

Chapter 63

Mergers and acquisitions

For 30 years following the end of World War II, the vertically-integrated Big 6 aluminum companies – Alcoa, Alcan, Kaiser, Reynolds, Pechiney and Alusuisse – grew into a functioning oligopoly. As smelters and fabricators, the Big 6 accounted for about 65% to 85% of the aluminum produced from 1945 to the early 1970s. The Big 6 also owned or controlled most of the world’s bauxite and alumina production. According to a September 1990 report by the federal Office of Technology Assessment, their market size allowed them to set prices by adjusting inventories and operating rates, and by building new capacity in anticipation of new demand. The “planned excess capacity” strategy made it difficult for new companies to enter the industry. The Big 6’s practices also resembled Alcoa’s in the early 20th century – control of natural resources and high barriers to entry and access to low-cost energy. But as electricity, labor and capital costs rose and demand slowed, the six companies turned to other strategies. The London Metal Exchange began to set prices in the late 1970s, and the Big 6 no longer worked together as a group – some sought to maintain prices by reducing production, while others turned to building new capacity in low-cost foreign sites.¹

The OTA report was requested by a subcommittee of the U.S. Senate Committee on Energy and Natural Resources. “The 1980s were turbulent for the domestic nonferrous metals industries,” the report said. “Many mines and plants were closed during the decade because of a variety of factors, including aging facilities, environmental regulations and low metals prices. The corporate structures of the industries also changed drastically as companies bought, sold and merged businesses in order to become more competitive.” The last new aluminum plant built in the U.S. was the Mt. Holly smelter in South Carolina, which opened in 1980. In the following decade, about 20% of U.S. aluminum smelting capacity closed. The four major U.S. aluminum companies expanded primary smelting overseas and emphasized their fabrication businesses in the U.S.²

U.S. aluminum production at the beginning of the 1980s was strong, at 4.7 million tons, and prices were high compared to the late 1970s, at 76 cents per pound. But the market cycled up and down through the 1980s, fluctuating between 47 and 76 cents during 1980-1987 before climbing to \$1.10 in 1988 and 89 cents in 1989. U.S. aluminum production also fluctuated during the 1980s but never rose above the 1980 level. The secondary scrap market increased about 40% over the decade to about one-third of total U.S. aluminum production. Aluminum consumption in the U.S. also fluctuated in

the 1980s, falling from 6.1 million tons in 1980 to 5.3 million tons in 1982, and fluctuating between 6 million and 6.7 million tons during the rest of the decade. In the nonsocialist countries outside the U.S., aluminum production increased steadily following the 1982 recession. By 1988, primary production increased by 8% to 13.8 million tons, secondary production increased 40% to 5.4 million tons, and consumption increased 27% to 19.8 million tons. Meanwhile, U.S. aluminum companies opened and closed plants and changed ownership during the 1980s – four alumina refineries and 10 aluminum smelters in the U.S. permanently closed and many others temporarily closed. All of the refineries and smelters that permanently closed operated in Texas, Louisiana, Alabama, Arkansas and Tennessee. From 1980-1988, U.S. refinery capacity declined 29% to 5.1 million tons, while smelter capacity declined 20% to 4 million tons.³

The aluminum industry was dramatically different 10 years later when the Wall Street Journal asked in March 1998, “Are aluminum makers setting themselves up for another glut?” The question came only a few years after an oversupply of aluminum worldwide, mostly a result of massive exports by the former-Soviet Union, had caused global prices to collapse. But by March 1998, Alcoa had plans to build an \$843 million smelter in British Columbia, Alumax had plans to build a 250,000 ton-per-year smelter also in British Columbia, Alcan was planning a new smelter in Quebec, and Reynolds announced it was restarting much of its idled capacity. Meanwhile in China, proposed aluminum projects would expand capacity there by 600,000 tons per year. One explanation for the interest in British Columbia was a recent change in rights for hydroelectric power produced in the Columbia River, which made about 1,400 megawatts available to the provincial government at low prices. An explanation for the expansion worldwide was the belief that aluminum would be used more and more in transportation, particularly in automobiles. Demand for aluminum cans was only expected to grow by 1% per year.⁴ the Chinese juggernaut was not recognized by that time.

By January 2002, merger mania reportedly was spreading through the global aluminum industry. One analyst said low aluminum prices on the London Metal Exchange were driving the mergers. Alcoa bid \$850 million for Elkem, a Norwegian light metals producer, but the bid was rejected. Norsk Hydro acquired VAW Aluminum AG of Germany, making the Norwegian company the world’s third largest aluminum producer after Alcoa and Alcan. Pechiney began looking at potential acquisitions after Norsk Hydro made its announcement. Two large mergers took place in 2000 – Alcoa acquired Reynolds, and Alcan merged with Alusuisse after Pechiney was forced to bow out under European Union anti-trust pressure. No more mega-mergers were predicted, but the acquisition of small producers was considered likely. Alcoa tried to acquire WMC Resources Ltd. in 2001, but the Australian bauxite and alumina producer rejected the offer. Small producers that were potential acquisition targets included smelters in The

Netherlands, Germany, Nigeria, Australia, Brazil, Argentina, Poland, Mexico and Romania.⁵ By 2010, five companies produced primary aluminum in the U.S. – Alcoa, Century Aluminum, Noranda Aluminum, Ormet Corp. and Rio Tinto Alcan. Together they produced 1.72 million tons of primary aluminum, nearly the same amount as in 2009. Three companies produced primary aluminum in Canada – Alcoa, Aluminerie Alouette and Rio Tinto Alcan. Together they produced 2.96 million tons of primary aluminum, a 2.2% increase over 2009.⁶

The Alcoa mergers

The era of mega-mergers in the aluminum industry began on March 9, 1998, when Alcoa announced that it was buying Alumax Inc., the third largest aluminum producer in the U.S., for \$2.8 billion in cash and stock. Alumax had been a target for takeover by the smaller Kaiser Aluminum Corp. in February 1996, but Kaiser backed out a month later. Alumax operated five smelters in the U.S. and Canada by itself or with a consortium. The Intalco plant in Ferndale, Wash., was the largest Alumax smelter, producing 272,000 tons per year. Alumax employed 14,400 people and operated 70 smelters, fabricating and distribution facilities in 22 U.S. states, Canada, Western Europe, Mexico, Australia, China and Poland. Its smelters produced 1.2 million tons of aluminum in 1997, earning the company \$2.9 billion in 1997. Alcoa employed 76,800 people at 178 locations in 28 countries. Its smelters produced 2.5 million tons, earning the company \$13.3 billion in 1997.⁷ Alcoa announced the merger with Alumax was completed in July. The combined company would have approximately 100,000 employees and would operate at 250 locations in 30 countries.⁸ One major U.S. aluminum extruding company filed an objection to the merger with the U.S. Justice Department, and Alcoa was required to divest itself of one cast plate plant.⁹ On Dec. 23, Alcoa and Century Aluminum announced that Century would take ownership of Alcoa's cast aluminum plate business in Vernon, California. The sale cleared the way for Alcoa's acquisition of Alumax Inc.¹⁰

Alcoa soon followed up with a hostile takeover bid to buy Reynolds Metals Co. for \$4.2 billion announced on Aug. 16, 1999. Reynolds had rejected an earlier friendly offer of cash for Reynolds' 64.4 million outstanding shares, calling Alcoa's bid inadequate and not in the best interests of the company's shareholders. Alcoa did not anticipate anti-trust actions to prevent the No. 1 and No. 3 U.S. aluminum companies from merging. "Alcoa believes that because of the global nature of the metals marketplace, the consolidation of the metal industry now occurring throughout the world, and the complementary nature of the businesses of both companies, the proposed Alcoa-Reynolds combination is not anti-competitive," Alcoa said in a press release. One week earlier, Alcan of Canada, Pechiney of France and Alusuisse-Lonza of Switzerland had announced a three-way merger aimed at creating a new market leader. Meanwhile, a

second bidder for Reynolds emerged, Michigan Avenue Partners, using money borrowed from General Electric.¹¹ Reynolds accepted the Alcoa bid one day later when the offer increased from \$4.1 billion to \$4.3 billion in cash and stock. The merger allowed Alcoa to retain its top position in the world even if Alcan, Pechiney and Alusuisse-Lonza merged. The wave of consolidations came at a time of low prices and depressed production in the aluminum industry. The combined Alcoa-Reynolds company would earn about \$20.5 billion in annualized revenues and control about 24% of primary aluminum capacity in the Western world, with 120,000 employees operating in 300 locations in 36 countries. "The new company will be better positioned to address the ongoing globalization of the metals industry and the new competitive landscape it is creating," Alcoa President and Chief Executive Alain Belda said.¹²

Much of the initial reaction to the proposed Alcoa-Reynolds merger was negative. Caradon, a North American-based aluminum extruding company, was expected to be one of the first companies to file an objection with the U.S. Justice Department. A source at Caradon told Platt's Metals Week that everyone should file an objection. "It should be automatic because it's not good for the consumer," the source said. U.S. automotive industry executives also were debating the merits of the merger. Some felt their objections to the earlier Alcoa-Alumax merger fell on deaf ears at the Justice Department. Some were expected to file an objection to maintain a consistent position, but others were not sure an Alcoa-Reynolds merger would be bad for the automotive industry. Some believed that with high demand for aluminum sheet, the new merger could reduce costs and eliminate waste while not raising prices. The executive vice-president of Crown Cork & Seal, a major manufacturer of aluminum cans, said the company had no plans to file an objection because of possible benefits from the merger.

13

Michigan Avenue Partners CEO Michael Lynch voiced criticism over the proposed Alcoa-Reynolds and Alcan-Pechiney-Alusuisse mergers. Lynch argued that the world aluminum market "has been a functioning oligopoly for too long" and was at risk of becoming monopolistic if the proposed mergers took place. Together, the two merged companies would control 60-70% of the world's supply of alumina, he said. Lynch cited a 93% rise in alumina prices between March 1999, when news about the Alcoa-Reynolds merger was first made public, and December 1999. Lynch said the explosion at Kaiser's alumina refinery in Gramercy, La., representing 3% of the global alumina supply, and construction delays at the alumina refinery in Worsley, Australia, representing 5% of the global supply, together could not explain why prices increased so much. He suggested that a "web of influence" between the five companies involved in the mergers gave them influence over 43.1% to 67.5% of the world's standard-purity aluminum output, and 64.7% to 84.4% of the world's high-purity aluminum output.¹⁴

The European Commission announced its decision to open up a more in-depth anti-trust investigation of the proposed Alcoa-Reynolds merger in December 1999. The investigation would focus on the possible impact on competition for alumina and aerospace alloys. The European Commission investigation was expected to delay a decision by the U.S. Justice Department, which might look more into the same two concerns. McCook Metals, one of the most vocal opponents of the merger, argued that the merger “would create a dangerous concentration of the marketplace” and that “Alcoa, a major competitor of McCook, would have a virtual stranglehold on raw materials.” A source told Platt’s Metals Week that neither Alcoa nor Reynolds were big users of high-purity ingot, so the merger would have little impact on Southwire and Noranda, which produced high-purity aluminum.¹⁵ On Feb. 11, 2000, Reynolds shareholders met in Richmond, Va., and approved the merger with 87% of those present in favor, 1% against and 12% abstained. The merger was still subject to review by regulating agencies in the U.S., Canada and Europe. Reynolds Chairman and CEO Jeremiah J. Sheehan remained confident the merger would be approved.¹⁶

U.S., European and Australian regulators approved the Alcoa-Reynolds merger by May 2000, on the condition that the new company divested itself of Reynolds’ 25% stake in the 204,000 ton-per-year smelter in Longview, Wash., as well as Reynolds’ stakes in three alumina refineries – 56% in Worsley, Australia; 50% in Stade, Germany; and 100% in Corpus Christi, Texas. The Longview smelter mostly produced high-purity aluminum, and U.S. and international regulators were worried about the small market in high-purity aluminum. Potential buyers for the Longview plant included Glencore, Golden Northwest Aluminum, Century Aluminum and Norsk Hydro.¹⁷ Alcoa and Michigan Avenue Partners reached an agreement for the sale of the Longview smelter in December 2000. The smelter would be operated by McCook Metals LLC, a subsidiary of Michigan Avenue Partners that owned and operated rolling mills.¹⁸ Alcoa closed the \$140 million deal in February 2001. The Longview plant employed about 900 workers at the time.¹⁹ By April 2001, Wall Street analysts said Alcoa would meet expectations and post earnings of 44 cents per diluted share, the same as for the first quarter of 2000. Alcoa had completed a \$1.1 billion cost-cutting effort in December and announced plans to save another \$1 billion over three years. Alcoa made 15 acquisitions in 2000 and sold the Worsley alumina refinery in Australia for \$1.49 billion. The good news about Alcoa came despite declining worldwide demand for aluminum, with the biggest drop in the U.S., especially in the transportation sector.²⁰

The demise of Kaiser

The story was much different for the Kaiser Aluminum Corporation, the smaller of the Big 3 U.S. aluminum producers that emerged from World War II. By the 1980s, Kaiser

was the fourth largest aluminum producer in the U.S., with an alumina refinery in Louisiana and two aluminum smelters in Washington. The smelters accounted for 7% of U.S. primary aluminum production. Kaiser also held interests in bauxite mines in Jamaica, alumina refineries in Jamaica and Australia, and aluminum smelters in Ghana, the United Kingdom, Australia and Bahrain. Kaiser was the target of several corporate takeover attempts during 1985-1987. British investor Alan Clore succeeded in taking over the company in 1987 but overextended himself and was forced to sell out to Maxxam in 1988. Maxxam refocused the company's business and reduced its debt, regrouping the company around its aluminum metals products business. Starting in 1984, Kaiser sold its agricultural, industrial and specialty chemicals, refractories, international trading and real estate operations. Kaiser sold its Ravenswood smelter in West Virginia to Stanwich Partners in 1988, which was linked to Marc Rich & Co.²¹ The West Coast Energy Crisis forced the shut-down of Kaiser's smelters in Tacoma and Spokane, Wash. Kaiser lost \$583.3 million in the fourth quarter 2001, compared to a net profit of \$10.9 million for the fourth quarter 2000. Kaiser President and CEO Jack Hockema attributed the company's financial problems to an economic recession that reduced aluminum demand, depressed prices for alumina and primary aluminum, lower shipments of primary aluminum out of Kaiser's two Pacific Northwest smelters, and reduced shipments from the Gramercy alumina refinery after it blew up on July 5, 1999.²²

Kaiser and its wholly-owned subsidiary, Kaiser Aluminum and Chemical Corp., filed for Chapter 11 bankruptcy protection in February 2002. The company cited a weakened economy, depressed metal prices and asbestos-related health claims.²³ The two companies had \$3 billion in assets with 5,800 employees generating \$1.5 billion in annual revenue. Kaiser used 5.9 million tons of the bauxite it mined and sold 1.8 million tons. The company produced 2.8 million tons of alumina, but only 400,000 tons were consumed internally, making Kaiser the world's largest seller of alumina to third parties. The company owned 49% of the Kaiser Jamaica Bauxite Co., 65% of Alumina Partners of Jamaica and 20% of Queensland Alumina Ltd. in Australia. Kaiser held a 90% interest in the Volta Aluminum Co. Ltd. smelter in Ghana and a 49% interest in the Anglesey Aluminium Ltd. smelter in Wales. The company also owned a rolling mill in Trentwood near Spokane.²⁴

Kaiser claimed \$3.3 billion in total liabilities, including \$20 million to the State of Louisiana for solid waste disposal, \$12.4 million to the State of West Virginia for a pollution control bond, \$10.8 million to the U.S. Defense Logistics Agency for a trade debt, \$8.3 million to Glencore for a trade debt, \$1.03 million to the Bonneville Power Administration for a trade debt, and \$225,000 each for two asbestos claims by individuals.²⁵ By June 2002, Kaiser was seeking a six-month extension for its Chapter 11

restructuring plan. Kaiser had recently lost a National Labor Relations Act case to the United Steelworkers that could cost the company \$180 million. Meanwhile, Kaiser was trying to sell its Mead smelter near Spokane. One analyst speculated Glencore might acquire the smelter in order to dismantle it and ship the parts to China, but other analysts said the Mead equipment was too old to be of value. A newspaper in London reported Rusal of Russia might be interested in acquiring the smelter.²⁶

As it struggled to climb out of bankruptcy, Kaiser made plans to rezone part of the 800 acres it owned near the Mead smelter for housing and commercial development, target medical and life insurance benefits for its 16,000 retirees and dependents, sell its operations in Jamaica, and resolve some of its environmental cleanup liabilities at dozens of sites across the U.S.²⁷ In June 2002, a federal bankruptcy judge ruled in favor of Kaiser on a class-action lawsuit with more than 24,000 claims brought by people who were injured or lost property in the alumina refinery explosion in Gramercy. Kaiser had been found to be 75% accountable for the accident during a trial.²⁸ In September, a bankruptcy judge ruled that Kaiser could pay its 55 top employees a \$7.5 million pay-out over two years in addition to \$14.9 million in severance pay, \$9.8 million for supplemental retirement pay, and \$24.6 million for 20 executives should they lose their jobs if another company took over Kaiser. The only objection to the plan was raised by the Steelworkers, which claimed the money would be better spent reopening plants and preserving benefits of retired employees.²⁹

In October, Kaiser opened talks with the federal Pension Benefit Guaranty Corporation to discuss “alternative solutions to pension plan funding.” Options announced by the company included “amortization” of unfunded liabilities or “the potential termination of pension plans.”³⁰ Thousands of union workers in Spokane sought assurances from Kaiser about the security of their pension plans. Kaiser’s bill for pension payouts in 2001 totaled more than \$36 million. When Kaiser filed for bankruptcy protection in February 2002, its pension plan was 90% funded, but by October it was only 73% funded. Some Steelworker officials worried the Pension Benefit Guaranty Corporation would pay only part of their pensions. Meanwhile, about 4,600 salaried workers in Kaiser Aluminum’s Salaried Retiree’s Association were also exposed to risk.³¹

Kaiser officials announced on Nov. 14, 2002, that the company might rebound from Chapter 11 bankruptcy protection in 2004 as it reconciled its claims through 2003. A reorganization plan had not yet been developed. Kaiser had posted a third quarter loss of \$83.4 million in 2002, on top of \$197.9 million losses for the first two quarters of 2002. The Trentwood rolling mill had lost about \$26.6 million for 2002. Trentwood had given up rolling aluminum for beverage cans and turned to fabricating specialty products for the aerospace industry. The aerospace industry, however, was in a financial

slump ever since the Sept. 11, 2001 terrorist attacks in the U.S. Prices for Trentwood products were down about 6%.³² In January 2004, Kaiser asked a federal bankruptcy court for relief from obligations to pay medical and life insurance benefits for thousands of retirees and dependents and to end its underfunded pension plans. The Steelworkers estimated retirees would lose about \$800 million in benefits. Kaiser officials said the company could not afford to pay ongoing and future costs, including \$60 million per year in post-retirement medical plan costs. Kaiser said the decision would affect 4,000 salaried and 7,000 hourly retirees and their dependents, but the union said it would affect 20,000 retirees. The Pension Benefit Guaranty Corporation had said in December 2003 that it would take over control of a retirement plan for 5,000 salaried workers that was underfunded by \$268 million.³³

Kaiser reached a last-minute settlement with the Steelworkers on Jan. 29, 2004, that saved some medical and retirement benefits for hourly workers. After two years in Chapter 11 protection, Kaiser had until Feb. 23 to file a reorganization plan. The company was losing about \$10 million per month, not including money it owed for pension plans or the \$800 million it owed to banks. Kaiser also faced \$100 million in liabilities for asbestos-containing products it had sold 20 years earlier. A bankruptcy settlement would end litigation arising from Kaiser's 20-month lockout of union workers in 1999 and 2000. The National Labor Relations Board had ordered Kaiser to pay \$200 million in back wages and benefits to 2,900 workers – the largest back-pay award ever ordered by the board – but in the settlement Kaiser had to agree to drop its appeal and the workers would have to accept \$175 million as an unsecured claim in bankruptcy court.³⁴ On Feb. 17, 2004, the Steelworkers reported that the union had ratified the settlement. If Chapter 11 bankruptcy was successful, the reorganized Kaiser would be 75% owned by the Steelworkers, and what would be made available to current workers when they retired would depend on Kaiser's future success. Pension plans for union workers who were already retired would likely be absorbed by the Pension Benefit Guaranty Corp.³⁵

Kaiser announced in 2003 that it intended to sell some of its commodity assets to reposition itself as a fabrication business. That included some of the company's foreign assets. In December 2003, Kaiser agreed to sell its 90% stake in the Volta Aluminum Co. smelter to the government of Ghana for between \$35 million and \$100 million, plus assumption of all Kaiser's liabilities and obligations.³⁶ In January 2004, Kaiser agreed to sell its 65% interest in Alpart to Glencore for \$160 million to \$170 million. Alpart's alumina refinery was recently expanded to 1.65 million tons per year, and the company's Jamaican reserves were capable of producing 3.5 million tons of bauxite per year through a joint venture.³⁷ In March 2004 however, a bankruptcy judge ordered Kaiser to hold an auction to sell its 65% interest in Alpart rather than sell its interest to

Glencore. Norsk Hydro, which owned the remaining 35% of Alpart, had first right of purchase.³⁸ In October 2004, Kaiser announced Rusal had successfully bid \$401 million in cash for Kaiser's 20% stake in the Queensland Alumina Ltd. refinery in Australia. Rusal would also purchase Kaiser's alumina and bauxite inventories and assume obligation for about \$60 million in Queensland debt.³⁹

When the reorganization process was completed, Kaiser would no longer be a vertically-integrated company. Kaiser's plans in 2004 were to move out of commodities and stay with fabrication – it had sold the Mead smelter but intended to keep the Trentwood rolling mill.⁴⁰ Kaiser officials announced on July 7, 2006, that the company had emerged from Chapter 11 bankruptcy and would begin issuing shares of common stock on NASDAQ beginning Oct. 7, 2006. According to the press release from its Foothill, Calif. headquarters, Kaiser had addressed all issues relating to material debt, legacy and asbestos-related liabilities.⁴¹ On June 20, 2007, Kaiser Aluminum Corp. announced plans to spend \$34 million increasing production capacity at its Trentwood rolling mill for heat-treated metal plate. That was on top of \$105 million in additional upgrades already underway at the rolling mill. Employment had doubled over five years to about 800 workers. The Trentwood plant, which produced plate for use by aerospace, transportation and industrial uses, had really made a turnaround, Steelworkers Local 338 President Dan Wilson said.⁴²

The foreign merger

While Alcoa merged with Alumax and Reynolds, a mega-merger was underway among three large foreign companies. Alcan initially failed to conclude a three-way merger with Alusuisse Lonza Group (Algroup) and Pechiney in 1999 after it was blocked by the European Union due to fears of anti-competition, but Alcan acquired Algroup in 2000 and then Pechiney in 2003, completing the three-way merger just the same. Alcan was formed in 1902 as the Northern Aluminum Co., the Canadian subsidiary of the Pittsburgh Reduction Co., which was later renamed Alcoa. The subsidiary's name was changed to the Aluminium Company of Canada in 1925 and the company separated from Alcoa in 1928 to address U.S. anti-trust issues.⁴³ Alusuisse's history could be traced back to Paul Heroult, the co-discoverer of the modern alumina reduction process, who worked with the Swiss Metallurgical Co., a German aluminum company established in 1887.⁴⁴ Pechiney's history predated Heroult, going back to 1854 and the production of aluminum metal by Produits Chimique Alais & Camarque Salindres. The French company grew by mergers and acquisitions of French aluminum companies and officially became Pechiney in 1981.⁴⁵

Alcan, Pechiney and Alusuisse announced the proposal to create the world's largest aluminum company on Aug. 11, 1999. To be temporarily called APA, the new company

would be established as a Canadian corporation with its legal headquarters in Montreal and regional headquarters in Europe. The chief executive's office would be in New York City. The new company would employ 91,000 people in 59 countries around the world.⁴⁶ When completed, 44% of the conglomerate's capital would be held by Alcan shareholders, 29% by Pechiney and 27% by Alusuisse-Lonza. The three companies independently realized sales in 1998 of \$21.6 billion with a before-tax profit of \$1.5 billion. The merger was expected to save a total of \$600 million per year. Most of the savings would come from plant closures, but a quarter of the savings would come from streamlining operations and optimizing research and development. About a third of the conglomerate's total capacity was considered high cost, but there were no immediate plans to idle any producing facilities.⁴⁷

With two large aluminum mergers possible in early August 1999, conventional wisdom among industry analysts was that both deals would gain regulatory approval, Platt's Metals Week reported. The APA merger was expected to have fewer problems with regulators than the Alcoa-Reynolds proposal. Concentrations of business by APA would take place mostly in Canada and Europe, but the Alcoa-Reynolds deal would affect alumina production, aluminum-smelting capacity and some downstream manufacturing, such as wheels. It was believed the APA deal could help Alcoa secure its merger with Reynolds since global market considerations could influence regulatory decisions. Alcoa-Reynolds would account for 50.1% of world primary aluminum smelting capacity. With Kaiser's alumina refinery in Gramercy out of operation, Alcoa-Reynolds would account for 100% of alumina production in the U.S. On the other hand, according to Pechiney Chairman Jean-Pierre Rodier, if the APA and Alcoa-Reynolds mergers took place the two conglomerates would account for only 30% of the global aluminum market.⁴⁸ Alcan shareholders approved the merger with Pechiney and Alusuisse in November 1999 by a 99% affirmative vote. The deal was still subject to approval by Canadian, U.S. and European Union regulatory agencies. Merrill Lynch gave Alcan a good rating after the result of the vote was announced.⁴⁹ News that the APA merger might be stalled by the European Commission caused jitters in the stock markets in March 2000, but many insiders still expected the merger to take place. Insiders speculated that the commission was opposed to a merger between the largest two of the three, Alcan and Pechiney, but that a merger between Alusuisse and Alcan or Alusuisse and Pechiney might be acceptable.⁵⁰

On April 13, 2000, it was announced that the APA merger had been cancelled after a vote by Alcan's board against the merger. The European Union had required certain divestitures to avoid anti-trust violations, and Alcan's board decided not to follow through. According to some analysts, Pechiney could have benefited the most from the merger. Analysts also believed a two-way merger between Alcan and Alusuisse-Lonza

did not seem likely since most of the cost-savings gained from the merger involved Pechiney.⁵¹ The three-way merger fell apart when the European Commission required that either Alcan divest itself of its can sheet mill in Norf, Germany, or that Pechiney divest itself of its rolling mill in Neuf-Brisach, France. Alcan refused to sell the Norf plant, which it considered “the most modern, largest rolling complex in Europe,” with two hot rolling mills and five cold mills. Pechiney’s Neuf-Brisach plant was much smaller, but politics prevented the company from selling that plant. Alcan management believed the European Commission’s concern over the merger was not reasonable since it would only create control over 32% of all the European aluminum can sheet market. The European Commission had focused on only the Western European can sheet market. An Alcan-Alusuisse merger was proposed that would combine Alcan’s network of low-cost Canadian aluminum smelters with Alusuisse’s low-cost alumina refineries in Australia. Alcan was building a 375,000 ton-per-year aluminum smelter in Alma, Quebec, in addition to expansion plans in Brazil and Korea.⁵²

About three years later, Alcan launched a cash-and-stock bid for Pechiney. The \$3.9 billion offer by the world’s second largest aluminum company was announced on July 7, 2003. Alcan officials said the combined companies would save about \$250 million per year with combined annual revenue of \$24 billion, claiming it was a win-win situation for both companies.⁵³ Pechiney reportedly had problems with closing major deals after the APA merger was blocked by the European Commission, including its attempt to acquire Corus Group PLC’s aluminum division. Pechiney officials said the new bid caught them by surprise, and they considered it hostile. Alcan officials said they were willing to sell the two large rolling mills objected to by the European Commission in 2000 in order to secure the deal.⁵⁴ The French government approved Alcan’s hostile takeover of Pechiney in September, but the deal still needed approval from the European Union. Pechiney rejected Alcan’s offer of \$44.70 per share as too low.⁵⁵

About a week later, Pechiney announced it had accepted Alcan’s bid of more than \$4.5 billion. Pechiney had considered separating its aluminum-producing assets from its packaging to prevent the takeover, but Alcan increased its per-share offer. Alcan also promised to offer to license Pechiney technology, a move considered necessary to satisfy European Union anti-trust worries.⁵⁶ Two weeks later, Alcan received approval from the U.S. Justice Department and European Commission. The U.S. stipulated that Pechiney must sell its aluminum rolling mill in Ravenswood, W.Va., while the European Commission said Alcan must sell its 50% share in the Norf rolling mill and its Gottingen and Nachterstedt mills in Germany or Pechiney’s Neuf-Brisach mills in France. The European Commission also said Alcan had agreed to continue licensing Pechiney smelter technology and to divest Alcan’s anode-baking furnace technology.⁵⁷

In March 2004, the U.S. Justice Department filed legal arguments demanding that Alcan sell the Pechiney rolling mill in Ravenswood because of anti-trust impacts. But West Virginia Gov. Bob Wise asked the Justice Department to reconsider, arguing that the plant employed about 1,000 workers and Alcan might not be able to find a buyer. The Justice Department claimed in September 2003 that the Alcan-Pechiney merger would give the new company too much of the brazing sheet market – material used to make heating and cooling systems for the automotive and airline industries. A Justice Department official claimed the nation’s public interest lay in what was good for the U.S., not West Virginia.⁵⁸

On May 18, Alcan announced it planned to sell off the rolled aluminum products business it owned prior to acquiring Pechiney, which had revenues of \$6 billion per year and employed 10,000 workers. The rolled aluminum products business produced beverage cans, automotive sheet, foil stock, lithographic sheet, painted sheet and other industrial products. Alcan said the move would address regulatory requirements related to the Pechiney acquisition and allow Alcan to concentrate on its bauxite and alumina businesses, primary aluminum production and packaging and engineering products.⁵⁹ A week later, Alcan officials announced that the Justice Department would approve Alcan’s plans to spin off its rolled aluminum business into an independent company as an alternative to divesting itself of the Ravenswood rolling mill.⁶⁰ Alcan became the largest aluminum producer in the world after it acquired Pechiney in 2004. The French aluminum company was the fourth-largest in production and fabrication and third-largest in packaging.⁶¹

Three years later, Alcoa announced a hostile take-over bid for Alcan in a deal worth \$27 billion. The combined companies would become the largest aluminum producers in the world. On May 22, 2007, Alcan’s board of directors recommended to its shareholders to reject Alcoa’s bid, saying it was inadequate in many respects and was contrary to the best interests of Alcan’s shareholders. Alcoa withdrew its bid on July 12 after Alcan’s board of directors unanimously recommended to Alcan’s shareholders to accept a bid by Rio Tinto.⁶² Rio Tinto PLC and Rio Tinto Ltd. were formed in June 1997. The companies traced their origin to 1873 when the Rio Tinto Co. was established to mine historic copper workings in Spain, which ended in 1954. A key piece of this huge global conglomerate was the Consolidated Zinc Corp., formed in 1905 to treat zinc tailings at the Broken Hill mine in Australia. In 1962, Rio Tinto and Consolidated Zinc, both British companies, merged to operate under the name Rio Tinto-Zinc. The new company invested in copper and uranium in Africa, copper and tin in Portugal, and borax around the world. By 1985, the conglomerate had divested into cement, chemicals, oil and gas. Between 1988 and 1994, Rio Tinto-Zinc disposed of its petroleum interests and focused on mining, acquiring gold, diamond, iron, bauxite, alumina, aluminum and coal mining

and processing assets worldwide. Its assets in 2002 included bauxite mining, alumina refining, aluminum smelting and power generation in Australia and other aluminum properties worldwide under the Comalco group; the Anglesley Aluminium smelter in England; Kennecott copper mines in Utah, along with other Kennecott minerals and energy assets; and the Hunter Valley coal operations in Australia.⁶³

Rio Tinto completed a friendly acquisition of Alcan on Nov. 15, 2007, in a deal worth \$38.1 billion. Rio Tinto Alcan Inc. became the third largest aluminum producer in the world after Alcoa and Rusal. Alcan's board of directors unanimously recommended the deal to Alcan's shareholders. Alcoa withdrew its bid later that same day.⁶⁴ The four-month merger process began on May 7, 2007, when the president and CEO of Alcoa announced the details of a hostile offer to purchase Alcan valued at \$33 billion. Alcoa promised to honor all contracts and to continue with projects promised by Alcan. Alcan's board of directors unequivocally rejected Alcoa's offer on May 22 and announced that Alcan was talking to other companies. Two days later, Alcoa announced that it had reviewed Alcan's response and saw no reason to change its terms. Alcoa said the offer represented a 35% gain to Alcan stockholders. On May 25, Alcan issued a press release stating that it might accept a better offer from Alcoa – or even reverse the roles and acquire Alcoa. Meanwhile, rumors of negotiations between Alcan and BHP Billiton, Rio Tinto and Norsk Hydro inflated the value of Alcan shares by 40% in just one month. On July 12, Rio Tinto offered to purchase Alcan for \$40 billion, and Alcan's chairman of the board of directors recommended that shareholders accept the offer.⁶⁵

It was not a merger of equals but clearly a takeover by Rio Tinto, which promised to honor all contracts and agreements made by Alcan and to make Montreal its world headquarters for primary aluminum production. On July 17, 2007, Alcan and Rio Tinto confirmed the sale of Alcan's packaging division and possibly other divisions at a later date. U.S., Canadian and European regulatory authorities approved the transaction, and the entire acquisition concluded on Sept. 28. But the story was not quite over – on Nov. 8, BHP Billiton, the world's largest mining company and Rio Tinto's rival, offered to acquire Rio Tinto for \$140 billion. Rio Tinto at first rejected the offer, saying it was insufficient, and then reversed that position on Dec. 3, agreeing to carry on discussions with BHP Billiton.⁶⁶ The start of a global recession in 2008 put an end to that last merger.⁶⁷ By 2013, Rio Tinto Alcan was the largest bauxite producer in the world and wholly owned or was in a joint venture with alumina refineries in Australia, Brazil, Canada and France. Expansion plans underway at the Yarwun refinery in Australia would make Rio Tinto Alcan the largest producer of alumina in the world. The company also owned eight aluminum smelters in Canada and additional aluminum smelters in Australia, New Zealand, France, the United Kingdom, the U.S., Cameroon, Iceland, Oman and Norway. Rio Tinto Alcan also owned 13 power stations with a capacity of 6,100

megawatts, which provided about half its power needs.⁶⁸ Rio Tinto's appetite for growth may not have abated after acquiring Alcan. In April 2017, it was reported that Rio Tinto might be interested in acquiring Alcoa – even though aluminum metal prices were at a five-year high. Metals reporter Brandon Dempster noted that Alcoa was an attractive buyout target because it was undervalued, had little debt for an industrial company in the metals business, and had a strong asset base. He noted that Alcoa had \$1.25 billion in debt, down from about \$1.44 billion, which he said was good relative to the business it was in and because Alcoa's debt was long-term. He also noted that Alcoa had \$852 million in cash, which brought down the net debt to \$397 million.⁶⁹

The mini-mergers

Mergers of a smaller scale took place in the U.S. as the number of primary aluminum smelters in the nation declined. Century Aluminum, created by Glencore in 1995 to be a holding company for Glencore's aluminum assets, invested in three U.S. smelters as well as overseas. Century's main asset in 1995 was the 170,000 ton-per-year aluminum smelter and the 600 million ton-per-year rolling mill in Ravenswood, W.Va. Some people in the industry believed Century was created to separate Ravenswood from Marc Rich, whose notoriety could harm business. Rich denied every having an ownership role in Ravenswood.⁷⁰ In February 2000, Century announced that it would acquire Xstrata's 23% interest in the Mt. Holly aluminum smelter in South Carolina for \$95 million. The acquisition would give Century a 49.67% in the smelter, with the remainder held by Alcoa. Century considered the 215,000 ton-per-year Mt. Holly smelter a safe investment despite the smelter's high power costs.⁷¹ As part of the deal, Century entered into a 10-year contract with Glencore to sell 50,000 tons per year from Mt. Holly. At the time, Glencore was the world's largest metals trader and owned 39.2% of Century.⁷² Alcoa sold its 50.3% stake in the Mt. Holly smelter to Century in October 2014 for \$67.5 million in cash. The smelter's power contract was set to expire in December 2015.⁷³ "Mount Holly is an excellent plant, and we are confident that, with some focus and targeted investments, the talented management team can produce even greater results," Century Aluminum President and CEO Michael Bless said. He added that the plant could be competitive in the global aluminum market if it could get favorable power rates.⁷⁴

In April 2000, Century announced plans to acquire the recently expanded 237,000 ton-per-year Southwire-NSA aluminum smelter plant in Hawesville, Ky. Analysts at Credit Suisse First Boston estimated that Century would pay about \$460 million for the plant. As part of the deal, Century would continue to supply high-purity aluminum from the Hawesville smelter to Southwire's nearby rod mill under a long-term contract. The Hawesville deal also was contingent on certain environmental issues and a long-

standing labor dispute with the Steelworkers. Workers at the Hawesville plant went on strike on June 26, 1998, after failing to win their first labor agreement, and the strike became a lockout in March 1999 when the company refused the union's offer to return to work. The Steelworkers responded positively to the news that Century might acquire the Hawesville plant, calling it "absolutely excellent news." A union spokesman said he did not foresee any problems, adding, "We've always had a pretty good relationship with Century." One stumbling block in the deal was the possibility that Century might be stuck with \$10 million in back pay for union workers. According to a Century spokesman, the Hawesville smelter had lower production costs than its Mt. Holly plant. Century was working on cost-cutting measures at its Ravenswood smelter. The Hawesville deal would approximately double Century's total smelting capacity, and the company planned on making future acquisitions.⁷⁵

To support Century's acquisition of the Hawesville smelter, Glencore agreed to purchase \$25 million in Century's preferred stocks. Then on March 6, 2001, Century announced that Glencore would take a 20% stake in the Hawesville aluminum plant, leaving Century with 80%.⁷⁶ The deal concluded about a month later. Southwire would continue to operate the adjacent rod and cable mill, and Century would provide molten high-purity aluminum to the Southwire mill.⁷⁷ Century financed a portion of the cash purchase price by selling \$325 million in mortgage notes due in 2008. The rest of the money included \$32 million in available cash, \$97.8 million "in proceeds from the disposition," and \$25 million from the sale of 500,000 shares of Century stock to Glencore. Glencore's 20% stake in the Hawesville smelter included title to the recently added fifth potline and a 20% undivided interest in parts of the facility other than the other four potlines. Glencore's investment in the acquisition was \$97.8 million.⁷⁸ Century purchased Glencore's 20% stake in early 2003 for \$105 million. The Hawesville smelter was Century's lowest-cost smelter, and adding Glencore's 48,400 tons per year would lower production costs by 1 cent per pound, despite going \$35 million into debt buying the 20% stake. The acquisition raised Century's total aluminum capacity to 500,000 tons per year at Hawesville, Ravenswood and Mt. Holly. Glencore and Century also had a nine-year supply contract under which Glencore paid a fixed price for 50,000 tons of aluminum per year from the Hawesville smelter.⁷⁹

Ten years later, Century acquired the 205,000 ton-per-year Sebree smelter in Kentucky, which was originally built by the Anaconda Company in the early 1970s. Century became Sebree's fifth owner when it paid Rio Tinto Alcan \$61 million for the 40-year-old smelter in June 2013. Rio Tinto had struggled under the weight of the 2007 Alcan acquisition, and Rio Tinto Alcan had announced in 2011 that Sebree was one of 13 aluminum plants around the world no longer considered part of the company's strategic plan. Rio Tinto Alcan said it would either sell or close the plant.⁸⁰ On June 3, 2013, Century announced

it had completed the Seabee acquisition. Access to market-based power for both the Seabee and the Hawesville smelters was key to the success of the smelters' operation.⁸¹ On Aug. 25, 2015, Century notified employees at Hawesville that it would temporarily curtail production at the smelter. Over production by China was blamed for the decision.⁸² In July 2016, Century announced it had secured a last-minute power deal that would keep the Mt. Holly smelter for 18 months. The plant was down to 50% capacity at the time and workers were cannibalizing parts from the smelter's inactive potline.⁸³ Century permanently closed the Ravenswood smelter in July 2015. The plant had been idled since February 2009. Century blamed power prices and increased exports of aluminum by China.⁸⁴

Buyouts and reorganization in the late 2000s helped create a new vertically-integrated aluminum producer in the U.S. The Noranda Aluminum Holding Co. was created in March 2007 with money from Apollo Management LP to acquire a portion of the aluminum business held by Xstrata for \$1.15 billion. Noranda had been a subsidiary of Xstrata and before that of Falconbridge Limited. In August 2009, Apollo completed a joint venture transaction and became the sole owners of the Gramercy alumina refinery and the St. Ann bauxite mining operation in Jamaica. Noranda had shared 50/50 ownership in the Gramercy and St. Ann businesses with Century Aluminum since 2004. About 40% of the output from the 4.5 million ton-per-year St. Ann bauxite operation went to a third party alumina refinery. Output from the 1.2 million ton-per-year Gramercy refinery went to supply the company's New Madrid smelter in Missouri and third parties in the chemical industry. The 263,000 ton-per-year New Madrid smelter accounted for about 15% of U.S. primary aluminum production. The New Madrid facility also produced rod, extrusion billet and foundry ingot. Noranda also operated modern rolling mills in Tennessee, North Carolina and Arkansas with a total capacity of 495 million tons per year that produced heavy gauge foil, light gauge converter foil, consumer foil and other products.⁸⁵

Additional mergers outside the U.S. changed the aluminum industry landscape after 2000. In May 2001, shareholders approved the \$32 billion merger of Billiton and Broken Hills Proprieties, creating BHP Billiton, the world's largest diversified mining company. Approval by the European Commission and Australia's Foreign Investment Review Board was expected by the end of June 2001. The new company's assets would include Worsley Alumina in Australia, aluminum smelting in South Africa, and iron ore, coal, copper, ferro-alloy, and oil and gas operations around the world.⁸⁶ In January 2002, Norsk Hydro announced plans to acquire VAW Aluminum of Germany. The acquisition would make Norsk Hydro one of the largest aluminum companies in the world and the largest in Europe.⁸⁷ VAW Aluminum's strengths were in rolling mills and cast products for the automotive industry. For Norsk Hydro, top managers believed the company

needed to grow to survive in an increasingly competitive global aluminum market, and it would be easier to grow by acquisition than by building expensive large-scale plants in Iceland or outside of Europe. VAW Aluminum's history dated back to 1917, when it was established as Vereinigte Aluminium-Werke Aktiengesellschaft.⁸⁸

The Russian mergers

A mega-merger in the former Soviet Union that came a decade after the end of the communist government alarmed global aluminum leaders because of the immense size of operations there and the taint of organized crime. In April 2000, an anticipated announcement stated that the largest aluminum producers in Russia would merge to form one company. The Nikolaev and Achinsk alumina refineries would be combined under the Sibirsky Aluminy group, and the Bratsk, Krasnoyarsk, Novokuznetsk and Sayansk aluminum smelters would be combined under control of the Sibneft oil group. The new company, Russky Aluminy or Rusal, would control about 80% of the Russian aluminum market and would compete in the world market as a major unified producer, controlling from 7% to 10% of the world's aluminum market. The Russian aluminum industry had grown by 8% between 1990 and 1999, reaching a total of 3.15 million tons per year of which 80% was exported. Some Russian industry experts questioned the success of the merger since the smelters had been operating independently for so long and much of the export business had been handled by "offshore entities." The Bratsk smelter was the largest in the world – it produced about 875,000 tons in 1999 and was expected to increase production to 900,000 tons in 2000. The Krasnoyarsk smelter produced 837,000 tons in 1999, while the other two smelters together produced about 660,000 tons. The Russian minister in charge of anti-trust issues approved the merger as a response to the Alcoa-Reynolds and the Alcan-Pechiney-Alusuisse mergers. A Western industry expert criticized the move, pointing to the domination of Russian business by organized crime, and in particular the number of murders associated with the Russian aluminum industry.⁸⁹

The Russian merger story wasn't over. In June 2002, Rusal CEO Alexander Boulygin told media that his company was in contact with BHP Billiton and Rio Tinto about forging a partnership for a new smelter and other improvements. Rusal was the world's second largest aluminum producer by then, and a "merger" with BHP Billiton or Rio Tinto would involve about \$4 billion. Rusal was also looking at mergers with other aluminum companies, including Kaiser Aluminum, which was in Chapter 11 bankruptcy proceedings, and Nalco, India's second largest aluminum producer. Rusal was facing a \$2.7 billion lawsuit in New York charging Rusal and its chairman with murder, bribery, extortion, mail and wire fraud, and money laundering.⁹⁰ Rusal, which produced 2.48 million tons in 2002, announced plans in May 2003 to increase production by 1.25

million tons by 2008 by building new facilities, expanding existing ones and acquiring new ones. In July 2003, Rusal announced it had awarded a \$700 million contract to the Canadian engineering company Hatch Group to build two new potlines at Rusal's Sayanogorsk aluminum smelter in Siberia to increase production by 270,000 tons per year. The Sayanogorsk smelter produced 413,865 tons in 2002. The Hatch Group also signed a contract to modernize the Sayanogorsk smelter. Rusal was a privately held company that was half owned by Russian tycoon Oleg Deripaska's company Base Element and a core of shareholders of the oil company Sibneft.⁹¹

The tenuous tie to Russia by the 175,000 ton-per-year smelter in Columbia Falls was through the Montana plant's owner, Glencore International AG. By 2006, the Swiss-based global commodities-trading company owned 100% of CFAC, 100% of the Evergreen aluminum smelter in Vancouver, Wash., and 100% of the Kubikenborg Aluminium smelter in Sweden. Glencore owned 29% of Century Aluminum Co., which included 100% of the Ravenswood smelter, 49.7% of the Mt. Holly smelter, 100% of the Hawesville smelter, 100% of the Nordural smelter in Iceland and 50% of the Gramercy refinery. A subsidiary of Glencore owned 100% of the Aughinish alumina refinery, 93% of the Windalco refinery in Jamaica, 65% of the Alpart refinery in Jamaica and 44% of the Eurallumina refinery in Sardinia.⁹²

On Oct. 9, 2006, a three-way merger was announced between Rusal, the Siberian-Urals Aluminium Co. (Sual) and Glencore to create the world's largest aluminum producer. The share split would result in 66% ownership by Rusal, 22% by Sual and 12% by Glencore. The merged company was expected to produce 4 million tons of aluminum and 11 million tons of alumina per year, equal to about 12.5% of the world's aluminum output and 16% of the world's alumina output. Investments in production over the next five years were expected to reach \$3 billion to \$3.5 billion. An initial public offering was expected in 18 months. The value of the new group was estimated at \$25 billion to \$30 billion, and revenue was projected at \$10 billion.⁹³ The merger was expected to clear anti-trust authorities by April 2007. The new group would employ 110,000 workers in 17 different countries. Russian billionaire Oleg Deripaska, Rusal's chairman, said the merger successfully completed the consolidation of aluminum production in Russia, and the merger with Glencore made the merger a global company.⁹⁴ Deripaska stood to benefit enormously. The deal showed the significance of Russia's rise in aluminum production, with low costs and high global aluminum prices. The deal would include smelters and refineries in Russia, China, Guyana, Australia, Ireland, Jamaica and Sweden.⁹⁵

The Russian mega-merger ran into a hurdle when Sual disputed Rusal's aluminum supply contract with Glencore. In 2011, Rusal's board of directors made a contract with Glencore over Sual's objections that called for selling \$43 billion worth of aluminum to

Glencore over seven years. The merged aluminum giant, United Company Rusal, expected to sell 1.4 million tons of aluminum to Glencore in 2012 as part of the deal. That amounted to about a third of United Company Rusal's total output and breached a shareholder contract. The deal turned the giant Russian aluminum company into "Glencore's production unit," Sual claimed publicly. All told, Glencore would buy 14.5 million tons of aluminum over the course of the deal, which could protect United Company Rusal from price declines over time. Glencore purchased about 45% of United Company Rusal's aluminum sales in 2010. All told, Glencore sold 3.9 million tons of aluminum that year – about 9% of total world production. In addition, United Company Rusal awarded Glencore a contract to sell the company's alumina through 2019, which brought the entire value of the deal up to \$47 billion. Sual claimed the contracts made Rusal too dependent on Glencore and said Rusal should have offered the metal to other competitive bidders, including Trafigura Beheer, Noble Group and Mitsubishi Corp.⁹⁶ Sual filed a lawsuit against Rusal and Glencore in the London Court of International Arbitration. On Jan. 16, 2014, Rusal's board of directors accepted a settlement in arbitration proceedings brought by Sual.⁹⁷ The matter was still unsettled by April 2016. United Company Rusal continued to modernize and expand its Russian facilities, with two new aluminum smelters coming online in 2017 that would run on less expensive hydroelectric power.⁹⁸

Glencore goes public

By 2010, Glencore was the largest company in Switzerland and the world's largest commodities-trading company, with a global market share of 60% for zinc, 50% for copper, 9% for grain and 3% for oil. By 2011, its main rivals in the global commodities trading business were Trafigura, Vitol and Cargill. In 2012, the BBC News reported that Glencore had more ships than the British Royal Navy. With operations in 40 countries, Glencore handled about 3% of the world's oil consumption.⁹⁹ Founded in 1974, Glencore initially focused on physical marketing of ferrous and nonferrous metals, minerals and crude oil. The company expanded into oil products after that. In the early 1980s, Glencore acquired an established Dutch grain trading company, and coal was later added to its energy products division. Over the years, Glencore evolved from purely marketing commodities sourced from third parties into a more active role in producing such commodities by acquiring mining, smelting, refining and processing production assets. Glencore's first equity investment was a 27% stake in Alumax's Mt. Holly aluminum smelter in 1987. Glencore acquired its first controlling interest in an industrial asset in 1988 when it bought a 66.7% interest in a zinc and lead mine in Peru. By 2011, Glencore and its subsidiaries owned production assets around the world in a wide range of commodities. Glencore also held shares in many publicly traded companies, including Xstrata in the United Kingdom, Century Aluminum in the U.S.,

Katanga Mining in Canada, Minara Resources in Australia, United Company Rusal in Hong Kong, and Chemoil Energy in Singapore.¹⁰⁰

On April 15, 2011, Glencore International AG announced its intention to sell about \$9 billion to \$11 billion worth of shares in London and Hong Kong in May. The initial public offering would amount to about 15% to 20% of the company's stock and at midpoint value could be worth about \$57 billion. It would be the largest IPO ever in London. About \$6.8 billion to \$8.8 billion worth of shares would go to outside shareholders, and about \$2.2 billion worth would go to Glencore's 485 partners. Among the top executives in the reorganization was former BP Chief Executive Tony Hayward, who became well known during the 2010 Deepwater Horizon oil spill in the Gulf of Mexico. Some of Glencore's business transactions in undeveloped countries were expected to undergo scrutiny during the IPO, including in the Democratic Republic of Congo. The Bolivian government was in talks with mine workers about nationalizing Glencore properties there. Glencore CEO Ivan Glasenberg was said to be hoping the IPO would be a steppingstone to acquiring Xstrata PLC, the mining giant in which Glencore held a 34% stake. Xstrata's value was estimated to be about \$70 billion.¹⁰¹

Glasenberg was born in a suburb of Johannesburg, South Africa. His father was from Lithuania, and his mother was South African. Glasenberg attended university there and began work as an auditor. He competed in race walking, but under apartheid he could never compete in the Olympics. He served as a clerk to fulfill his national military service requirement. A person who knew Glasenberg at the time said he assumed Glasenberg was against apartheid, and like many Jewish South Africans, he left the country. Glasenberg studied for an MBA at the University of Southern California and graduated in 1983. He successfully applied for work with Marc Rich and was sent to South Africa. By that time, Rich had been charged with tax evasion and other crimes by U.S. authorities and had fled to Switzerland. Rich later told his biographer, Daniel Ammann, that he made about \$2 billion supplying oil to the apartheid regime in South Africa. Glasenberg was a junior member of Rich's staff in the coal division.¹⁰²

By the time the UN adopted an international oil embargo on South Africa in 1987, Glasenberg had moved on, selling coal for Rich in Australia and China. In 1991, Glasenberg was brought to the company's head office in Switzerland to head up the coal division, where he caught Rich's eye. Years later, when Glasenberg moved to the top ranks of Glencore, Rich told *The Guardian*, "I liked him right away. He is an excellent analyst, very intelligent and hard working. Without a doubt, he is the strong man at Glencore." Glasenberg was named Glencore's CEO in 2002. Although he became one of the wealthiest men in the world after the initial public offering in 2011, Glasenberg did not live an opulent lifestyle. He reportedly owned one home, a discreet modern villa in a

village near Zurich. One person who knew Glasenberg thought he was driven by the fear of failure, not the acquisition of wealth. The Financial Times once described Glasenberg as “one of the great enigmas of the corporate world.” The Guardian called him “probably the Most Important Businessman You Have Never Heard Of.”¹⁰³

Glasenberg had been with Glencore since 1984 and was part of the management-led buyout of Marc Rich in 1994. Bloomberg estimated that Glasenberg’s stake in the company could reach \$9.6 billion through the initial public offering – more than the founders of Google and Blackstone Group earned in their IPOs. Glasenberg would end up owning 16% of Glencore, with the company’s market value capitalization being about \$61 billion. Four other Glencore executives were expected to become billionaires, including Daniel Mate and Telis Mistakidis, top traders in zinc, copper and lead; Tor Petersojn, director of coal and coke; and Alex Beard, who oversaw oil trading. The top executives would be barred from selling their shares for one year after the IPO. After that, they could sell up to 20% of their holdings over four years.¹⁰⁴ The executives could also expect high annual pay and bonuses. Glasenberg’s exact worth had been unclear until the 1,637-page prospectus was made public. His stake in Glencore was about 18.1%. The prospectus made no specific mention of Xstrata, in which Glencore held a 34% stake, but it was widely assumed Glencore wanted to merge with Xstrata.¹⁰⁵ News about the IPO made Glasenberg a target of notoriety. A mailbox at his home was blown up in January 2013 by an unnamed organization that said it wanted to draw attention to an annual meeting of the World Economic Forum at nearby Davos, Switzerland. By then, Glencore was nearing completion of a merger with Xstrata, which would create the world’s fourth largest mining company with \$80 billion in market capitalization. “All over the world, people are fighting against Glencore and Xstrata,” the unnamed group said in an e-mail. “It is these struggles and these perspectives that we are attacking in Switzerland.”¹⁰⁶

The publicity and transparency of the initial public offering brought back to life the notorious history of Glencore’s predecessor – Marc Rich & Co. But Glencore had some history of its own after it made a break with Marc Rich in the mid-1990s. On May 4, 2011, Reuters reported that the prospectus for the IPO mentioned criminal activity by an employee in Belgium. The facts of the case involving agricultural commodities dated to between 1999 and 2003, and the case was opened in 2003 with cooperation by French and Dutch police. The prospectus also listed more than 30 risks to the broader company and its marketing and trading operations. Glencore was known for its willingness to move ahead of its competitors into risky countries such as in Eastern Europe, Central Africa and South America. Among the risks associated with those areas was fraud and corruption, “both internally and externally.” The company’s size “may make fraudulent or accidental transactions difficult to detect,” the prospectus stated.

“In addition, some of Glencore’s industrial activities are located in countries where corruption is generally understood to exist.”¹⁰⁷

Details from the prospectus made their way to the Flathead Valley in Montana, where the Daily Inter Lake reported on sulfur clouds impacting residents and effluent impacting streams near copper mines in Zambia, risks of spills into rivers in the Democratic Republic of Congo, pollution problems at a zinc smelter in Kazakhstan and metal contamination in the Virgin Islands. “If it is perceived Glencore is not respecting or advancing the economic and social progress and safety of the communities in which it operates, reputation and shareholder value could be damaged,” the company stated in the prospectus.¹⁰⁸ Forbes magazine noted that the 1,637-page long prospectus mentioned Marc Rich & Co. three times but did not mention its founder once. Other media noted that Glencore’s IPO succeeded despite the company’s notorious past and present leaders – founder Marc Rich was a tax fugitive who was pardoned by President Bill Clinton and Hayward was linked to the Gulf of Mexico oil spill.¹⁰⁹

Claims about Glencore drew media attention as the date of the IPO approached. In one report, proceeds from an oil sale to Glencore were seized from officials in the Democratic Republic of Congo during a 2005 investigation into government corruption in the African nation.¹¹⁰ Television Suisse Romande had reported in June 2006 on allegations of corruption and human rights violations by Glencore at its Cerrejon mining subsidiary’s operations in Colombia. A local union president accused Cerrejon of forced expropriations and evacuations of entire villages to enable the coal mine to expand. Glencore-Xstrata’s huge coal operations in Colombia were fined nearly \$700,000 in 2009 for several environmental violations. The BBC reported in April 2012 that Glencore had paid associates of paramilitary organizations in Colombia to steal land and sell it to the Glencore subsidiary Prodeco for a new open-cast coal mine. In all these cases, Glencore denied the allegations.¹¹¹ According to a 2011 Reuters report, Zambian officials claimed pollution from Glencore’s Mopani copper mines caused acid rain and health problems in an area where 5 million people lived. Mopani’s processing plant was upgraded by March 2014 to eliminate 97% of the sulfur dioxide emissions. Glencore also had interests in the Kansuki copper mine, the Mutanda copper mine and the Luilu copper refinery in the Democratic Republic of Congo. When Glasenberg was asked in 2012 about acidic waste being discharged into a river in the three years since Glencore took over the refinery, he told an interviewer that “it was impossible to remedy any way faster.”¹¹²

The IPO on May 19, 2011, was considered a “lukewarm market debut,” with share prices struggling to rise above the launch price. More than 530 million shares changed hands during the day, with the price climbing at one point to about 4% above the offer price. Many investors were unable to purchase shares because of the large volume, and the

price dropped back to the launch price. Some investors said the strong demand in London's largest ever public offering was largely due to the relatively small amount of shares made available after much of the shares were allocated to Glencore's "cornerstone" investors. Glencore's current shareholders, including Glasenberg, would hold 80% of the company.¹¹³ The \$60 billion valuation turned nearly 500 Glencore employees into overnight multimillionaires and made five senior executives into billionaires. "We are not going to change the way we operate," Glasenberg said. "Being public will have absolutely no effect on the business." According to the company's prospectus, Glencore controlled more than half of the international market in zinc and copper and about one third of the seaborne coal. It was one of the world's largest grain exporters, with about 9% of the market, and it handled about 3% of the daily global oil consumption for customers ranging from state-owned energy companies in Brazil and India to large international firms like ExxonMobil and Chevron. Glencore posted revenues of \$186 billion in 2011 and employed about 55,000 people in at least 40 countries, generating an average return on equity of 38%.¹¹⁴

By 2012, Glencore was moving closer to acquiring Xstrata, which would provide Glencore with an "empire stretching from the Sahara to South Africa," according to the Africa Confidential newsletter. Glencore traded in 90 commodities in more than three dozen countries. As the world's "largest middleman," the IPO afforded Glencore a way to expand its role in the entire business chain, from mines and smelters to storage facilities for finished products, and from pumping oil to shipping it to refineries, all the while hedging and trading. "When you are vertically integrated, you make more at every step," an industry source in Geneva said. "The money stays in the same pocket." Glencore leveraged information to take advantage of wild swings in the commodities market. As Deutsche Bank noted in its report on the IPO, Glencore "benefits directly from the volatility." Deutsche Bank also noted that Glencore was willing to go into riskier countries to access raw materials, including copper in the Democratic Republic of the Congo, coal in Colombia, oil and natural gas in Equatorial Guinea and gold in Kazakhstan.¹¹⁵

While Marc Rich had admitted to paying bribes to work in risky places, Glencore denied doing so at the time of the IPO, saying in its "corporate practice" statement, "We will not be complicit in any third party's violation of the law in any country, nor the payment nor receipt of bribes, nor participate in any other criminal, fraudulent or corrupt practice." At the same time, Glencore warned investors they shouldn't be surprised by things that might happen. "Some of Glencore's industrial activities are located in countries where corruption is generally understood to exist," the prospectus stated. One way to stay clean was to utilize "gatekeepers," middlemen who personally dealt with corrupt leaders, the prospectus stated. According to Ken Silverstein, writing in the

May 2012 issue of Foreign Policy magazine, a former Glencore trader said the gatekeepers “could do all the things I couldn’t do or didn’t want to do.”¹¹⁶

With all this said, the question for many business analysts was why Glencore had gone public. Silverstein presented several theories why the commodities trader might be willing to give up its Swiss-protected secrecy: 1) it made many Glencore executives very wealthy; 2) Glencore needed capital to support its ambitious global growth plans, including acquiring Xstrata; and 3) more optimistically, Glencore was moving away from the old system of leveraging relationships with corrupt leaders to a “rule-based system.” As one trader told Silverstein, “You can be damn sure that Glencore wouldn’t have gone public if it didn’t have structures in place to keep making money. It must have calculated that it can still come out ahead despite having very ambitious targets.” Another trader said, “You can be the smartest trader in the world, and you can’t make money without access to production.” Marc Rich commented on the IPO shortly after it was announced. “Discretion is an important factor of success in the commodity business,” he said. “They probably don’t have a choice. Transparency is requested today. It limits your activity, to be sure, but it’s just a new strategy to which they have to adapt.” The impact of Marc Rich on the philosophy at Glencore was profound, Silverstein said. Glasenberg learned from Rich during the 1980s and became one of Rich’s “most trusted lieutenants.” Four other top Glencore executives worked for Rich, developing a strong work ethic and unwilling “to go messing from the formula of Rich’s success.” Insiders said Glencore and other trading companies were run by Glencore alumni – “Marc Rich’s children.”¹¹⁷

On May 27, 2011, Data Explorers released figures on how the IPO had fared. The specialty research company said short-sellers were interested in the IPO as investors looked for protection in a volatile commodities market by buying shares in the sector’s largest trader. About 18.6 million shares of Glencore were out on loan, Data Explorers reported, indicating hedge funds were betting on a future share price fall. Glencore had successfully raised the \$10 billion it wanted, but share prices stayed at the mid-level launch price after a “lackluster market debut.” Demand for Glencore shares exceeded supply several times. Commentators blamed the poor post-IPO performance on valuation concerns and the pessimistic outlook for global commodities prices. Glencore said the IPO listing was for the long-term, which many expected would be the company’s “long-expected move on miner Xstrata.” Glencore already held a controlling stake in Xstrata.¹¹⁸

Glencore-Xstrata

Xstrata originated as Sudelektra Holding AG, a Swiss-based construction-engineering company founded in 1926 that built power lines and generating plants in South America.¹¹⁹ Over the years, the company expanded into mining, and by 1994 the

company had evolved into a diversified natural-resources group with businesses in Australia, South Africa, South America and North America. The company changed its name to Xstrata AG on April 12, 1999.¹²⁰ By 1996, Glencore held a 40.5% stake in Sudelektra, which had total assets of \$499.7 million and shareholder equity of \$281.1 million.¹²¹ Shares in Sudelektra went public in 1998.¹²² By then, Sudelektra was the second largest integrated ferrochrome producer, with interests in aluminum, timber, oil and metals and employing 4,165 workers. The company continued to see growth as Xstrata. By April 2000, the company's stock was trading at 2.67 times its book value and market capitalization totaled \$1.23 billion.¹²³

Serious speculation about a merger between Glencore and Xstrata surfaced in early 2012, sparking interest and concerns. In April 2012, Natasha Malpani warned about creating new behemoths that were too big to fail. "The union will give the mining behemoth control over a third of the global market for thermal coal and make it the world's largest producer of zinc," she wrote. Malpani noted that the merger had long been anticipated and made good business sense, but "the deal needs to be scrutinized in terms of value for society as well as the shareholder." She warned that the vertical integration for coal, zinc, copper and lead "could prove to be at the expense of the consumers," adding that "the industry is dominated by mining giants such as BHP Billiton and Rio Tinto (both of which have shocking environmental and human rights records) that are continuing to acquire smaller miners." Because Glencore already owned 34% of Xstrata and Xstrata had emerged from Glencore, some regulators already regarded them as one entity. "Furthermore, both Glencore and Xstrata are known to be notoriously secretive," she wrote.¹²⁴

A shareholder vote on the proposed merger to create the world's fourth-largest natural resource group was delayed to Sept. 7, 2012, so Glencore and Xstrata could deal with regulators. By taking no action, the U.S. Justice Department appeared to indicate it would not oppose the merger, but Xstrata officials were still in talks with the European Commission, China and South Africa. The new company would be called Glencore Xstrata and would have a market value of \$90 billion and control businesses from mining and refining to storage and shipping for commodities like coal, copper and corn.¹²⁵ The merger was completed on May 2, 2013. According to MultiWatch, a pro-labor and pro-environment watchdog organization based in Germany, "Glencore Xstrata has been making exorbitant profits and has presented itself as an enterprise that embraces sustainable and socially responsible practices. By contrast, people who have been adversely affected by mining activities associate the corporation with exploitation and the destruction of the environment and their human habitats." The group cited open-pit mining, miles of pipelines, air pollution and water pollution. The group made its claims in a 111-page report called "Billions from the exploitation of raw materials – the Swiss

multinational corporation, Glencore Xstrata.” The report referred to Glencore’s origins with Marc Rich & Co. and the United Steelworkers run-in with Marc Rich during the strike and lockout at the Ravenswood aluminum smelter in West Virginia. MultiWatch also described allegations of illegal trading by Marc Rich & Co. and by Glencore with embargoed nations or dictators around the world.¹²⁶

Two years later, rumors surfaced about a pending merger or acquisition between Glencore and Rio Tinto. The merger would be a \$160 billion deal, uniting the second-largest (Glencore) and fourth-largest (Rio Tinto) mining companies in the world and knocking BHP Billiton off the top position. On Dec. 4, 2014, Rio Tinto CEO Sam Walsh told investors the merger was not likely because the proper value must be offered for the assets and commodities prices were too low. Rio Tinto expected to have 80% of its aluminum smelting capacity in production by the first quarter of 2015, which would be a unique position in the industry. Rio Tinto claimed a competitive advantage because of its hydropower and other low-carbon power sources. Rio Tinto also claimed that bauxite could be “the next iron ore.” The company exported 20 million tons of bauxite per year to China and had the largest bauxite resources in the aluminum industry.¹²⁷

A global commodities crisis that originated with the Wall Street meltdown in 2008 continued to affect miners and traders by 2014. Glencore shares that sold for about \$8 apiece during the 2011 IPO had dropped to \$5.23 by July 2014 and just \$1.04 by September 2015, leading some financial experts to forecast the end of the company. Glencore tried to climb out from under \$46.98 billion in debt by raising fresh equity, closing mines, selling trading inventory and canceling dividend payments. It was rumored that Glencore was seeking a buyer for its agricultural business at \$12 billion and that Glencore might go private again, by way of a sovereign wealth fund or a similar buyer. One explanation for the higher IPO price was that investors believed that by combining mining and trading, Glencore would be better at hedging during down times, with trading supporting the more cyclical mining sector.¹²⁸

By 2015, Glencore Xstrata was ranked 10th in the Fortune Global 500 list of companies and was the world’s third largest “family” business. With 181,000 employees around the world, the company posted \$170 billion in revenue, \$8 billion in operating income and \$8.1 billion in net income. Weak global prices in 2015, particularly for coal and copper producers, led to a net loss of \$676 million for operations in the first half of 2015. Glencore Xstrata’s stock value had fallen significantly by September 2015, and the company began to take steps in reducing its \$30 billion in debt by selling stock and assets.¹²⁹ On Aug. 14, Glencore Xstrata announced it had sold three mining projects for \$290 million in an attempt to address the company’s huge debt amidst a falling commodities market. Glencore sold a copper mine in the Philippines, a nickel mine in

the Dominican Republic and a nickel mine in the Ivory Coast that were inherited when Glencore merged with Xstrata. Glencore also sold the Cosmos nickel mine in Australia and a 23.9% stake in the Lonmin mine in South Africa, the world's third-largest platinum producer. The slowing Chinese economy was one factor in the commodities market slump.¹³⁰

On Sept. 7, 2015, Glencore announced it would suspend its dividends and sell assets and shares. The company was under pressure to cut its \$30 billion in net debt, one of the largest in the industry, as prices sank to more than six-year lows for its key products – copper and coal. The company's shares were down 59% for the year – a worse performance than that of rival mining companies BHP Billiton and Rio Tinto. The company said it planned to cut its debt by one-third by the end of 2016 by selling assets and shares and using money from its top management to raise \$2.5 billion. Once exclusively a commodities trader, Glencore had moved into raw materials during a boom at the start of the 2000s and paid \$41 billion for Xstrata. Glencore's competitors in mining did not have a large trading unit. One analyst said Glencore's reputation took a hit because it took on too much expansion, made some bad trades and made some poor investments, but its mining rivals also had made big mistakes.¹³¹ Glasenberg announced that he and his management team would take part in raising 22% of the capital needed to bolster the company's balance sheet. Morgan Stanley would underwrite the rest. The move would leave Glasenberg on the hook for several hundred million dollars. Glasenberg was Glencore's second-largest shareholder, with about 8.4%. Qatar's sovereign wealth fund was the largest shareholder.¹³²

Aluminum hoarding

In the midst of the global commodities crisis, Glencore found itself facing allegations of artificially inflating aluminum prices and disrupting supplies by restraining supplies from warehouses. JP Morgan, Goldman Sachs, the London Metal Exchange and other subsidiaries were also named in the 2013 lawsuit filed by several U.S. aluminum fabricators and manufacturers – and a representative for U.S. beverage consumers. The story began in 2010 when Goldman Sachs paid \$500 million to acquire Metro International Trade Services, a metals storage business in Romulus, Mich., near Detroit. The price was relatively low, and Goldman wanted to broaden its physical commodity holdings, which had become an important complement to its derivatives trading in London and the U.S. At the time of the acquisition, 900,000 tons of aluminum was stored in the Detroit warehouses – and the amount was growing daily. The value of the stored aluminum was expected to increase when markets improved, and Metro had been paying hedge funds, physical commodity traders and other tenants \$100 to \$200 per ton as an incentive to leave the metal there for longer periods. All told, the Metro

facility held 1 million to 2 million tons of aluminum, zinc and lead, with about two dozen clients. Rental fees ran to about 40 cents per ton per day, generating more than \$100 million in revenue per year in 2010. Rental fees had increased to 45 cents per ton by 2012, and revenue had increased to \$200 million.¹³³

The typical client at Metro International Trade Services was a hedge fund that bought physical aluminum from a producer like Alcoa, shorted it through the futures market as it was being shipped to the warehouse, took ownership of warrants on the aluminum once it arrived in Detroit, and then offered the warrants for sale to another party who might wait for aluminum spot prices to rise. The result was reluctance by the owners of aluminum metal to sell it to fabricators, which created a supply shortage. In summer 2011, the Coca-Cola Company called the London Metal Exchange to complain that the amount of aluminum in storage was piling up while the price was increasing. The price did not reflect normal market supply and demand, Coca-Cola said, but instead was the result of shrewd tactics by Goldman Sachs. Every day that the metal sat in those Detroit warehouses, the aluminum delivery premium was driven up, the beverage company said. "The situation has been organized artificially to drive premiums up," said Dave Smith, Coca-Cola's strategic procurement manager. "It takes two weeks to put aluminum in and six months to get it out." Aluminum prices had increased by 13% between 2010, when Goldman Sachs acquired the Metro facilities, and 2014.¹³⁴

On Aug. 6, 2013, Master Screens Inc. and Daniel Price Bart, a Tallahassee, Fla., resident who consumed canned beverages, filed a lawsuit in U.S. District Court for the Northern District of Florida alleging Glencore Xstrata, JP Morgan, Goldman Sachs, the London Metal Exchange and other subsidiaries artificially inflated aluminum prices and disrupted supplies by restraining supplies from warehouses. Another lawsuit had been filed in Detroit five days earlier. The second lawsuit broadened the geography and number of companies. A third lawsuit was filed in Louisiana on Aug. 7 by River Parish Contractors Inc., an aluminum and steel fabricator. All three filings called for a class action lawsuit, with allegations centered on Goldman Sachs and Metro International Trade Services, which the plaintiffs claim violated anti-trust laws. U.S. regulators were scrutinizing ownership of commodity storage facilities by major U.S. banks. A JP Morgan spokesman dismissed the lawsuits as without merit, noting that aluminum prices were down 40% from their peak in 2006.¹³⁵

A total of 26 price-fixing lawsuits by end-users of aluminum were combined into one case in December 2013. The plaintiffs alleged that the defendants conspired to drive up aluminum prices since May 2009 by reducing supply and that the defendants delayed delivery of aluminum from warehouses, sometimes creating delays up to 16 months. On Aug. 4, 2014, Glencore filed a request in U.S. District Court in New York asking that it be

dismissed from the lawsuits. Glencore said it was a “Jersey holding company” with offices in Baar, Switzerland, and as a result had never bought or sold physical aluminum, London Metal Exchange warrants or LME aluminum futures, and never owned or operated warehouses. However, Glencore subsidiaries Pacorini Metals USA LLC and Pacorini Metals Vlissingen BV, which were named in the lawsuit, did operate warehouses. Pacorini Metals AG, a Swiss-based unit of Glencore and the parent company of Pacorini Metals USA, called the allegations “too sparse, too generalized, and too conclusory” and would not confirm or deny that it was a metals trader.¹³⁶

U.S. District Court Judge Katherine Forrest dismissed one of the price-fixing lawsuits in September 2014. “It’s taken a year, tied up thousands of hours of attorneys’ time, caused the biggest shake up in the LME’s warehouse rules in decades, instigated ongoing regulatory scrutiny and polarized sectors of the aluminum industry,” Metal Miner commented online. In her 85-page decision, Judge Forrest said that while it was clear that the defendants’ actions affected the aluminum marketplace, there was no indication they intended to manipulate prices. She described the result as “unintended consequences of rational profit maximizing behavior rather than the product of conspiratorial design.” As Metal Miner commented, “Few would argue the warehouse companies and their owners have benefited financially from their control of the LME warehouse system since aluminum stocks mushroomed in the wake of the 2008 financial crisis. The concentration of warehouse space in the hands of very few operators in certain locations gave those firms unprecedented control and leverage.” Metal Miner added, “The probability that they acted independently but in full knowledge of what the other parties were doing doesn’t count as collusion. The problems at the LME warehouses occurred in part because of a lack of competition.” Most of the plaintiffs were told they will not be able to appeal the ruling.¹³⁷ The Second U.S. Circuit Court of Appeals in Manhattan ruled 3-0 against the aluminum buyers in August 2016 saying they lacked standing. In the ruling, Judge Dennis Jacobs said that the plaintiffs “did not (and could not) suffer anti-trust injury” because they neither participated in a market affected by anticompetitive conduct, nor showed that their injuries were “inextricably intertwined” with injuries that the defendants intended to inflict. The decision upheld Judge Forrest’s 2014 decision. Regulators in the U.S. and Europe had also examined aluminum price-fixing allegations.¹³⁸

Judge Forrest reluctantly extended the discovery deadlines in another of the price-fixing cases in April 2016. She had ruled in 2015 that the aluminum buyers, including Agfa Corp., Agfa Graphics NV, Mag Instrument Inc., Eastman Kodak Co. and Fujifilm Manufacturing USA Inc., could amend their anti-trust claims, but she also ruled that certain manufacturing companies that used aluminum lacked standing in the suit. A class of first-level buyers of sheet, slabs and ingot also had been proposed, including

Ampal Inc., Custom Aluminum Products Inc., Claridge Products and Equipment Inc., and Extruded Aluminum Corp.¹³⁹ Additional anti-trust lawsuits were filed. Reynolds Consumer Products LLC and Southwire Co. LLC filed a price-fixing lawsuit in New York's Southern District federal court against Glencore, Goldman Sachs., JP Morgan Chase Bank on July 26, 2016. The plaintiffs alleged that the defendants engaged in a "blatant, well-documented conspiracy to artificially increase aluminum prices." The plaintiffs said that together they had purchased more than a million tons of aluminum between 2011 and 2014, including metal from Glencore and fellow defendant J. Aron & Co., a commodities division within Goldman Sachs. The plaintiffs claimed the defendants carried out a "nefarious scheme" that reduced the amount of aluminum available on the spot market, which drove up standardized premiums on aluminum and provided the defendants profits through increased warehouse storage fees and increased trading profits. The plaintiffs claimed violations of the federal Sherman Act, New York's Donnelly Act, Michigan's Anti-trust Reformation Act, Illinois' Anti-Trust Act and Georgia's Fair Business Practices Act.¹⁴⁰

Shifting smelting overseas

At the same time mega-mergers were consolidating the global aluminum industry, primary aluminum production was making a mass exodus out of the U.S. to foreign plants. The U.S. had 22 aluminum smelters in 2000, of which 21 were operating. By 2015, only eight aluminum smelters remained in the U.S., of which four were making metal. The U.S. aluminum industry was impacted by low metal prices, as the global market was witnessing over supply, but the change coincided with increasing use of aluminum instead of steel in the transportation sector, including the mass market Ford F-150 pickup truck. In 2015, Alcoa announced it planned to shut down three more smelters, leaving its 270,000 ton-per-year Warrick plant in Indiana the only smelter Alcoa had operating in the U.S. The company was changing into "a commodity business that is positioned to succeed throughout the cycle," Alcoa Chairman and CEO Klaus Kleinfield said – Alcoa's Wenatchee, Intalco and Massena West smelters would be operated in "swing capacity." Century Aluminum was facing similar changes – its Ravenswood smelter closed in 2009 and was scheduled to be permanently decommissioned, the Hawesville smelter was down to 40% capacity, the Sebree smelter was down to two of three potlines, and the Mt. Holly smelter faced closure by the end of 2015 if a power contract could not be negotiated. Noranda was facing a \$26.4 million third-quarter loss. Making up the loss of U.S. aluminum production was a surge in smelter construction in China's northwestern provinces, where plants benefited from state-of-the-art technology, economies of scale and captive coal fields that provided low-cost power. About 600,000 tons of Chinese smelter capacity was set up as swing plants, ready to restart if global aluminum prices increased again. Part of the supply-

demand gap could be met by Canadian smelters, which benefited from low-cost hydroelectric power in Quebec, and from new smelters in Russia and the Mideast.¹⁴¹

About 56,000 workers were employed in the U.S. aluminum industry in 2005, with six companies operating 15 primary smelters at about 67% of rated capacity. About 2.5 million tons of aluminum was produced by the smelters worth \$4.8 billion, and another 5.6 million tons was imported. About 2.3 million tons was exported and about 6.8 million tons was consumed by U.S. manufacturers. Imports increased by about 14% as demand continued to grow in the U.S. About 3 million tons of aluminum was produced by recycling, of which about 63% came from new scrap from manufacturing and about 37% came from old scrap, such as discarded aluminum products. Production had increased at smelters around the world, with inventories reaching 3.4 million tons by August.¹⁴²

Primary aluminum production was slightly higher by 2008, but metal value was about 64% higher as the average price per pound increased from 88 cents to \$1.32. Overall, domestic primary aluminum production increased substantially in the first half of the year as plants restarted under new power contracts, but two plants cut back in the second half of the year because of high energy prices and low aluminum prices. U.S. smelters were operating at about 72% of rated capacity.¹⁴³ Then the impacts of the Wall Street meltdown became felt and soon led to a global recession. Weak market conditions by mid-October 2008 led Moody's Investors Services to downgrade Alcoa's outlook from "Stable" to "Negative." Costs continued to be high while growing inventory drove down prices. All segments of the aluminum market were affected except alumina. Aluminum prices had dropped by 32% from a record-high \$3,380 per ton on July 11. Copper, lead, nickel and other metal prices were also sharply down.¹⁴⁴

Alcoa shares fell to a 52-week low of \$5.27 a share by March 2009, compared to \$44.76 in May 2008. In New York, aluminum prices fell from \$1.50 per pound in early September 2008 to 59 cents per pound. Analyst Charles Bradford of Bradford Research said it cost Alcoa 90 cents per pound to make aluminum. "Everybody is losing money, and it's only a matter of time before people shut down (smelters)," he said.¹⁴⁵ Alcoa was the No. 1 aluminum manufacturer in the U.S. and No. 2 in the world, but it posted a \$1.19 billion net loss in the fourth quarter because of excess supply and weak demand, in addition to sizable one-time charges. Analysts said Alcoa was in good financial health and capable of handling its debt, but others said its stock dividends could be reduced or eliminated unless aluminum prices rebounded. Alcoa had plans to cut 13,500 jobs by the end of 2009 and reduce its output and capital spending. The company also planned to sell off four of its money-losing consumer-related businesses. Alcoa expected worldwide

consumption to decrease by 2% in 2009, primarily because of economic slowdowns in China, North America and Europe.¹⁴⁶

Aluminum production in the U.S. increased by 15% in 2010 and by 4.2% in 2011, but the industry never fully recovered.¹⁴⁷ The U.S. aluminum industry shrank from 23 active aluminum smelters in 2001 to six by 2016 with more closures planned. Alcoa smelters that had closed since 1990 included Rockdale in Texas, Badin in North Carolina, Alcoa in Tennessee, Eastalco in Maryland, Massena West and Massena East in New York, and Warrick in Indiana. The Wenatchee smelter in Washington was not expected to restart, while the Intalco smelter in Washington continued to operate under a smaller power contract. Alcoa began to downsize its primary aluminum production as a companywide strategy with a Jan. 6, 2012, announcement that it would cut back production at all of its facilities by 12%. Alcoa was smelting about 4.5 million tons of aluminum per year. Aluminum prices had fallen more than 27% from their peak in 2011 as a result of slowed housing construction in China, along with debt problems and a depressed economy in Europe. About half of all global aluminum production went to China.¹⁴⁸

On May 1, 2013, Alcoa announced it would conduct a 15-month review to consider reducing the company's total smelter capacity by another 11%. About 13% was already idled. "Because of persistent weakness in global aluminum prices, we need to review every option to maintain Alcoa's competitiveness," said Chris Ayers, Alcoa's president of Global Primary Products. Plants that cost more to operate because of energy costs or regulatory uncertainty would be the focus of the review. The company would also look at its alumina refinery output.¹⁴⁹ Alcoa CEO Klaus Kleinfeld blamed a glut of aluminum in the global market and low metal prices for the decision. Nearly \$1 billion in profit had disappeared as prices fell about 33% on the London Metal Exchange. The company was doing better with value-added products, from beverage cans to aircraft parts, which accounted for \$13.2 billion in revenue in 2012. Kleinfeld said he expected the automotive industry to be a boost to aluminum producers, as the average aluminum content in automobiles increased from 30% to 35% by 2015. Alcoa spent \$300 million in 2012 expanding its Iowa sheet plant and planned to spend \$275 million expanding sheet production at its Tennessee plant.¹⁵⁰

Alcoa announced on Nov. 2, 2015, it would curtail 503,000 tons of smelting capacity in the U.S., which amounted to 31% of the U.S. capacity but only 1% of global capacity. Once implemented, Alcoa would have closed, divested or curtailed about 47% of its U.S. smelting capacity since 2007. Metal prices on the London Metal Exchange had fallen 27% in the past year, reaching six-year lows and eliminating about a third of U.S. aluminum smelting capacity. Some researchers predicted nearly all U.S. smelters would close in 2016. Aluminum prices fell to \$1,460 per ton at the London Metal Exchange in

late October, and experts believed U.S. smelters could not produce metal profitably when prices fell below \$1,500. Foreign smelters benefited from lower labor costs, cheaper energy and weaker domestic currencies, which favored exporting. But growing aluminum output in China had driven prices so low that the Bank of America estimated about half of aluminum producers around the globe were losing money. China was expected to produce 55% of the primary aluminum in the world for 2015, up from 24% in 2005, while the U.S. was expected to decline from 2.5 million tons in 2005 to 1.6 million tons in 2015.¹⁵¹ The Alcoa announcement also included partially curtailing capacity at its Point Comfort, Texas, alumina refinery by about 1.2 million tons. Alcoa also announced it planned to divide into two industry-leading publicly-traded companies in the second half of 2016 – an upstream-focused company that included mining, refining, smelting, energy and casting businesses, and a value-adding company that included rolled products, engineered products, and transportation and construction products.¹⁵²

Aluminum demand in North America increased 5% in 2014, and aluminum shipments were the largest since 2006 – but it was fabricated aluminum, not ingot aluminum. While the North American aluminum industry shipped 12.7 million tons and consumed 11 million tons in 2014, primary aluminum production had declined 7.1%. Aluminum demand in North America since the start of the recession in 2009 had grown by 38.3% through 2014, and North American aluminum companies had plans for expansions and other upgrades worth more than \$2.3 billion. The growth and the investment was primarily for products for the automotive industry, and sheet capacity was expected to increase by 2 million tons.¹⁵³

The Aluminum Association promoted the advantages of using aluminum for manufacturing automobiles and trucks. Aluminum increasingly had become the “material of choice” in the transportation sector, from Ford F-150 pickup trucks to luxury cars made by Audi, Mercedes-Benz and Land Rover. The Ford F-150, one of the most popular vehicles in the U.S. and one of the most profitable motor-vehicle lines in the world, would be about 700 pounds lighter by using a high-strength, military-grade, all-aluminum body. Aluminum was the second-most used material in vehicles after steel. The Aluminum Association noted that on average, 90% of a salvaged vehicle’s aluminum was recycled, which translated into energy savings on an economical scale. Aluminum recycling during manufacturing also saved energy – nearly 90% of the scrap, about 500,000 tons per year, was recycled. Recycling one ton of aluminum saved about 21 barrels of oil.¹⁵⁴

Aluminum’s light weight also meant energy savings while vehicles were being driven, amounting to 108 million barrels of crude oil per year compared to an all-steel fleet. The

Aluminum Association also noted that because of aluminum's light weight, manufacturers could use thicker body panels to create safer vehicles. "Pound for pound, aluminum can absorb twice the crash energy of mild steel," the trade organization said. Increasingly, consumers wanted more fuel-efficient vehicles, and new U.S. fuel-economy regulations would require 54.5 miles per gallon by 2025. Ford President and CEO Alan Mulally said in 2015 that "pound for pound, aluminum is stronger and tougher than steel" and that aluminum "will be the material of choice" for the Ford Motor Company moving forward.¹⁵⁵ Ford announced in December 2015 that it planned to invest \$1.3 billion in a new body shop, retooling and other facility upgrades at its Louisville, Ky., plant for manufacturing the all-aluminum body for the F-Series Super Duty pickup trucks.¹⁵⁶ A month later, Alcoa announced plans to close its 269,000 ton-per-year Warrick smelter, bringing overall U.S. aluminum production down to 720,000 tons per year, the lowest since 1950. Roy Harvey, Alcoa's global primary products president, explained the Warrick closure by saying "these assets are not competitive" amidst "challenging market conditions." Aluminum metal prices on the London Metal Exchange fell 18.6% in 2015 and were hovering around 6 ½ year lows. Notably, Alcoa said it would keep the Warrick rolling mill open to meet demand from U.S. automobile manufacturers.¹⁵⁷

From 2007 to 2014, Alcoa closed or sold 1.3 million tons of smelting capacity and planned to close or sell more as it changed its focus from primary aluminum production to higher-profit value-added business. The strategy was considered successful, as the company reported a \$368 million profit in 2014. Alcoa was the third largest aluminum producer in the world by 2014 after the Aluminum Corporation of China Ltd. (Chinalco also known as Chalco) and Rusal. Alcoa had \$23.9 billion in revenue, \$368 million in net income, 59,000 employees, and \$37.4 billion in assets at more than 200 facilities in 30 countries. Alcoa's Global Rolled Products segment accounted for 51% of revenues and included two divisions – Global Packaging for beverage containers, industrial packing and foil, and Aerospace, Transportation and Industrial for aluminum plate and sheet. The Global Primary Products segment accounted for 28% of revenue and included mining, refining, smelting and energy operations. The Engineered Products and Solutions segment accounted for 25% of revenue. Alcoa owned and operated most of its alumina refineries through a 60% share of Alcoa World Alumina and Chemicals.¹⁵⁸

Alcoa planned to split into two publicly traded entities by mid-2016 – an aluminum commodity-trading business that would be called Alcoa and a higher-value manufacturing operations company called Arconic. According to plans, the Alcoa branch would have 17,000 workers and annual revenue of \$13.2 billion, and Arconic would have 43,000 workers at 157 sites and annual revenue of \$14.5 billion.¹⁵⁹ The split into two publicly traded companies was scheduled to take place effective Nov. 1, 2016, as

shareholders sought higher returns amid a continuing global commodity slump. Arconic would take over the faster growing aerospace and automotive businesses, and Alcoa would maintain the traditional aluminum smelting and refining operations.¹⁶⁰

Alcoa had made significant investments in facilities that Arconic would inherit. By 2016, Alcoa had launched a \$300 million expansion at its Davenport, Iowa, rolling mill to meet the growing demand for aluminum in the automobile and truck manufacturing industry. The Davenport facility utilized Alcoa 951 technology, a state-of-the-art pre-treatment that improved adhesive bonding for alloy sheet, extrusions and castings in vehicle assemblies. Adhesive bonding was considered an easier method for joining aluminum parts in automobile plants. Reducing the weight of vehicles was considered beneficial for climate change concerns – replacing two pounds of steel in a vehicle with aluminum could save the environment from 20 pounds of carbon dioxide emissions within the life of the vehicle. Automobile manufacturers expected the percentage of aluminum used in vehicles to double by 2025 to 16%.¹⁶¹ Alcoa had arranged \$10 billion in long-term supply contracts for Airbus, Boeing and GE Aviation in 2015 that went to Arconic after the split. On Nov. 7, 2016, Arconic announced its first major supply deal, a \$1 billion contract to supply Airbus Group SE with aluminum sheet and plate. This deal with Airbus included providing smaller components but also manufacturing the major structural parts that kept aircraft together in the air and on landing. By early 2017, Arconic had lined up \$450 million in long-term agreements for forged aluminum wheels, especially for trucks, as well as business in 3D-printed nickel and titanium airframe, ducting and engine parts for Airbus aircraft.¹⁶²

Foreign plants

As Alcoa's U.S. smelting capacity shrank, the company continued to maintain and even invest in foreign plants. By the time of the split, Alcoa owned or held a share in smelters in Portland, Australia; Sao Luis, Brazil; Baie Comeau, Becancour and Deschambault, Canada; Fjaröal, Iceland; Lista and Nosjoen, Norway; and Aviles, La Coruna and San Ciprian, Spain. The Alcoa-owned Reydarfjordur smelter in Iceland began operating in April 2008 with a capacity of 346,000 tons per year. The 690 megawatt Karahnjúkar hydroelectric dam was built to power the smelter, and additional smelters were planned. Alcoa conducted a feasibility study from 2005 to 2011 for a second Alcoa smelter in Iceland near Husavik powered by geothermal power with a 250,000 ton-per-year capacity but canceled the project in October 2011.¹⁶³ Alcoa was also involved in an enormous vertically-integrated facility in Saudi Arabia with many of the elements located in one place. Alcoa began construction of the Ma'aden aluminum facility in 2010 as a joint venture with the Saudi Arabian Mining Co. The project included a bauxite

mine, alumina refinery, aluminum smelter and rolling mill with an ocean-going shipping terminal. Cheaper energy in Saudi Arabia was a driving force for the deal.¹⁶⁴

Construction of the \$10.8 billion aluminum complex in Saudi Arabia was nearing completion by 2012. The smelter would be powered by a gas-fired generating plant that was part of the facility.¹⁶⁵ In full operation, about 4 million tons of bauxite per year would be transported from Ma'aden's bauxite mine in Saudi Arabia at Al Ba'itha by rail about 372 miles to the 1.8 million ton-per-year alumina refinery at Ras Al Khair on the Persian Gulf. Alumina from the refinery would go to the nearby 740,000 ton-per-year Ma'aden Aluminium Smelter, and produced metal would go to the nearby 380,000 ton-per-year Ma'aden Aluminium Rolling Mill. The facility, which also included a 120,000 ton-per-year aluminum recycling plant, was expected to be the lowest cost aluminum complex in the world. The alumina refinery operated for the first time on Dec. 21, 2014.¹⁶⁶ The smelter ran into a few technical glitches when started up in 2014, but it produced more aluminum than in its initial capacity forecast by May 2014. The refinery was up to 60% of capacity by then, and about 70% to 80% of the smelter's production was being exported. Alcoa owned about 25% of the \$10.8 billion aluminum project.¹⁶⁷

By 2016, five large smelters were operating on the Persian Gulf, while new smelters were operating in India and Iceland and older operations in Russia, Canada, Australia and Norway underwent upgrades or expansions. But all this paled in comparison to the incredible growth of the aluminum industry in China, which by 2016 accounted for more than half the aluminum production in the world. China had about 120 aluminum smelters – including more than 40 with a capacity of 350,000 tons per year, each twice the size of the aluminum plant in Columbia Falls, Mont. Since 2010, China had closed about 3 million tons of smelting capacity but added 17 million. China's aluminum producers seemed immune from the commodities crisis that hampered Glencore and other aluminum companies. Chinese aluminum exports increased by 14.4% in the first three quarters of 2015, while producers in the U.S., India and Russia were cutting back and prices hovered at a six-year low. Output from Chinese smelters increased by 18% during that time, and there was little sign that Chinese production would cut back any time soon – Chinese aluminum companies added about 3 million tons per year of smelting capacity in the first three quarters of 2015 and could add another 1 million before the year's end. Overcapacity in China had led to more aluminum being exported. The exports remained profitable in the depressed commodity economy because tax credits or cheap loans from the Chinese government made up for depressed aluminum prices, and because Chinese producers could claim a premium over London Metal Exchange prices because of faster delivery times from warehouses. In one example of government assistance, when Chalco announced in October 2015 that it would close its

530,000 ton-per-year smelter in Liancheng, the local government offered to subsidize the smelter's power supply and Chalco only cut 150,000 tons.¹⁶⁸

The global aluminum industry had been slammed by cheap aluminum exports by the former Soviet Union in the early 1990s, but that was nothing like the onslaught by China. The volume of Chinese aluminum exports threatened aluminum plants around the world. Richard Talley, a former commodities analyst, warned in a Nov. 16, 2015, opinion column that cheap Chinese aluminum exports could drive some U.S. aluminum producers into bankruptcy. Talley said the U.S. aluminum industry employed 155,000 workers directly and 670,000 indirectly, and generated more than \$65 billion directly and \$152 billion indirectly in the U.S. economy. China benefited from a combination of tax rebates, cheap energy prices and lax regulations – China still used coal to generate electrical power while the U.S. was reducing coal-fired power plants to lessen impacts to global warming.¹⁶⁹

On April 18, 2016, the United Steelworkers filed a petition asking the U.S. government to invoke the 1974 Trade Act and impose broad and steep tariffs to help the U.S. aluminum industry. “The domestic industry is disappearing before our eyes,” said Terrence Stewart, a lead lawyer in the case for the Steelworkers. “Quick relief and addressing the underlying imbalance between global supply and demand are essential if we are going to have any industry left.” The Steelworkers also argued that U.S. aluminum production was important to national defense. China was the target of the tariff, but it also would affect Canada and other countries that exported to the U.S. Meanwhile, Alcoa was closing aluminum smelters in the U.S. while continuing to rely on production in Canada, Iceland and Saudi Arabia in an effort to improve efficiency, the company said.¹⁷⁰

Tom Jennemann, a New York-based business reporter, offered a contrary opinion on April 20, 2016. China was not to blame for the lack of competitiveness by the U.S. aluminum industry, he said. The real reasons were the strong U.S. dollar and the rise of the Middle Eastern aluminum industry. Imports of cheap semi-fabricated aluminum from China had been exaggerated, Jennemann said. The amount of aluminum plate, sheet, bars and other products from China had increased from 286,000 tons in 2014 to 391,000 tons in 2015, but the U.S. consumed about 5.5 million tons of aluminum each year. China's impact on global aluminum prices also did not explain the decline of the U.S. aluminum industry, he said – it was the strong U.S. dollar, which benefited companies that imported their raw materials from countries with weak currencies. The Canadian loonie, for example, had fallen to 70 cents against the U.S. dollar, and primary aluminum production in Canada had increased by 13.9% for the year ending March 2016. Jennemann also noted that Middle Eastern smelters, centrally located for shipping

to Asia, Europe and the U.S. and using inexpensive electrical power, had increased production from 2.7 million tons in 2010 to 4.1 million tons in 2014. Warnings about the impact by Middle Eastern smelters on U.S. competitiveness were never made because they were co-owned by U.S. and European firms, including Rio Tinto, Alcoa and Norsk Hydro, Jennemann said.¹⁷¹

Aluminum Association President and CEO Heidi Brock provided an optimistic outlook for the U.S. aluminum industry in a Dec. 3, 2015, opinion piece in *Metal Miner*. The industry was still strong despite low market prices and curtailment announcements. Claims that the U.S. aluminum industry was “fighting for its life,” she said, were “overblown, misjudged and simply incorrect.” Brock noted that the industry was working together to improve trade conditions, support transparency in the financial trading of aluminum and promoting common-sense regulations. Aluminum use had become so commonplace that it had become ubiquitous. Demand in the U.S. and Canada in 2014 totaled more than 12.5 million tons, approaching record levels last seen in the mid-2000s. That was more than five times the demand seen in 1960, and the U.S. and Canadian population had not doubled since the 1960, she noted. At the same time, global demand had seen 5% to 8% year-over-year growth in demand from 2010 to 2015.¹⁷²

Brock recalled bullish projections in 2010 that called for global demand doubling between 2010 and 2020 and noted that the industry was on track to exceed that forecast. “People use more aluminum today than ever before, and this shows no sign of abating,” she said. Brock also noted that nearly 80% of aluminum industry jobs were in recycled aluminum or downstream businesses, like rolling mills and foundries. The value-added segment had made significant investments to meet projected demand by the auto and aerospace industry, including \$2.5 billion in investments announced in 2013. The U.S. industry produced about 8.5 billion pounds of recycled aluminum in 2014, twice as much as in 1980 and more than any other country except China. Recycled aluminum required 92% less energy to produce than new aluminum, Brock noted, but an anonymous comment by *Metal Miner* noted that recycled aluminum could not be used for many key aerospace and military applications. Brock also noted that curtailed plants were not permanently closed and could be restarted if market prices dropped, but many of the 20-some U.S. plants that operated in 2000 no longer existed – they had been demolished and scrapped out.¹⁷³

The new president weighed in on the global aluminum market on April 27, 2017, when President Donald Trump issued a memo for Commerce Secretary Wilbur Ross on “Aluminum Imports and Threats to National Security.” Trump listed aluminum among six core industries. “In the case of aluminum, both the United States and global markets for aluminum products are distorted by large volumes of excess capacity – much of

which results from foreign government subsidies and other unfair practices,” he wrote. “Efforts to work with other countries to reduce excess global capacity have not succeeded.” Artificially low prices suppress profits in the U.S. aluminum industry, which in turn discourages long-term investment and hinders research and development. “If the present situation continues, it may place the American aluminum industry at risk by undermining the ability of American aluminum producers to continue investment, research and development, and by reducing or eliminating jobs needed to maintain a pool of skilled workers essential for the continued development of advanced aluminum manufacturing,” he said.¹⁷⁴

Trump said the Ross had initiated an investigation of the matter under Section 232 of the Trade Expansion Act of 1962. Trump asked Ross to “consider the domestic production of aluminum needed for projected national defense,” “recognize the close relation of the nation’s economic welfare to our national security,” “consider any substantial unemployment, decrease in government revenues, loss of skills or investment, or other serious effects resulting from the displacement of any domestic products by excessive aluminum imports,” and “consider the status and likely effectiveness of efforts of the United States to negotiate a reduction in the levels of excess aluminum capacity worldwide.” According to a fact sheet provided by Trump, aluminum imports to the U.S. in 2016 increased by 18% while U.S. production fell by 47%; seven of eight aluminum smelters based in the U.S. either shut down, reduced production or were idled; U.S. imports of semi-fabricated aluminum from China increased by 183% U.S. imports of aluminum foil from China increased from zero in 2004 to 22 % by 2017; and employment in the U.S. aluminum industry fell by nearly 13% from 2015 to 2016. If the Commerce Department found that aluminum imports impaired the national security of the U.S., Trump would have 90 days to determine what action should be taken to remedy the harm.¹⁷⁵

On June 27, 2017, four days after the Commerce Department held a public hearing on President Trump’s request to investigate whether aluminum imports posed a national security threat, Bloomberg View ran an article by commodities strategist Shelley Goldberg stating that Trump was wrong about aluminum imports. Goldberg noted that the amount of aluminum consumed by the U.S. military was “insignificant” when compared to the total imported to the U.S. and consumed by the U.S. economy. “Most of the metal imported by the U.S. comes from nations such as China and Canada, and typically serves civilian uses for automobiles, packing, roofing, road signs and consumer durables, none of which implicate national security,” she wrote. Goldberg noted that the Trade Expansion Act did not define “national security,” which gave Trump wide latitude to define the threat. She noted that since the Act’s passage, 26 investigations had been conducted with only two leading to import restrictions – both were for crude

oil, including from Iran in 1979 and from Libya in 1982. In the most recent Section 232 investigation, the Commerce Department determined in 2001 that iron ore and semi-finished steel imports did not threaten national security, she noted.¹⁷⁶

According to the U.S. Geological Survey, primary aluminum production in the U.S. had fallen for four straight years from 2013 to 2016, reaching the lowest level since 1951. Three primary aluminum smelters had shut down in 2016 because of high power prices, low aluminum prices and technical issues, Goldberg said. The result was an 18% increase in aluminum imports in 2016 over 2015. Goldberg noted that the U.S. military needed only 30,000 tons of specialty aluminum, and that need could be met by spending about \$25 million to expand aluminum production and by utilizing fractional crystallization to remove impurities from ordinary primary aluminum. "Surely there is a need for consistent rules within the international trading system and for all member states to play fair on trade," she wrote, "but using security as the negotiating tool is not the right approach, and the potential consequences aren't worth it." Goldberg also noted that any action taken to remedy a national security issue would be short-lived for two reasons: 1) larger issues would persist, such as energy prices and the strength of the U.S. dollar, and 2) aluminum was sold in a global market, and if prices became prohibitively high for importing countries, they would curb purchases, which would force down international prices and rebalance the market.¹⁷⁷

¹ "Nonferrous Metals: Industry Structure, Background Paper No. OTA-BP-E-62," Congress of the United States, Office of Technology Assessment, Sept. 1990 [AL5138]

² Office of Technology Assessment, Sept. 1990 [AL5138]

³ Office of Technology Assessment, Sept. 1990 [AL5138]

⁴ Chris Adams, "Wave of aluminum expansion is under way," Wall Street Journal, March 2, 1998 [AL0344]

⁵ Amanda Cooper, "Small aluminum producers grab merger baton," Reuters, Hoover's online, Jan. 10, 2002 [AL3148]

⁶ "U.S. Primary Aluminum Production, Report for December 2010," Aluminum Association online, Jan. 10, 2011 [AL4322]

⁷ Kie Relyea, "Alcoa to buy Alumax," Bellingham Herald, March 10, 1998 [AL0062]

⁸ Patricia A. Plunkert, "Aluminum," U.S. Geological Survey Mineral Commodity Summaries, January 1999 [AL0792]

⁹ Joseph Pete, "Ford pumps \$1.3B more into aluminum pickups," Northwest Indiana Times, Dec. 25, 2015 [AL0529]

¹⁰ "Century to acquire Alcoa's California cast aluminum plate business," Alcoa online, Dec. 23, 1998 [AL5040]

¹¹ Robin Sidel, "Alcoa plans hostile bid for Reynolds," Reuters, Aug. 16, 1999 [AL0429]

¹² Robin Sidel, "Alcoa to buy Reynolds, ending hostile bid," Reuters, Aug. 19, 1999 [AL0430]

¹³ Pete, Dec. 25, 2015 [AL0529]

¹⁴ "Independents, Alcan debate effects of mergers," Platt's Metals Week, Jan. 17, 2000 [AL0868]

¹⁵ "EC, U.S. hone reviews of Alcoa-Reynolds merger plan," Platt's Metals Week, Dec. 27, 1999 [AL0863]

-
- ¹⁶ “Reynolds Metals shareholders approve merger with Alcoa,” press release, Reynolds Metals Co. online, Feb. 11, 2000 [AL0907]
- ¹⁷ “Alcoa/Reynolds merger desired effects remain to be seen,” Platt’s Metals Week, May 8, 2000 [AL1373]
- ¹⁸ “Alcoa to sell Longview smelter to MAP,” Aluminum Association online, Dec. 27, 2000 [AL2607]
- ¹⁹ “Longview Aluminum takes Chapter 11 route,” Puget Sound Business Journal, March 5, 2003 [AL3330]
- ²⁰ Robert Guy Matthews, “Alcoa is on target to meet forecasts, thanks to power-reselling strategy,” Wall Street Journal, April 6, 2001 [AL3707]
- ²¹ Office of Technology Assessment, Sept. 1990 [AL5138]
- ²² “Kaiser Aluminum reports results for fourth quarter, full year of 2001,” Kaiser Aluminum Corp. online, April 12, 2002 [AL3213]
- ²³ AP, “Kaiser Aluminum files for bankruptcy,” Feb. 12, 2002 [AL3795]
- ²⁴ “Kaiser bankruptcy news,” Bankruptcy Creditors Service Inc. online, Feb. 14, 2002 [AL3164]
- ²⁵ Bankruptcy Creditors Service, Feb. 14, 2002 [AL3164]
- ²⁶ John Stucke, “Report says Kaiser may sell smelter,” Spokane Spokesman-Review, June 14, 2002 [AL3808]
- ²⁷ “Newstrack, Kaiser Aluminum Corp. bankruptcy,” Spokane Spokesman-Review, Nov. 17, 2003 [AL3473]
- ²⁸ “Kaiser Aluminum wins court OK of preliminary class-action settlement,” Dow Jones, June 26, 2002 [AL3809]
- ²⁹ AP, “Ailing Kaiser rewards execs,” Seattle Times, Sept. 7, 2002 [AL3249]
- ³⁰ “Kaiser seeks pension funding solution,” Houston Business Journal, Oct. 24, 2002 [AL3281]
- ³¹ “Retired employees of bankrupt aluminum company worry over pension security,” Spokane Spokesman-Review, Oct. 27, 2002 [AL3282]
- ³² “As losses mount, Kaiser Aluminum will spend part of 2003 reconciling claims,” Spokane Spokesman-Review, Nov. 15, 2002 [AL3283]
- ³³ AP, “Kaiser asks termination of retirement, pension programs,” Longview Daily News, Jan. 13, 2004 [AL3514]
- ³⁴ John Stucke, “Kaiser proposal forces agonizing decision, inadequate coverage or no insurance at all is the likely choice for Steelworkers, retirees,” Spokane Spokesman-Review, Jan. 29, 2004 [AL3530]
- ³⁵ John Stucke, “Steelworkers ratify settlement with Kaiser, deep cuts for retirees,” Spokane Spokesman-Review, Feb. 17, 2004 [AL3543]
- ³⁶ “Kaiser inks deal to sell Valco smelter to Ghana,” Aluminum Association online, Dec. 22, 2003 [AL3511]
- ³⁷ “Kaiser Aluminum signs agreement to sell its interest in an alumina refinery in Jamaica,” Kaiser Aluminum Corp. online, Jan. 21, 2004 [AL3512]
- ³⁸ “Kaiser to auction interests in Alpart,” Houston Business Journal, March 23, 2004 [AL3560]
- ³⁹ “Kaiser Aluminum says Rusal has winning bid for QAL,” Reuters, Oct. 28, 2004 [AL3816]
- ⁴⁰ John Stucke, “Kaiser bankruptcy reorganization moves along,” Spokane Spokesman-Review, Nov. 18, 2004 [AL3847]
- ⁴¹ Heidi Desch, “CFAC wants BPA power,” Hungry Horse News, Aug. 31, 2006 [AL3957]
- ⁴² AP, “Kaiser to spend another \$34 million to boost capacity in Spokane,” Aluminum Association online, June 20, 2007 [AL3983]
- ⁴³ “Our history,” Rio Tinto Alcan online, June 17, 2013 [AL4393]
- ⁴⁴ George David Smith, “From monopoly to competition, The Transformations of Alcoa, 1888-1986,” 1988 [AL1284]

-
- ⁴⁵ Faithi Habashi, "Karl Josef Bayer and his time – Part 2, On the occasion of the hundredth anniversary of his death," Canadian Institute of Mining Bulletin, October 2004 [AL5095]
- ⁴⁶ "Company profile," Alcan online, Sept. 23, 1999 [AL0663] and Sidel, Aug. 16, 1999 [AL0429]
- ⁴⁷ "Alcoa bid puts No 3 Reynolds 'in play,' outcome uncertain," "Alcan, Pechiney, Algroup to be world's largest producer?" and "Antitrust implications of merger deals debated," Platt's Metals Week, Aug. 16, 1999 [AL0431]
- ⁴⁸ Platt's Metals Week, Aug. 16, 1999 [AL0431]
- ⁴⁹ "Alcan shareholders OK merger," Platt's Metals Week, Nov. 29, 1999 [AL0670]
- ⁵⁰ "EU review reports cast doubt on three-way APA merger," Platt's Metals Week, March 6, 2000 [AL1178]
- ⁵¹ Noah Barkin, "Aluminium mega-merger now two-way affair," Reuters, April 13, 2000 [AL1297]
- ⁵² "Alcan/Algroup combination to provide strength, analysts," Platt's Metals Week, April 17, 2000 [AL1309]
- ⁵³ "Alcan launches hostile bid for Pechiney," Reuters, July 7, 2003 [AL3407]
- ⁵⁴ "Alcan bids \$3.9B for Pechiney; French company opposes cash and stock offer that would create the world's largest aluminum company," Reuters, July 7, 2003 [AL3408]
- ⁵⁵ "Alcan gets French approval for Pechiney bid," Ottawa Business Journal, Sept. 5, 2003 [AL3446]
- ⁵⁶ Paul Betts and Daniel Dombey, "Alcan wins over Pechiney with increased takeover offer," Financial Times, Sept. 13, 2003 [AL3448]
- ⁵⁷ Martin Arnold, Daniel Dombey and Den Warn, "U.S. and EU approve Alcan bid," Financial Times, Sept. 30, 2003 [AL3454]
- ⁵⁸ "Fed officials demand sale of West Virginia aluminum mill," Aluminum Association online, March 18, 2004 [AL3555]
- ⁵⁹ "Alcan plans to spin off rolled products business," Reuters, May 18, 2004 [AL3581]
- ⁶⁰ "Alcan says spinoff of rolled-products group helps meet antitrust requirements," Stockhouse USA online, May 26, 2004 [AL3597]
- ⁶¹ "110 years of history in Canada," Aluminum Association online, July 25, 2015 [AL4889]
- ⁶² For more information, see "Rio Tinto completes acquisition of 100% of Alcan," Rio Tinto online, 2007
- ⁶³ "Company history," "Key data/group operations," "Major group operations," "Management organization chart," and "Contact information," Rio Tinto online, June 26, 2002 [AL3231]
- ⁶⁴ For more information, see "Rio Tinto completes acquisition of 100% of Alcan," Rio Tinto online, 2007 [AL4084]
- ⁶⁵ Aluminum Association online, July 25, 2015 [AL4889]
- ⁶⁶ Aluminum Association online, July 25, 2015 [AL4889]
- ⁶⁷ For more information, see Rebecca Keenan, "BHP withdraws \$66 billion stock offer for Rio Tinto," Bloomberg online, Nov. 25, 2008
- ⁶⁸ "Our history," Rio Tinto online, June 17, 2013 [AL4393]
- ⁶⁹ Brandon Dempster, "Who's going to buy Alcoa?" Seeking Alpha online, April 13, 2017 [AL5531]
- ⁷⁰ "Century Aluminum Company – Company Profile, Information, Business Description, History, Background Information on Century Aluminum Company," Reference For Business online, Sept. 22, 2016 [AL5329]
- ⁷¹ "Century ups Mt. Holly stake as acquisition role continues," Platt's Metals Week, Feb. 14, 2000 [AL0957] and "Century completes acquisition of added share in Mt. Holly plant," Business Wire, April 10, 2000 [AL1307]
- ⁷² "Century to raise stake in South Carolina reduction plant to 49.67%," Business Wire, Feb. 7, 2000 [AL1306]
- ⁷³ "Alcoa to sell ownership stake in Mt. Holly smelter to Century Aluminum," Alcoa online, Oct. 23, 2014 [AL4693]

-
- ⁷⁴ David Wren, "Century Aluminum completes acquisition of Mt. Holly facility," Charleston Post and Courier, Dec. 1, 2014 [AL4694]
- ⁷⁵ "Southwire aluminum smelter may finally be sold," Platt's Metals Week, April 10, 2000 [AL1294]
- ⁷⁶ "Glencore to take 20% share in Hawesville, Kentucky primary aluminum plant being acquired by Century," Century Aluminum Co. online, March 6, 2001 [AL3059]
- ⁷⁷ "Century completes acquisition of Kentucky plant," Century Aluminum Co. online, April 2, 2001 [AL3060]
- ⁷⁸ Century Aluminum Co. online, April 2, 2001 [AL3260]
- ⁷⁹ "Century to buy smelter stake from Glencore," Aluminum Association, Jan. 29, 2003 [AL3340]
- ⁸⁰ Chuck Stinnett, "Century completes acquisition of Sebree aluminum smelter," Charleston Post and Courier online, June 3, 2013 [AL4402]
- ⁸¹ "Century Aluminum completes acquisition of Sebree KY smelter," Century Aluminum Co. online, June 3, 2013 [AL4401]
- ⁸² For more information, see "Century Aluminum to idle plant in Hawesville, Ky. causing more than 500 layoffs," WDRB Television online, Aug. 26, 2015
- ⁸³ For more information, see David Wren, "Power deal saves 300 jobs at Century, Mt. Holly smelter aims to win back business after securing supplier," Charleston Post and Courier, July 5, 2016
- ⁸⁴ For more information, see Ann Ali, "Century Aluminum permanently closes Ravenswood, WV plant," WOWK Television online, July 27, 2015
- ⁸⁵ "History, our company, Noranda Aluminum," Noranda Aluminum Inc. online, Nov. 5, 2011 [AL4223] and "About Noranda, history," Noranda Aluminum Inc. online, June 17, 2013 [AL4395] and "Xstrata sell aluminum assets to Apollo Management for \$1.15 billion," Aluminum Association online, April 12, 2007 [AL3985]
- ⁸⁶ "BHP Billiton," Engineering and Mining Journal, July 1, 2001 [AL3089]
- ⁸⁷ "Norsk Hydro becomes the largest aluminum company in Europe," Financial Times, Jan. 7, 2002 [AL3146]
- ⁸⁸ "History, 1947, Ardal: light at the end of the tunnel; 1963: Work for fishermen on land; 1986: Hydro + ASV = a strong alloy; 2002: VAW – a dream comes true; 2007: Just aluminium, 105 years on," Norsk Hydro online, Aug. 11, 2015 [AL4919]
- ⁸⁹ "Russia's leading aluminum groups announce merger," Platt's Metals Week, April 24, 2000 [AL1361]
- ⁹⁰ "Rusal wants to forge aluminum merger," The Independent, Financial Times, June 9, 2002 [AL3230]
- ⁹¹ "Russia's Rusal awards \$700 mln aluminium deal," Yahoo Business online, July 8, 2003 [AL3415]
- ⁹² "Glencore International AG, Commodity Departments, Aluminum, Alumina, Bauxite," Glencore International AG online, Oct. 10, 2006 [AL3961]
- ⁹³ "Rusal, Sual and Glencore announce merger," Ros Business Consulting online, Oct. 11, 2006 [AL3965] and "Holders of Rusal to get 66% in merged Rusal, Sual, Glencore," Prime-Tass Business News Agency online, Oct. 9, 2006 [AL3962]
- ⁹⁴ "Rusal, Sual, Glencore announce creation of Russian aluminium giant," Mosnews.com, Oct. 9, 2006 [AL3963] and "Rusal, Sual, Glencore merger will result in the world's largest aluminium and alumina producer," Azom.com, Oct. 10, 2006 [AL3964]
- ⁹⁵ "Rusal deal would make it biggest aluminum firm," Daily Inter Lake, Oct. 10, 2006 [AL3960]
- ⁹⁶ Yuliya Fedorinova and Ilya Khrennikov, "Rusal's \$43 billion seven-year Glencore deal feeds feud," Bloomberg online, April 23, 2012 [AL5278]

-
- ⁹⁷ “Rusal approves terms to settle dispute with Sual,” Canadian Mining Journal, Jan. 16, 2014 [AL5281]
- ⁹⁸ Fedorinova and Khrennikov, Aug. 23, 2012 [AL5278]
- ⁹⁹ For more information, see Rebecca Marston, “Glencore and Xstrata: How much power would they have?” BBC News, Oct. 1, 2012
- ¹⁰⁰ “Group structure, History, Strategy, Sustainability, Financial highlights 2010,” Glencore International AG online, May 27, 2011 [AL4145]
- ¹⁰¹ Dana Cimilluca, “Glencore unveils plan for London IPO, names chairman,” Wall Street Journal, April 15, 2011 [AL4126]
- ¹⁰² Helen Pidd, Dan Glaister, David Smith and Ian Cobain, “The rise of Glencore, the biggest company you’ve never heard of,” The Guardian, May 19, 2011 [AL5137]
- ¹⁰³ Pidd, Glaister, Smith and Cobain, May 19, 2011 [AL5137]
- ¹⁰⁴ Christine Harper, Zijing Wu and Elisa Martinuzzi, “Glencore CEO’s IPO wealth may beat Google founders,” Bloomberg online, May 4, 2011 [AL4130]
- ¹⁰⁵ Kylie MacLellan and Elzio Barreto, “Glencore \$11 billion IPO to make billionaires of bosses,” Reuters, May 4, 2011 [AL4132]
- ¹⁰⁶ John Revill, Alex McDonald and Neil MacLucas, “Police investigating explosion at Glencore CEO’s home,” Bloomberg online, Jan. 25, 2013 [AL4311]
- ¹⁰⁷ Clara Ferreira-Marques and Quentin Webb, “Glencore lists fraud, criminal case among IPO risks, Glencore outlines risks in bumper prospectus, Details Belgium criminal case, Subsidiary, former employee, current employee charged,” Reuters, May 4, 2011 [AL4131]
- ¹⁰⁸ Rob Davies, “Report details environmental challenges facing Glencore,” Daily Inter Lake, May 15, 2011 [AL4138]
- ¹⁰⁹ Laurie Bennett, “Glencore pulls off IPO despite some nefarious connections,” Muckety News online, May 26, 2011 [AL4144]
- ¹¹⁰ For more information, see Tony Allen-Mills, “Congo sapped of riches as Denis menaces Boulevard Saint-Germain,” The Australian, June 17, 2008
- ¹¹¹ For more information, see “Panorama questions over Glencore mines,” BBC News, April 16, 2012
- ¹¹² For more information, see “Glencore linked to acid waterfall in DR Congo,” BBC News, April 16, 2012
- ¹¹³ Clara Ferreira-Marques and Kylie MacLellan, “Glencore’s record IPO makes muted debut,” Reuters, May 19, 2011 [AL4143]
- ¹¹⁴ Ken Silverstein, “A giant among giants,” Foreign Policy online, May 2012 [AL4256]
- ¹¹⁵ Silverstein, May 2012 [AL4256]
- ¹¹⁶ Silverstein, May 2012 [AL4256]
- ¹¹⁷ Silverstein, May 2012 [AL4256]
- ¹¹⁸ Sinead Cruise, “Short-sellers eye Glencore: data,” Reuters, May 27, 2011 [AL4142]
- ¹¹⁹ “Company Research Report – Xstrata AG,” Wright Investors Service, April 14, 2000 [AL1295]
- ¹²⁰ “Sudelektra Holding AG wishes to announce that it proposes to change its name to Xstrata AG,” press release, Xstrata online, April 12, 1999 [AL0815]
- ¹²¹ “Interim results for the six month period ended 30 June 1996 (unaudited),” Xstrata online, Sept. 9, 1996 [AL0805]
- ¹²² “Investor Relations,” Xstrata online, Dec. 28, 1999 [AL0802]
- ¹²³ Wright Investors Service, April 14, 2000 [AL1295]
- ¹²⁴ Natasha Malpani, “Mining merger of Glencore and Xstrata: The new ‘too big to fail’ behemoths,” policymic.com, April 2012 [AL4354]

-
- ¹²⁵ AP, "Vote on Glencore merger with Xstrata postponed until Sept. 7," Daily Inter Lake, July 13, 2012 [AL4262]
- ¹²⁶ "Billions from the exploitation of raw materials – The Swiss multinational corporation, Glencore Xstrata," MultiWatch Association, May 2014 [AL4946]
- ¹²⁷ Dimitra DeFotis, "Rio Tinto Glencore marriage? Cash to shareholders more likely," Barron's online, Dec. 5, 2014 [AL4655]
- ¹²⁸ Stuart Burns, "Glencore: Down but not out of the fight," Ag Metal Miner online, Sept. 30, 2015 [AL5196]
- ¹²⁹ For more information, see "Relatively successful," Daily Chart, The Economist, Nov. 3, 2014 and Vivienne Walt, "Glencore digs out of the abyss," Fortune, July 21, 2016
- ¹³⁰ Thomas Biesheuvel, "Glencore sells three Xstrata mining projects for \$290 million," Bloomberg online, Aug. 14, 2015 [AL4951]
- ¹³¹ Olivia Kumwenda, "Glencore reins in debt as commodity price slump persists," Reuters, Sept. 7, 2015 [AL4950]
- ¹³² Matthew Curtain, "Glencore's Ivan Glasenberg takes a calculated gamble," Wall Street Journal, Sept. 7, 2015 [AL4949]
- ¹³³ "How aluminum became a cash cow for Goldman," CNBC online, June 3, 2014 [AL5327]
- ¹³⁴ CNBC online, June 3, 2014 [AL5327]
- ¹³⁵ Melanie Burton, "Glencore, JP Morgan sued over warehouse aluminum prices," Reuters, Aug. 7, 2013 [AL4407]
- ¹³⁶ "Glencore seeks dismissal of U.S. aluminum price-fixing claim," Reuters, Aug. 5, 2014 [AL4566]
- ¹³⁷ "U.S. district judge dismisses LME aluminum warehouse litigation," Metal Miner online, Sept. 2, 2014 [AL4576]
- ¹³⁸ Jonathan Stempel, "Aluminum price-fixing claims rejected by U.S. appeals court," Reuters, Aug. 9, 2016 [AL5276]
- ¹³⁹ Matthew Perlman, "Discovery extended in aluminum buyer antitrust suit," Law 360 online, April 12, 2016 [AL5194]
- ¹⁴⁰ Kelly Knaub, "Reynolds sues Goldman Sachs, others over aluminum prices," Law 360 online, July 27, 2016 [AL5275]
- ¹⁴¹ Andy Home, "Is the curtain coming down on US aluminum smelting?" Reuters, Nov. 24, 2015 [AL5282]
- ¹⁴² "Aluminum," U.S. Geological Survey online, 2006 [AL4042]
- ¹⁴³ "Aluminum," U.S. Geological Survey online, 2009 [AL4045]
- ¹⁴⁴ AP, "Moody's cuts Alcoa's outlook to 'Negative,'" MSN Money Central online, Oct. 13, 2008 [AL4013]
- ¹⁴⁵ Reuters, "Alcoa, aluminum maker shares down on price drop," Thomson Financial News, March 5, 2009 [AL4050]
- ¹⁴⁶ Andrew Leckey, "Aluminum giant Alcoa closely tied to economy," Richmond Times-Dispatch, March 2, 2009 [AL4051]
- ¹⁴⁷ Shannon Dininny, "After 60 years, 2 aluminum plants remain in state," Everett Herald online, June 25, 2012 [AL4266] and "U.S. Primary Aluminum Production, Report for December 2012," Aluminum Association online, Jan. 10, 2013 [AL4320]
- ¹⁴⁸ John Miller, "Alcoa to cut capacity 12%," Wall Street Journal, Jan. 6, 2012 [AL4687]
- ¹⁴⁹ "Alcoa mulls production cuts," Recycling Today, May 7, 2013 [AL4358]
- ¹⁵⁰ "Alcoa looks for ways to raise cash, CEO tells shareholders," Pittsburgh Tribune Review, May 3, 2013 [AL4359]
- ¹⁵¹ Joe Deaux, "When a 127-year-old U.S. industry collapses under China's weight," Bloomberg online, Nov. 3, 2015 [AL5204]

-
- ¹⁵² “Alcoa to curtail smelting and refining capacity to further drive upstream competitiveness,” Alcoa online, Nov. 2, 2015 [AL4987]
- ¹⁵³ “North American aluminum demand grows 5.0 percent in 2014,” Aluminum Association, Feb. 23, 2015 [AL5236]
- ¹⁵⁴ “Automotive quick read,” Aluminum Association, Oct. 9, 2015 [AL4963]
- ¹⁵⁵ Aluminum Association, Oct. 9, 2015 [AL4963]
- ¹⁵⁶ Joseph Pete, “Ford pumps \$1.3B more into aluminum pickups,” Northwest Indiana Times, Dec. 25, 2015 [AL5029]
- ¹⁵⁷ “Alcoa smelter closure to bring US aluminum output to post-WWII levels,” Reuters, Jan. 7, 2016 [AL5043]
- ¹⁵⁸ For more information, see “Alcoa Inc. 2013 Annual Report, Form 10-K, Filing Date Feb 13, 2014”
- ¹⁵⁹ For more information, see “Alcoa Inc. 2013 Annual Report, Form 10-K, Filing Date Feb 13, 2014”
- ¹⁶⁰ For more information, see Reuters, “Alcoa board approves plan to split the company into 2 in November,” Fortune online, Sept. 30, 2016
- ¹⁶¹ “Over 125 years of innovation leadership, timeline,” Alcoa online, 2016 [AL5098]
- ¹⁶² For more information, see Arconic online, Feb. 4, 2017, and John W. Miller, “Alcoa spinoff Arconic in \$1 billion Airbus deal,” MarketWatch online, Nov. 7, 2016
- ¹⁶³ For more information, see “Trade and Economy,” Embassy of Iceland, Oct. 15, 2009
- ¹⁶⁴ For more information, see “Ma’aden,” Saudi Arabian Mining Co., Feb. 6, 2017
- ¹⁶⁵ John Miller, “Alcoa’s hometown footprint is shrinking,” Wall Street Journal, Sept. 16, 2013 [AL4688] and Pittsburgh Tribune Review, May 3, 2013 [AL4359]
- ¹⁶⁶ “Refinery at Ma’aden-Alcoa joint venture produces first alumina from Saudi bauxite,” Alcoa online, Dec. 21, 2014 [AL5199]
- ¹⁶⁷ Maha El Dahan, “Saudi, Alcoa aluminium smelter production to top initial target this year,” Reuters, May 12, 2015 [AL5200]
- ¹⁶⁸ Biman Mukherji, “Rising Chinese production keeps lid on aluminum prices,” Wall Street Journal, Nov. 10, 2015 [AL5202]
- ¹⁶⁹ Richard Talley, “Too little, too late for the U.S. aluminum industry?” The Hill online, Nov. 16, 2015 [AL4988]
- ¹⁷⁰ Keith Bradsher, “Union seeks higher tariffs on U.S. imports of raw aluminum,” New York Times, April 18, 2016 [AL5207]
- ¹⁷¹ Tom Jennmann, “China not to blame for lack of U.S. smelting competitiveness,” Fast Markets online, April 20, 2016 [AL5300]
- ¹⁷² Heidi Brock, “The challenges are real, but the U.S. aluminum industry can still thrive,” Aluminum Association, from Ag Metal Miner online, Dec. 3, 2015 [AL5205]
- ¹⁷³ Brock, Dec. 3, 2015 [AL5205]
- ¹⁷⁴ President Donald Trump, “Aluminum imports and threats to national security,” memo to Commerce Secretary Wilbur Ross, April 27, 2017 [AL5601]
- ¹⁷⁵ Trump, April 27, 2017 [AL5601]
- ¹⁷⁶ Shelley Goldberg, “Trump is wrong about aluminum imports,” Bloomberg View, June 27, 2017 [AL5602]
- ¹⁷⁷ Goldberg, June 27, 2017 [AL5602]