,300 t/yr (16 million pounds per year) of head castings would supplement the castings already being provided by GM's own casting operations in Saginaw, MI, and Castech SA's facilities in Saltillo, Mexico (Wrigley, 2000c).

Ford opened a new aluminum casting plant in Brook Park, OH, to produce engine blocks for its new 2.3 liter, in-line four-cylinder engine. Initial production at the plant was expected to be about 110,000 aluminum engine blocks per year. Precision sand casting will be used to produce the engine blocks (Wrigley, 2000b). In November, Ford and Nematik signed an agreement giving Nematik control of Ford's two big aluminum parts-casting plants in Ontario, Canada, the Windsor Aluminum Plant and the Essex Aluminum Plant. These two plants consume enough secondary aluminum alloy to produce an estimated 81,600 t (180 million pounds) of engine castings each year (Wrigley, 2000a).

Alcan and Ford signed a multiyear aluminum supply agreement. Alcan will provide metal in various forms, including foundry ingot for cast products and flat-rolled autobody sheet for Ford's stamping plants. Alcan will also provide design and technology support services, and Ford will purchase minimum monthly volumes of metal with options for additional amounts as required (Alcan Aluminium Ltd., 2000b).

Anticipating a major increase for aluminium suspension system components in the automotive market, Hayes Lemmerz International Inc. announced plans to build a new foundry in Montague, MI. The plant reportedly would use primary aluminum casting alloys to produce control arms, knuckles, crossmembers, and other components for the North American automotive industry (Wrigley, 2000e).

Pechiney sold its remaining interest in American National Can Group (ANC) to Rexam plc of the United Kingdom. With can plants elsewhere in Europe, the addition of ANC's 38 billion beverage cans per year gives Rexam an annual canmaking capacity of 45 billion cans and makes the company the world's largest can manufacturer (Metal Bulletin, 2000q).

Ball Corp., a metal and plastic packaging supplier, announced several plant closures during the year. Ball's Salisbury, NC, aluminum beverage can plant, which had the capacity to produce about 1 billion cans per year, was closed during the third quarter. Ball also announced that it had halted a previous owner's plans to install a beverage can line in a plant in China and had written off a 10% stake in a Russian beverage can joint venture (Platt's Metals Week, 2000d). Ball closed a two-piece aluminum beverage can manufacturing line at its Richmond, British Columbia, plant, and a metal coating and sheeting operation at its Hamilton, Ontario, facility was expected to close by March 2001 (American Metal Market, 2000c).

Crown Cork & Seal reported the reorganization of its U.S. metal packaging units from a single business unit into three divisions—beverage cans, food cans, and aerosol cans. The breakup would give the company the flexibility to sell or joint venture the individual divisions (Platt's Metals Week, 2000i).

Stocks

Domestic inventories of aluminum ingot, mill products, and scrap decreased to 1.55 Mt at yearend 2000 from 1.87 Mt at yearend 1999 (Aluminum Association Inc., 2001b). The LME

reported that primary aluminum metal ingot at its U.S. warehouses decreased dramatically to 125 t at yearend 2000 from 12,700 t at yearend 1999. The LME also reported that at yearend 2000 its U.S. warehouses did not hold any stocks of aluminum alloy ingot compared with 860 t at yearend 1999 (London Metal Exchange Ltd., 2000).

Prices

The monthly average U.S. market price of primary aluminum metal, as reported by Platt's Metals Week, fluctuated throughout the year. The monthly average price began the year at 80.1 cents per pound and, by December, had fallen to 74.3 cents per pound. However, the average price for the year increased from 65.7 cents per pound in 1999 to 74.6 cents per pound in 2000.

The LME cash price for high-grade primary aluminum ingot followed the same general trend as the U.S. market price. The 2000 average annual LME cash price was 70.3 cents per pound.

In May 1999, the Commodity Exchange (COMEX) division of the New York Mercantile Exchange (NYMEX) launched an aluminum futures contract for primary aluminum ingot. During its first full year of trading, the average monthly spot settlement price followed the trend of both the U.S. market and LME prices. The monthly average, based on a rolling average of the daily spot settlement price, declined from 80.3 cents per pound in January to 74.6 cents per pound in December.

Purchase prices for aluminum scrap, as quoted by American Metal Market, also fluctuated during the year but closed at lower levels than those at the beginning of the year. The yearend price ranges for selected types of aluminum scrap were as follows: mixed low-copper-content aluminum clips, 47.5 to 48.5 cents per pound; old sheet and cast aluminum, 38.5 to 39.5 cents per pound; and clean, dry aluminum turnings, 40 to 41 cents per pound.

Aluminum producers' buying price range for processed and delivered UBCs, as quoted by American Metal Market, also closed lower at yearend. The price range began the year at 57 to 59 cents per pound and closed the year at 53 to 54 cents per pound. Resource Recycling published a monthly transaction price for aluminum UBCs in its Container Recycling Report. During the year, the monthly average decreased significantly from 62.9 cents per pound in January to 53.9 cents per pound in December. However, similar to the U.S. market price trend of primary aluminum ingot, the annual average price for aluminum UBCs in 2000 of 57.7 cents per pound was higher than the 1999 annual average of 50.6 cents per pound.

The yearend indicator prices for selected secondary aluminum ingots, as published in American Metal Market, also decreased significantly compared with those of 1999. The closing prices for 2000 were as follows: alloy 380 (1% zinc content), 68.7 cents per pound; alloy 360 (0.6% copper content), 74.1 cents per pound; alloy 413 (0.6% copper content), 73.8 cents per pound; and alloy 319, 72.7 cents per pound. Platt's Metals Week published an annual average U.S. price of 65.6 cents per pound for A-380 alloy (3% zinc content). The average LME cash price for a similar 380 alloy was 55.2 cents per pound.

Trade

Total exports of aluminum materials from the United States increased 7% in 2000 compared with those of 1999 (table 8).

Exports of semifabricated material and scrap increased but exports of crude metals and alloys decreased compared with those of 1999 (table 9). About two-thirds of total U.S. exports were accounted for by Canada and Mexico.

Imports for consumption decreased in 2000 compared with those of 1999, reversing a 3-year upward trend that began in 1997 (table 10). Canada remained the major source country by supplying 55% of the total imports in 2000 (table 11). Russia continued to be the second largest supplier of aluminum materials. The decline in imports of crude metal and alloys from Russia was more than compensated for by increased imports of semifabricated materials and scrap.

World Review

Despite the temporary closure of production capacity in the Pacific Northwest region of the United States, world production of primary aluminum metal increased by 2% in 2000 compared with that of 1999 (table 12). Production increased owing in part to the opening of new smelters in Canada and Mozambique. U.S. and Asian demand was weak, especially during the latter half of the year, whereas European demand was reported to be steady.

Unwrought aluminum inventories held by members of the IAI decreased slightly to 1.79 Mt at yearend 2000 from 1.80 Mt at yearend 1999. Unwrought aluminum is defined by the IAI as aluminum in its basic cast form made from primary metal or from scrap and which is unworked in the metallurgical sense. IAI total aluminum inventories decreased to 3.09 Mt at yearend 2000 from 3.18 Mt at yearend 1999. Total aluminum is unwrought aluminum plus unprocessed scrap, metal in process, and finished semifabricated (mill) products (International Aluminium Institute, 2001).

Inventories of primary aluminum metal held by the LME decreased dramatically from 774,000 t at yearend 1999 to 322,000 t at yearend 2000. Aluminum alloy inventories, however, increased to 88,000 t at yearend 2000 from 78,000 t at yearend 1999 (London Metal Exchange Ltd., 2000).

Armenia.—The Government of Armenia and Russia's Sibirsky Aluminy signed a joint-venture agreement to rebuild the Armenal foil mill in Yerevan. Sibirsky agreed to invest about \$32 million in exchange for 44% of the plant ownership. The remaining 56% would remain with the state-controlled Kanaker Aluminum Works. The mill, which had been idled for 6 years, was expected to reach its full capacity of about 2,200 t/mo of foil by the middle of 2001. Sibirsky planned to increase its ownership to 74% over 3 or 4 years (Interfax Mining & Metals Report, 2000a).

Australia.—Capral Aluminium Ltd. sold its 150,000 t/yr Kurri Kurri primary aluminum smelter in New South Wales to Germany's VAW Aluminium AG (Platt's Metals Week, 2000g). VAW, whose worldwide smelter capacity increased by 30% to 575,000 t/yr with this purchase, announced plans to modernize and expand capacity at Kurri Kurri by 15,000 t/yr before 2003 (Metal Bulletin, 2000w). Capral also announced plans to phase out its sheet rolling operations at Granville by the end of 2000. The associated metal recycling and remelt facility would be retained and converted to extrusion billet production. Capral intended to concentrate on its downstream processing and distribution business (Metal Bulletin, 2000g).

Rio Tinto plc became the sole owner of Comalco Ltd., a major Australian supplier of bauxite, alumina, and primary

aluminum metal to the world market. Rio Tinto acquired the publicly held 27.6% of Comalco during the first half of 2000. Comalco's interests include the Weipa bauxite mine (100%) in Queensland, the Boké Mine (4%) in Guinea, the Gladstone alumina refinery (30%) in Queensland, the Eurallumina refinery (56%) in Italy, the Bell Bay (100%) and Boyne Island (54%) smelters in Australia, and the Tiwai Point smelter (79%) in New Zealand (Rio Tinto plc, 2001, p. 39).

Pechiney agreed to purchase AMP Life Limited's 15.5% direct stake in the Tomago primary aluminum smelter in New South Wales. The purchase would increase Pechiney's interest in the 440,000 t/yr smelter to 51.55% from 36.05%. The other participants in the Tomago joint venture are Gove Aluminium Finance Ltd. (36.05%) and VAW Tomago Inc. and VAW Australia Pty Ltd. with a combined stake of 12.4% (Pechiney, 2000a).

Alcoa of Australia Limited, a joint venture of Alcoa Inc. and WMC Ltd., announced the restart of its idled capacity at the Portland and Point Henry primary aluminum smelters. The capacity had been idled since the mid-1990s. Alcoa of Australia was operator and part owner of the 450,000-t/yr Portland smelter and 100% owner/operator of the 180,000-t/yr Point Henry smelter (American Metal Market, 2000b). On September 15, Alcoa increased its ownership in the Portland smelter to 55% from 45% with the purchase of Eastern Aluminium Ltd. (Alcoa, 2001b, p. 10-11).

Azerbaijan.—Fondel Metal Participants, a Dutch company, won a tender for the management of Azerbaijan's aluminum holding company, Azeraluminy. Fondel agreed to modernize the company's facilities that include the 60,000-t/yr Sumgait smelter, the Gyandja alumina refinery, and local alunite mines. The Gyandja refinery, which can process both imported bauxites and local alunite ore, was the company's only operational facility in 2000 (Metal Bulletin, 2000d).

Bahrain.—The Government of Bahrain approved in principle a \$1.7 billion expansion project for Aluminium Bahrain B.S.C. (Alba) and passed the proposal on to the ministerial committee of finance and economy for further study. The project, if approved, would increase capacity at Alba's 500,000-t/yr primary aluminum smelter to 750,000 t/yr (American Metal Market, 2000a).

Brazil.—Vale do Rio Doce Alumínio S.A. (Aluvale) reported the start of a 43,000-t/yr expansion at its Alumínio Brasileiro S.A. (Albrás) primary aluminum smelter. The \$90 million expansion at the 361,000-t/yr smelter was expected to be completed by September 2001 (Metal Bulletin, 2000a).

Cia Brasileira de Alumínio (CBA) began construction on a 70,000-t/yr expansion at its 237,000-t/yr primary aluminum smelter in Sao Paulo. The \$400 million project, which also included investments in CBA's hydroelectric plants, was expected to be completed by the end of 2002 (Kinch, 2000).

Billiton plc acquired an indirect 2.1% stake in Companhia Vale do Rio Doce (CVRD) through its purchase of a 66.97% share of Sweet River Investment Ltd. The Sweet River assets correspond to a 7.74% share of Valepar SA, the controlling shareholder of CVRD. CVRD through its fully owned subsidiary Aluvale, has interests in the Albras and Santa Cruz primary aluminum smelters (Billiton plc, 2000a).

Canada.—On October 21, approximately 32 months after groundbreaking ceremonies, the first reduction cell at Alcan Aluminium Ltd.'s Alma smelter was energized. Startup of the smelter's 432 reduction cells will continue through the fall of

2001, at which time the smelter was expected to reach its full capacity of 400,000 t/yr (Alcan Aluminium Ltd., 2000i).

On December 8, Alcan announced that it would temporarily close 50,000 t/yr of capacity at its primary aluminum smelter in Kitimat, British Columbia, for at least 10 months. Alcan believed that the temporary shut down and other energy reduction steps would conserve enough energy to keep the other six potlines at the 272,000-t/yr smelter operational. An acute shortage of water in the Nechako Reservoir, the result of 3 consecutive years of low inflows into the reservoir, reduced the hydroelectric power availability and forced the company to take this action (Alcan Aluminium Ltd., 2000j).

Workers at the 372,000-t/yr Aluminerie de Bécancour primary smelter in Quebec accepted a new 4-year labor agreement that reportedly included a 3% wage increase the first year and 2.8% increases each year thereafter. The previous 6-year contract expired on June 30 (Platt's Metals Week, 2000a).

Lavalum, a joint venture of scrap processor SNF/Quebec Metal Recycle Inc. and the provincial Government of Quebec, announced the opening a new secondary aluminum smelter. The smelter was expected to produce 2,950 t/mo (6.5 million pounds per month) of aluminum alloys (Worden, 2000b).

China.—During the year, numerous expansion plans for primary aluminum smelters throughout China were announced.

Baotou Aluminium Group planned to add a new 50,000-t/yr potline to its 110,000-t/yr smelter by the end of 2001 (Platt's Metals Week, 2000e).

The 20,000-t/yr Hubei Aluminium Smelter received Government approval to proceed with a planned 100,000-t/yr expansion program (CRU Aluminium Monitor, 2000a).

Work reportedly began on the 100,000-t/yr expansion at the 85,000-t/yr Lanzhou Aluminium Smelter. Completion of the project was expected in 2 to 3 years (American Metal Market, 2000e).

The Taiyuan Aluminium Works in Shanxi Province began construction work on a planned 80,000-t/yr expansion at its 30,000-t/yr primary aluminum smelter. Once the new line became operational at the end of 2001, the company planned to close one of the two existing 15,000-t/yr potlines because of pollution factors (Platt's Metals Week, 2000q).

Tongchuan Aluminium Industry commissioned a new 5,000-t/yr potline at its 50,000-t/yr smelter in Shaanxi Province (CRU Aluminium Monitor, 2000b).

Xiezhou Aluminium Plant in Shanxi Province reported the completion of a new 40,000-t/yr potline at its 30,000-t/yr smelter. The company planned to upgrade the existing potlines and increase capacity to 100,000 t/yr by the end of 2001 (Platt's Metals Week, 2000t).

Yunnan Aluminium Plant reportedly completed its smelter expansion increasing capacity from the previous 40,000 t/yr to 130,000 t/yr. The company was awaiting Government approval to further expand the smelter's capacity to 250,000 t/yr (Platt's Metals Week, 2000u).

Zunyi Aluminium Plant started construction on a new 100,000-t/yr potline at its 32,000-t/yr smelter in Guizhou Province, which could be completed in 2002 (Platt's Metals Week, 2000v).

Egypt.—The Aluminium Company of Egypt (Egyptalum) announced plans to increase capacity at its 195,000-t/yr primary smelter to 245,000 t/yr by 2002. In October 1997, a 50,000-t/yr prebaked potline was commissioned and an existing potline (Potline 5) was shut down. Egyptalum expects to complete the

conversion of Potline 5 to prebake technology by mid-2002, thereby increasing the smelter's capacity to 245,000 t/yr (Aluminium Company of Egypt, Smelter, accessed May 25, 2001, at URL <http://www.egyptalum.com.eg/smelter.html>).

France.—PSA Peugeot Citroën and Pechiney signed a strategic partnership agreement for the development of aluminum applications in Peuleot and Citroën vehicles. The 10-year agreement provides the framework for cooperation between the two groups with the aim of increasing production of mass-produced aluminum parts and making innovative developments for vehicle weight reduction (Pechiney, 2000b).

Germany.—VAW Aluminium AG and Sweden's Sapa AB, formerly Gränges AB, terminated their agreement aimed at VAW taking over Sapa's foil business, Eurofoil. VAW reported that it had withdrawn its application with the German cartel office after it became apparent that the office would not give its approval. The former agreement had included foil mills in Belgium, Luxembourg, and Sweden (Köhl, 2000).

Hungary.—Magyar Aluminium Rt (MAL) integrated its affiliates into one holding company to reduce administrative overhead and to simplify strategic planning. MAL incorporated Ajkai Timfold, owner of the 300,000-t/yr Ajka alumina refinery, and Inotai Aluminium, which owns 93% of the 35,000-t/yr Inota aluminum smelter (Metal Bulletin, 2000m).

India.—Alcan announced the sale of its 54.62% interest in Indian Aluminium Co., Ltd. (Indal) to Hindalco Industries Ltd. The purchase included about 100,000 t/yr of primary aluminum smelter capacity (Metal Bulletin, 2000b).

Hindalco's board of directors approved a \$575 million expansion of its operations in Renukoot. Aluminum smelter capacity would be expanded to 342,000 t/yr from 242,000 t/yr and the alumina refinery capacity would increase to 660,000 t/yr from 450,000 t/yr. The expansion was expected to be completed by July 2002 (Raghuvanshi, 2000).

Expansion plans continued at National Aluminium Co. Ltd. Bauxite production capacity at the Panchpatmali Mine was scheduled to double to 4.8 Mt/yr by 2001. Capacity at the 800,000-t/yr alumina refinery at Damanjodi was expected to increase to 1.575 Mt/yr in early 2002, and the Angul smelter expansion that would increase capacity to 345,000 t/yr from 230,000 t/yr was expected to be commissioned by mid-2002 (Hall, 2000).

Indonesia.—Production at P.T. Indonesia Asahan Aluminium Co.'s (PT Inalum) primary aluminum smelter returned to 85% to 90% of its 225,000-t/yr capacity with 440 of its 510 pots on-line. Receding water levels in Lake Toba in 1998-99 had reduced hydroelectric power generation forcing PT Inalum to reduce production levels at the smelter by as much as 60% in mid-1998 (Platt's Metals Week, 2000c).

Iran.—The production rate at Almahdi Aluminium Corp.'s primary aluminum smelter at Bandar Abbas reached about 25,000 t/yr. The company expected the smelter, which was commissioned in June 1997, to reach full production of 110,000 t/yr by the end of 2001 (Metal Bulletin, 2000e).

Japan.—Alcoa announced that construction had begun on a new forged aluminum commercial vehicle wheel plant in Joetsu City, Niigata Prefecture, to meet increased demand for polished aluminum truck and bus wheels in Japan. The plant was expected to be operational by the latter half of 2001 and to reach full capacity in late 2002 (Alcoa Inc., 2000d).

Nippon Light Metal Co. Ltd. announced a major restructuring of its extrusion business that would close one-third of the

company's 33 extrusion lines by the end of March 2001. The company also reported the curtailment of production of aluminum substrates for computer disks (Metal Bulletin, 2000p).

Mitsubishi Materials Corp. and Mitsubishi Aluminium Co. Ltd. announced plans to build an integrated aluminum recycling plant that would consolidate aluminum UBC recycling operations that were being conducted at several different locations. The plant would convert UBCs into slabs ready for rolling into can stock. Slab production, which was expected to start in 2001, was estimated at 60,000 t/yr (Metal Bulletin, 2000o).

Korea, Republic of.—Alcan, through its subsidiary Alcan Taihan Aluminium Limited, acquired Aluminium of Korea Limited (Koralu). The acquisition of Koralu positioned Alcan as Asia's leading aluminum rolled products company. The Koralu facility included casting, hot rolling, cold rolling, and extensive finishing operations as well as aluminum foundry alloy and billet operations supported by a research and development center (Alcan Aluminium Ltd., 2000e).

Malaysia.—Malaysia's Aluminium Industries commissioned a new aluminum foil mill. The plant was capable of producing foil down to 0.006 millimeters thickness for the pharmaceutical and food packaging industries (Metal Bulletin, 2000n).

Mexico.—Hayes Lemmerz launched a capacity expansion program at its Chihuahua wheel plant that was expected to increase production to 1.2 million cast light-alloy wheels per year from 300,000 wheels per year (Wrigley, 2000e).

Mozambique.—On September 29, the Mozambique Aluminium Co.'s (Mozal) primary aluminum smelter near Maputo was officially opened. The feasibility study for the smelter started in November 1995, and construction began in May 1998. The 250,000-t/yr smelter uses Pechiney's AP30S technology and has one potline with a total of 288 pots. The smelter is a joint venture involving Billiton plc (47%), Mitsubishi Corp. (25%), the Industrial Development Corp. of South Africa Ltd. (24%), and the Government of Mozambique (4%). The smelter produced its first metal on June 18, 2000, and exported its first consignment of ingots to Europe in August (Billiton plc, 2000b; Millbank, 2000). By the end of December, all 288 pots were in operation (Mozambique Aluminium Co., 2000). Billiton reported that the company will complete feasibility studies into the possible construction of a second 250,000-t/yr potline at Mozal. Any decision, however, could be at least a year away (Metal Bulletin, 2000l).

Nigeria.—Reynolds, which was merged with Alcoa, transferred its 10% interest in Aluminium Co. of Nigeria (Alscon) to the other private partner in the company, Germany's Ferrostaal AG, whose ownership increased to 30%. The remaining 70% of Alscon was owned by the Nigerian government. The responsibility for the technical running of the 193,000-t/yr smelter, which has been closed since June 1999, was also transferred from Reynolds to Ferrostaal (Metal Bulletin, 2000r).

Norway.—Elkem ASA's aluminum operations are organized in Elkem Aluminium ANS, a 50-50 partnership with Alcoa. In 2000, Alcoa acquired over 30% of the outstanding shares of Elkem ASA (Alcoa Inc., 2001b, p. 10).

Elkem Aluminium ANS announced plans to modernize and expand its 121,000-t/yr Mosjøen primary aluminum smelter. Two of the plants four potrooms (two potlines) were converted from Soderberg to prebaked technology in 1989. The

remaining Soderberg line is scheduled to be converted and expanded by 2003. Upon completion, annual capacity at the smelter would increase to 188,000 t/yr (Elkem ASA, 2000).

Meanwhile, conversion work on Potrooms 1 and 2 at the 83,000-t/yr Lista smelter was expected to be completed in the first half of 2001. The installation of a new Soderberg technology was expected to yield significant environmental improvements while increasing production capacity by 10,000 t/yr (Elkem ASA, 2001, p. 26).

Norsk Hydro ASA confirmed that the company will invest approximately \$600 million in the expansion and modernization of its Sunndal primary aluminum smelter. A new smelter with a production capacity of 238,800 t/yr will be built on the site and a 66,000-t/yr Soderberg facility, which was started in 1954, will be closed gradually to prevent the loss of production during construction. The company stated that the remaining 90,000 t/yr of existing capacity will continue to operate. The new smelter will consist of 340 new cells using Hydro's HAL250 technology. Upon completion in 2004, total capacity at the site will increase to 328,800 t/yr, making it the largest aluminum smelter in Europe (outside of Russia). The design of the cell linings and rectifiers will be such that amperage can gradually be increased, providing an additional 22,000 t/yr of production capacity by 2007 (Norsk Hydro ASA, 2000a; Norsk Hydro ASA, 2001b).

Oman.—A feasibility study for a proposed \$2.5 billion, 480,000-t/yr primary aluminum smelter in Sohar was completed. An implementation review to identify potential technologies and project funding was begun (Mining Journal, 2000b).

Russia.—A new aluminum company, Russky Aluminy (Russian Aluminium), was formed by combining the assets of the Sibneft shareholder group and Siberian Aluminium. Russian Aluminium manages about 70% of Russia's primary aluminum smelting capacity. The company controls Russia's three largest smelters—Bratsk (900,000 t/yr), Krasnoyarsk (800,000 t/yr), and Sayansk (400,000 t/yr). On the alumina side, the company controls the Achinsk (900,000 t/yr) and the Nikolayev (1.05 Mt/yr) refineries. The downstream operations that are either fully or partly owned by the company include the Samara Metallurgical Plant, the Sayanal foil mill, the Rostar can plant, and the Belaya Kalitva Metallurgical Production Assn. (Metal Bulletin, 2000s).

A second new group, SUAL Holding, was a merger of the aluminum assets of Siberian-Urals Aluminium Co. and the Trustconsult Group. SUAL controls the Irkutsk (262,000 t/yr), Bogoslovsk (162,000 t/yr), Uralsky (70,000 t/yr), and Kandalaksa (63,000 t/yr) primary aluminum smelters. The company also owns the Bogoslovsk (930,000 t/yr) and Uralsky (570,000 t/yr) refineries, the Northern and Southern Urals bauxite mines plus the Srende-Timan bauxite deposits (CRU Alumina Monitor, 2000). Downstream facilities include the Kamensk-Uralsky Metallurgy Plant (rolling mill), the Mikhailovsky Nonferrous Metal Processing Plant (Mikhalum foil plant), and the Irkutsk and Kirinsky cable plants (Interfax Mining & Metal Report, 2000d).

Scotland.—Alcan reported the closure of its 8,000-t/yr primary aluminum smelter in Kinlochleven. The Kinlochleven smelter, built in 1907, was one of the world's oldest smelters still in operation (Alcan Aluminium Ltd., 2000f).

South Africa.—Billiton was conducting a feasibility study for an additional 125,000-t/yr potline at its 500,000-t/yr Hillside

smelter (Mining Journal, 2000a).

Spain.—Alcoa Inespal built a new aluminum extrusion plant at La Salva del Camp to make extruded aluminum profiles for the automotive and construction industries. By yearend, a 1,350-t press with an output of 4,000 t/yr was operational. A second line was expected to startup in August 2001, doubling the plant's capacity (Alcoa Inc., 2001a, p. 24).

Norsk Hydro announced plans to build a 60,000-t/yr aluminum remelt plant in Azuqueca near Madrid. The plant, which will produce extrusion ingot from scrap for growing markets in Spain and Portugal, was expected to be completed by yearend 2001 (Norsk Hydro ASA, 2000e).

Sweden.—Gränges AB changed its name to Sapa AB. Sapa was already being used as a corporate and brand name by Gränges' aluminum extrusion division. The formal change of name and company logo took place in mid-February (Metal Bulletin, 2000k).

Glencore International AG reported that it had acquired Kubikenborg Aluminium Sundsvall AB (KAS), owner of the 100,000-t/yr primary aluminum smelter in Sundsvall, Sweden. KAS had been formed by the plant's management group that bought the smelter from Gränges in 1998 (American Metal Market, 2000d).

Switzerland.—Algroup, the aluminum division of Aluisse Lonza Group Inc., announced its decision to continue the operation of its 35,000-t/yr primary aluminum smelter at Steg at least until the end of 2005. The continuation of the Steg plant, which was originally scheduled for closure at the end of 2001, became possible because of the extension of a fixed power price and supply contract to 2005. The continuation of plant operations will require some technical adjustments that will result in an increase in capacity to 43,000 t/yr (algroup, 2000).

Norsk Hydro signed an agreement with Aluminium Martigny S.A. to continue operating its remelt plant in Martigny. The agreement saved the plant, which produced about 25,000 t/yr of extrusion billet and foundry alloys, from imminent closure. While the potrooms at the Martigny primary smelter will remain closed, Norsk Hydro will operate the casthouse to produce specialty products for extruders and foundries in Europe (Norsk Hydro ASA, 2000d).

Taiwan.—New Sun Metal Industry Co. completed the expansion of its secondary aluminum smelter that increased capacity to 156,000 t/yr. The expansion enabled the company to diversify into sheet rolling, t-bar, anode, and deox production (Metal Bulletin, 2000u).

United Kingdom.—Alcan reported the restart of 50,000 t/yr of primary aluminum capacity at its smelter in Lynemouth to compensate for the closure of Alcan's Isle Maligne smelter in Canada and the Kinlochleven smelter in Scotland. The restart was completed by the end of the year (Alcan Aluminium Ltd., 2000f).

Alcan also announced the planned closure of its foil plant in Rogerstone, Newport, South Wales by June 2001. Some products will be transferred to other plants in the Alcan network but the majority of the plant's business will be discontinued. The larger Rogerstone sheet facility on the same site will continue to operate and remain a key part of Alcan's sheet manufacturing system in Europe (Alcan Aluminium Ltd., 2000d).

Alcoa announced the acquisition of British Aluminium. The acquisition included three soft-alloy extrusion operations at Banbury, St. Helens, and Latchford, England; a heat-treat plate

mill in Kitts Green, Birmingham, England; and a sheet mill in Dolgarrog, Wales. The acquisition also included two distribution businesses, Baco Metal Centres and Aluminium Supply Aerospace, with branches located throughout the United Kingdom and Ireland (Alcoa Inc., 2000l).

Alcoa also acquired Baco Consumer Products, Ltd., headquartered near London. Baco is the United Kingdom's leading supplier of household wraps, including aluminium foil, plastic bags, cling film, and trash bags (Alcoa Inc., 2000c).

Alcoa announced the acquisition of MCG Closures Limited from Wassall plc. The acquisition included plants near Birmingham, England; Rieti, Italy; and a distribution center in the Netherlands. MCG became part of Alcoa Closure Systems International, 1 of 25 Alcoa business units and a leading global manufacturer of plastic closures for the beverage industry (Alcoa Inc., 2000a).

Norsk Hydro signed an agreement with Aluminium Holding UK Ltd. to purchase its entire shareholding in Deeside Aluminium Ltd. in Wrexham, Wales. Deeside operates an extrusion ingot casting plant that uses aluminum scrap as a feed source. The plant has an output of 38,000 t/yr of extrusion ingot. Upon approval of the takeover by the United Kingdom authorities, Norsk Hydro plans a significant improvement program that will improve productivity and increase capacity to 43,000 t/yr. The improvement program will also pave the way for a possible future expansion to 60,000 t/yr (Norsk Hydro ASA, 2000c).

Ukraine.—Kaiser completed a technical feasibility study for the reconstruction of smelting capacity at Zaporozhye Aluminum Works (Zalk). The conversion of the smelter's Soderberg technology to prebaked anode technology was expected to increase capacity at the 110,000-t/yr primary aluminum smelter to about 160,000 t/yr and to reduce costs. Financing for this conversion was expected to be secured from the sale of 68.1% of the state-owned shares in the company. The Government would retain 25% of the shares and employees 6.9% (Interfax Mining & Metals Report, 2000c). At the end of November, the Ukrainian State Property Fund announced that Kremenchug Auto Works (Kraz) Foreign Trade Company had won the tender for the shares in Zalk with a bid of \$101.5 million. Glencore International reportedly owns about 90% of the shares in Kraz Foreign Trade Company (Interfax Mining & Metals Report, 2000b).

Ukrainian Aluminium Co., a company linked with Russia's Sibirsky Aluminy, purchased a 30% stake in the 1.05 Mt/yr Nikolayev alumina plant. Ukrainian Aluminium planned to modernize the alumina plant and increase its capacity to 1.3 Mt/yr. As a condition of the sale, the company also agreed to build a primary aluminum smelter in the Ukraine (Platt's Metals Week, 2000n). Construction of the new 100,000-t/yr smelter was due to begin by 2002 and would take 5 to 6 years to complete (Platt's Metals Week, 2000s). By the end of 2000, Ukrainian Aluminium acquired an additional 15% stake in the Nikolayev alumina refinery (Platt's Metals Week, 2000r).

Venezuela.—Norsk Hydro acquired a 33.3% stake in Pianmecca, located in Puerto Ordaz next to the Venalum smelter, which will supply liquid aluminum to the casthouse. Pianmecca expected to produce 30,000 t of extrusion ingots and 8,000 t of wire rod in 2001. Norsk Hydro planned to increase future production levels at the plant through investments and plant improvements (Norsk Hydro ASA, 2000f).

Technology

Toronto University scientists completed an evaluation of Aluminum Power Inc.'s aluminum-air fuel cell. The scientists reported that "although nickel-metal-hydride and lithium-ion battery systems represent a tremendous advance in battery technology, their power pales in comparison with the energy available from an aluminum-air cell." The cell generates power through an electro mechanical reaction between the aluminum, placed in an alkaline solution, and oxygen from the air. Electricity is produced as the aluminum oxidizes in the alkaline solution. Key to the cell's effectiveness is its high energy output, which results from the characteristic energy density of aluminum and the fact that three electrons are released for every atom of aluminum reacted (American Metal Market, 2000g).

The aluminum-air cell technology can be adapted to a variety of applications, including electric vehicles, emergency power sources, and portable electronic devices. Aluminum Power announced that it had achieved 8 hours of talk time and 5½ days of standby power using its newly developed aluminum-air fuel cell for mobile telephones in a digital mode compared with 2 hours of talk time for lithium-ion or nickel-cadmium batteries. The company claimed that when the technology is perfected about 25 hours of talk time and 240 hours of standby power would be possible (Pinkham, 2000).

Outlook

Weakness in the national economies of most areas of the world is expected to lead to very little growth, or possibly a small decrease, in demand for aluminum in 2001. It is anticipated that this weakness will be short-lived and that demand will pick up in 2002 and thereafter.

On the supply side, energy costs and shortages continued to force companies to temporarily idle smelter capacity. By July 2001, the United States had idled almost 1.8 Mt of capacity; combined with announced capacity reductions in Brazil and Canada, almost 2.2 Mt/yr of production capacity was removed from the world supply. However, the reduction in demand and additional production, from new smelters in Canada and Mozambique plus brownfield expansions that are coming on-stream, are expected to keep world supply and demand fairly balanced in 2001. In later years, however, if demand picks up and the energy cost and supply situations have not been reversed, shortages could appear.

On the demand side, the automotive and construction industries are expected to be the drivers for aluminum demand in the future. Growth in the packaging and container industry has stabilized, especially in the United States and Europe. There is still room for growth in the packaging industries of Asia and Latin America, but even there the growth rate over the past few years has slowed. Overall, world demand is expected to continue to grow, despite a possible drop in the growth rate for the next year or so as the world economies begin their recoveries.

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TABLE 1
SALIENT ALUMINUM STATISTICS 1/

(Thousand metric tons, unless otherwise specified)

	1996	1997	1998	1999	2000
United States:					
Primary production	3,577	3,603	3,713	3,779	3,668
Value (million dollars)	\$5,630	\$6,120	\$5,360	\$5,470	\$6,030
Price (average cents per pound), U.S. market (spot)	71.3	77.1	65.5	65.7	74.6
Inventories (December 31):					
Aluminum industry 2/	1,860	1,860	1,930	1,870	1,550
LME stocks in U.S. warehouses 3/	33	8	13	14	(4/)
National Defense Stockpile	57	(4/)	--	--	--
Secondary recovery: 5/	3,310	3,550	3,440	3,690 r/	3,450
New scrap	1,730	2,020	1,950	2,120 r/	2,080
Old scrap	1,570	1,530	1,500	1,570 r/	1,370
Exports (crude and semicrude)	1,500	1,570	1,590	1,640	1,760
Imports for consumption (crude and semicrude)	2,810	3,080	3,550	4,000	3,910
Aluminum industry shipments 6/	8,330	8,880	9,260	9,840	9,840
Supply, apparent 7/	8,340	8,740	9,040	9,890 r/	9,610
Consumption, apparent 8/	6,610	6,720	7,090	7,770 r/	7,530
World production	20,800 r/	21,700 r/	22,600 r/	23,600 r/	24,000 e/

e/ Estimated. r/ Revised. -- Zero.

1/ Data are rounded to no more than three significant digits, except "Primary production" and "Prices."

2/ Includes ingot, semifabricated material, and scrap. Data for 1996 through 1998 from Current Industrial Reports, Series M33-D, U.S. Department of Commerce, U.S. Census Bureau. Data for 1999 and 2000 from Aluminum Association Inc.

3/ Includes aluminum alloyed material.

4/ Less than 1/2 unit.

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

6/ Shipped to domestic industry.

7/ Defined as domestic primary metal production plus secondary recovery plus imports minus exports plus adjustments for Government and industry stocks changes.

8/ Apparent supply less recovery from purchased new scrap.

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

Company	Yearend capacity (thousand metric tons)		2000 ownership
	1999	2000	
Alcan Aluminum Corp.:			
Seabee, KY	186	186	Alcan Aluminium Ltd., 100%.
Alcoa Inc.: 2/			
Alcoa, TN	210	210	Alcoa Inc., 100%.
Badin, NC	115	115	Do.
Evansville, IN (Warrick)	300	300	Do.
Ferndale, WA (Intalco)	272	272	Alcoa Inc., 61%; Mitsui and Co. Ltd., 32%; YKK Corp., 7%
Frederick, MD (Eastalco)	174	174	Do.
Longview, WA 3/	204	204	Alcoa Inc., 100%
Massena, NY 3/	123	123	Do.
Massena, NY	125	125	Do.
Mount Holly, SC	215 r/	215	Alcoa Inc., 50.3%; Century Aluminum Co., 49.7%.
Rockdale, TX	315	315	Alcoa Inc., 100%.
Troutdale, OR 3/	121	121	Do.
Wenatchee, WA	220	220	Do.
Total	2,390 r/	2,390	
Century Aluminum Co.:			
Ravenswood, WV	168 r/	168	Century Aluminum Co., 100%.
Columbia Falls Aluminum Co.:			
Columbia Falls, MT	168	168	Glencore AG, 100%
Goldendale Aluminum Co.:			
Goldendale, WA	168	168	Private interest, 60%; employees, 40%.
Kaiser Aluminum & Chemical Corp.:			
Mead, WA (Spokane)	200	200	MAXXAM Inc., 100%.
Tacoma, WA	73	73	Do.
Total	273	273	

See footnotes at end of table.

TABLE 2--Continued
PRIMARY ANNUAL ALUMINUM PRODUCTION CAPACITY IN THE UNITED STATES, BY COMPANY 1/

Company	Yearend capacity (thousand metric tons)		2000 ownership
	1999	2000	
NSA:			
Hawesville, KY	237	237	Southwire Co., 100%.
Noranda Aluminum Inc.:			
New Madrid, MO	222 r/	222	Noranda Mines Ltd., 100%.
Northwest Aluminum Corp.:			
The Dalles, OR	82	82	Private interests, 100%.
Ormet Primary Aluminum Corp.:			
Hannibal, OH	255	257	Ormet Corp., 100%.
Vandalco Inc.:			
Vancouver, WA	116	116	Vandalco Inc., 100%.
Grand total	4,270	4,270	

r/ Revised.

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

2/ Individual plant capacities are U.S. Geological Survey estimates based on company reported total.

3/ Alcoa and Reynolds merged in June 2000.

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

(Metric tons)

Class	Consumption	Calculated recovery	
		Aluminum	Metallic
1999:			
Secondary smelters	2,130,000 r/	1,450,000 r/	1,560,000 r/
Integrated aluminum companies	1,230,000	1,010,000	1,080,000
Independent mill fabricators	787,000	674,000	720,000
Foundries	101,000	85,300	91,300
Other consumers	8,880	8,810	8,810
Total	4,250,000 r/	3,230,000 r/	3,460,000 r/
Estimated full industry coverage	4,560,000 r/	3,450,000 r/	3,690,000 r/
2000:			
Secondary smelters	1,960,000	1,350,000	1,450,000
Integrated aluminum companies	1,060,000	873,000	930,000
Independent mill fabricators	800,000	689,000	736,000
Foundries	95,600	80,200	85,800
Other consumers	14,600	14,600	14,600
Total	3,940,000	3,010,000	3,220,000
Estimated full industry coverage	4,220,000	3,220,000	3,450,000

r/ Revised.

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

2/ Data 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 2000 1/ 2/

(Metric tons)

Class of consumer and type of scrap	Stocks, January 1	Net receipts 3/	Consumption	Stocks, December 31
Secondary smelters:				
New scrap:				
Solids	12,800 r/	300,000	294,000	18,300
Borings and turnings	7,950 r/	325,000	324,000	9,660
Dross and skimmings	4,260 r/	531,000	532,000	4,080
Other 4/	3,750 r/	222,000	222,000	3,060
Total	28,700 r/	1,380,000	1,370,000	35,100

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 2000 1/ 2/

(Metric tons)

Class of consumer and type of scrap	Stocks, January 1	Net receipts 3/	Consumption	Stocks, December 31
Secondary smelters--Continued:				
Old scrap:				
Castings, sheet, clippings	6,650 r/	352,000	354,000	4,730
Aluminum-copper radiators	2,130 r/	20,600	21,000	1,710
Aluminum cans 5/	1,170 r/	88,200	88,000	1,350
Other 6/	5,930 r/	119,000	119,000	5,990
Total	15,900 r/	580,000	582,000	13,800
Sweated pig	465 r/	10,800	11,100	191
Total secondary smelters	45,100 r/	1,970,000	1,960,000	49,100
Integrated aluminum companies, foundries, independent mill fabricators, other consumers:				
New scrap:				
Solids	22,400	801,000	806,000	17,900
Borings and turnings	104	23,100	22,900	318
Dross and skimmings	131	8,480	8,470	137
Other 4/	9,690 r/	212,000	214,000	6,930
Total	32,400 r/	1,040,000	1,050,000	25,300
Old scrap:				
Castings, sheet, clippings	3,060	148,000	144,000	6,940
Aluminum-copper radiators	439	6,500	6,700	241
Aluminum cans	13,600 r/	750,000	737,000	26,900
Other 6/	22	29,800	29,800	22
Total	17,100 r/	935,000	918,000	34,100
Sweated pig	86	2,840	2,740	179
Total integrated aluminum companies, etc.	49,500 r/	1,980,000	1,970,000	59,600
All scrap consumed:				
New scrap:				
Solids	35,200 r/	1,100,000	1,100,000	36,200
Borings and turnings	8,050 r/	348,000	347,000	9,970
Dross and skimmings	4,400 r/	540,000	540,000	4,210
Other 4/	13,400 r/	433,000	437,000	9,990
Total	61,100 r/	2,420,000	2,420,000	60,400
Old scrap:				
Castings, sheet, clippings	9,710 r/	500,000	498,000	11,700
Aluminum-copper radiators	2,570 r/	27,100	27,700	1,960
Aluminum cans	14,700 r/	838,000	825,000	28,300
Other 6/	5,960 r/	149,000	149,000	6,010
Total	33,000 r/	1,510,000	1,500,000	47,900
Sweated pig	551 r/	13,600	13,800	370
Total of all scrap consumed	94,600 r/	3,950,000	3,940,000	109,000

r/ Revised.

1/ Includes imported scrap. According to reporting companies, 24.5% of total receipts of aluminum-base scrap, or 974,000 metric tons, was received on toll arrangements.

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

3/ Includes inventory adjustment.

4/ Includes data on foil, can stock clippings, and other miscellaneous.

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

6/ Includes municipal wastes (includes litter) and fragmented scrap (auto shredder).

TABLE 5
PRODUCTION AND SHIPMENTS OF SECONDARY ALUMINUM ALLOYS BY INDEPENDENT SMELTERS
IN THE UNITED STATES 1/

(Metric tons)

	1999		2000	
	Production	Net shipments 2/	Production	Net shipments 2/
Diecast alloys:				
13% Si, 360, etc. (0.6% Cu, maximum)	24,700 r/	24,600 r/	30,600	30,200
380 and variations	424,000 r/	419,000 r/	515,000	526,000
Sand and permanent mold:				
95/5 Al-Si, 356, etc. (0.6% Cu, maximum)	31,300 r/	31,200 r/	127,000	126,000
No. 319 and variations	148,000 r/	139,000 r/	137,000	139,000
F-132 alloy and variations	38,100 r/	37,500 r/	30,400	30,200
Al-Mg alloys	639	639	639	639
Al-Zn alloys	2,520 r/	1,950 r/	2,240	2,930
Al-Si alloys (0.6% to 2.0% Cu)	2,020	2,020	2,020	2,020
Al-Cu alloys (1.5% Si, maximum)	924	924	2,290	2,290
Al-Si-Cu-Ni alloys	949	952	949	951
Other	712	761	1,320	1,350
Wrought alloys, extrusion billets	221,000 r/	221,000 r/	210,000	210,000
Miscellaneous:				
Steel deoxidation	(3/)	(3/)	(3/)	(3/)
Pure (97.0% Al)	(3/)	(3/)	(3/)	(3/)
Aluminum-base hardeners	3,470	3,480	3,470	3,470
Other 4/	125,000 r/	121,000 r/	122,000	124,000
Total	1,020,000 r/	1,000,000 r/	1,190,000	1,200,000
Less consumption of materials other than scrap:				
Primary aluminum	77,400 r/	XX	77,600	XX
Primary silicon	49,200 r/	XX	50,200	XX
Other	10,400 r/	XX	16,700	XX
Net metallic recovery from aluminum scrap and sweated pig consumed in production of secondary aluminum ingot 5/	887,000 r/	XX	1,040,000	XX

r/ Revised. XX Not applicable.

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

2/ Includes inventory adjustment.

3/ Withheld to avoid disclosing company proprietary data; included with "Miscellaneous: Other."

4/ Includes other die-cast alloys.

5/ 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, BY INDUSTRY 1/

Industry	1999		2000	
	Quantity (thousand metric tons)	Percent of grand total	Quantity (thousand metric tons)	Percent of grand total
Containers and packaging	2,320	20.7	2,260	20.4
Building and construction	1,470	13.1	1,450	13.1
Transportation	3,600	32.2	3,610	32.5
Electrical	739	6.6	770	6.9
Consumer durables	760	6.8	770	6.9
Machinery and equipment	661	5.9	679	6.1
Other markets	293	2.6	293	2.6
Total to domestic users	9,840	88.1	9,840	88.6
Exports e/	1,330	11.9	1,270	11.4
Grand total	11,200	100.0	11,100	100.0

e/ Estimated.

1/ 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 1/ 2/

(Thousand metric tons)

	1999	2000
Wrought products:		
Sheet, plate, foil	5,000 r/	4,840
Pipe, tube, extruded, shapes	1,640 r/	1,920
Rod, bar, wire, cable	549 r/	303
Forgings (including impacts)	108 r/	106
Powder, flake, paste	54	59
Total	7,360 r/	7,230
Castings:		
Sand	158	NA
Permanent and semipermanent mold	533	NA
Die	1,030	NA
Other	135	NA
Total	1,850	NA
Grand total	9,210	NA

r/ Revised. NA Not available.

1/ 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.

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

Source: The Aluminum Association Inc.; U.S. Department of Commerce.

TABLE 8
U.S. EXPORTS OF ALUMINUM, BY COUNTRY 1/

Country or territory	Metals and alloys, crude		Plates, sheets, bars, etc. 2/		Scrap		Total	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
1999:								
Azerbaijan	--	--	1	\$3	--	--	1	\$3
Brazil	110	\$714	60,200	172,000	17	\$96	60,300	173,000
Canada	145,000	225,000	489,000	1,180,000	162,000	149,000	795,000	1,560,000
France	143	541	6,990	30,900	85	129	7,220	31,500
Germany	1,610	6,900	5,640	32,200	90	279	7,340	39,400
Hong Kong	661	1,230	4,110	15,600	24,600	33,100	29,400	49,900
Italy	127	269	2,530	12,500	53	122	2,710	12,900
Japan	71,700	113,000	10,400	87,400	35,200	40,700	117,000	241,000
Korea, Republic of	798	2,440	16,700	53,100	29,300	29,100	46,800	84,600
Mexico	93,700	147,000	152,000	444,000	60,400	79,100	306,000	670,000
Netherlands	130	289	1,310	6,610	711	793	2,150	7,700
Philippines	14	65	536	2,460	296	98	847	2,620
Russia	5	73	9	85	--	--	14	158
Saudi Arabia	1	7	8,150	22,400	64	128	8,210	22,500
Singapore	111	575	1,850	13,200	1,290	1,750	3,250	15,500
Slovakia	--	--	9	54	--	--	9	54
Slovenia	--	--	55	128	3	12	58	140
South Africa	(3/)	8	327	1,930	(3/)	4	328	1,940
Taiwan	660	1,740	10,900	33,200	31,300	29,800	42,900	64,800
Thailand	106	205	3,900	14,400	92	135	4,100	14,700
Ukraine	--	--	(3/)	4	--	--	(3/)	4
United Kingdom	1,040	5,270	16,700	72,800	403	810	18,100	78,800
Venezuela	229	1,990	17,900	38,700	--	--	18,100	40,700
Other	2,640	7,610	98,500	330,000	73,500	80,000	175,000	418,000
Total	318,000	515,000	907,000	2,570,000	419,000	445,000	1,640,000	3,530,000

See footnotes at end of table.

TABLE 8--Continued
U.S. EXPORTS OF ALUMINUM, BY COUNTRY 1/

Country or territory	Metals and alloys, crude		Plates, sheets, bars, etc. 2/		Scrap		Total	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2000:								
Azerbaijan	--	--	--	--	--	--	--	--
Brazil	829	1,520	31,900	98,100	159	180	32,900	99,800
Canada	125,000	208,000	504,000	1,310,000	225,000	221,000	854,000	1,740,000
France	30	122	5,530	29,400	1,790	3,290	7,350	32,800
Germany	858	5,130	4,980	30,100	1,150	2,820	6,990	38,100
Hong Kong	1,440	2,420	2,610	13,000	28,900	34,400	33,000	49,900
Italy	33	111	2,070	12,000	8	11	2,110	12,100
Japan	44,300	74,400	9,840	74,400	27,800	35,500	81,900	184,000
Korea, Republic of	3,640	11,900	20,500	77,000	34,100	38,100	58,200	127,000
Mexico	87,700	140,000	156,000	523,000	78,000	105,000	321,000	768,000
Netherlands	244	1,020	3,280	12,900	415	621	3,940	14,500
Philippines	41	61	774	3,530	265	435	1,080	4,020
Russia	--	--	211	1,180	47	64	258	1,250
Saudi Arabia	1	11	8,380	20,300	2	6	8,380	20,300
Singapore	414	1,160	2,630	15,700	346	459	3,390	17,300
Slovakia	--	--	11	35	--	--	11	35
Slovenia	--	--	(3/)	4	--	--	(3/)	4
South Africa	24	220	80	919	15	68	118	1,210
Taiwan	2,200	3,540	8,430	31,000	30,300	31,500	40,900	66,000
Thailand	822	1,720	6,860	24,300	1,020	1,420	8,700	27,400
Ukraine	--	--	1	25	--	--	1	25
United Kingdom	1,090	3,770	20,400	94,700	5,450	5,910	26,900	104,000
Venezuela	63	125	17,200	40,200	33	117	17,300	40,500
Other	4,800	12,400	102,000	353,000	141,000	167,000	248,000	532,000
Total	273,000	468,000	907,000	2,770,000	576,000	648,000	1,760,000	3,880,000

-- Zero.

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

2/ Includes castings, forgings, and unclassified semifabricated forms.

3/ Less than 1/2 unit.

Source: U.S. Census Bureau.

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

Class	1999		2000	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Crude and semicrude:				
Metals and alloys, crude	318,000	\$515,000	273,000	\$468,000
Scrap	419,000	445,000	576,000	648,000
Plates, sheets, bars, strip, etc.	857,000	2,280,000	845,000	2,380,000
Castings and forgings	15,300	113,000	14,700	137,000
Semifabricated forms, n.e.c.	34,600	171,000	48,000	248,000
Total	1,640,000	3,530,000	1,760,000	3,880,000
Manufactures:				
Foil and leaf	65,000	211,000	61,100	219,000
Powders and flakes	8,320	35,800	9,600	47,500
Wire and cable	33,100	127,000	29,500	122,000
Total	106,000	374,000	100,000	388,000
Grand total	1,750,000	3,900,000	1,860,000	4,270,000

1/ 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. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY CLASS 1/

Class	1999		2000	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Crude and semicrude:				
Metals and alloys, crude	2,650,000	\$3,760,000	2,490,000	\$4,030,000
Plates, sheets, strip, etc., n.e.c. 2/	593,000	1,330,000	628,000	1,530,000
Pipes, tubes, etc.	24,100	98,100	20,800	109,000
Rods and bars	118,000	349,000	142,000	449,000
Scrap	615,000	666,000	625,000	744,000
Total	4,000,000	6,200,000	3,910,000	6,860,000
Manufactures:				
Foil and leaf 3/	89,900	271,000	87,800	293,000
Flakes and powders	3,560	10,100	5,020	14,000
Wire	97,600	172,000	118,000	231,000
Total	191,000	452,000	211,000	538,000
Grand total	4,190,000	6,660,000	4,120,000	7,400,000

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

2/ Includes plates, sheets, circles, and disks.

3/ Excludes etched capacitor foil.

Source: U.S. Census Bureau.

TABLE 11
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY COUNTRY 1/

Country	Metals and alloys, crude		Plates, sheets, bars, etc. 2/		Scrap		Total	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
1999:								
Argentina	22,400	\$32,200	1,330	\$2,330	3,990	\$5,110	27,700	\$39,700
Australia	60,900	89,700	2,050	4,220	9	14	63,000	94,000
Bahrain	22,700	32,300	26,600	48,400	--	--	49,200	80,700
Belgium	20	468	4,050	11,900	198	197	4,260	12,600
Brazil	56,700	74,100	1,720	3,450	33,100	37,800	91,500	115,000
Canada	1,500,000	2,210,000	427,000	943,000	287,000	314,000	2,210,000	3,460,000
Croatia	--	--	273	933	--	--	273	933
Czech Republic	83	106	591	1,740	40	45	714	1,890
France	492	4,960	11,800	53,500	11,500	10,400	23,900	68,900
Germany	813	4,490	38,900	146,000	6,810	10,100	46,500	161,000
Italy	2,130	2,530	3,030	9,780	518	581	5,670	12,900
Japan	429	942	23,600	80,100	816	929	24,800	82,000
Korea, Republic of	--	--	21,400	42,300	--	--	21,400	42,300
Mexico	2,460	4,280	17,700	56,100	86,100	90,700	106,000	151,000
Netherlands	1,280	2,070	3,490	10,400	10,700	13,100	15,400	25,600
Norway	3,280	6,270	1,610	2,830	140	142	5,030	9,240
Panama	367	650	1,230	3,340	5,820	6,390	7,420	10,400
Russia	711,000	939,000	54,700	96,800	65,300	68,600	831,000	1,100,000
Slovakia	203	216	1	2	--	--	204	218
Slovenia	--	--	4,000	11,800	--	--	4,000	11,800
South Africa	18,300	24,000	4,070	10,400	169	144	22,500	34,500
Spain	273	427	3,230	7,360	2,100	2,370	5,600	10,200
Tajikistan	17,200	20,600	--	--	--	--	17,200	20,600
Ukraine	26,600	30,600	(3/)	10	5,510	6,310	32,200	36,900
United Arab Emirates	17,800	25,100	--	--	3,240	3,130	21,000	28,300
United Kingdom	10,900	14,300	15,100	56,000	19,500	21,000	45,500	91,300
Venezuela	127,000	178,000	16,800	29,100	26,000	29,500	169,000	236,000
Other	53,000	69,700	51,200	143,000	46,500	45,300	151,000	258,000
Total	2,650,000	3,760,000	735,000	1,770,000	615,000	666,000	4,000,000	6,200,000

See footnotes at end of table.

TABLE 11--Continued
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY COUNTRY 1/

Country	Metals and alloys, crude		Plates, sheets, bars, etc. 2/		Scrap		Total	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2000:								
Argentina	59,000	100,000	1,360	2,950	1,300	1,710	61,700	105,000
Australia	23,000	38,800	2,840	6,300	--	--	25,800	45,100
Bahrain	22,000	37,300	22,000	45,100	103	49	44,100	82,500
Belgium	21	97	3,690	11,600	99	120	3,810	11,800
Brazil	42,800	69,700	9,810	17,200	32,900	48,900	85,500	136,000
Canada	1,420,000	2,390,000	435,000	1,050,000	289,000	345,000	2,150,000	3,780,000
Croatia	--	--	163	547	--	--	163	547
Czech Republic	21	29	307	1,040	--	--	328	1,070
France	869	8,230	10,400	43,200	11,400	9,820	22,700	61,300
Germany	643	4,810	41,700	163,000	6,740	8,380	49,100	176,000
Italy	200	265	2,980	10,700	35	44	3,220	11,000
Japan	336	787	21,400	80,500	753	1,360	22,500	82,700
Korea, Republic of	89	274	13,300	33,900	514	1,050	13,900	35,200
Mexico	4,570	6,670	22,000	79,000	76,000	85,800	102,000	171,000
Netherlands	218	626	4,200	13,000	2,510	2,620	6,930	16,300
Norway	7,010	13,500	106	418	--	--	7,110	14,000
Panama	12	14	1,480	4,710	7,200	9,040	8,690	13,800
Russia	670,000	996,000	66,500	159,000	100,000	122,000	837,000	1,280,000
Slovakia	255	273	2	9	--	--	257	282
Slovenia	--	--	4,350	14,000	--	--	4,350	14,000
South Africa	24,000	36,400	23,300	53,500	599	660	47,900	90,600
Spain	343	644	402	1,630	161	205	905	2,470
Ukraine	10,200	12,600	--	--	6,830	7,240	17,000	19,800
United Arab Emirates	53,300	94,900	--	--	4,990	6,080	58,300	101,000
United Kingdom	5,290	8,210	15,400	60,700	5,650	6,340	26,300	75,200
Venezuela	120,000	165,000	24,900	47,900	19,800	23,300	165,000	236,000
Other	25,800	42,400	63,700	187,000	58,400	64,200	148,000	293,000
Total	2,490,000	4,030,000	791,000	2,080,000	625,000	744,000	3,910,000	6,860,000

-- Zero.

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

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

3/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 12
ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country	1996	1997	1998	1999	2000 e/
Argentina	184	187	187	205 r/	260
Australia	1,372	1,495	1,627	1,718	1,769 3/
Azerbaijan	1	5	-- e/	-- e/	--
Bahrain	461	490	501 r/	503 r/	509 3/
Bosnia and Herzegovina e/ 4/	10	15	28 r/	70 r/	90
Brazil	1,195	1,200	1,208	1,250	1,277 3/
Cameroon e/	82	91	82 r/	92 r/	95
Canada	2,283	2,327	2,374	2,390	2,373 3/
China e/	1,770	1,960	2,340	2,530 r/	2,550
Croatia e/ 4/	38 3/	35	35	35	35
Egypt	179	178	195 r/	193 r/	193
France	380	399 e/	424	455 r/	441 3/
Germany	576	572	612	634 r/	644 3/
Ghana	137	152	56 e/	104 r/	156 3/
Greece e/	141	133	146	160 r/	163 3/
Hungary e/	30 3/	35	35	35	35

See footnotes at end of table.

TABLE 12--Continued
ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY 1/ 2/

(Thousand metric tons)

Country	1996	1997	1998	1999	2000 e/
Iceland 5/	104	123	173 r/	220 r/	224 3/
India 6/	531	484	542	550 e/	560
Indonesia e/ 6/	225	216 3/	130	100	160
Iran	80 r/	92 r/	124 r/	137 r/	140
Italy	184	188	188 e/	187 r/	189 3/
Japan 7/	17	17	16 r/	11 r/	7 3/
Mexico 6/	61	66	62	67 r/	66
Mozambique	--	--	--	--	54
Netherlands	227	232	264 e/	287 r/	300
New Zealand	283 r/	310 r/	318 r/	327 r/	325
Nigeria e/	-- 3/	3	20	16	--
Norway	863	919	996	1,020 r/	1,026 3/
Poland 8/	52	54	54	55 e/	55
Romania 9/	141	163	170 r/	174 r/	175
Russia	2,874	2,906	3,005	3,146	3,245 3/
Serbia and Montenegro 4/	37	66	61 r/	73 r/	70
Slovakia 6/	111 r/	110 r/	108 r/	109 r/	110 3/
Slovenia e/ 4/	60	60	50 e/	50	50
South Africa	570	673	677 r/	679 r/	671 3/
Spain	362	360	362	364 r/	366 3/
Suriname e/	32 3/	32	29	10	--
Sweden	98	98	96 e/	99 r/	101 3/
Switzerland	27	27	32	34 r/	35
Tajikistan	198	206 r/	196	229	300 3/
Turkey	60	62	62	62	60
Ukraine	90 e/	101	107	112	104 3/
United Arab Emirates	259	378	387	440 e/	500
United Kingdom	240	248	258	272	305 3/
United States	3,577	3,603	3,713	3,779	3,668 3/
Venezuela	629	634	585 r/	570	570
Total	20,800 r/	21,700 r/	22,600 r/	23,600 r/	24,000

e/ Estimated. r/ Revised. -- Zero.

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

2/ 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 or remelted materials." International reporting practices vary from country to country, some nations conforming to the foregoing definition and others using different definitions. For those countries for which a different definition is given specifically in the source publication, that definition is provided in this table by footnote. Table includes data available through May 11, 2001.

3/ Reported figure.

4/ Primary ingot plus secondary ingot.

5/ Ingot and rolling billet production.

6/ Primary ingot.

7/ Excludes high-purity aluminum containing 99.995% or more as follows, in metric tons: 1996--29,351; 1997--36,136; 1998--35,063; 1999--34,893 (revised); and 2000--40,956.

8/ Primary unalloyed ingot plus secondary unalloyed ingot.

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