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ALUMINUM [ADVANCE RELEASE]

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Aluminum

By Adam M. Merrill

Domestic survey data and tables were prepared by Susan M. Weaver, statistical assistant.

During 2021, total aluminum production (primary plus aluminum recovered from scrap) in the United States was 4.19 million metric tons (Mt), 3% more than that in 2020, and apparent consumption was 4.03 Mt, essentially unchanged from that in 2020 (table 1). While primary production decreased, secondary production, net imports, and total inventories increased. Net imports (imports minus exports) of total aluminum in 2021 were 2.56 Mt, 25% more than those in 2020. Net imports of crude metal in 2021 were 3.41 Mt, 11% more than those in 2020; net imports of semifabricated aluminum products were 562,000 metric tons (t), 93% more than those in 2020. Net exports of scrap were 1.42 Mt in 2021, 9% more than those in 2020 (tables 10, 12). Total aluminum inventories in the United States stored in London Metal Exchange Ltd. (LME)-registered warehouses (including estimated off-warrant inventories) and by industry at yearend 2021 increased by 15% compared with those at yearend 2020 (table 1).

Domestic primary aluminum smelters produced 889,000 t of aluminum metal in 2021, 12% less than the amount in 2020; production decreased for 2 consecutive years and was near historic lows continuing a 30-year trend of declining production (fig. 1). The value of production in 2021, based on the average U.S. market price, increased to $2.71 billion, 37% more than that in 2020. The increase in value was due to a 54% increase in price despite a 12% decrease in production. At yearend, three companies were operating a total of six primary aluminum smelters in five States. One smelter, which was idled in 2015 and remained on care-and-maintenance status throughout 2021, started permanent closure in December. Another smelter remained on care-and-maintenance status, which began in July 2020. About 42% [690,000 metric tons per year (t/yr)] of the 1.64 million metric tons per year (Mt/yr) of domestic primary aluminum smelting capacity, including idle potlines at operating smelters, was idle at yearend (table 2).

Primary aluminum was produced in 40 countries in 2021. China was the world's leading producer, accounting for 58% of world production. The other major producing countries were India (6%), Canada and Russia (5% each), and the United Arab Emirates (4%), in descending order. World primary metal production increased by 4% compared with that in 2020. Increased production in China and India was partially offset by decreased production in Germany and the United States. The United States was the 9th-ranked producer of primary aluminum, the same ranking since 2018; it had been ranked 12th in 2017 (table 13).

Aluminum recovered from purchased and tolled scrap was 3.30 Mt in 2021, 8% more than that in 2020 (table 3). Of this recovered metal, 54% came from new (manufacturing) scrap, and 46% came from old (obsolete aluminum products) scrap (table 1). In 2021, the leading types of new aluminum scrap consumed were extrusions, and dross and skimmings, accounting for 27% and 25% of total new scrap. Used beverage cans (UBCs) and castings were the leading sources of old aluminum scrap consumed in 2021, accounting for 34% and 23% of total old scrap (table 4).

Aluminum prices generally increased through the first 10 months of the year, then decreased in November before increasing in December. The aluminum spot price on the LME averaged $1.123 per pound, 45% more than that in 2020. The 2021 annual average U.S. market price of primary aluminum ingot increased by 54% to $1.385 per pound from that in 2020 (table 8).

In 2021, global primary aluminum consumption increased by 10% as consumption in nearly every country increased from that in 2020. Consumption in China increased by 6% in 2021. China was the world's leading consumer of primary aluminum, accounting for 58% of global consumption in 2021 (CRU Aluminium Monitor, 2023). Globally, production increased by 4% to 67.5 Mt from 65.0 Mt (revised) in 2020, largely owing to new smelting capacity in China, offsetting decreased production from complete and partial shutdowns in other countries including the United States (table 13). Global inventories of aluminum metal and alloys held by LME-registered warehouses (including estimated off-warrant stocks) decreased by 58% to 1.25 Mt from those in 2020 (London Metal Exchange Ltd., 2020, 2021a, b, 2022).

Apparent consumption of aluminum in the United States was 4.03 Mt, essentially unchanged compared with 3.98 Mt in 2020. U.S. net import reliance for aluminum as a percentage of apparent consumption increased to 40% in 2021 from 39% in 2020 as net imports (excluding scrap) and secondary production increased by 370,000 t and 247,000 t, respectively, offsetting the 123,000-t decrease in primary production (table 1).

Government Actions and Legislation

A tariff on aluminum imports into the United States was imposed on March 23, 2018, under the authority of section 232 of the Trade Expansion Act of 1962. On January 19, 2021, the President of the United States announced an exemption from the 10% tariff on aluminum imports from the United Arab Emirates that would have been effective on February 3, 2021. However, on February 1, 2021, the new President of the United States revoked the decision to exempt aluminum imports from the United Arab Emirates from the 10% tariff (Executive Office of the President, 2021).

In February, the U.S. Department of Commerce (DOC) issued its final determinations of antidumping and countervailing duty investigations of aluminum foil imports from China between August 14, 2017, and December 31, 2018. Antidumping duty rates ranging from 23.62% to 47.57% and countervailing duty rates ranging from 17.05% to 48.36% were set on foil imports from China (Coyne, 2021c).

On April 27, the U.S. International Trade Commission (USITC) issued its final determinations of antidumping investigations for common alloy aluminum sheet imports from 16 countries and countervailing duty investigations of the imports from 3 countries. The antidumping investigations determined that imports of common alloy aluminum sheet produced in Bahrain, Brazil, Croatia, Egypt, Germany, India, Indonesia, Italy, Oman, Romania, Serbia, Slovenia, South Africa, Spain, Taiwan, and Turkey were sold below fair market value, and antidumping duty rates were set on those imports. The countervailing duty investigations determined that common alloy aluminum sheet producers in Bahrain, India, and Turkey also benefited from Government subsidy programs, and final countervailing duty rates were set. The DOC issued its final determinations of the investigations on March 4. The Aluminum Association Inc. had filed a complaint in March 2020 alleging that the imports from these countries were sold in the United States below fair market values (Coyne, 2021e; Roh, 2021a; U.S. Department of Commerce, International Trade Administration, 2021b).

The DOC started the Aluminum Import Monitoring and Analysis (AIM) system on June 28. The AIM system was intended to aid in enforcement of trade agreements and to circumvent evasion of tariffs and quotas on aluminum and aluminum products. Applications for required import licenses for covered aluminum products must be obtained through the AIM system. The country where primary aluminum was smelted and the country where the aluminum was most recently cast must be reported. Secondary aluminum was excluded from the requirements (Lazzaro, 2021b; U.S. Department of Commerce, International Trade Administration, 2021a).

On October 30, the European Union and the United States reached an agreement to remove the 10% tariff on aluminum imports from member countries of the European Union that do not exceed specified quotas. Effective January 2022, the tariff would only be applied to imports of unwrought aluminum and wrought products that exceed 18,000 t/yr and 366,000 t/yr, respectively. The tariff was imposed in 2018 under authority of section 232 of the Trade Expansion Act of 1964. As part of the agreement, tariffs on specific goods produced in the United States exported to member countries of the European Union would not be imposed (Lazzaro, 2021a).

On November 11, the DOC issued antidumping and countervailing orders on aluminum foil imports from five countries. Combined antidumping and countervailing duty rates were set at 29.11% for Armenia, 13.93% to 63.05% for Brazil, 5.82% for Oman, 62.18% for Russia, and 4.88% for Turkey. The USITC issued its final determinations in the case on October 19, finding that imports of aluminum foil from the five countries harmed producers in the United States (Coyne, 2021d; Lazzaro, 2021g, h).

On December 20, the DOC announced its determination in a countervailing duty investigation of aluminum sheet imported from China between April 23, 2018, and December 31, 2019. The investigation concluded that six companies in China received Government subsidies to produce aluminum sheet. Countervailing duties ranging between 32.22% and 277.35% were assigned to the companies investigated (Coyne, 2021f).

In 2021, the REMADE Institute awarded funding to several aluminum research projects including achievement of 100% recycling of aluminum in diecasting applications; material and vehicle design for high-value recycling of aluminum and steel automotive sheet; and selective recovery of elements from molten aluminum alloys. The U.S. Department of Energy had established the REMADE Institute, a public-private partnership, in 2017 to develop recycling technologies (Light Metal Age, 2021c; REMADE Institute, 2021).

Production

Primary.—Domestic production data were based on information compiled from U.S. Geological Survey (USGS) monthly surveys sent to three companies that owned seven primary aluminum smelters, all of which responded. Primary aluminum production in the United States was 889,000 t, 12% less than that in 2020 (table 1). Decreased production was attributed to the shutdown of one smelter in July 2020 and power supply and weather-related issues at another smelter.

In March, Century Aluminum Co. announced that equipment issues at the Hawesville, KY, smelter related to severe weather in December 2020 were resolved in February. The 250,000-t/yr primary aluminum capacity smelter had been producing at a rate of approximately 200,000 t/yr prior to a partial shutdown. In 2021, the Hawesville smelter shipped 166,000 t of primary aluminum, 29,000 t less than that in 2020 (Century Aluminum Co., 2021c; 2021e, p. 9; 2022, p. 9). On April 16, employees at Century's Hawesville, KY, smelter, represented by the United Steelworkers union, ratified a labor contract. The contract would expire on April 1, 2026. Production at the 250,000-t/yr smelter continued during the contract negotiations. Century also announced that it would add 60 new jobs at the smelter (Century Aluminum Co., 2021a).

In June, Century initiated the restart of approximately 57,000 t/yr of capacity at the Mount Holly, SC, smelter. Earlier in March, Century and the South Carolina Public Service Authority, commonly known as Santee Cooper, finalized a power supply contract for the smelter for enough power to enable the restart of the additional capacity. The contract would be effective from April 1, 2021, to December 31, 2023, and provide a minimum of 290 megawatts of power. The contract would supply enough power to restart approximately 57,000 t/yr of capacity that was shut down in December 2015. The restart process was scheduled to be completed by yearend 2021. Only one-half of the smelter's 230,000 t/yr of capacity had been producing since December 2015 owing to high electricity prices (Century Aluminum Co., 2021c, d).

On December 13, Alcoa Corp. announced that the temporary shutdown of its smelter in Wenatchee, WA, would be permanent and would commence immediately. Alcoa idled the 146,000-t/yr smelter in 2015, citing high power prices. The 1,100-hectare (2,800-acre) site would be redeveloped for other uses (Alcoa Corp., 2021b).

Secondary and Semifabricated Products.—Domestic production data were based on information compiled from USGS monthly and annual surveys sent to 52 secondary aluminum facilities. For 2021, responses were received from 26 of the facilities. Domestic secondary aluminum production

in 2021 was 3.30 Mt, 8% more than that in 2020 (table 1). Increased secondary aluminum production was attributed to restarts at smelters shut down in response to market conditions and safety concerns related to the global coronavirus disease 2019 (COVID-19) pandemic.

On January 12, employees of Constellium SE's (France) secondary smelter and rolling mill in Muscle Shoals, AL, ended their strike, agreeing to a new 5-year collective bargaining agreement. On December 15, 2020, approximately 400 employees of Constellium represented by the United Steelworkers union went on strike to dispute terms of a new labor contract. The smelter and rolling mill recycled UBCs and other scrap to produce can sheet and other types of aluminum sheet (Roh, 2020, 2021b; Lazzaro, 2021c).

On March 31, Alcoa completed the sale of the Warrick rolling mill in Evansville, IN, to Kaiser Aluminum Corp., for approximately $670 million. Alcoa retained ownership of the 269,000-t/yr Warrick primary aluminum smelter but would supply molten aluminum to Kaiser. The rolling mill would continue to produce can sheet (Alcoa Corp., 2021c; Kaiser Aluminum Corp., 2021).

In August, Matalco Inc. (Canada), a subsidiary of Giampaolo Group S.R.L. (Italy), began production at its new remelting and casting facility in Wisconsin Rapids, WI, which had begun construction in 2019. The facility could produce 113,000 t/yr of aluminum billet or rolling ingot. Products manufactured at the Wisconsin Rapids facility would serve the automotive industry (Light Metal Age, 2021a).

In August, Alexandria Industries completed expansion of its extrusion facility in Alexandria, MN, by installing a 17.8-centimeter (reported as 7-inch), 26-million-newton extrusion force, front-loading extrusion press line. The new equipment improves capacity, is capable of extruding harder alloy, and uses automated technology that reduces the number of necessary workers (Svendsen, 2021).

In November, Constellium restarted its 3.66-meter (reported as 144-inch) cold aluminum rolling mill located at Ravenswood, WV. The rolling mill was upgraded with modern mechanical, electrical, hydraulic, and process control systems. In addition to the cold aluminum mill, the Ravenswood facility included a casthouse, hot mill, and plate shop, which provided rolled products to the defense industry (Constellium SE, 2021a, b).

Consumption

Apparent consumption of aluminum in the United States was 4.03 Mt in 2021, essentially unchanged from 3.98 Mt in 2020 (table 1). Net imports of crude aluminum and unwrought crude metal products to the United States from Canada increased by 10% from those in 2020. Shipments of semifabricated products by producers in the United States and Canada to their combined domestic markets increased by 11% from those in 2020 (tables 10, 12). Producers of unwrought and semifabricated aluminum products in the United States and Canada reported that they shipped 91.8% of their products to markets in the United States and Canada. Of the grand total of shipments, the transportation industry accounted for 32.4%; containers and packaging, 20.3%; building and construction, 13.2%; electrical, 8.1%; machinery and equipment, 7.5%; consumer durables, 7.3%; and other markets, 2.9%. Exports to external markets accounted for 8.2% of shipments from producers in the United States and Canada in 2021 (table 6).

Shipments of aluminum to the transportation sector increased by 12% and accounted for 35% of 2021 shipments 2021 within the United States and Canada (table 6). Total light-vehicle sales in the United States in 2021 were 14.9 million units, 3% more than those in 2020. Vehicle production in the United States was 1.56 million units in 2021, 19% less than that in 2020 (Bureau of Economic Analysis, 2023).

The Boeing Co. (Chicago, IL) reported that it delivered 340 commercial aircraft in 2021, more than double (117% increase) the deliveries in 2020 but 11% less than those in 2019. The increase in 2021 was attributed to two major factors: (1) the resumption of operations after a COVID-19 pandemic-related temporary suspension in the first half of 2020; and (2) increased deliveries of the 737 MAX aircraft, which resumed in December 2020 after being grounded by the Federal Aviation Administration in 2019 following two 737 MAX accidents. Boeing delivered 245 units of its 737 MAX aircraft in 2021 and anticipated reaching a production rate of 31 per month by early 2022. The 737 MAX aircraft accounted for 72% of all commercial aircraft deliveries by Boeing in 2021. In May, Boeing paused production of its 787 aircraft citing production issues and associated rework. In 2021, Boeing produced 14 units of its 787 aircraft, 74% less than production in 2020 (Boeing Co., The, 2022, p. 33–34, 37, 92).

In 2021, shipments of aluminum to the building and construction sector increased by 9% from those in 2020 and accounted for 14% of domestic shipments (table 6). In 2021, housing starts in the United States increased by 15% from those in 2020; completed houses increased by 5% from those in 2020. Total U.S. construction spending during 2021 increased by 8.3% compared with that in 2020; spending on residential construction increased by 22.9%, whereas spending on the more-aluminum-intensive nonresidential construction decreased by 3.0% (U.S. Census Bureau, 2021, 2022a, b).

Aluminum shipments for containers and packaging increased by 8% in 2021 compared with those in 2020 and accounted for 22% of domestic shipments in 2021. Aluminum shipments for electrical products increased by 10% in 2021 from those in 2020 and accounted for 9% of domestic shipments in 2021. In 2021, aluminum shipments increased compared with those in 2020 for consumer durables (by 21%), machinery and equipment (19%), and other markets (11%) (table 6).

Stocks

According to data reported by The Aluminum Association Inc. (2022a, b), inventories of aluminum ingot, mill products, and scrap by producers in the United States and Canada were 1.87 Mt at yearend 2021, an increase of 29% from those at yearend 2020. LME-approved U.S. warehouses (including estimated off-warrant stocks) held a total of 68,800 t of combined primary aluminum and alloyed aluminum at yearend 2021, 71% less than that at yearend 2020. Primary aluminum metal ingot stocks in LME-approved U.S. warehouses (including estimated off-warrant stocks) were 57,400 t at yearend 2021, 73% less than that at yearend 2020. At yearend

2021, LME warehouses in the United States held 11,400 t of North American Special Aluminum Alloy Contract metal ingot (including estimated off-warrant stocks), 55% less than that at yearend 2020. Global yearend 2021 inventories of unalloyed aluminum metal held by LME-registered warehouses (including estimated off-warrant stocks) were 1.23 Mt, 58% less than that at yearend 2020; aluminum alloy inventories were 13,700 t, 52% less than that at yearend 2020 (London Metal Exchange Ltd., 2020, 2021a, b, 2022).

Prices

The annual average U.S. spot market price of primary aluminum metal in 2021 was $1.385 per pound, 54% more than that in 2020. The monthly average price, as reported by S&P Global Platts Metals Week, averaged $1.056 per pound in January, then increased steadily through October, reaching $1.681 per pound. The monthly average price dropped sharply in November to $1.476 per pound then remained essentially unchanged at $1.494 per pound in December. In 2021, the annual average LME cash price increased by 45% to $1.123 per pound from $0.772 per pound in 2020. The indicator prices for selected scrap and secondary aluminum alloy ingot, as published in Fastmarkets-AMM, generally followed the same trend as primary ingot prices. Scrap and secondary alloy ingot prices ended the year 53% to 88% higher than at yearend 2020 (table 8).

Foreign Trade

Imports of aluminum increased by 15% during 2021 compared with those in 2020. Imports for consumption of crude aluminum metal and alloys increased by 11%; semifabricated aluminum materials imports increased by 21%; and imports of scrap increased by 25%. Canada remained the leading source country, accounting for 70% of crude metal and alloys, 59% of scrap, 17% of semifabricated aluminum materials, and 57% of total aluminum imports in 2021. China accounted for 13% of semifabricated aluminum material imports, up from 12% in 2020 and 9% in 2019, but down from 18% in 2018 and 33% in 2017. Mexico accounted for 30% of scrap imports. The United Arab Emirates accounted for 10% of crude aluminum metal and alloy imports. Russia accounted for 5% of crude aluminum metal and alloy imports, up from 3% in 2020, but down from 5% in 2019, 9% in 2018, and 15% in 2017 (table 12).

Exports of aluminum increased by 7% during 2021 compared with those in 2020. Exports of crude aluminum and scrap increased by 3% and 14%, respectively, whereas semifabricated aluminum material exports decreased by 9%. In 2021, 50% of United States exports of unmanufactured aluminum were shipped to Canada, China, and Mexico, up from 45% in 2020, but down from 52% in 2019, 63% in 2018, and 76% in 2017. Canada and Mexico were the leading destinations for semifabricated aluminum exports, receiving 46% and 41% of United States exports, respectively. Scrap accounted for 71% of total aluminum exports in 2021; Malaysia (25%), India (21%), the Republic of Korea (14%), China (10%), and Mexico (8%) were the leading destinations. China received 8% of aluminum exports during 2021, down from 9% in 2020, 12% in 2019, 17% in 2018, and 30% in 2017; 94% of the exports to China in 2021 were scrap, up from 90% in 2020 (table 10).

World Industry Structure

Production.—World primary aluminum production increased by 4% in 2021 compared with that in 2020 (table 13). Increased production in Brazil, China, India, and Iran was partially offset by decreased production in the United States. China was the leading producer and accounted for 58% of global primary aluminum production. India, Canada, Russia, and the United Arab Emirates, in descending order of production, accounted for an additional 20% of production. Since 2000, production increased in China by 36.1 Mt (1,289%), India by 3.32 Mt (516%), the United Arab Emirates by 2.07 Mt (440%), Bahrain by 1.05 Mt (207%), Canada by 764,000 t (32%), and Russia by 395,000 t (12%), but production decreased in the United States by 2.78 Mt (76%) and Australia by 204,000 t (12%).

Mergers, Acquisitions, and Divestitures.—United Company RUSAL Plc (Russia) acquired Aluminium Rheinfelden GmbH, a German manufacturer of aluminum alloys and semifinished aluminum products. The acquisition had been approved by the German Federal Cartel Office and the German Federal Ministry for Economic Affairs and Energy. Expanded access to an international network of automotive customers and a larger customer base for RUSAL's low-carbon aluminum were cited as reasons for the acquisition (United Company RUSAL Plc, 2021b).

RUSAL announced in May that it planned to demerge high-carbon assets, resulting in two independent companies that would be free to pursue separate strategies. When complete, RUSAL would change its name to AL+ and concentrate on low-carbon aluminum metal, such as its ALLOW brand. Resulting from this separation, a newly formed company would hold and operate Russian assets including alumina refineries located in the Ural geographical region, Achinsk, Bogoslovsk, and Pikalevo and smelters in Bratsk, Irkutsk, Kandalaksha, Novokuznetsk, and Volgograd. The demerger was expected to be final by the first quarter of 2022 (Thomson Reuters, 2021; United Company RUSAL Plc, 2021c).

Norsk Hydro ASA (Norway) divested its rolling business to private equity firm KPS Capital Partners, LP (New York, NY). KPS Capital Partners' newly acquired aluminum rolling business was renamed Speira Holdings, LP. The acquired business included seven rolling plants located in Germany and Norway, including the world's largest aluminum rolling mill and finishing mills (KPS Capital Partners, LP, 2021b; Norsk Hydro ASA, 2021b).

KPS Capital Partners acquired aluminum extruders Metra Holding S.p.A. (Italy), Metra S.p.A. (Italy), and Profile Customs Extrusions, LLC (Rome, GA). With five plants across Canada and Italy, Metra and Metra Holding produced finished aluminum profiles for the building and construction industries. Profile Customs Extrusions was a custom manufacturer and finisher of extruded aluminum profiles serving the construction, electrical, hurricane protection, marine, and transportation end markets (KPS Capital Partners, LP, 2021a).

Weatherization product manufacturer M-D Building Products, Inc. (Oklahoma City, OK) acquired Cardinal Aluminum Co. (Louisville, KY), an aluminum extruder, fabricator, and finisher. The company reported that the acquisition would strengthen

its product portfolio and open additional markets (Light Metal Age, 2021b).

World Review

Australia.—In August, UACJ Corp. (Japan) formed an agreement with Sunrise Energy Metals Ltd. (Australia) to produce aluminum-scandium alloys for the transportation industry. Aluminum can be made stronger and more heat resistant when alloyed with scandium. Sunrise Energy Metals planned to mine and produce scandium whereas UACJ would develop and test aluminum-scandium alloy products (Sunrise Energy Metals Ltd., 2021, p. 18; UACJ Corp. 2021).

In November, Alcoa announced that it was restarting 35,000 t/yr of capacity at its 358,000-t/yr Portland Aluminium smelter in the State of Victoria. The potline had been idle since 2009 and the restart was enabled by a new power supply contract. Work necessary for the restart began immediately, and the first production of aluminum was expected in the third quarter of 2022. Portland Aluminium was a joint venture between Alcoa (33%), CITIC Nominees Pty. Ltd. (22.5%), Marubeni Aluminium Australia Pty. Ltd. (22.5%), and Alumina Ltd. (22%) (Coyne, 2021b).

Brazil.—In August, Novelis Inc. (Atlanta, GA), a subsidiary of Hindalco Industries Ltd. (India), completed a $150 million expansion at its aluminum rolling and recycling plant located in Pindamonhangaba. The expansion increased the capacity for both the rolling and recycling operations by 100,000 t/yr each. Total sheet rolling and recycling capacities at the plant had increased to 680,000 t/yr and 490,000 t/yr, respectively (Novelis Inc., 2021).

In September, Alcoa restarted 268,000 t/yr of capacity at the 447,000-t/yr Alumar smelter in Sao Luis. The Alumar smelter, a joint venture between Alcoa (60%) and South32 Ltd. (40%), was idle since 2015. High power prices and low aluminum prices were cited when the smelter was shut down, but an Alcoa spokesperson stated that a new power supply agreement made the restart possible. The smelter is located adjacent to an alumina refinery that would supply it with alumina. The first metal would be produced in the second quarter of 2022, and the restart process was expected to be completed by yearend 2022 (Alcoa Corp., 2021a, p. 1, 3; Coyne, 2021a).

Canada.—Primary aluminum production in 2021 was 3.14 Mt, essentially unchanged from that in 2020, and accounted for 5% of total world production (table 13).

In June, Rio Tinto plc commenced production of scandium oxide at its commercial-scale demonstration plant in Sorel-Tracy, Quebec Province. The plant sourced scandium oxide from titanium waste streams produced at its Rio Tinto Fer et Titane metallurgical complex. The plant's full capacity was 3 t/yr of scandium oxide. Scandium oxide would be used by Rio Tinto to produce aluminum-scandium alloys for the aerospace, defense, and three-dimensional (3D) printing industries (Rio Tinto plc, 2021b, c).

On October 4, Rio Tinto reached an agreement on a labor contract with the union that represented workers at the smelter at Kitimat, British Columbia Province. About 65% of the smelter's 432,000-t/yr capacity was shut down when the dispute started on July 25. Nearly 900 employees were involved in the dispute. Rio Tinto restarted production from the affected capacity, but a schedule for the full restart was not available (Ong, 2021b; Rio Tinto plc, 2021a, d).

ELYSIS Corp., a joint venture between Alcoa and Rio Tinto plc (United Kingdom), announced that it had commenced construction at the Alma smelter in Saguenay, Quebec Province, to install its inert anode technology in a commercial-scale smelting pot. The smelter, owned by Rio Tinto, had a capacity of 473,000 t/yr and is located near the ELYSIS research and development center, which was completed in December 2020. In November, ELYSIS announced that it had produced aluminum using its inert-anode-smelting process without direct greenhouse emissions at its Industrial Research and Development Center located near the Alma smelter. Inert-anode-smelting technology was designed to produce primary aluminum without a carbon anode and would eliminate direct carbon emissions from carbon dioxide and fluorocarbons. ELYSIS planned to commercialize the inert anode technology in 2024. Alcoa and Rio Tinto planned to retrofit their existing smelters with the inert anode technology and ELYSIS would license the process to other smelters (Alcoa Corp., 2021e; ELYSIS Corp., 2021; Hotter, 2021; Rio Tinto plc, 2021e).

China.—Primary aluminum production in 2021 was 38.9 Mt, 5% more than that in 2020, and accounted for 58% of total world production (table 13). At yearend, primary aluminum smelting capacity was 43.3 Mt/yr, a slight increase from 42.3 Mt/yr at yearend 2020 (China Metal Market—Alumina and Aluminum, 2021e, 2022).

Several Provincial and regional governments instituted production limits on high-energy consuming industries, including the aluminum industry, to reduce power consumption amid power shortages and implementation of carbon emission targets. Production restrictions were imposed in Guangxi Autonomous Region, Guizhou Province, Henan Province, Inner Mongolia Autonomous Region, Ningxia Autonomous Region, Qinghai Province, Shaanxi Province, Shandong Province, Xinjiang Uyghur Autonomous Region, and Yunnan Province (S&P Global Platts Metals Daily, 2021a–c, e, f).

Since 2017, in an effort to control pollution during winter months, the Government of China has required aluminum smelters and alumina refineries in certain areas to shut down capacity from October 1 to the following March 31. The policy required aluminum smelters and alumina refineries to close 30% of their capacity and carbon anode plants to close 50% of their capacity. The policy also required secondary aluminum smelters in the affected locations to decrease production by 50%. The policy applied to facilities in 26 cities. The policy was expected to be renewed each winter in the future (Hotter, 2017; Mok, 2017; China Metal Market—Alumina and Aluminum, 2018b).

Guangxi Autonomous Region.—Baise Mining Group Co., Ltd. commissioned the final phase of its Geely Baikuang Tianlin aluminum smelter, located in Tianlin County, Baise Prefecture. Primary aluminum capacity increased to 300,000 t/yr from 200,000 t/yr. Construction started in 2017, and first production commenced in May 2018 (China Metal Market—Alumina and Aluminum, 2021b, c).

Guizhou Province.—By October, Xingren Denggao Aluminum Co., Ltd. completed the 250,000-t/yr second stage of

its aluminum smelter located in Xingren County. The expansion increased total capacity at the smelter to 500,000 t/yr. The first stage of the smelter was commissioned in 2018 (China Metal Market—Alumina and Aluminum, 2021d).

Henan Province.—Idled capacity at the Henan Hengkang Aluminum Co., Ltd. smelter was restarted in April. By October, the company had reactivated the smelter's full capacity of 240,000 t/yr and expected primary aluminum output of 100,000 t by yearend. The smelter originally started production in 2007, was idled in 2009 and again in 2015, before shutting down most recently in 2018 (China Metal Market—Alumina and Aluminum, 2021b).

Inner Mongolia Autonomous Region.—SPIC Baiyinhua Coal & Power Co., Ltd. completed construction of a 400,000-t/yr aluminum smelter. Startup was delayed until mid-2022 owing to carbon emission restrictions in the region. Construction at the site, located at Baiyinhua, Xilingol League, began in 2019 (China Metal Market—Alumina and Aluminum, 2021d).

Yunnan Province.—In July, Yunnan Shenhuo Aluminium Co., Ltd. (a subsidiary of Henan Shenhuo Coal & Power) shut down 180 electrolytic pots reducing primary aluminum capacity at its Funing County smelter by 350,000 t/yr. The Yunnan Province experienced power shortages, and the smelter was required to reduce power consumption by 30%. Construction began in July 2018 and reached an operating capacity of 750,000 t/yr in 2021. The company had planned to achieve the smelter's full 900,000-t/yr capacity by June 2021 (China Metal Market—Alumina and Aluminum, 2018a, 2021a; S&P Global Platts Metals Daily, 2021d).

Iceland.—In February, Rio Tinto revised its electricity contract with Landsvirkjun Power, the national power company of Iceland, for its 212,000-t/yr ISAL primary aluminum smelter, located in Hafnarfjordur. The renegotiated price would continue through 2032 and prompted a rampup to full capacity by yearend. Total primary aluminum production for the ISAL smelter in 2021 was 203,000 t (Lazzaro, 2021e; Rio Tinto plc, 2022, p. 351).

In July, Century signed a 3-year extension to its power supply agreement with Landsvirkjun for the Grundartangi smelter. The contract would provide power to the 260,000-t/yr smelter through 2026, including an increase in the amount of power supplied as capacity creep increased production from the smelter (Century Aluminum Co., 2021b).

Malaysia.—Malaysia's Ministry of International Trade and Industry delayed implementing a new regulation on scrap imports that was originally scheduled to take effect on September 1, 2021, until January 1, 2022. The new rule required scrap metal imports to contain a minimum of 94.75% metal and applied to aluminum, copper, and steel scrap. Through the first 9 months of 2021, 382,000 t of aluminum scrap was exported from the United States to Malaysia, which was 25% of all aluminum exports from the United States (table 9). In recent years, Malaysia has become an important destination for aluminum scrap since China imposed restrictions on scrap exports from the United States (Choo and Chin, 2021).

New Zealand.—In January, Rio Tinto signed a new power deal with Meridian Energy for its 373,000-t/yr Tiwai Point primary aluminum smelter, located in the Southland region. This deal extended operation of the smelter through 2024, avoiding closure that was anticipated in August. In 2021, total primary aluminum production for the Tiwai Point smelter was 333,000 t (Lazzaro, 2021d; Rio Tinto plc, 2022, p. 351).

Netherlands.—Damco Aluminium Delfzijl Coöperatir U.A. (ALDEL) shut down production from its primary aluminum smelter in Delfzijl. An increase in power prices in Europe was cited as the reason for shutting down the 110,000-t/yr smelter. ALDEL continued producing extrusion billet and other value-added products using scrap and remelting primary aluminum from other sources in the casthouse, which had 50,000 t/yr of capacity (Ong, 2021a).

Romania.—In December, ALRO S.A. (a subsidiary of Vimetco N.V.) announced that it would reduce production of primary aluminum at its 265,000-t/yr smelter in Slatina. Two of the smelter's five electrolysis lines would be idled until energy costs decreased. ARLO continued to operate its processed aluminum facilities as normal, supplementing as needed with purchased primary aluminum and recycled metal (ALRO S.A., 2019, 2021).

Russia.—In April, RUSAL announced that it had produced aluminum at its Krasnoyarsk smelter using its inert anode technology that generated zero carbon emissions. Test batches were delivered to customers to demonstrate the benefits and usability of the product. According to the company, its inert anode process emits less than 0.01 t of carbon dioxide per ton of aluminum when hydropower is used as the power source (United Company RUSAL Plc, 2021a).

The Government of Russia announced an export duty on aluminum and other metals that would be in effect from August 1 to yearend. The duty base rate would be 15% with a specific duty of $254 per metric ton on aluminum. The duty would be applied to unwrought, nonalloyed aluminum and to some alloyed products including extrusion billet, foundry alloys, and rolling slab. Many market traders predicted that prices in the United States and countries in Europe would increase to reflect the duty, and RUSAL (which owned all the primary aluminum smelters in Russia) stated that it planned to pass on at least part of the duty to customers. In the first quarter of 2021, RUSAL reported that 42% of its sales were to countries in Europe and 8% of its sales were to the United States. Russia was the source of 5% of crude aluminum imports to the United States in 2021 through the end of May (table 13). The Government of Russia cited efforts to control metal price inflation in Russia as the reason for the export duty (Bouckley, 2021; Hinton and Roh, 2021; Roh, 2021c, d; Yang and Mason, 2021).

Slovakia.—In December 2021, Norsk Hydro announced that it would reduce primary aluminum production at its 175,000-t/yr Slovalco smelter by 40%. This action superseded a previous decision in 2019 to reduce production at the smelter by 20%. Hydro cited high energy prices as the reason for the shutdown. The smelter was a joint venture between Hydro (55.3%) and Penta Investments Ltd. (44.7%) (Norsk Hydro ASA, 2019, 2021a).

South Africa.—South32 signed a 10-year power supply contract with South Africa's state-owned utility Eskom for the Hillside smelter. The contract would provide power to the

720,000-t/yr smelter through 2031 and replaced contracts that included pricing based on the LME aluminum price and were priced in U.S. dollars (Warwick, 2021).

Spain.—On December 29, Alcoa and employees at the smelter in San Ciprian reached an agreement to end a strike that started on September 27. Production continued at the smelter, but shipments of aluminum were blocked during the strike. Terms of the agreement included the shutdown of production of primary aluminum from the 228,000-t/yr smelter on January 1, 2022, for a period of 2 years and a commitment by Alcoa to restart production in January 2024. Alcoa would pay employee salaries during the temporary shutdown. The casthouse would continue to operate using remelted aluminum from other sources during the shutdown of the smelter, and the adjacent alumina refinery would continue to produce. Alcoa would seek a long-term power contract at a competitive rate for the smelter to restart in 2024. Alcoa cited high local power prices as the reason for the shutdown (Alcoa Corp., 2021a, p. 3; 2021d; Lazzaro, 2021f).

United Arab Emirates.—In November, Emirates Global Aluminum PJSC (EGA) completed the expansion of its 2.0-Mt/yr primary aluminum Al Taweelah smelter in Abu Dhabi. The project added 66 new reduction cells to the three existing potlines, increasing the overall production capacity at the smelter by 78,000 t/yr of primary aluminum. In 2021, EGA reported sales of 2.54 Mt of cast aluminum, representing production from its Al Taweelah and Jebel Ali smelters (Emirates Global Aluminum PJSC, 2021, 2022).

Outlook

Throughout 2021, aluminum prices generally trended upwards in the United States and in world markets. Consumer demand for manufactured products, including those made from aluminum, increased as economies recovered from the effects of the global COVID-19 pandemic in 2020. Additionally, higher energy prices worldwide, caused in part by a weak energy supply, rapidly recovering economies, and a colder-than-expected winter in the Northern Hemisphere, contributed to higher aluminum prices.

China, the world's leading aluminum producer, contributed to the trend of higher aluminum prices, as new regulations were enforced to decrease overall energy consumption and to manage peak energy use. Additionally, higher prices for alumina amid alumina refinery shutdowns in Brazil and Jamaica added pressure to production costs for smelters. The World Bank expected power supplies to become less restricted in 2022, which may increase primary aluminum availability (Alvarez and Molnar, 2021; World Bank Group, 2021, p. 40).

World consumption of aluminum in 2022 is expected to increase as economic recovery from the global COVID-19 pandemic continues. Inventories at LME-registered warehouses are expected to continue the destocking that took place in 2021. Primary aluminum smelters in the United States are expected to maintain production at the current rate, provided that energy contracts continue to ensure a steady supply at favorable prices, although tightening alumina supplies from Jamaica lend a degree of uncertainty.

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TABLE 1
SALIENT ALUMINUM STATISTICS[1]

(Thousand metric tons unless otherwise specified)

		2017	2018	2019	2020	2021
United States:						
Primary production:						
Quantity		741	891	1,093	1,012	889
Value	millions	$1,611	$2,254 r	$2,398	$1,983	$2,714
Price, average, U.S. market, spot	cents per pound	98.3	114.7	99.5	89.7	138.5
Stocks, December 31:						
Aluminum industry[2]		1,470 r	1,570 r	1,600 r	1,450 r	1,870
London Metal Exchange Ltd., U.S. warehouses[3]		254	186	120	235	69
Secondary recovery:[4]						
New scrap		2,050	2,140	1,920	1,630	1,780
Old scrap		1,590	1,570	1,540	1,420	1,520
Total		3,630	3,710	3,470	3,050	3,300
Exports, crude, semicrude, and scrap		2,900	3,080	2,970	2,750	2,950
Imports for consumption, crude and semicrude[5]		6,220	5,550	5,280	4,260 r	4,830
Supply, apparent[6]		7,730	7,040	6,910	5,610 r	5,810
Consumption, apparent[7]		5,680	4,900	4,980	3,980	4,030
World, production[8]		59,400 r	63,300 r	62,600 r	65,000 r	67,500

rRevised.
[1]Table includes data available through July 13, 2022. Data are rounded to no more than three significant digits except primary production and prices; may not add to totals shown.
[2]Data from The Aluminum Association Inc.; includes ingot, semifabricated material, and scrap inventory levels for producers in the United States and Canada.
[3]Includes aluminum alloyed material. Includes estimated off-warrant inventories at yearend 2019 and reported off-warrant inventories at yearend 2020 and 2021.
[4]Metallic recovery from purchased, tolled, or imported new and old scrap expanded for full industry coverage.
[5]Does not include scrap.
[6]Defined as domestic primary metal production plus secondary recovery plus imports (excluding scrap) minus exports plus adjustments for London Metal Exchange Ltd. (U.S. warehouses) and industry stock changes.
[7]Defined as domestic primary metal production plus secondary recovery from old scrap plus imports (excluding scrap) minus exports plus adjustments for London Metal Exchange Ltd. (U.S. warehouses) and industry stock changes.
[8]May include estimated data.

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

(Thousand metric tons)

Company and location	Yearend capacity	
	2020	2021
Alcoa Corp.:		
Evansville, IN (Warrick)	269	269
Ferndale, WA (Intalco)	279	279
Massena, NY	130	130
Wenatchee, WA	146	--
Total	824	678
Century Aluminum Co.:		
Hawesville, KY	252	252
Mount Holly, SC	231	229
Sebree, KY	218	220
Total	701	701
Magnitude 7 Metals LLC,[2] New Madrid, MO	263	263
Grand total	1,790	1,640

-- Zero.
[1]Table includes data available through July 13, 2022. Data are rounded to no more than three significant digits; may not add to totals shown.
[2]A subsidiary of Alubar Metals e Cabos S.A. (Barcarena, Brazil).

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
2020:			
Secondary smelters	1,710,000	1,240,000	1,330,000
Independent mill fabricators	1,370,000	1,180,000	1,250,000
Foundries	76,100	65,100	69,600
Other consumers	2,950	2,950	2,950
Total	3,160,000	2,490,000	2,660,000
Estimated full industry coverage	3,420,000	2,690,000	3,050,000
2021:			
Secondary smelters	2,060,000	1,460,000	1,570,000
Independent mill fabricators	1,420,000	1,220,000	1,300,000
Foundries	84,500	72,200	77,300
Other consumers	2,950	2,950	2,950
Total	3,560,000	2,750,000	2,940,000
Estimated full industry coverage	3,860,000	2,980,000	3,300,000

[1]Table includes data available through July 13, 2022. Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Excludes recovery from other than aluminum-base scrap.

TABLE 4
U.S. STOCKS, RECEIPTS, AND CONSUMPTION OF PURCHASED NEW AND OLD ALUMINUM SCRAP IN 2021[1, 2]

(Metric tons)

Class of consumer and type of scrap	Stocks, January 1	Net receipts[3]	Consumption	Stocks, December 31
Secondary smelters:				
New scrap:				
Extrusions	15,800	346,000	346,000	15,700
Can stock clippings	6,070	68,700	67,000	7,700
Other wrought sheet and clippings	4,670	182,000	183,000	3,120
Castings	4,270	85,300	83,900	5,680
Borings and turnings	3,920	147,000	147,000	4,460
Dross and skimmings	13,800	517,000	512,000	18,300
Total	48,500	1,350,000	1,340,000	54,900
Old scrap:				
Castings	2,980	183,000	183,000	2,950
Extrusions	7,690	172,000	172,000	7,840
Aluminum cans[4]	8,170	59,900	65,500	2,520
Other wrought products	5,010	128,000	127,000	6,090
Auto shredder scrap	4,150	171,000	170,000	4,580
Total	28,000	714,000	718,000	24,000
Grand total secondary smelters	76,500	2,060,000	2,060,000	78,900
Integrated aluminum companies, foundries, independent mill fabricators, other consumers:				
New scrap:				
Extrusions	3,230	225,000	225,000	3,060
Can stock clippings	1,560	276,000	275,000	2,770
Other wrought sheet and clippings	5,440	207,000	212,000	414
Castings	240	16,300	16,300	240
Borings and turnings	735	13,200	13,100	811
Dross and skimmings	127	-107	--	20
Total	11,300	738,000	742,000	7,310
Old scrap:				
Castings	4,830	153,000	153,000	4,830
Extrusions	--	--	--	--
Aluminum cans[4]	1,400	436,000	436,000	1,710
Other wrought products	8,280	172,000	169,000	12,000
Auto shredder scrap	805	9,550	8,960	1,390
Total	15,300	771,000	766,000	19,900
Grand total integrated aluminum companies	26,600	1,510,000	1,510,000	27,200
All scrap consumed:				
New scrap:				
Extrusions	19,100	571,000	572,000	18,700
Can stock clippings	7,630	345,000	342,000	10,500
Other wrought sheet and clippings	10,100	389,000	395,000	3,530
Castings	4,510	102,000	100,000	5,920
Borings and turnings	4,660	160,000	160,000	5,270
Dross and skimmings	13,900	517,000	512,000	18,300
Total	59,900	2,080,000	2,080,000	62,300
Old scrap:				
Castings	7,810	336,000	336,000	7,780
Extrusions	7,690	172,000	172,000	7,840
Aluminum cans[4]	9,570	496,000	501,000	4,220
Other wrought products	13,300	300,000	296,000	18,100
Auto shredder scrap	4,950	180,000	179,000	5,970
Total	43,300	1,480,000	1,480,000	43,900
Grand total of all scrap consumed	103,000	3,570,000	3,560,000	106,000

-- Zero.

[1]Table includes data available through July 13, 2022. Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes imported scrap. According to reporting companies, 2.89% of total receipts of aluminum-base scrap, or 103,181 metric tons, was received on toll arrangements.

[3]Includes inventory adjustment.

[4]Used 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[1]

(Metric tons)

	2020		2021	
	Production	Net shipments[2]	Production	Net shipments[2]
Diecast alloys:				
13% Si, 360, etc. (0.6% Cu, maximum)	27,700	28,200	34,000	34,200
380 and variations	222,000	224,000	247,000	245,000
Sand and permanent mold:				
95/5 Al-Si, 356, etc. (0.6% Cu, maximum)	33,200	33,200	37,500	37,600
No. 12 and variations	1,360	1,360	1,590	1,590
No. 319 and variations	26,000	27,800	25,400	25,300
F-132 alloy and variations	2,330	2,380	2,870	2,860
Al-Mg alloys	7,710	8,630	11,200	11,300
Al-Zn alloys	(3)	(3)	(3)	(3)
Al-Si alloys (0.6% to 2.0% Cu)	2,240	2,310	2,190	2,230
Al-Cu alloys (1.5% Si, maximum)	(3)	(3)	(3)	(3)
Al-Si-Cu-Ni alloys	1,070	1,110	232	259
Other	394	832	1,060	959
Wrought alloys, extrusion billets	659,000	660,000	726,000	727,000
Miscellaneous:				
Steel deoxidation	9,070	9,070	10,700	10,700
Pure (97.0% Al)	W	W	W	W
Other[4]	77,800	76,700	84,300	84,600
Total	1,070,000	1,080,000	1,180,000	1,180,000
Less consumption of materials other than scrap:				
Primary aluminum	148,000	XX	162,000	XX
Primary silicon	20,200	XX	23,300	XX
Other	8,960	XX	9,210	XX
Net metallic recovery from aluminum scrap and sweated pig consumed in production of secondary aluminum ingot[5]	893,000	XX	989,000	XX

W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous: Other." XX Not applicable.

[1]Table includes data available through July 13, 2022. 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 "Sand and permanent mold: Other."
[4]Includes other diecast 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 AND CANADA, BY INDUSTRY[1]

	2020		2021	
Industry	Quantity (thousand metric tons)	Percent of grand total	Quantity (thousand metric tons)	Percent of grand total
Containers and packaging	2,250	20.4	2,430	20.3
Building and construction	1,450	13.1	1,570	13.2
Transportation	3,450	31.2	3,860	32.4
Electrical	876	7.9	964	8.1
Consumer durables	725	6.5	874	7.3
Machinery and equipment	753	6.8	896	7.5
Other markets	312	2.8	347	2.9
Total	9,810	88.7	10,900	91.8
Exports	1,250	11.3	982	8.2
Grand total	11,100	100	11,900	100

[1]Table includes data available through July 13, 2022. 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)

	2019	2020	2021
Wrought products:[3]			
Sheet, plate, foil	5,840	5,230	5,830
Pipe, tube, extruded shapes	2,600	2,280	2,650
Rod, bar, wire, cable	439	474 [r]	506
Forgings (including impacts)	163	121 [r]	138
Powder, flake, paste	57	51	60
Total	9,100	8,160	9,180
Castings:			
Sand	352	208 [r]	245
Permanent and semipermanent mold	494	432 [r]	444
Die	1,300	1,130 [r]	1,070
Other	4	23 [r]	24
Total	2,150	1,790	1,780
Grand total	11,200	9,950	11,000

[r]Revised.
[1]Table includes data available through July 13, 2022. Data are rounded to no more than three significant digits; may not add to totals shown.
[2]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.
[3]Wrought products data series includes net shipments in both the United States and Canada.

Source: The Aluminum Association Inc.

TABLE 8
ALUMINUM PRICES[1]

(Dollars per pound)

Material	2020	2021
Primary aluminum, average:[2]		
U.S. market	0.897	1.385
London Metal Exchange cash price	0.772	1.123
NASAAC[3] cash price, average	0.622	1.070
Secondary alloy, average:[4]		
319.1 (3% Cu)	0.797	1.275
356.1 (0.2% Cu)	0.883	1.403
A360.1 (0.6% Cu)	0.855	1.388
A380.1 (3% Zn)	0.740	1.213
A413.1 (0.6% Cu)	0.862	1.404
Scrap, average:[4]		
Clean, dry turnings	0.357	0.672
Mixed low-copper-content clips	0.436	0.730
Old cast	0.414	0.684
Old sheet	0.412	0.679
Used beverage cans	0.499	0.765

[1]Table includes data available through July 13, 2022.
[2]Source: S&P Global Platts Metals Week.
[3]North American Special Aluminum Alloy Contract.
[4]Source: Fastmarkets-AMM.

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

	2020		2021	
Class	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Crude, semicrude, and scrap:				
Metals and alloys, crude	206,000 r	$429,000 r	213,000	$614,000
Scrap	1,840,000 r	2,250,000 r	2,100,000	3,820,000
Plates, sheets, bars[2]	700,000	3,550,000 r	638,000	3,440,000
Castings and forgings	13,400	279,000 r	12,200	243,000
Semifabricated forms, n.e.c.[3]	54,600 r	370,000 r	54,500	415,000
Total	2,820,000	6,890,000 r	3,010,000	8,520,000
Manufactures:				
Foil and leaf	73,600	321,000	92,200	444,000
Powders and flakes	3,700	22,600	5,000	27,700
Wire and cable	7,880	43,500	9,590	58,300
Total	85,200	387,000	107,000	530,000
Grand total	2,900,000	7,270,000 r	3,120,000	9,050,000

rRevised.
[1]Table includes data available through April 21, 2022. Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes castings, forgings, strip, and unclassified semifabricated forms.
[3]Not elsewhere classified.

Source: U.S. Census Bureau.

TABLE 10
U.S. EXPORTS OF ALUMINUM, BY COUNTRY OR LOCALITY[1]

	Metals and alloys, crude		Plates, sheets, bars[2]		Scrap		Total	
Country or locality	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2020:								
Brazil	122	$431	3,100	$31,200	5,530	$7,380	8,760 r	$39,000
Canada	77,100 r	151,000 r	300,000	1,120,000 r	72,300	122,000	450,000 r	1,390,000 r
China[3]	1,890	3,560	22,100	198,000	223,000	236,000	247,000	438,000
France	3,390 r	12,100 r	7,490	69,000 r	1,140	6,220	12,000	87,300 r
Germany	1,890	6,080	5,350	46,100	8,420 r	20,900	15,700	73,000 r
India	478	1,010	1,530	15,400	308,000 r	371,000	310,000 r	387,000
Indonesia	8	21	93 r	1,500 r	97,200 r	108,000	97,300 r	109,000
Italy	200	417	1,990	28,200 r	5,130	4,830 r	7,320	33,500 r
Japan	1,590 r	5,630 r	13,100	159,000	19,800 r	32,200 r	34,500 r	197,000
Korea, Republic of	674	2,320	21,000 r	177,000 r	286,000 r	357,000 r	308,000	537,000
Malaysia	3,740	5,280	2,570	23,500	417,000 r	449,000 r	423,000 r	478,000 r
Mexico	107,000 r	219,000 r	269,000	1,250,000	152,000	200,000 r	527,000	1,670,000
Philippines	237	376	393	4,250	5,740	6,520	6,370	11,100
Russia	1	75	41	1,500	30,900 r	36,700 r	30,900 r	38,200 r
Saudi Arabia	13	100	528	2,790	1,840	2,180	2,380	5,070
Singapore	119	1,560	3,040 r	40,500 r	2,930	2,700	6,090 r	44,800 r
Taiwan	4,270	9,100	4,820	45,100	42,900 r	80,500 r	52,000 r	135,000
Thailand	421	835	823	7,400	73,100 r	87,100 r	74,400 r	95,300 r
United Kingdom	360	1,570	7,040	74,100 r	3,050	5,530	10,500	81,200 r
Other	2,730	9,170	36,400	261,000	86,500 r	118,000 r	126,000	389,000 r
Total	206,000 r	429,000 r	700,000	3,550,000 r	1,840,000 r	2,250,000 r	2,750,000	6,240,000 r
2021:								
Brazil	33	302	1,560	19,600	4,810	9,780	6,410	29,600
Canada	66,000	193,000	296,000	1,320,000	99,700	194,000	462,000	1,710,000
China[3]	2,320	5,130	11,200	117,000	219,000	396,000	232,000	518,000
France	3,620	14,200	4,490	47,100	819	4,210	8,920	65,600
Germany	1,530	5,060	3,670	42,600	4,100	20,800	9,300	68,400
India	761	1,920	1,150	10,400	442,000	798,000	444,000	810,000
Indonesia	(4)	19	19	784	71,000	118,000	71,000	119,000
Italy	39	215	1,020	15,400	3,600	6,530	4,660	22,200
Japan	835	3,200	3,630	64,600	29,400	63,300	33,800	131,000
Korea, Republic of	1,240	5,080	8,830	86,200	283,000	513,000	294,000	605,000
Malaysia	1,140	2,970	2,670	24,200	519,000	898,000	523,000	925,000
Mexico	126,000	354,000	265,000	1,340,000	167,000	336,000	559,000	2,030,000
Philippines	17	57	134	2,200	4,520	7,550	4,670	9,800
Russia	(4)	3	79	1,820	53,100	94,200	53,200	96,100
Saudi Arabia	2	22	201	2,690	212	330	415	3,040
Singapore	113	1,020	2,440	26,300	997	838	3,550	28,100
Taiwan	3,520	11,300	4,660	36,600	34,700	75,800	42,800	124,000
Thailand	402	1,120	847	7,330	75,100	130,000	76,300	139,000
United Kingdom	124	888	5,550	63,700	3,280	9,610	8,960	74,200
Other	4,960	14,900	25,300	208,000	79,800	139,000	110,000	362,000
Total	213,000	614,000	638,000	3,440,000	2,100,000	3,820,000	2,950,000	7,870,000

rRevised.
[1]Table includes data available through June 15, 2022. Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes castings, forgings, strip, and unclassified semifabricated forms.
[3]Includes Hong Kong.
[4]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 11
U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY CLASS[1]

Class	2020 Quantity (metric tons)	2020 Value (thousands)	2021 Quantity (metric tons)	2021 Value (thousands)
Crude, semicrude, and scrap:				
Metals and alloys, crude	3,270,000	$6,320,000	3,630,000	$10,400,000
Plates, sheets, strip, n.e.c.[2]	992,000 r	3,190,000 r	1,200,000	4,590,000
Pipes, tubes[3]	25,200 r	185,000 r	36,700	256,000
Rods and bars	2,030	12,000	1,930	12,900
Scrap	542,000	685,000	680,000	1,260,000
Total	4,830,000 r	10,400,000 r	5,550,000	16,500,000
Manufactures:				
Foil and leaf[4]	89,900 r	360,000 r	98,900	447,000
Powders and flakes	12,500	46,700 r	15,200	62,600
Wire	5,940 r	32,000 r	7,280	46,100
Total	108,000 r	439,000 r	121,000	556,000
Grand total	4,940,000 r	10,800,000 r	5,670,000	17,100,000

rRevised.
[1]Table includes data available through April 21, 2022. Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Not elsewhere classified; includes circles, disks, plates, and sheets.
[3]Includes tube or pipe fittings such as couplings, elbows, sleeves.
[4]Does not include etched capacitor foil.

Source: U.S. Census Bureau.

TABLE 12

U.S. IMPORTS FOR CONSUMPTION OF ALUMINUM, BY COUNTRY OR LOCALITY[1]

	Metals and alloys, crude		Plates, sheets, bars[2]		Scrap		Total	
Country or locality	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
2020:								
Argentina	156,000	$296,000	3	$37	--	--	156,000	$296,000
Australia	86,700	166,000	383 r	2,950 r	19	$29	87,100	169,000
Austria	(3)	18	23,600	98,000 r	-- r	2 r	23,600	98,000 r
Bahrain	75,000	140,000	17,400 r	52,400 r	--	--	92,300 r	193,000 r
Brazil	--	--	9,080 r	24,700 r	8,300	8,320	17,400	33,000
Canada	2,300,000	4,480,000	195,000 r	665,000 r	353,000	438,000 r	2,850,000 r	5,580,000 r
China[4]	794	2,720	118,000 r	355,000 r	127 r	397 r	119,000 r	358,000 r
France	2,320	26,000	11,600 r	48,400 r	915	1,730	14,800 r	76,100 r
Germany	574	5,020	60,800 r	240,000 r	2,960	6,060	64,300 r	251,000 r
India	90,000 r	160,000 r	22,100 r	61,000 r	343	849	112,000 r	222,000 r
Indonesia	--	--	15,600 r	45,100 r	--	--	15,600 r	45,100 r
Japan	(3)	5	15,100 r	66,100 r	775	7,270	15,900 r	73,400 r
Korea, Republic of	14,000	21,000	26,300	76,800 r	3,290	5,740	43,600	104,000 r
Mexico	705	1,250	36,200 r	149,000 r	142,000	178,000	179,000 r	328,000 r
Oman	99	172	63,000	144,000	--	--	63,100	145,000
Russia	113,000	192,000	20,300 r	67,500 r	39	100	133,000	259,000 r
South Africa	4,490	8,140	32,900	85,200 r	--	--	37,400	93,400
Taiwan	351	997	24,500 r	77,300 r	272	434	25,100 r	78,700 r
United Arab Emirates	335,000	633,000	1,830 r	4,970 r	35	324	337,000	638,000
United Kingdom	338 r	1,220 r	4,670	19,000 r	4,100	7,390	9,110	27,600 r
Venezuela	25	30	--	--	55	159	80	189
Other	86,000	189,000	294,000 r	903,000 r	24,900	29,300	405,000 r	1,120,000 r
Total	3,270,000	6,320,000	992,000 r	3,190,000 r	542,000	685,000	4,800,000 r	10,200,000 r
2021:								
Argentina	110,000	309,000	175	801	--	--	110,000	310,000
Australia	116,000	315,000	497	3,560	39	83	117,000	319,000
Austria	1,500	4,840	29,700	132,000	51	62	31,300	137,000
Bahrain	155,000	389,000	24,600	73,600	--	--	180,000	463,000
Brazil	(3)	3	433	2,120	10,600	17,100	11,000	19,200
Canada	2,530,000	7,520,000	201,000	845,000	403,000	753,000	3,130,000	9,110,000
China[4]	1,740	6,600	158,000	582,000	280	953	160,000	590,000
France	2,180	25,800	8,000	45,100	257	2,050	10,400	72,900
Germany	2,860	11,900	37,600	182,000	2,990	8,730	43,500	203,000
India	55,500	129,000	15,100	59,500	(3)	4	70,600	188,000
Indonesia	--	--	15,600	49,000	8	32	15,600	49,000
Japan	9	25	46,700	172,000	2,260	1,480	49,000	173,000
Korea, Republic of	12,900	31,900	34,300	134,000	155	265	47,400	167,000
Mexico	14,800	49,300	60,300	286,000	205,000	384,000	280,000	719,000
Oman	3,460	7,740	84,700	259,000	--	--	88,200	267,000
Russia	193,000	424,000	14,100	46,300	--	--	207,000	470,000
South Africa	2,040	4,930	42,000	136,000	--	--	44,100	141,000
Taiwan	91	372	5,810	36,600	23	62	5,920	37,000
United Arab Emirates	354,000	944,000	3,880	12,400	309	1,010	358,000	958,000
United Kingdom	128	1,010	5,390	27,900	3,510	6,070	9,020	35,000
Venezuela	--	--	--	--	453	637	453	637
Other	76,900	201,000	413,000	1,510,000	50,600	84,100	541,000	1,800,000
Total	3,630,000	10,400,000	1,200,000	4,590,000	680,000	1,260,000	5,510,000	16,200,000

rRevised. -- Zero.

[1]Table includes data available through April 21, 2022. Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes circles, disks, pipes, rods, and tubes.

[3]Less than ½ unit.

[4]Includes Hong Kong.

Source: U.S. Census Bureau.

TABLE 13

ALUMINUM, PRIMARY: WORLD PRODUCTION, BY COUNTRY OR LOCALITY[1, 2]

(Thousand metric tons)

Country or locality	2017	2018	2019	2020	2021
Argentina	403	419	427	377 r	400
Australia	1,487	1,574	1,570	1,585 r	1,565
Azerbaijan	29	47	33 r	30 r	30
Bahrain	981	1,011	1,365	1,549	1,561
Bosnia and Herzegovina[3]	126	132	69	--	--
Brazil	802	659	650	685 r	772
Cameroon e	67	85	63	86 r	80
Canada	3,212	2,923	2,854	3,119	3,137
China	32,273	35,802	35,044	37,080	38,900
Egypt	314	300 e	300 e	260 e	260 e
France	430 r	390 r	390 r, e	396 r, e	400 e
Germany	550	529	508 r	529 r	500 e
Ghana e	35	42	42	30	30
Greece	182	187	182	182	184
Iceland	764 r	734 r	690 r	728 r	750 e
India	3,269	3,675	3,640	3,558	3,967
Indonesia	219	242	250	245	243
Iran e	338	305 r	258 r	370 r	460
Kazakhstan	254	258	278	282 r	280 e
Malaysia e	700	750	760	760	760
Montenegro	39 r	40 r	37 r	37 r	40 e
Mozambique	577	571	565	571	565
Netherlands	29	41 r	81 r	150 e	230 e
New Zealand	337	341	351	333	333
Norway	1,253	1,295	1,300 e	1,330 e	1,400 e
Oman	253	380	391	397	395
Qatar	620	616	627	632	634
Romania[4]	282	283	280	271	293
Russia	3,583	3,627	3,637	3,639	3,640
Saudi Arabia	786	776 r	776 r	796 r	800 e
Slovakia	173	174	175	152	164
Slovenia	84	81	68	50 r	50 e
South Africa	716	714	717	717	714
Spain e	350	350	220	200	200
Sweden	123	125	120	117	124
Tajikistan	103	96	101	84 r	80 e
Turkey e	80	80	80	80	80
United Arab Emirates	2,611	2,640	2,570	2,520	2,540
United Kingdom	47	44	39	36 r	40 e
United States	741	891	1,093	1,012	889
Venezuela	144	86	8 e	20 e	20 e
Total	59,400 r	63,300 r	62,600 r	65,000 r	67,500

eEstimated. rRevised. -- Zero.

[1]Table includes data available through June 9, 2022. All data are reported unless otherwise noted; totals may include estimated data. 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 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.

[3]Primary ingot plus secondary ingot.

[4]Primary unalloyed metal plus primary alloyed metal, thus including weight of alloying material.

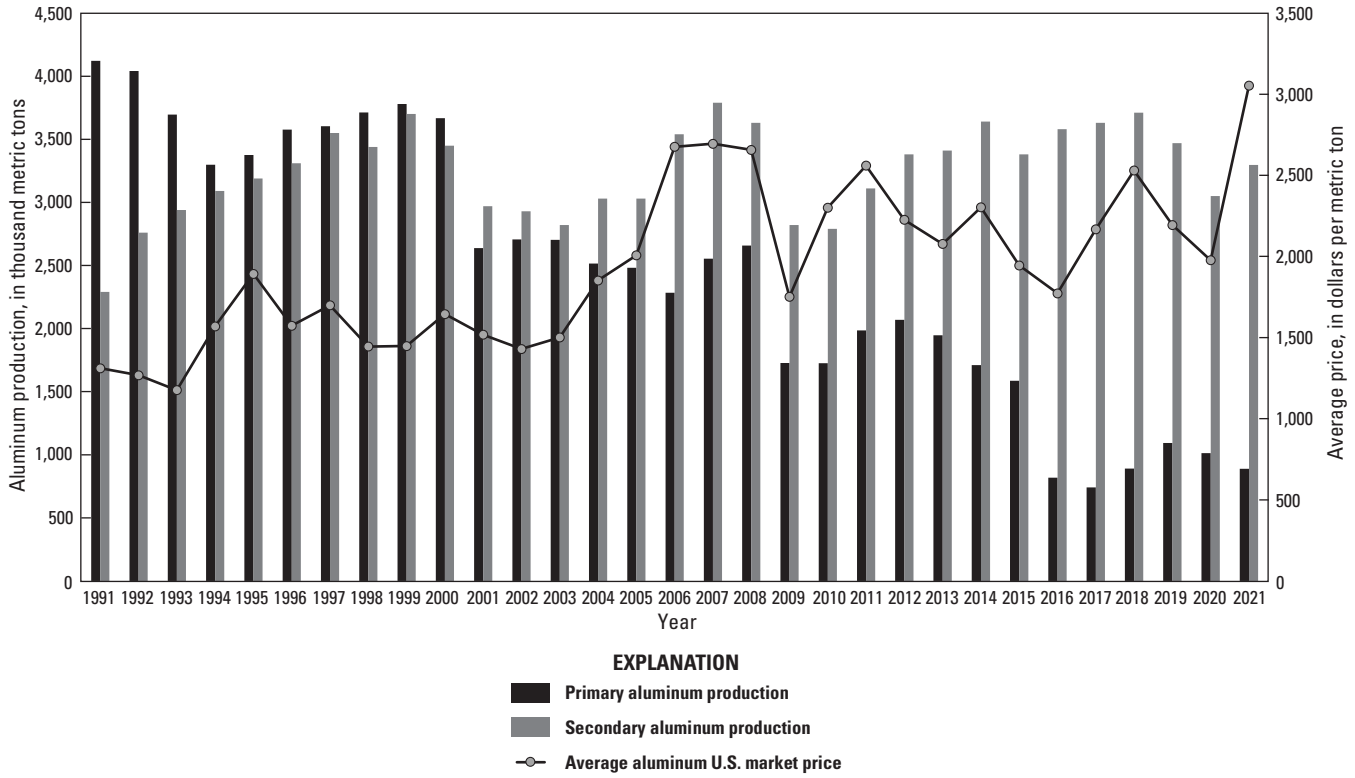

Figure 1. Chart showing the amount in thousand metric tons of primary and secondary aluminum produced in the United States for the time period of 1991 through 2021. Chart also shows the average value in dollars per metric ton of primary aluminum for the time period of 1991 through 2021. There is an overall trend of declining amounts of primary aluminum over the time period. Secondary aluminum production has fluctuated with the economic cycle over the time period. The chart shows the price of aluminum has fluctuate with the economic cycle over the time period.