

Aluminum Marketing Research

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This is **Aluminum marketing research** and can include information on the **background, market structure, definitions, competitors, trends and developments of aluminum** and is related to other topics such as minerals, metals and bauxite.

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Background

The number of metal mining operations in the United States has been dropping since the early 1980s, while industrial mineral operations have been increasing. For metal ores and concentrates, the value of imports exceeded the value of exports for most of the 1990s, while the United States for the most part exported more raw industrial minerals than it imported.

The United States has large reserves of important metals such as copper, iron ore, and zinc, but it depends on other nations to provide metals that it lacks or cannot readily mine. In 1998, for instance, the United States produced 6 percent of the world's iron ore but relied on other countries to supply roughly 17 percent of the iron ore it consumed. Other metals that the United States counts on foreign producers to supply include bauxite and alumina, chromium, cobalt, manganese, nickel, platinumgroup metals, tin, tungsten, and zinc.

The long-term outlook of U.S. mining industries is affected by factors such as access to public lands, the regulatory environment, advances in mining technology, and the location, quality, and potential profitability of ore deposits. For metal mining, one of the most important issues in recent years has been access to public lands for the exploration and development of mineral deposits.

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Market Structure

The value of U.S. mine production of metals (SIC 10) declined significantly in 1998 in current and constant (1992) dollars, dropping 19.1 percent and 13.3 percent, respectively, owing to falling metal prices. Over the period 1992-1998, metal mine production value in real terms declined 2.3 percent annually on average, with the value of production peaking at \$11.7 billion in 1995. Growth in constant dollars also trended downward slightly over that period and trended upward slightly in current dollars. The growth in the value of total output in constant dollars for iron and other ferrous ores, copper ore, and miscellaneous nonferrous ores rose slightly over the 3-year period 1996-1998 and is projected by Standard & Poor's DRI to be about 2 percent per year between 1998 and 2004. The recent slow growth in metal mine production value does not reflect the relatively high demand for most metal commodities over that period. Oversupply has kept prices down for many metals even as high demand in the United States has kept production rates relatively high in recent years, except for 1998.

Some important metals in which the United States is nearly self-sufficient or produces the majority of its supply are, in order of increasing self-sufficiency, zinc, lead, iron ore, and copper. The United States is a net exporter of molybdenum and gold. The relative positions of these commodities with respect to net import reliance were nearly unchanged in 1998 compared with 1997, except that iron ore and copper exchanged places. Although completely dependent on imports of bauxite and alumina, the United States is the world's largest exporter of aluminum metal.

Total employment in metal mining was about 50,000 in 1998, down more than 7 percent from 1997. Over the longer term (1992-1998), employment declined at a rate of 1 percent per year on average. With the value of mine production in real terms generally declining at a slightly higher rate than did total employment, value of output per employee also declined slightly over that period.

With respect to the value of mine production in 1998, gold was highest among metals at \$4.0 billion, followed by copper at \$3.3 billion, iron ore at \$1.9 billion, zinc at \$840 million, molybdenum at \$454 million, and lead at \$440 million. The value of iron and steel and ferrous foundry industry production was \$73 billion, and the value of primary aluminum produced at U.S. smelters was \$5.3 billion. Economic conditions in 1998 and 1999 were generally good, particularly in transportation, housing, and construction, resulting in a relatively high demand for metals. Favorable economic indicators point to a moderation of this trend through 2004 in several indexes that are important to

metals consumption. For example, as projected by the U.S. Department of Commerce, Bureau of the Census, total housing starts will decline slightly between 1999 and 2003. Total multiunit structures are expected to remain about the same, but total single-unit structures are projected to decrease approximately 10 percent. Light vehicle construction is expected to fall slightly from 15.7 million units in 1999 to 15.3 million units in 2000 but rise to 15.7 million units by 2003.

Recycling remained a strong component of metals supply in the United States in 1998 and 1999. The commodities with the highest recycling rates (defined as metal recovered from old and new scrap as a percentage of apparent supply) were lead (66 percent), steel (59 percent), titanium (50 percent), aluminum (39 percent), copper (37 percent), nickel (29 percent), tungsten (28 percent), cobalt (23 percent), chromium (21 percent), and tin (21 percent). In steel, scrap-based electric arc furnaces have captured a major portion of steelmaking capacity: 45 percent in 1998. The impact of the Asian financial crisis on U.S. metals markets could be felt most in iron and steel scrap. U.S. exports to that region declined significantly in 1998. Consequently, prices for carbon steel scrap also experienced a substantial drop. Stainless steel scrap prices experienced a similar price decline. With signs of recovery in Asia in 1999, the scrap markets are expected to rebound in 2000 with a sustained high level of economic activity in the United States.

Market Metrics

Aluminum and Nonferrous Metals

The nonferrous metals include more than four dozen metals that are mined in quantities that range from a few kilograms per year to several million tons per year and that have diverse uses. The more economically important of these metals are the base metals (aluminum, copper, lead, tin, and zinc) and the precious metals (gold, silver, and the six platinum-group metals). The base metals are important because they are produced and used in large quantities, and the precious metals because they have high unit values. The United States produces large amounts of most of these economically important nonferrous metals and uses large quantities of all of them. In terms of the dollar value of production or consumption, all these important metals rank among the top two dozen of the 90 or so mineral commodities used in the domestic economy (see Figure 1-6 for domestically refined values of some of these metals). Standard & Poor's DRI projects real annual growth of 3.2 percent between 1998 and 2004.

The United States is the world's largest producer and user of aluminum. It imports substantial quantities of aluminum metal and is completely dependent on foreign sources for the aluminum ore—bauxite—it needs. It also imports large quantities of the intermediate product alumina, of which more than 90 percent is smelted to the metal; the balance of this alumina and some domestically produced alumina are used in refractories (a nonmetallic material suitable for use in high-temperature applications), abrasives, and several other applications. Domestic primary aluminum production grew from 3.3 Mt in 1994, at the peak of imports of metal from the countries of the former Soviet Union, to 3.7 Mt in 1998. Secondary production from old scrap at 1.5 Mt accounted for 21 percent of domestic aluminum production in 1998. U.S. apparent consumption of aluminum was about 7.1 Mt in 1998.

Aluminum Domestic Production and Use

The domestic supply of aluminum includes three major components: primary ingot production, secondary (scrap) recovery, and trade. In 1998, 3.7 Mt of primary aluminum metal was produced by 13 companies operating 23 primary aluminum smelters. Montana, Oregon, and Washington accounted for 39 percent of the production; Maryland, New York, Ohio, and West Virginia for 22 percent; and other states for 39 percent. On the basis of published market prices, the value of primary metal production was \$5.4 billion. The secondary metal sector, which includes both postconsumer scrap and prompt industrial scrap, has maintained steady growth in its share of the domestic supply and now accounts for more than 38 percent of the domestic aluminum supply.

Imports for consumption increased significantly in 1998 compared with 1997. Canada is the dominant trading partner for aluminum imports and exports, accounting for about 60 percent of U.S. imports of ingot and approximately 55 percent of both imported mill products and scrap. Russia remained the second largest supplier of aluminum materials. Imports of crude metal and alloys from Russia increased dramatically (43 percent) in 1998, returning to a level that had not been seen since 1994. Canada received about 45 percent of U.S. ingot exports in 1998, and Mexico accounted for an additional 30 percent of the U.S. primary ingot shipments.

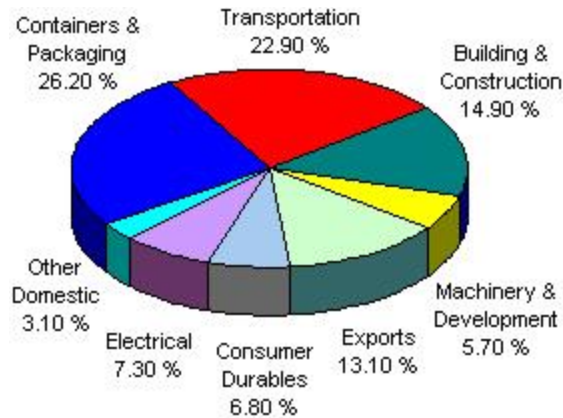
The transportation sector continued to be the dominant market for aluminum in the United States, surpassing the packaging industry, which dominated the market before 1995. Transportation uses for aluminum accounted for more than 35 percent of domestic consumption, with packaging accounting for about another 25 percent. Building and construction, electrical, consumer durables, machinery and equipment, and other uses accounted for the remainder.

Recent Events, Trends, and Issues

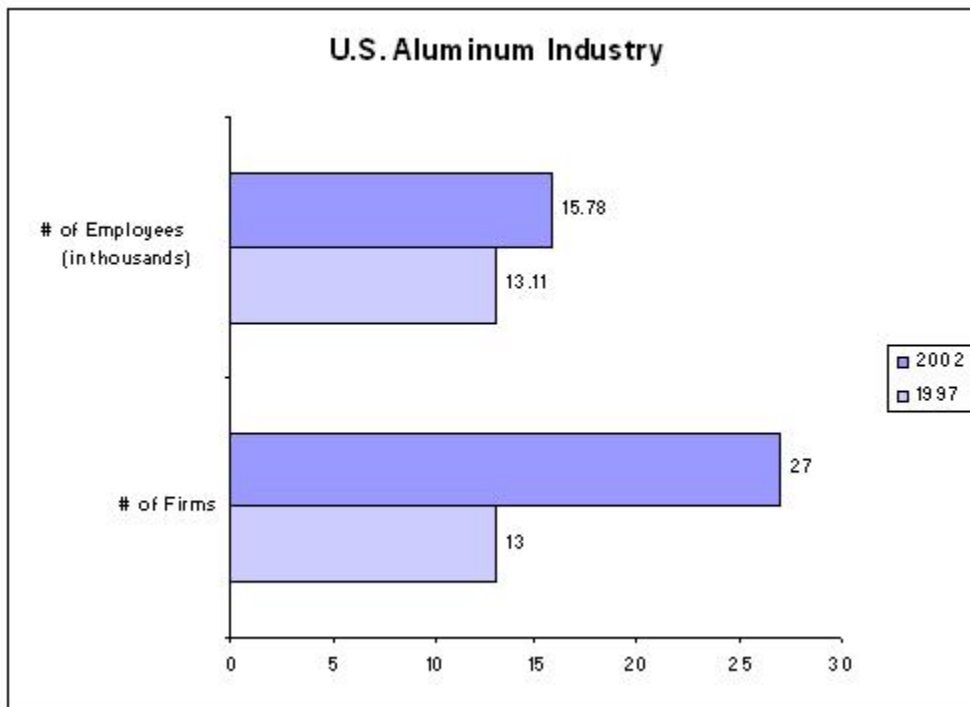
The Defense Logistics Agency completed the sale of aluminum metal from the National Defense Stockpile (NDS) in 1998. On April 24, the sale of 323 metric tons exhausted the inventory of aluminum metal held by the NDS and completed the 2-year sales program of 57,000 tons of aluminum metal.

Domestic primary aluminum production increased 3 percent in 1998 compared with 1997. Domestic smelters continued to operate at about 88 percent of engineered or rated capacity. Although there were significant changes in the ownership or operating status of several domestic smelters, overall domestic production capacity remained essentially unchanged. World production also increased 3 percent in 1998. Aluminum demand continued to be strong in the United States, and demand in Europe, although tempered by the Asian economic crisis, remained relatively strong. The Asian aluminum markets, however, reflected the economic and financial crises in that area. Indications that the economic crisis in Asia may be easing a bit suggest that world aluminum demand will improve. Aluminum demand in the United States is expected to remain relatively strong, and demand in western Europe, though weaker, is expected to continue to be positive. World production is expected to continue to increase as smelter capacities increase. The two greenfield smelter projects under construction in Canada and Mozambique should come on-stream in the next couple of years. Additional projects are being considered, and so in the near term, metal supply should be sufficient to meet overall world demand. Demand is expected to continue to grow, with the major growth area continuing to be the domestic and foreign transportation industries.

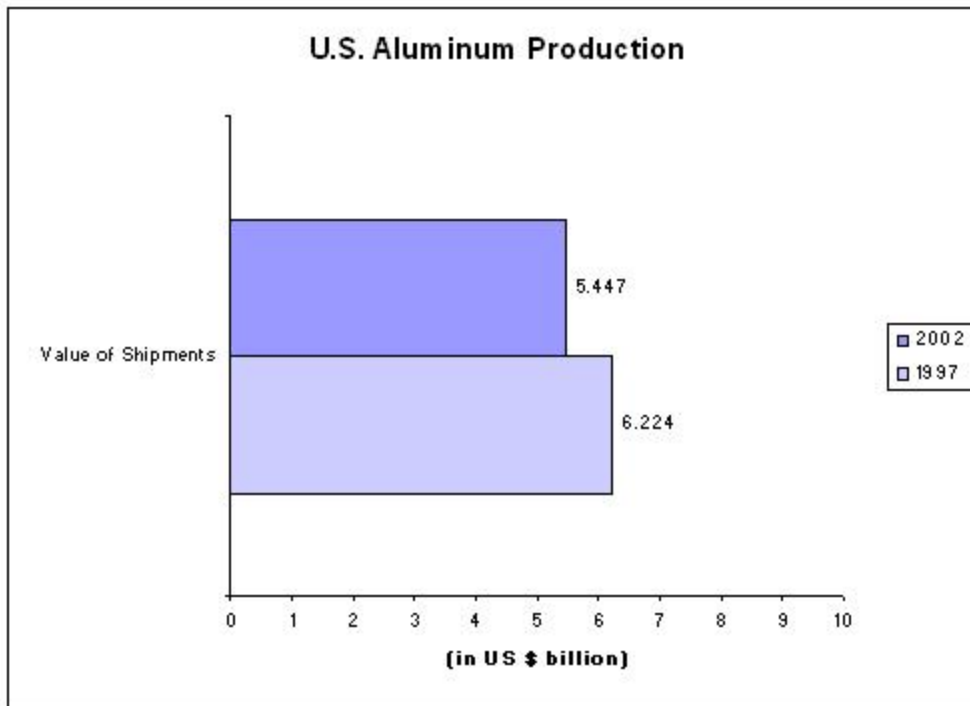
Aluminum Usage Categories



The aluminum mining industry has seen strong growth. The U.S. Department of Commerce estimated that the number of firms in aluminum production in the U.S. doubled in the five year period from 1997 through 2002, although it raised productivity at the same time by decreasing workers employed by almost 17% (see chart below).



At the same time, the value of aluminum industry shipments had slipped in the five year period, to slightly less than US \$5.5 billion annually (see chart below). That number has increased significantly since that time.



The growth in aluminum production has been especially high in the past 10 years. It is estimated that production of aluminum exceeded 32 million tons in 2006.

Estimated world production since World War II

Year	Estimated Aluminum production (in million tons annually)
1950	1.5
1960	4.9
1970	10.1
1980	15.0
1990	19.5
2000	25.0
2007	32.0

Aluminum demand is expected to rise approximately 3 to 4% annually. The core growth in production is expected to be in countries with less expensive access to power. Despite the enormous growth in Chinese demand for aluminum, it is not expected that the country will increase production radically as the cost of energy within their country is seen as too high. China, however, was the largest producer of aluminum in 2005, with an almost 20% market share.

Recent aluminum production estimates for key geographies

Geography	Production (12 month moving average) (in thousand metric tons)			
	1996	2000	2004	2007
North America	460	510	465	450
Europe	490	610	685	700
All other regions	520	605	755	850

Twenty years ago, American, Canadian and European firms dominated most of the aluminum market. In fact, they likely accounted for more than 50% of production at the time. Currently, these producers account for less than 25% of the total as production has shifted more towards emerging markets countries with access to cheaper power sources. Some major firms expect the demand for aluminum to remain high and are planning major expansion. Rusal for example, continues to buy up local power companies and plans to increase capacity by 60% in the next 5 to 8 years.

Industry Definitions

- Alloy - homogeneous mixture of two or more elements, at least one of which is a metal, and where the resulting material has metallic properties.
- Corrosion - deterioration of essential properties in a material due to reactions with its surroundings.
- Ductility - the mechanical property of being capable of sustaining large plastic deformations due to tensile stress without fracture (in metals, such as being drawn into a wire).
- Non-magnetic - not attracted to magnetic fields.

Industry Players

- Rusal
Headquartered in Russia
Merger of Sual Group, OAO Rusal and assets of Glencore AG
Revenues of US \$8.6 billion in 2006
- Alcoa
Headquartered in Pittsburgh, Pennsylvania
Revenues of \$31.5 billion in 2006
Net Income of \$2.2 billion in 2006
- Norsk Hydro
4th largest aluminum producer worldwide
Major producer of oil and gas in Norway
43% owned by the Norwegian government
Produces over 1.6 million tons of aluminum annually

- Rio Tinto
Headquartered in the UK
Revenues of US \$22 billion in 2006
Market capitalization of US \$97 billion
33% profit margin
Bought, for \$38 billion rival, Alcan
- Alcan
Headquartered in Montreal, Canada
Revenues of US \$25 billion in 2006
Purchased by Rio Tinto for US \$38 billion in late 2007

Trends and Recent Developments

With the price of aluminum remaining high, companies are investing heavily to find dedicated power sources to be able to produce aluminum. They are looking even further afield, often in very remote locations to set up aluminum producing operations. Some of these firms, including Rusal and Norsk Hydro are looking to remote spots in Siberia or other locations for new production sites. The new rule seems to be to get closer to the production source as opposed to closer to the customer. The geographic center of gravity continues to shift. The Middle East, as a consequence of its major oil and gas reserves, is expected to significantly grow its aluminum production. With the same objective in mind, Norsk Hydro has teamed up with Qatar Petroleum to expand capacity in Qatar. Alcoa has set up production operations in Iceland where it has better access to hydropower. For the most part, aluminum operations in the Pacific Northwest of North America have been almost shut down due to the high cost of fuel.

Many firms are also focused more on the core production functions and are spinning off ancillary operations such as aluminum packaging or aluminum can production (Rusal). Alcoa has also recently been interested in selling some of its consumer-oriented operations including ones in the automotive sector.

The price of aluminum, like those of almost all commodities except gold, has been very volatile recently. While it had risen dramatically in early 2008 to reach 1.24 per pound on the Comex spot market, the price has recently dropped to .63 per pound (February 12, 2009) - almost a 50% drop. The market capitalization of some aluminum producers has been severely cut. For example, in the last year, Alcoa's share price has dropped from a high of US \$44 per share, to only \$6.30 as of February 20, 2009, reducing its market capitalization to only US \$5 billion. With the deepening worldwide economic recession, it is unclear that aluminum or other commodity prices will be rising significantly anytime before 2010 or even later.

Sources

U.S. Department of the Interior
U.S. Department of Commerce
Corporate websites

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