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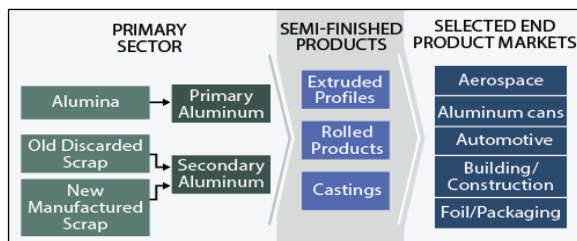
U.S. Aluminum Manufacturing: National Security and Tariffs

Aluminum—a lightweight, ductile, malleable, and corrosion-resistant metal—is increasingly used in many industrial and technological applications, including in products used for national defense and lower emission vehicles. In Congress, views on the aluminum industry generally diverge between those who support policies to increase domestic production for national security and economic reasons and others who argue that such policies may raise aluminum prices and harm aluminum-consuming sectors (e.g., transportation equipment, containers and packaging, and construction).

Domestic Aluminum Manufacturing

Aluminum is manufactured through two distinct processes (see **Figure 1**). Primary aluminum production consists of mining bauxite, refining it to produce alumina, then smelting it to yield aluminum. Secondary aluminum derives from recycled scrap metal. Sources of the scrap are (1) old scrap, recovered from finished products such as used aluminum cans, auto parts, and aircraft; and (2) new scrap, material left over from processing aluminum into consumer or industrial products.

Figure 1. Aluminum Sources and Uses



Source: Figure adapted by CRS from NERA Economic Consulting, *Impacts of Potential Aluminum Tariffs on the U.S. Economy*, June 2017.

Secondary aluminum can be substituted for primary aluminum in most uses; however, primary aluminum is favored in applications with high quality and consistency requirements, such as electronics and aerospace manufacturing. A few smelters worldwide produce primary aluminum of sufficient purity for use in military aircraft, as well as in lightweight armor plating found in many defense ground and weapon systems. According to the Department of Defense (DOD), military requirements for aluminum represent about 3% of total U.S. consumption of aluminum. In 2020, U.S. production of primary aluminum totaled 1.0 million metric tons, reports the U.S. Geological Survey (USGS), well below peak domestic production of 4.7 million metric tons in 1980. The United States was the world's top producer through 2000. By 2020, the United States accounted for 1.5% of the world's primary aluminum production. Global overcapacity, driven by certain foreign government subsidies—particularly by China—has reduced the global price of aluminum. After China, the world's largest producers of primary aluminum in 2020 were India,

Russia, Canada, and the United Arab Emirates, ranked in order. The United States was ninth.

At year-end 2020, three companies—Alcoa, Century Aluminum, and Magnitude 7 Metals—operated six primary aluminum smelters in the United States, compared to five companies operating nine primary smelters domestically in 2010. Primary smelters operated at about 49% capacity in 2020, down from 60% in 2019. U.S. secondary aluminum production was 3.2 million metric tons in 2020, over three times U.S. primary aluminum production. China was the world's largest producer of secondary aluminum in 2019, followed by the United States and Japan.

Factors Affecting U.S. Production

In addition to imports and global overcapacity, high domestic costs depress U.S. production of primary aluminum. Comparatively high electricity costs in the United States, where electricity can account for up to 40% of the cost of primary aluminum production, encourages firms to locate smelters in countries such as Canada and Iceland with lower electricity costs. Exchange rates and labor costs may also adversely affect U.S. smelter production.

U.S. primary smelters also use older, less energy-efficient technologies than newer plants in the Middle East and Asia. The newest U.S. primary smelter opened in 1980. Primary smelting also involves large capital investments: a new smelter may represent at least a \$2 billion investment. In recent years, several U.S. primary aluminum production facilities have reduced production or closed partly due to industry consolidation. CRS is not aware of any aluminum producers having announced plans to build new primary smelters in the United States.

Production of secondary aluminum is usually more economically attractive, as the capital cost of a secondary smelter is much lower than for a primary aluminum smelter. The Energy Information Administration estimates secondary smelters use 6% of the energy required by primary smelters. One company reportedly plans to build a new rolling mill in the United States for secondary aluminum.

U.S. Demand for Aluminum Products

The economic downturn in 2020 caused by the COVID-19 pandemic contributed to shut downs or reduced production at the facilities of U.S. aluminum-consuming industries, reducing U.S. consumption of aluminum to 2.9 million metric tons, down 41% from 2018, according to USGS. Likewise, imports of *primary aluminum* shrank to 3.2 million metric tons in 2020, a drop of 42% from 2018. More than two-thirds of U.S. primary aluminum imports in 2020 were from Canada, where Alcoa operates three primary aluminum smelters, followed by the United Arab Emirates, Argentina, and Russia. The United States imports

a small amount of *secondary aluminum*, a total of 530,000 metric tons in 2020.

China, which became the world's largest primary aluminum producer in 2002, accounted for more than half the world's production in 2020, but does not export it in commodity form to the United States. Instead, China ships to the United States semi-fabricated aluminum products, such as bars, rods, and wire, which are subject to U.S. trade actions.

Aluminum Industry Jobs and Wages

U.S. aluminum manufacturing employed an annual average of 60,585 workers in 2019, according to the Bureau of Labor Statistics (BLS). Of these, jobs in primary and secondary aluminum production numbered 14,224; BLS preliminary data show employment at 13,217 in June 2020. The remaining jobs are at facilities that make rolled or extruded products from primary or secondary aluminum.

Primary aluminum workers earned an average wage of \$81,522 in 2019, higher than the average wage of \$69,920 for all U.S. manufacturing workers. The secondary aluminum sector paid an average wage of \$63,328 in 2019.

Though the 10% tariff imposed by the Trump Administration on certain aluminum products (see “Trump Administration Actions” below) may have been a factor in sustaining some jobs domestically in aluminum manufacturing in 2018 and 2019, preliminary data show the combined number of jobs in primary and secondary aluminum manufacturing shrank 9% in June 2020 from June 2019. This is attributable, in part, to a decision by Alcoa in April 2020, to fully curtail “uncompetitive smelting capacity” at its aluminum smelter in Washington, citing “declining market conditions.”

Trump Administration Actions

To address the national security implications of aluminum imports, in March 2018, the Trump Administration imposed a 10% tariff, or in some cases a quota, on U.S. imports of certain aluminum products from almost all countries, and in January 2020, expanded the tariff to certain derivative aluminum products. The tariffs and quotas were applied under Section 232 of the Trade Expansion Act (19 U.S.C. §1862, as amended), which allows a President to restrict imports if the Department of Commerce (Commerce) finds they threaten or impair U.S. national security. The Biden Administration has not announced plans to remove or amend the tariffs.

According to Commerce's Section 232 report on aluminum, a primary aim of the Trump Administration's 10% tariff was to raise the price of imported aluminum to encourage domestic manufacturers to restart idled capacity. USGS figures show that from January to November 2020, the average price of primary aluminum in the United States registered at \$1,944 per metric ton, more than 15% higher than the global price. In addition, U.S. primary aluminum production rose by 12% from 2018 to 2020, but total aluminum production (primary plus secondary) fell 9%.

Century Aluminum, represented by the American Primary Aluminum Association (APAA), is the main proponent of the Section 232 tariffs and chiefly a domestic producer. Since 2018, Century has added some capacity domestically. One of its three U.S. smelters is fully operational. Magnitude 7 Metals, another APAA member and solely a domestic producer, operates the nation's third-largest

smelter by capacity. The company has said it may be forced to shutter its smelter if the tariffs are removed.

Alcoa, the largest domestic producer with substantial overseas production, opposes the tariff, and has not restarted any domestic capacity and has curtailed its smelter in Washington. The Aluminum Association, the industry's broadest trade group representing Alcoa, as well as aluminum recyclers, fabricators, and industry suppliers, opposes the U.S. tariff on aluminum imports. It has asked for a global forum to discuss aluminum excess capacity, subsidies by China, and a U.S.-Chinese negotiated agreement.

Companies can petition the Commerce Department to exclude specific imported aluminum products from the Section 232 tariffs. As of February 7, 2021, Commerce has received 27,571 product exclusion requests, including from Alcoa; the agency has granted about 60% of the requests. Some U.S. firms have testified before Congress that the exclusion process is burdensome, opaque, and costly. Commerce is implementing some changes to the process and a monitoring system requiring importers to share data, such as the country where aluminum used in the manufacture of the imported product was smelted and poured.

The United States-Mexico-Canada Agreement (USMCA), in effect since July 1, 2020, requires 70% North American aluminum content for auto parts and vehicles to qualify for tariff-free trade. This may increase demand for North American aluminum over time as the average vehicle gradually uses more aluminum to meet USMCA rules of origin requirements.

Other Congressional Considerations

In 2020, some Members sought to add aluminum and aluminum alloys to DOD's specialty-metals provision (10 U.S.C. §2533b) and to apply to DOD and the Department of Transportation a domestic sourcing mandate. Neither provision was included in the FY2021 National Defense Authorization Act (NDAA; P.L. 116-283).

Some Members have expressed concern that insufficient domestic production of primary aluminum could pose a grave risk in a national security crisis. These Members have advocated for the President to employ Title III of the Defense Production Act (DPA; 50 U.S.C. §4533) to offer U.S. aluminum producers economic incentives, such as loan guarantees or purchase commitments. The FY2021 NDAA requires the Secretary of Defense to submit a report to Congress, due not later than March 1, 2022, on how the DPA could be used to increase domestic aluminum refining, processing, and manufacturing.

Past Congresses have considered legislation to override the already imposed Section 232 trade actions. These include S. 3230 in the 115th Congress to undo the Section 232 tariffs on aluminum and steel imports from Canada, Mexico, and the European Union and bills to check or modify the authority previously delegated to the President. None have become law.

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