
Antaike is an independent market research institution. Since being established in 1992, Antaike has built a reputation for its authoritative, strategic, and in-depth analysis of the metals industries and markets. It also provides news, trade and production data, prices and forecasts. Drawing on our extensive research and authoritative analysis, we wish to provide the following views regarding the global aluminum industries and markets.

I. All indicators show that the U.S. aluminum industry is healthy.

   a. The increase in U.S. domestic demand of aluminum is strong.

   In addition to China, the United States is the largest country that consumes aluminum, with its annual consumption amounting to 30 percent of total global consumption. The demand for aluminum in the United States reached a historical peak in 2006, at 12.3 million tons. However, the global financial crisis in 2008 caused shrinking demand in the U.S. domestic market.
domestic demand has gradually recovered since then. In particular, in 2012 the aluminum applications in automobile panels expanded significantly in the United States, and correspondingly, U.S. domestic consumption of aluminum substantially increased. In 2015, U.S. domestic consumption rose to 111.68 million tons, an increase of 37.4% compared with 2009, and 8.3 percentage points higher than average global consumption during the same time period.

b. By relocating primary aluminum production to overseas regions with cost-effective energy resources, the production costs of the U.S. aluminum companies have decreased significantly. The United States was the birthplace of the global aluminum industry. Due to rising electricity and labor costs, U.S. primary aluminum production gradually lost its competitiveness. No new primary aluminum plant has been built since the 1990s, and high-cost capacity was been shutting down successively since then. At the same time, primary aluminum production has been shifting to energy-rich regions such as Canada, Iceland, and Middle East. The rationalization of global aluminum production has significantly brought down the production costs of the U.S. aluminum companies. According to the annual report of Alcoa, in 2016 the manufacturing costs of its primary aluminum were USD1,581 per ton, a decrease of 14% compared with 2015. The abandonment of U.S. primary aluminum production was inevitable based on cost realities and the context of the global aluminum industry. Moreover, the global aluminum industry has become the beneficiary of the regional transfer of the global aluminum industry.
The U.S. aluminum supply is strongly guaranteed through various sources.

The United States is the world’s second largest consumer of aluminum with 11 million tons of aluminum consumed on an annual basis for many years. Despite the decrease in domestic primary aluminum production, U.S. aluminum supply is guaranteed by imports and recycled scrap aluminum. In particular, due to the huge aluminum stock and the rich aluminum scrap resources in the United States, secondary aluminum has become an important part of U.S. aluminum supply. In 2002, the production of secondary aluminum surpassed that of primary aluminum in the United States. At present, the quantity of recycled aluminum is around 4 million tons, accounting for nearly 40% of the total aluminum supply in the U.S.

d. The United States has world-class aluminum processing capabilities, dominating the global market for high-end aluminum products.

With a long history of aluminum processing, a full range of equipment for the manufacturing of its high-end aluminum products, and second-to-none research, application development, technical control, and production management, the United States remains a world leader in the manufacturing of high-end aluminum products, such as plate and sheet for aviation and automobiles. For instance, a great deal of aviation alloy was first developed by the United States and the key manufacturing technology was first mastered by the United States as well. In the promising automobile aluminum field, it is the United States that first developed and seized the market for automobile body sheets (“ABS”). It became the world’s largest manufacturer of ABS by investing in this product segment. In 2016, accounting for about 40% of the world’s total aluminum ABS, the U.S. capacity for ABS exceeds those of European countries.
II. Primary aluminum production tends to transfer to regions with distinct energy advantages, which reflects optimal allocation of global resources and the strategic choices made by Western aluminum companies.

Producing primary aluminum is energy-intensive. In order to lower production costs, global primary aluminum production continues to converge to countries and regions where energy is abundant. Russia and Canada have an advantage in hydropower. The Middle East and Iceland have abundant oil and gas and low electricity prices. These are regions where the primary aluminum industry has recently grown, and this has nothing to do with China. In contrast, production of primary aluminum in the United States and Europe has shrunk. In other words, the history of the primary aluminum industry reflects a trend towards production in energy-rich regions.

Antaike and CRU’s research data show that the cost of alumina and electricity account for 40% and 32%, respectively, of the production cost of primary aluminum (liquid metal cost). As the primary aluminum producers are facing a common alumina market, the pursuit of lower cost electricity becomes the differentiating factor among global primary aluminum manufacturers. In recent years, due to the shift towards energy-rich regions and associated decreases in energy prices, the average price of primary aluminum production dropped dramatically. In 2016, the average electricity price in the primary aluminum industry was 0.028USD / kWh, a decrease of 10% compared to 2008. Among the major primary aluminum producing countries, the lowest electricity cost was in Canada, with a price of only 0.016USD / kWh in 2016. In the United States, the electricity price was 0.030USD / kWh in 2016, slightly higher than the global average;
the electricity price in the Middle East was 0.027 USD / kWh, slightly lower than the global average.

Significantly, China is the country with the greatest decline in electricity prices in recent years. Energy costs have been reduced due to the transferring towards western regions with power advantages, the increase in the proportion of self-powered plants year-over-year, and the emergence of new models such as LAN, direct purchases of electricity. In 2016, the electricity price in China was 0.033USD / kWh, a decrease of 37.9% compared to that in 2008. In addition, technology for primary aluminum production in China has progressed such that energy consumption is among the most efficient in the world, effectively reducing Chinese electricity costs. In 2016, comparable alternating current power consumption was 13270 kWh / t.Al, which is 5% lower than the global average, and much lower than that in Europe and North America.

In terms of labor costs, the U.S. has the highest labor costs at 247 USD / t.Al; China’s labor costs are among the lowest in the world, at only 52 USD / t.Al.

Canada and Russia, the two countries with the lowest cost of primary aluminum production, also are the main source of U.S. imports of aluminum and alloy ingots. Canada's primary aluminum production is largely attributable to two companies, namely Rio Tinto and Alcoa, whose production accounts for 50% and 30% of Canada's total capacity respectively. From Alcoa's perspective, Canada represents the single largest country for primary aluminum capacity, accounting for 25% of Alcoa’s total capacity. Thus, the global primary aluminum industry reflects the optimal allocation of resources.
III. Deepening regional collaboration and an international division of labor is the overall trend for global development of the aluminum industry.

Aluminum demand is closely related to economic development. Developed economies, such as the United States, Europe and Japan, have been the main drivers of global aluminum consumption, while consumption in developing countries is relatively low. International trade in aluminum results from the geographic differences in the production and consumption of aluminum. Russia and the Middle East are net exporters of aluminum. The United States, Japan and Germany are net importing countries. This is the inevitable result of regional cooperation and an international division of labor in the global aluminum industry.

IV. There is no direct relationship between China’s increasing output and changes in the London Metal Exchange price for aluminum. The aluminum price outside of China primarily reflects the supply-and-demand relationship in that particular region.

a. China’s increasing aluminum output has not depressed the international aluminum price.

China’s domestic aluminum market and global aluminum markets are distinct because China restricts aluminum exports. In particular, China maintains a 15% export duty on aluminum, and effectively bans primary aluminum exports. Thus, China’s aluminum output has minimal direct impact on the international aluminum market. According to historical data, the statistical correlation between the change of the output of China’s primary aluminum and the change of the LME aluminum price is only 0.38, and thus, there is no relationship between them. Please see Figure 1.
b. The LME aluminum price is determined by the supply-demand relationship outside China. Meanwhile, foreign investors have manipulated the market.

The change in supply and demand fundamentals is the primary factor that causes aluminum price fluctuations. Due to the restrictions on the export of primary aluminum, China does not affect the international aluminum market supply. Thus, the supply-and-demand relationship outside of China becomes the decisive factor in determining the international aluminum price. In addition, institutional investors and traders have taken advantage of various rules to manipulate the international market, further affecting international aluminum prices. For example, from 2012 through 2014, some international investment banks and traders took advantage of LME warehouse rules and rendering the aluminum stock shut out, and therefore,
artificially causing a shortage of aluminum supply in the global markets. Such activities further caused a significantly increased premium; for instance, in 2014, the average premium reached a historical peak at USD472 per ton. These producers and traders have received considerable benefits through such market manipulations. This phenomenon has nothing to do with China’s own aluminum production or domestic pricing.

**Figure 2.** The balance between primary aluminum supply and demand and premium

* Right coordinate: the balance of supply and demand (1000 tons); left coordinate: premium (USD/Ton)

Antaike expresses the above views based on pure facts, which reflect the objective and accurate situations of global aluminum markets and industry. In conclusion, therefore, we do not believe that imports of aluminum from China have any impact on the national security in the United States.