

# Growing Aluminum Rolling Capacity in the U.S. to Boost Raw Material Demand

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**A**luminum demand declined in the first half of 2023, following a buoyant 2022. The decline is primarily connected to slower economic growth and rising federal interest rates. However, overall demand remains relatively strong compared to the past decade's average and the long-term industry outlook is quite strong, according to the Aluminum Association. Demand is expected to rise considerably in the coming decade—largely driven by increased demand for beverage cans in the packaging sector in the U.S., as well as demand for aluminum sheet products for the automotive sector. This demand growth is evidenced by the construction of new rolling mills in the U.S., which is positive news for everyone working in this industry and related sectors.

Among the new rolling capacity that will be coming online in the coming years is the 600,000 tpy integrated rolling and casting plant in Alabama,<sup>1</sup> which Novelis expects to start production in mid-2025. Steel Dynamics is building a 650,000 tpy facility in Mississippi through its new business Aluminum Dynamics, with a new cold rolling mill from SMS set to start production in the first half of 2025.<sup>2</sup> In addition, can manufacturer Ball Corp. and Manna Capital announced plans to build a new aluminum can sheet rolling mill and recycling center in New Mexico, with the mill expected to be operational in 2026.<sup>3</sup> These mills are expected to supply the can sheet, automotive, and other markets (more on these projects can be found in the article on page 36). Altogether, the three mills are expected to add at least 752,000 tpy of new can sheet output in order to support growing demand from the packaging and automotive sectors in the U.S.

## The Need for Raw Material Security

Primary production in the U.S. was 860,000 tons in 2022.<sup>4</sup> By contrast, the U.S. recovered 3.4 million tons of aluminum from purchased scrap in 2022, of which about 56% came from new (manufacturing) scrap and 44% from old (post-consumer) scrap. Aluminum recovered from old scrap was equivalent to about 29% of apparent consumption. Furthermore, the country imported 6.5 million tons of aluminum for consumption in 2022. Therefore, the apparent consumption of aluminum in the U.S. was around 5.1 million tons in 2022 (including primary and secondary production and imports, but not including exports of scrap and semis and other adjustments). This data illustrates the significance of both secondary aluminum and imported aluminum products in the U.S.

Nevertheless, the North American flat rolled aluminum industry is facing a supply deficit estimated at over 2 million tons, which is largely driven by growing demand from the automotive and sustainable beverage can industries.<sup>5</sup> With the current investments in increased rolling capacity, there arises the question: Where will these new rolling operations source their feedstock from? The methods available include domestic primary aluminum capacity, importing raw slab or semi-finished aluminum from other countries, the construction of new remelting or recycling slab facilities, increasing the recycling rate of used beverage cans (UBCs), or looking to new sources, namely land-fill mining.

**Domestic Primary Aluminum Capacity:** In the early 1970s, the global aluminum industry was dominated by the “Six Majors”—Alcoa, Alcan, Reynolds, Kaiser, Pechiney, and Alusuisse. Altogether, they produced about 73% of primary aluminum worldwide,<sup>6</sup> and at the time, the U.S. was the largest aluminum producer in the world. However, the U.S.'s share of global primary output has slipped from 32% in 1972 to about 9% in 2000 and to about 1% in 2022 (Figure 1). To be more precise, the U.S. produced about 3.7 million tons of primary aluminum in 2000, which has plunged by 76% to 860,000 tons in 2022.<sup>7</sup> Over the decades, the U.S. primary aluminum industry has gone from being a flourishing manufacturing sector to almost disappearing, with the production base shifting away from the U.S. to Asia. In other words, the U.S. transformed from a producer of light metal to a net consumer—despite multifold demand increases across a variety of sectors.

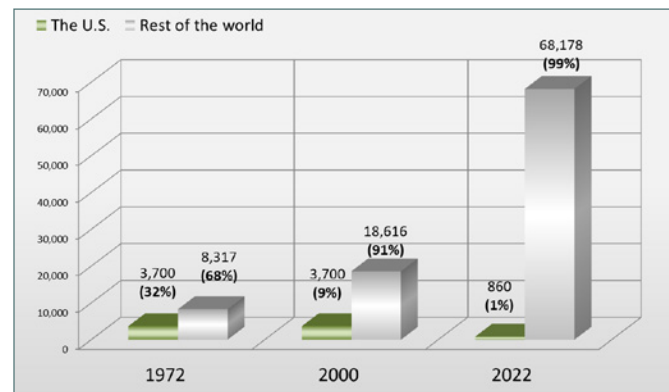


Figure 1. The U.S. share of aluminum production (per thousand tons). (Source: Phinix.)

Currently, only three companies—Alcoa, Century Aluminum, and Magnitude 7 Metals—are operating in the U.S. By the end of 2020, these three companies operated six primary smelters in the U.S., compared to five companies operating nine primary smelters in 2010.<sup>8</sup> This was due to the fact that Alcoa and Century Aluminum closed some of their capacities in 2022, causing a production loss of about 300,000 tons.

It is wishful thinking to believe that the U.S. will revive its closed primary capacities. Apart from the threats of import and global overcapacity, primary producers are weighed down by high electricity, interest rates, and labor costs. Further, the closed smelters operate on older, less energy-efficient technologies compared with the current smelters in China, the Middle East, and the rest of Asia. Many U.S. primary producers relocated smelters to Canada and Iceland for the availability of hydropower and cheaper electricity. Further, new smelters entail large capital investments, which are economically infeasible when industries consolidate.

Recently, leading end-consumers of aluminum—such as Ford, General Motors, Pepsi Co., and Ball Corp.—issued an appeal to the U.S. Department of Energy (DOE) to facilitate federal investments via the Inflation Reduction Act (IRA) to ensure a reliable supply of domestically produced, clean aluminum.<sup>9</sup> These consumers opined

that the IRA presents a powerful opportunity for the country to resume primary aluminum supply. However, it remains to be seen whether any action will be taken in this regard.

**Importing Aluminum:** The current supply deficit in North America is currently being addressed through imports of higher-cost aluminum flat rolled products, with about 25% of the aluminum on the market coming from imports. According to data from the U.S. Department of Commerce, the U.S. imported 6.3 million tons of aluminum products for domestic consumption in 2022, of which 4.2 million tons was unwrought aluminum.<sup>10</sup> Canada and the United Arab Emirates (UAE) remained the largest supplier of unwrought primary aluminum to the U.S., with Australia, Bahrain, and India accounting for another major portion of the imports. In addition, 1.2 million tons of plate, sheet, and strip (including can stock) was imported in 2022, primarily from China (at 210,000 tons) followed by Canada, Korea, Oman, and Thailand.

When a country is building up rolling capacities to substitute imports, the concept of importing aluminum rolling slab to feed those mills is a self-contradictory option. Further, outside of Canada, the semi-finished aluminum supplier countries for the U.S. have some of the highest carbon footprints globally, which goes against circular economy and sustainability goals.

Another major concern with imports is the shifting landscape for international trade. For example, the U.S. has imposed Section 232 quotas for the import of aluminum from a number of countries (with exemptions for Canada, Mexico, and Australia) and has also issued anti-dumping and countervailing duties on several semi-finished products imported from China and Korea. Quotas, tariffs, and duties make imports from domestic manufacturers expensive, which affects the sector's profitability. In addition, the continuously changing politics around these measures can make the price of imports unpredictable.

**Constructing New Remelt and Recycling Units:** In order to ensure a steady supply of raw aluminum to their new facilities and better control the cost and quality of that supply, each of the three operations planning to install rolling mills in the U.S. are simultaneously working to expand their remelt and recycling capacity. Novelis plans to add a new center for recycling beverage cans alongside its new rolling facility in Alabama (the first integrated facility of its type in 40 years). When fully operational, this will increase the company's recycling capacity by 15 billion cans per year. Notably, the company recycled over 82 billion used beverage cans in 2022.

Simultaneously, Steel Dynamics plans to use a significant amount of aluminum scrap in its proposed rolling mill, sourcing secondary metals from its recycling platform, OmniSource, one of the largest nonferrous metal recyclers in North America. It will also set up two supporting satellite aluminum slab casting centers located in Arizona and Mexico, which will secure the supply of slab for the company's new rolling mill.

Likewise, Ball plans to install a recycling center adjacent to its new rolling mill in New Mexico. This will enable the company to increase the recycled content of its can sheet and ensure the supply of raw material to its mill.

Other independent secondary aluminum billet and slab producers in North America are also working on expanding their secondary metal output in order to serve the growing flat rolled aluminum market. For example, Matalco commissioned its secondary slab plant in Franklin, KY, at the end of 2022, with an annual capacity of 195,000 tons of slab.<sup>11</sup> Matalco has a combined capacity to produce more than 950,000 tons of low-carbon aluminum products annually.

In addition, MetalX and Manna Capital are partnering to build a new greenfield aluminum rolling slab facility in either northeast Indiana, northwest Ohio, or southern Michigan.<sup>12</sup> The facility will be designed to produce 100,000 tons per year of ultra-low carbon aluminum rolling slab with a high recycled content. The plant will cater to the beverage, packaging, and auto industries and is expected to be operational in 2026.

Constructing an in-house recycling and casting operation is an excellent option for companies—though it is not always viable for every company due to the available space in their plant and the initial capital investment costs. Another potential issue is that these slab casting operations in themselves require access to large amounts of scrap—and to meet these needs, recycling rates need to increase in order to make post-consumer scrap more readily available.

**Increasing the Recycling Rate of UBCs:** Increased recycling of aluminum UBCs could be a real game-changer in solving the domestic demand-supply gap. According to a report from S&P Global, the three aluminum rolling mill investments could add about 1.4 billion lbs (700,000 tons) of new demand for UBC scrap in the U.S., which currently has a market of about 2 billion lbs.<sup>13</sup>

The current UBC recycling rate in the U.S. hovers around 46% (Figure 2). For an industry that produces more than 100 billion aluminum cans per year, translating into the consumption of about one can per day for every American, this is undeniably low. This compares to a much higher rate of 100% in Brazil and nearly 80% in Scandinavia and Japan. Aluminum cans are a leading example of closed-loop recycling, with a high recycled aluminum content and the ability to return to store shelves as fresh cans within 60 days. However, much work needs to be done in the U.S., which is lagging despite infrastructure and technology support.

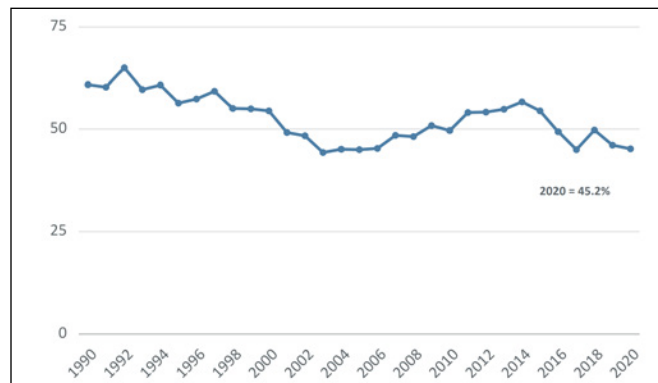


Figure 2. Consumer aluminum can recycling rate from 1990 to 2020.<sup>14</sup>

As the Can Manufacturing Institute (CMI) has pointed out, if the aluminum UBC recycling rate were 70% in 2020—instead of 45%—more than 25 billion cans would have been recycled. These 25 billion fresh cans would have generated huge revenue for the U.S. recycling system and saved enough energy to power more than one million U.S. homes annually.

As reported by the Aluminum Association, about 3 billion lbs (1.5 million tons) of cans were shipped in 2020, while only 1.3 billion lbs (650,000 tons) of cans were recycled by U.S. consumers in the same year.<sup>14</sup> That means that 850,000 tons went unrecycled in 2020. Considering the dollar value of the UBC scrap in 2020 at \$991/ton, around \$840 million worth of aluminum ended up in landfills. If responsibly recycled, that volume could have been made into new cans and added to the revenue stream. Considering the present value of UBC scrap per

ton (about \$1,300/mt), that amount of unrecycled cans would have been worth more than \$1 billion.

An effective container deposit system in the U.S.—at the state or national level—could play a significant role in raising the aluminum recycling rate. Only ten states in the U.S. currently have a can-deposit system, and the UBC recycling rate in those states varies from 61% to 88%, according to a 2021 report from Ball Corp.<sup>15</sup> Notably, aluminum can sheet producers recycled about 47 billion UBCs in 2020, and 40 billion of those came from the ten states with deposit systems.<sup>16</sup> This proves that successful container deposit programs could be effectively utilized in the other states to substantially increase the total national UBC recycling rate.

**Landfill Mining:** Landfill mining is a novel concept that involves excavating landfills, from which the buried resources are recovered and processed for environmental, economic, or social benefits. The vast quantities of metal buried in landfills could be suitable for use as potential secondary resources. Nonferrous metals contribute the most to the revenues from landfill mining, and aluminum has the highest potential among them (as discussed in a previous article in *Light Metal Age*, October 2023).

In 2018, landfills received about 2.7 million tons of aluminum or about 1.8% of all municipal solid waste landfilled that year.<sup>17</sup> According to research conducted by Phinix, the total amount of aluminum landfilled in the U.S. is about 90.2 million tons, which means that the average amount of aluminum landfilled yearly since 2010 has been around 2.55 million tons, or 2.83% of the total amount of aluminum landfilled. Notably, aluminum cans compose about 20% of landfilled aluminum.

This raises a pertinent question about the viability of recovering the aluminum cans that have been landfilled in the last ten years. Currently, this process is still in the experimental stage, but it could be a revolutionary method for sourcing aluminum. However, policymakers, local and federal governments, and landfill owners will need to unite to shape landfill mining into one of the most sustainable methods for aluminum recovery.

### The Bottom Line

Greenfield rolling capacity expansion in the U.S. is important to the North American market, considering the growing demand from the automotive and packaging sectors. However, the industry needs to work towards securing the raw material supply chain for the more than 752,000 tpy of new rolling sheet output coming online in the next few years. Currently, this growth represents an opportunity for those countries that export crude and semi-finished aluminum to the U.S. However, for the U.S., the real value addition will only be realized if the country can feed those new rolling mills from domestic supply. Expanding primary aluminum capacity remains questionable at this time, though independent producers and the rolling mills themselves are investing in remelt and recycling operations to ensure their own supply. Regardless, increasing UBC recycling through can deposit schemes and growing consumer awareness is going to be vital to providing access to scrap. The next step down the road is landfill mining, which could completely close the recycling loop and extract these wasted resources from the earth.

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