

December 2021

Aluminum Cast Plate Market

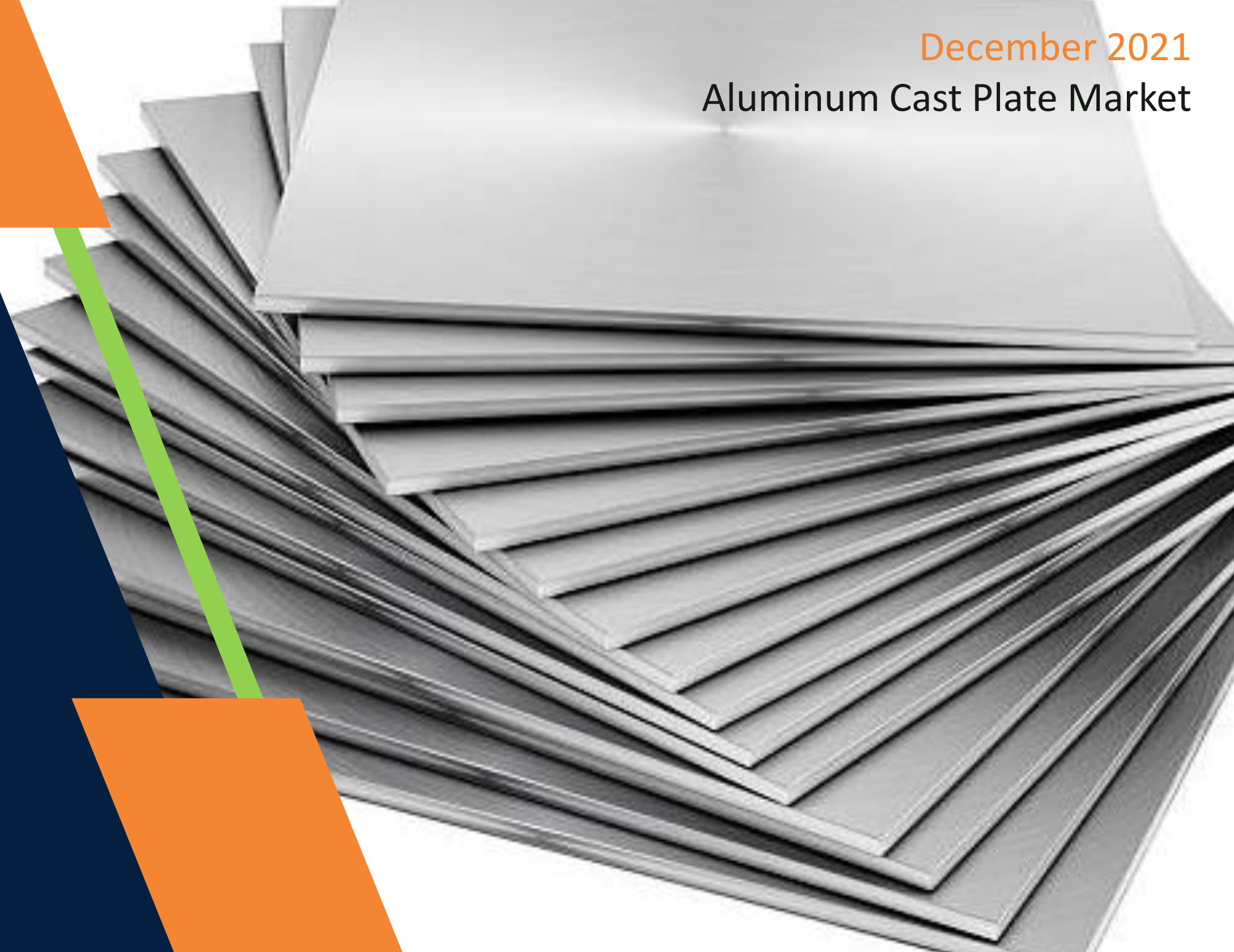


Table of Contents

1

Market Size and Growth Prospects

- » *Production*
- » *Consumption*
- » *Regional Focus*
- » *Aluminum Plate*
- » *COVID Impact*

2

Product Markets

- » *Value Chain*
- » *Key End-use Markets*

3

Effect of Tariffs

- » *Effect of Tariffs by the US Government*

4

Market Drivers and Trends

- » *Key Market Drivers*
- » *Key Market Trends and Recent Developments*

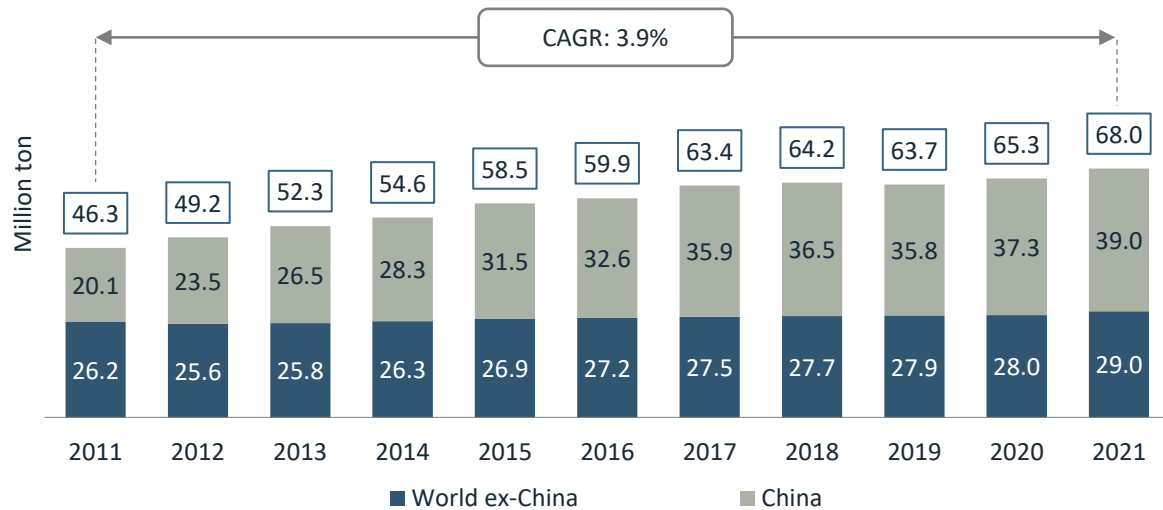
5

Outlook

- » *Production Projection*
- » *Consumption and Price Projection*

Market Size and Growth – Primary Aluminum (1/2)

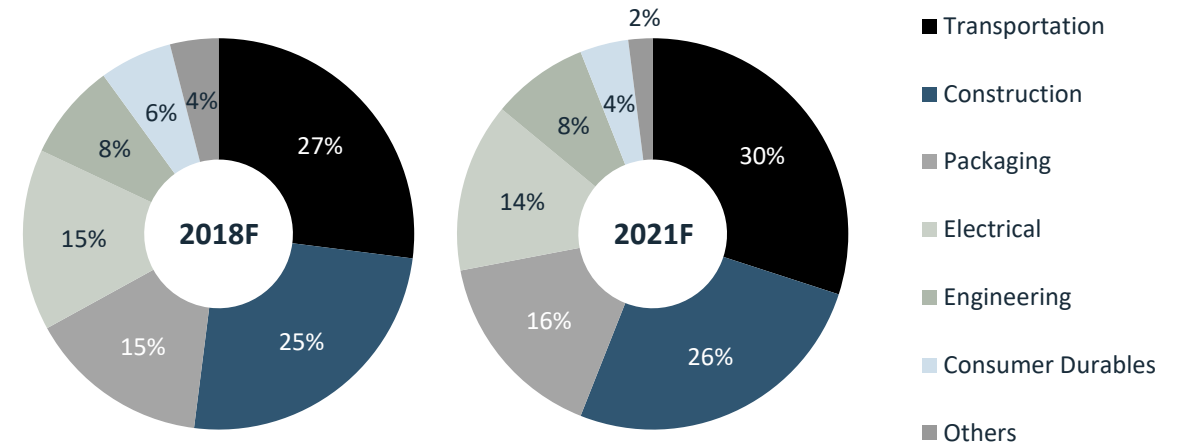
Global Primary Aluminum Production (a)



Growth in annual production over the last decade has been dominated by subsidized production in China.

- ❑ The primary aluminum production grew by 28% during 2000-2020, with production from China rising more than 13x during the same period. Notably, China's total share in global primary aluminum production increased from 11% in 2000 to 57% in 2020.
- ❑ The global primary aluminum production declined for the first time in 2019 over the last decade, primarily due to trade war fears and a decrease in downstream demand. Previously, the metal's output contraction was in 2009, when it dropped by 5.7% year-over-year. China primarily led the 2019 decline with a nearly 2% drop in production to 35.8 million tons. Western Europe and Latin America also experienced a dip in production in 2019.

Global Aluminum Consumption Growth Trend by End-use Sector (b)



Transportation and construction are the largest market segments, accounting for more than half of total consumption.

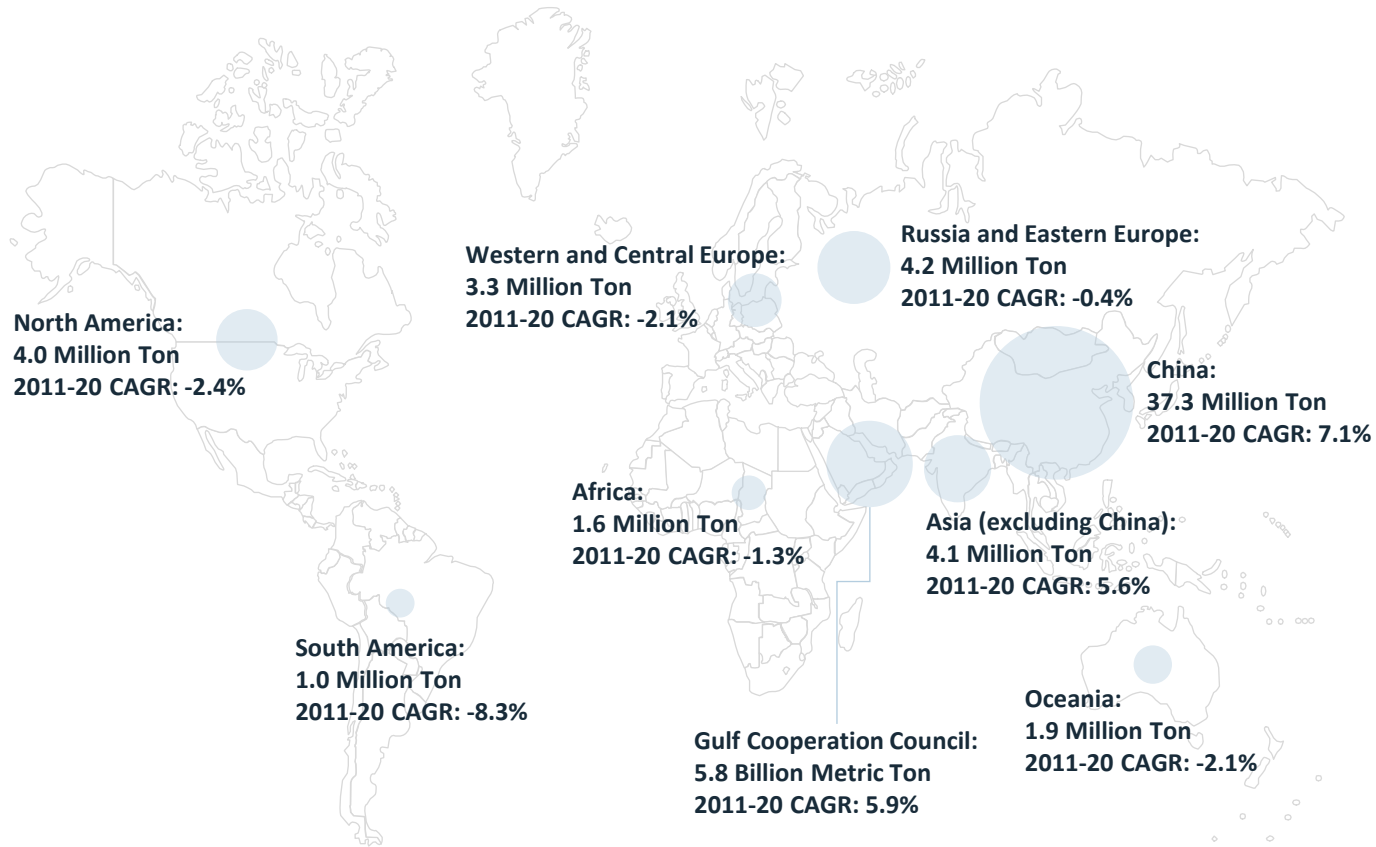
- ❑ Aluminum is a convenient option for various industries due to its unique properties such as lightweight, recyclability, conductivity, non-corrosiveness, and durability.
- ❑ Transportation remains the top market segment, with its share in total consumption expected to increase from 27% in 2018 to 30% in 2021. Due to its lightweight properties (3 times lighter than steel), aluminum products aid in fuel efficiency, making it an efficient choice for automotive, defense, and aviation applications. The use of aluminum in the packaging industry is expected to increase, with a share in total consumption increasing from 15% in 2018 to 16% in 2021. With its infinitely recyclable properties, aluminum is being widely used in the packaging industry, such as beverage cans and foils.

a) Source: International Aluminum Institute (IAI) - <https://international-aluminium.org/statistics/primary-aluminium-production/>.

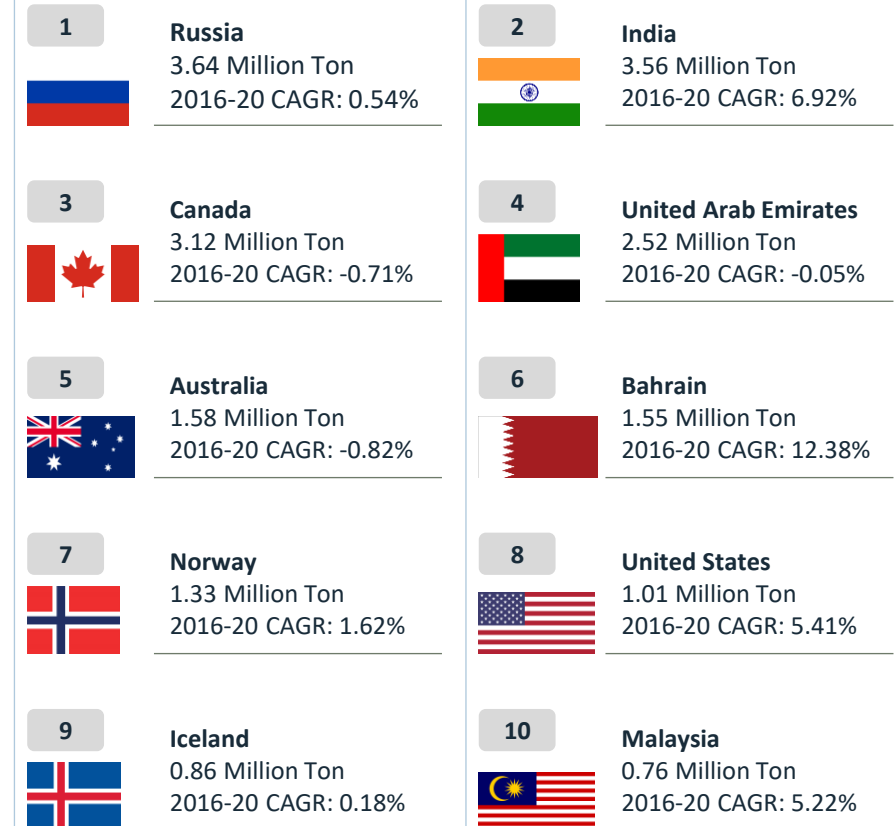
b) Source: Alumina Limited - 2021 Half Year Results Presentation.

Market Size and Growth – Primary Aluminum (2/2)

Global Primary Aluminum Production – Regional Focus (2020) ^(a)



Top 10 Countries excluding China (2020) ^(b)

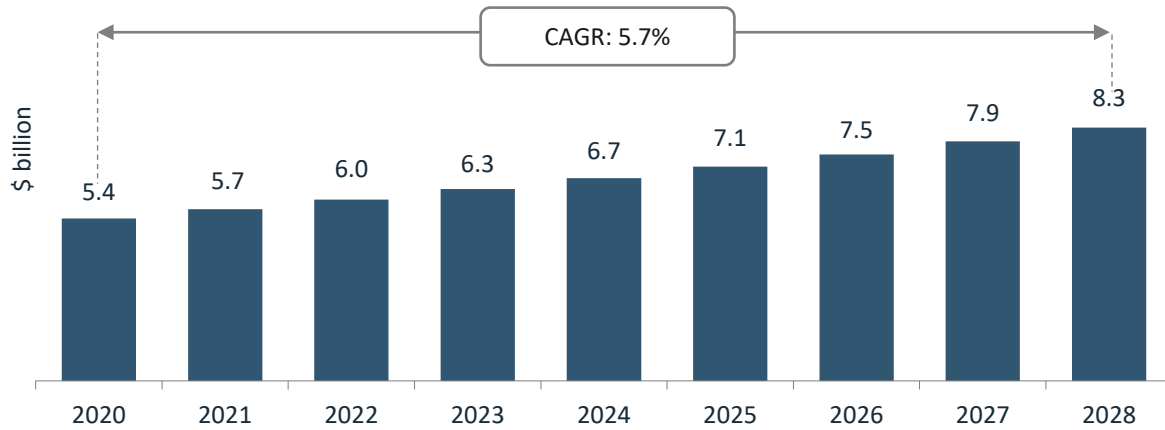


a) Source: International Aluminum Institute (IAI) - <https://international-aluminium.org/statistics/primary-aluminium-production/>.

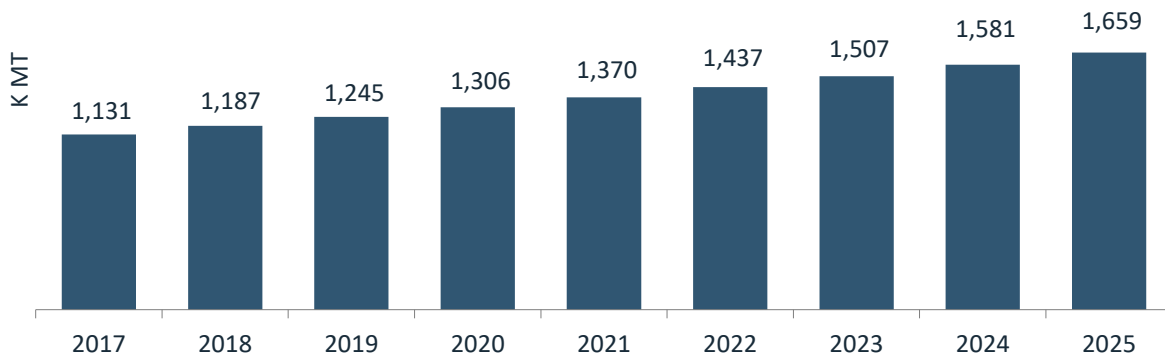
b) Source: USGS.

Market Size and Growth – Aluminum Plate

Global Aluminum Plate Market Size (a)

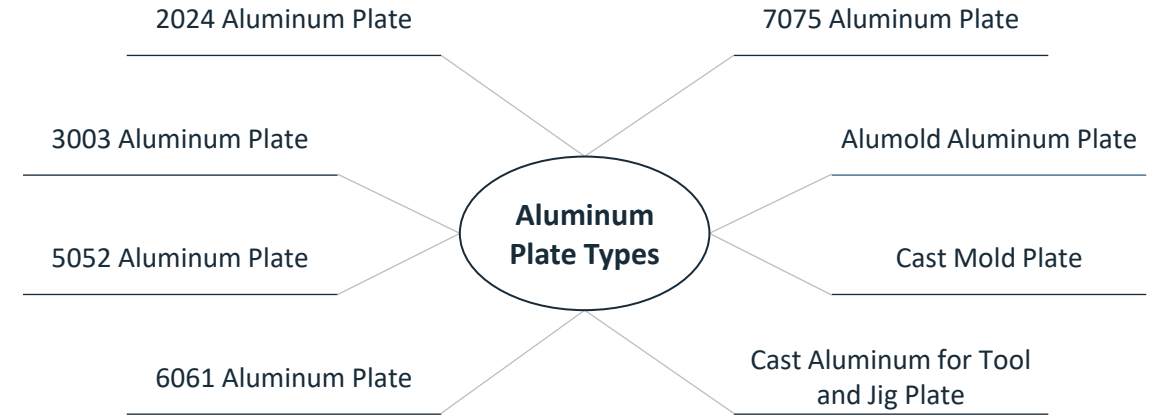


Global Aluminum Plate Market Size By Volume (c)



A shift in preference toward lightweight materials is increasing the demand for aluminum plates across various sectors.

Aluminum Plate Segmentation By Type (b)



✓ **Aluminum is replacing other materials**

- ❑ Due to high flexibility, cost-effectiveness, non-corrosive, heat resistance, and high thermal conductivity, aluminum plates have replaced the usage of steel across multiple end-use industries. The rising popularity of electric vehicles (EVs) has been instrumental in driving demand for aluminum plates.

✓ **Increasing stringency in regulations**

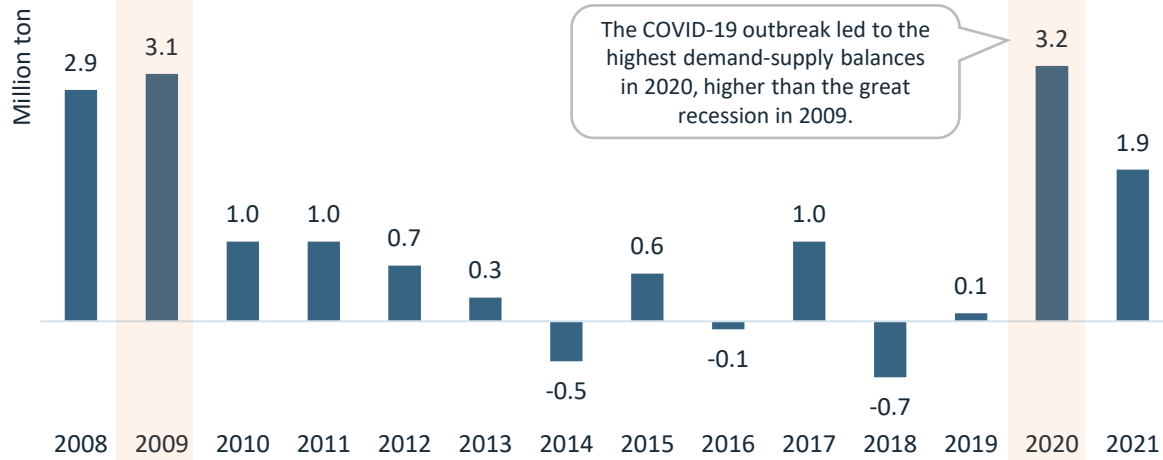
- ❑ Demand for aluminum plates is primarily attributable to the increasing usage in heavy-duty applications in the aerospace, military, and transportation sectors. In addition, increasing stringency in regulations for the reduction in vehicle weight, which is consequently causing a decrease in carbon emissions, is boosting the demand for aluminum plates.

a) Source: Reports and Data - <https://reportsanddata.com/report-detail/aluminum-plate-market>.

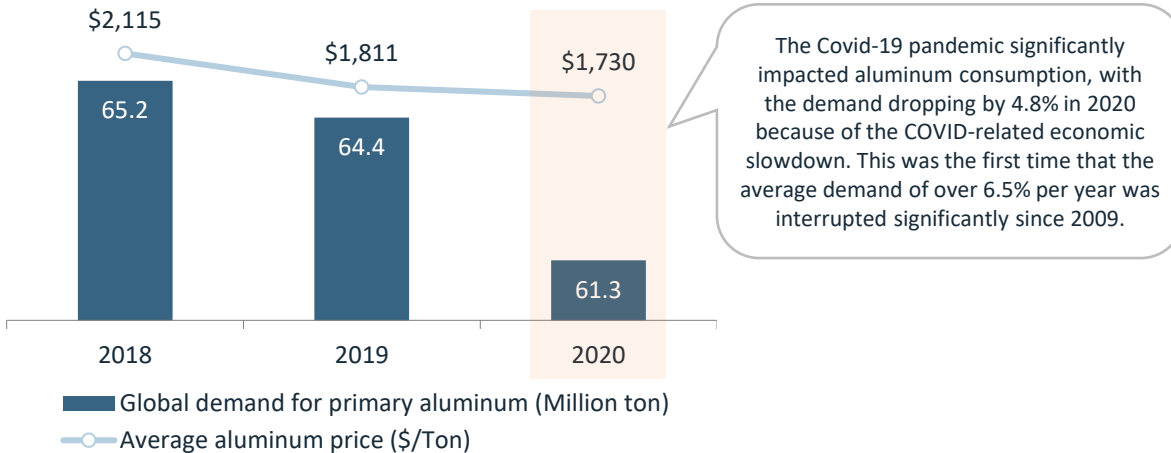
b) Source: Alro Steel - https://www.alro.com/divsteel/metals_comp_type.aspx?Mat=ALUMINUM&Type=Plate&mc=AL.

COVID Impact

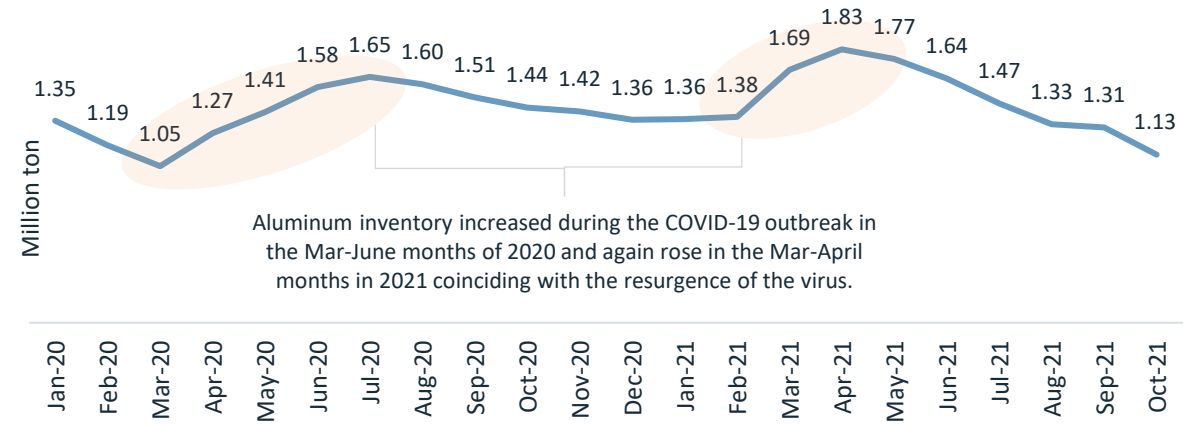
Global Primary Aluminum Market Balances (a)



Global Demand for Primary Aluminum (c)



Aluminum - LME Aluminum stock (b)



- ❑ The COVID-19 pandemic led to the implementation of stringent lockdown regulations across several nations in 2020, resulting in disruptions in the import and export of aluminum plates. Aluminum prices have followed a similar trend to that of the other base metals with the spread of the coronavirus. Prices fell by 18.2% from \$2,115/Ton in 2018 to \$1,730/Ton in 2020.
- ❑ COVID-19 also had a significant impact across various sectors. Transportation and construction, which account for more than 50% of aluminum consumption, significantly affected the price of aluminum due to the fall in demand.
- ❑ Comparable to the primary aluminum sector trends, global demand for aluminum rolled products also declined by 5.8%, from 28.1 million tons in 2019 to 26.5 million tons in 2020. As per CRU forecasts, China, considered a major consumer country of primary aluminum, increased its share in global demand from ~56% in 2019 to ~60% in 2020. This was primarily due to the faster containment of the COVID-19 pandemic and the accelerated resumption of economic activities.

a) Source: Alumina Limited - 2020 Full-Year Result.

b) Source: Aluminium - LME Aluminium stock - https://www.westmetall.com/en/markdaten.php?action=averages&field=LME_AI_cash#y2020.

Table of Contents

1

Market Size and Growth Prospects

- » Production
- » Consumption
- » Regional Focus
- » Aluminum Plate
- » COVID Impact

2

Product Markets

- » Value Chain
- » Key End-use Markets

3

Effect of Tariffs

- » Effect of Tariffs by the US Government

4

Market Drivers and Trends

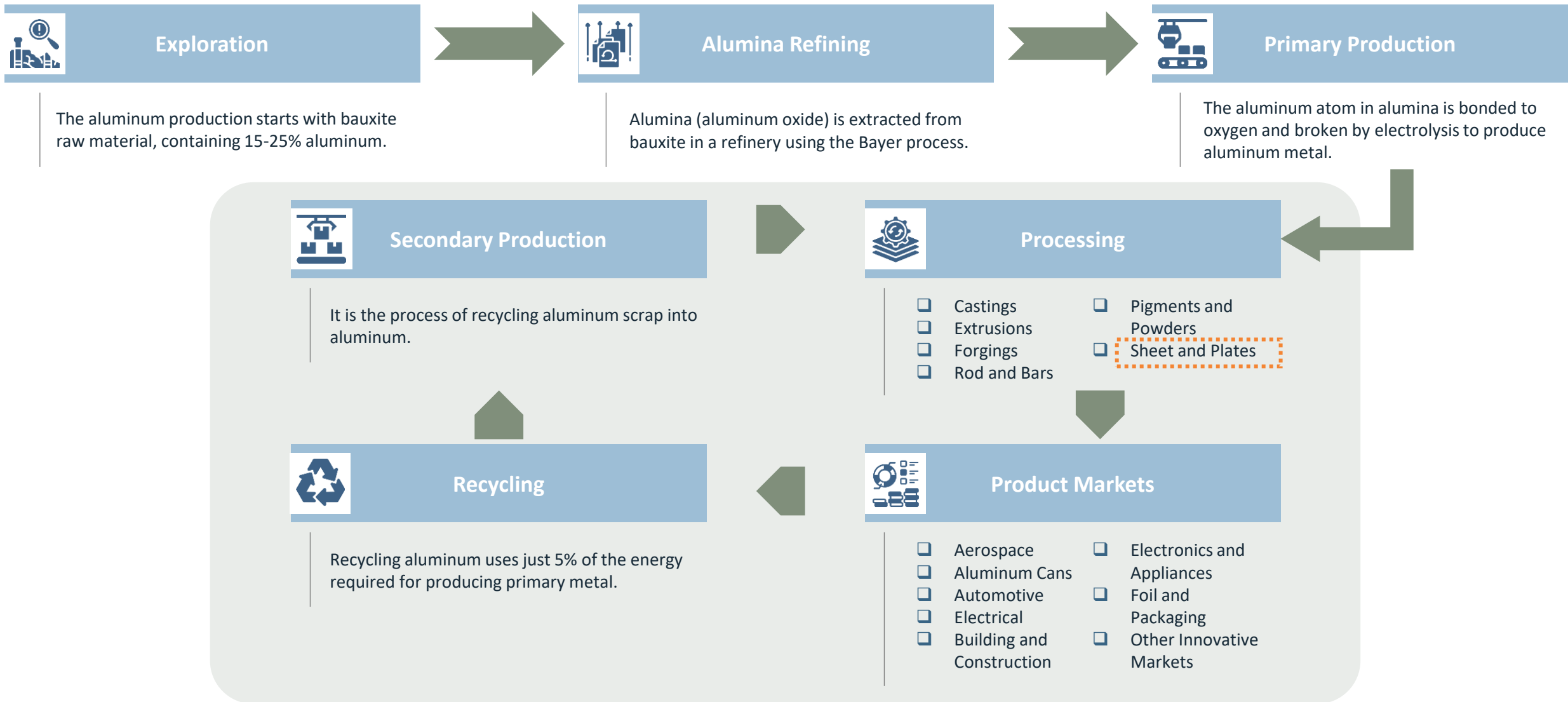
- » Key Market Drivers
- » Key Market Trends and Recent Developments

5

Outlook

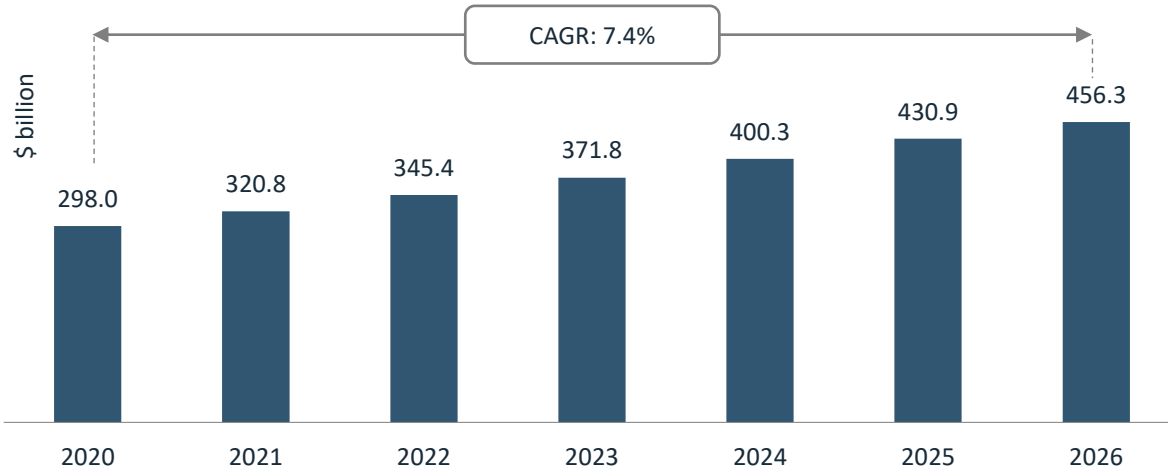
- » Production Projection
- » Consumption and Price Projection

Industry Value Chain



Product Market Overview (1/4)

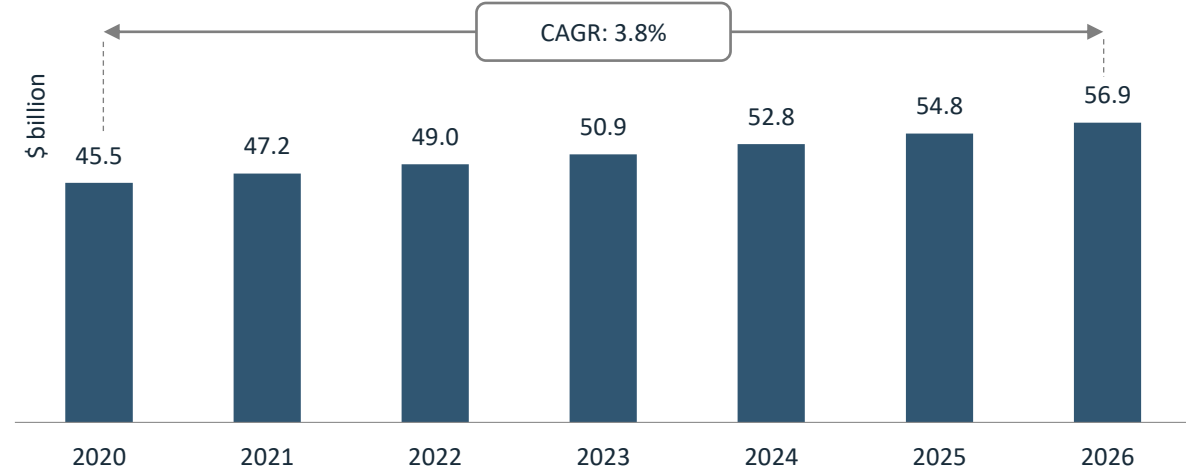
Aerospace Market ^(a)



Aluminum alloys are the first choice for commercial planes and military cargo/transport aircraft.

- ❑ The demand for next-generation lightweight and fuel-efficient aircraft is expected to drive the growth of the global aerospace industry. Thus, demand for aluminum and other products for the aerospace market is expected to increase due to its lightweight and other properties. The aerospace industry is expected to grow with the increase in air traffic in emerging economies, supported by the rise of the middle-class population. With the growth in the aerospace market, demand for aerospace materials will also increase. The global aerospace materials market is expected to expand at a CAGR of 8.8%, growing from \$37.9 billion in 2021 to \$57.9 billion by 2026.
- ❑ Demand for high-strength aluminum alloys in the aerospace market is increasing due to their corrosion resistance and lightweight nature. The high-strength aluminum alloys industry is expected to grow at a CAGR of 6.3% during 2020-2026.

Aluminum Cans Market ^(b)



The rising preference for aluminum cans and an increasing number of health-conscious consumers are expected to drive the market.

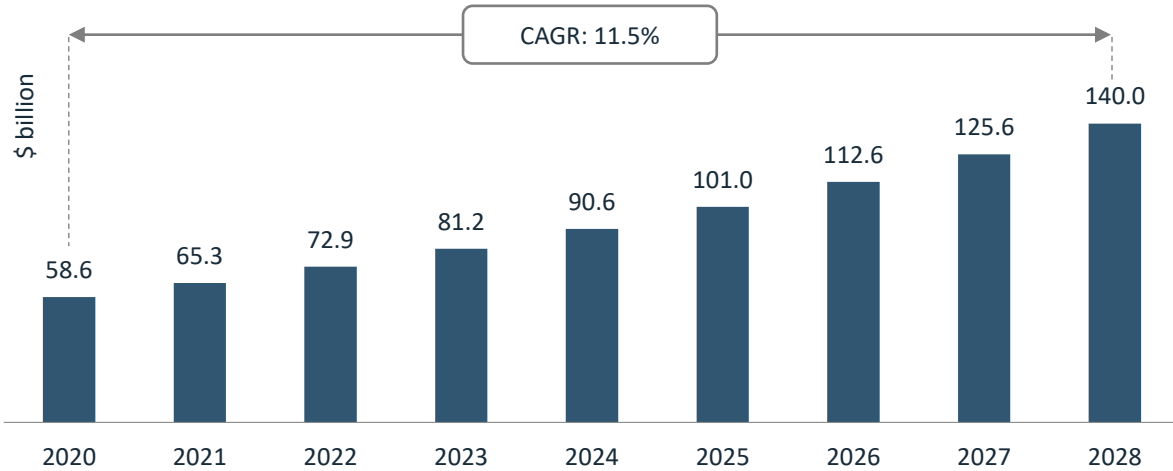
- ❑ Aluminum cans are gaining importance due to their stackable and lightweight resistance to transportation, allowing brands to transport more beverages using less material. Aluminum cans are used for packaging several products, such as soft drinks, oil, chemicals, perfumes, pharmaceuticals, and cosmetics.
- ❑ An increase in the demand for recycled packaging products and growing environmental concerns about plastics usage are expected to increase the demand for metal packaged products, including aluminum cans. North America dominates the market due to the high consumption of processed and ready-to-eat food products.
- ❑ The global beverage market is expected to increase at a CAGR of 1.7% during 2020-2026, thereby increasing the demand for aluminum cans.

a) Source: The Business Research Company - <https://www.thebusinessresearchcompany.com/report/aerospace-market/>.

b) Source: IMARC - <https://www.imarcgroup.com/aluminium-cans-manufacturing-plant/>.

Product Market Overview (2/4)

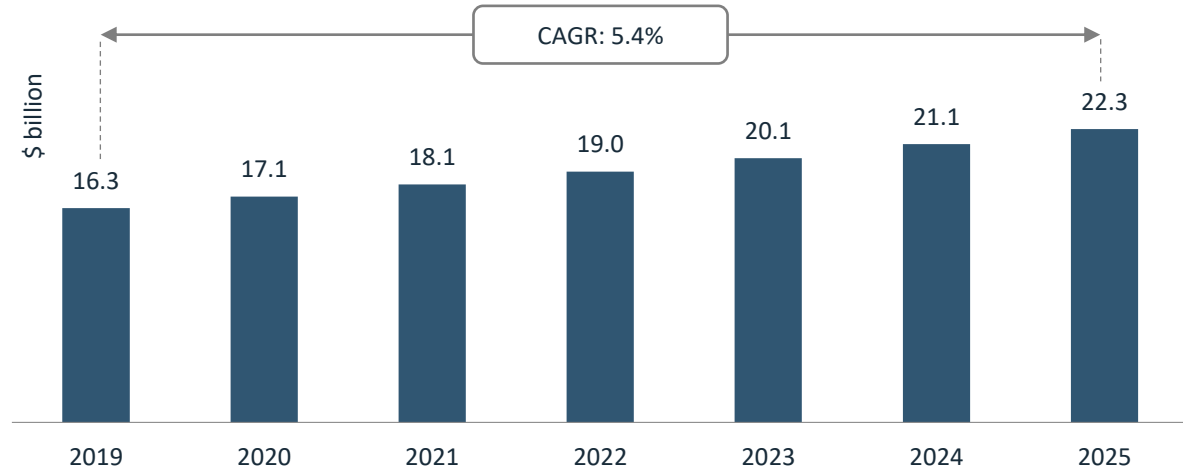
Automotive Aluminum Market ^(a)



The use of aluminum in the production of passenger cars and commercial trucks and buses is fueling the market growth.

- Performance advantages, including lightness and impact resistance associated with aluminum, have increased its demand among automakers. Additionally, an increase in the usage of secondary or recycled aluminum in the manufacturing of automobiles created a positive impact on the automotive industry.
- The global automotive sales market is expected to grow at a CAGR of 3.7%, from 85.32 million units in 2020 to 122.83 million units by 2030. The sharp increase in the production and sales of automobiles is expected to fuel the demand for associated aluminum products.
- Market expansion is also attributed to the implementation of government regulations for using lightweight and environment-friendly materials in vehicle production.

Aluminum for Construction Market ^(b)



Infrastructural developments and increase in urbanization are driving the demand for aluminum in the construction sector.

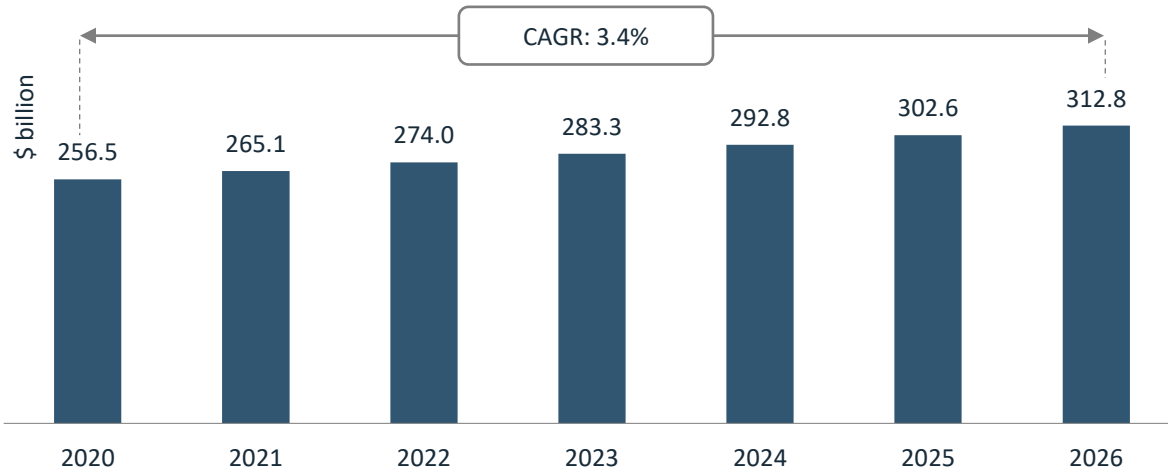
- Aluminum is increasingly being used in various construction activities. Being light weighted, it is the second most used material in construction. Aluminum Composite Panel (ACP) is widely used as cladding or façade material of buildings, insulation, and signage. The Aluminum Composite Panel (ACP) market is expected to register a CAGR of over 6% during 2021 – 2026.
- The global construction market is expected to reach \$22.1 trillion by 2028, growing at a CAGR of 7.2% during 2020-2028, presenting significant growth opportunities for aluminum for construction market. In addition, the global aluminum doors and window market is expected to reach \$78.78 billion by 2030, growing at a CAGR of 3.0% during 2022-2030, owing to increasing demand for aluminum from the construction sector.

a) Source: Meridian Market Consultants - <https://meridianmarketconsultants.com/pressrelease/automotive-aluminum-market/>.

b) Source: Market Watch - [Aluminum for Construction Market Share](#).

Product Market Overview (3/4)

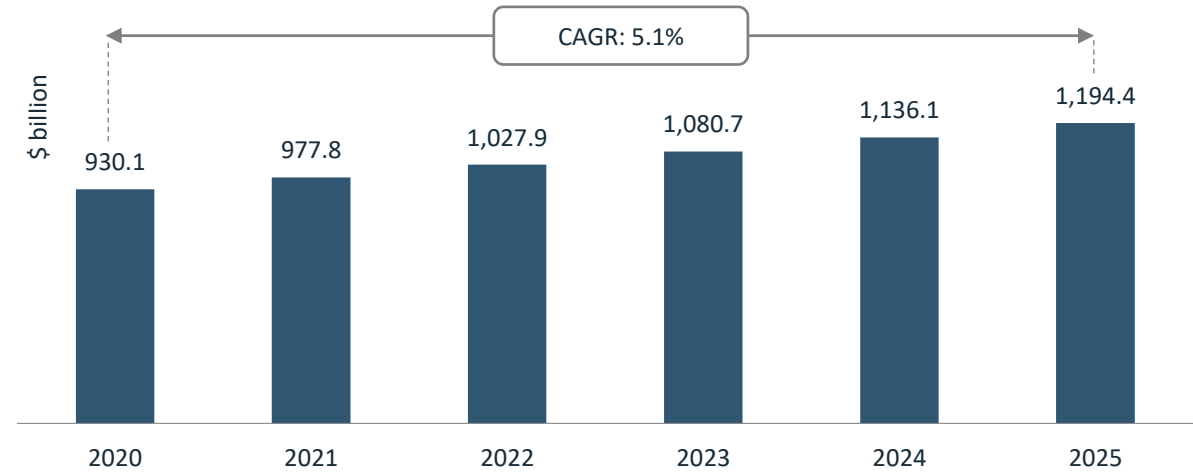
Power Transmission and Distribution Equipment Market ^(a)



Aluminum is increasingly being used in power transmission and distribution due to its higher conductivity and cost-effectiveness.

- Increasing demand for electricity, new power generation capacity additions and the expansion of transmission and distribution infrastructure are major drivers for the electricity transmission and distribution market. The electricity transmission and distribution systems include switchgear, power cables, wires, transmission towers, and others.
- Aluminum is one of the most widely used materials for electricity transmission and distribution, and it is increasingly replacing copper wires and cables. The aluminum wire market is expected to reach \$51.3 billion by 2026.
- Many companies are shifting towards using aluminum wires to construct new power lines, especially in the low voltage lines sector.

Consumer Electronics and Home Appliances Market ^(b)



Technological advancements and digitalization coupled with changing consumer preferences for innovative and smart products are driving the industry.

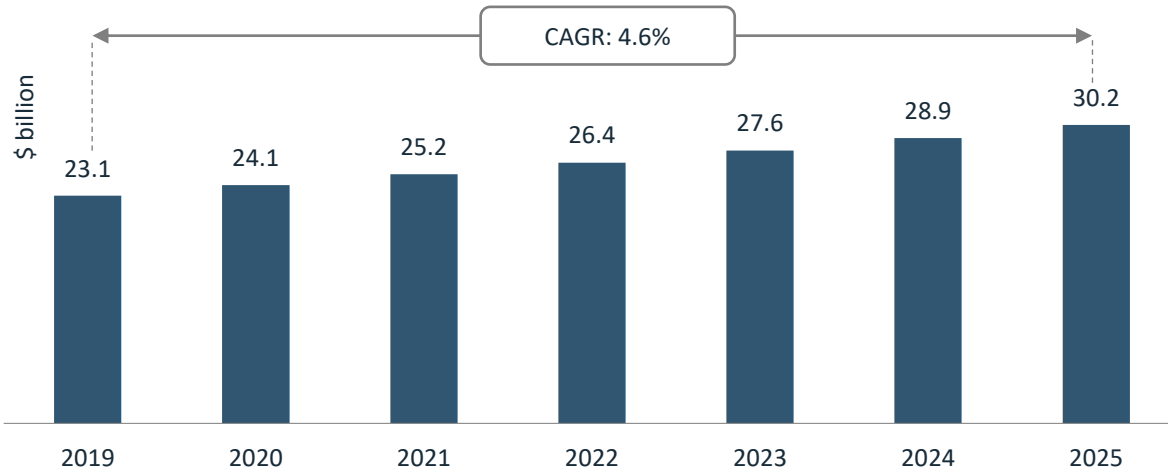
- Increasing demand for premium appliances, rising disposable purchasing power, and urbanization are driving the global electronics and appliances market during the forecasted period.
- The audio-visual appliances segment constitutes the largest share of approximately 65% in the consumer electronics market. The residential part of the market holds the largest market share based on application.
- The US holds the largest market share and is expected to dominate the market in the coming years, considering its current market share and historical growth.

a) Source: GlobeNewswire - <https://www.globenewswire.com/en/news-release/2021/07/12/2261110/0/en/Global-Power-Transmission-and-Distribution-Equipment-Market-to-Rich-312-8-Billion-by-2026.html/>.

b) Source: KTVN - [Global Consumer Electronics and Home Appliances Market](#).

Product Market Overview (4/4)

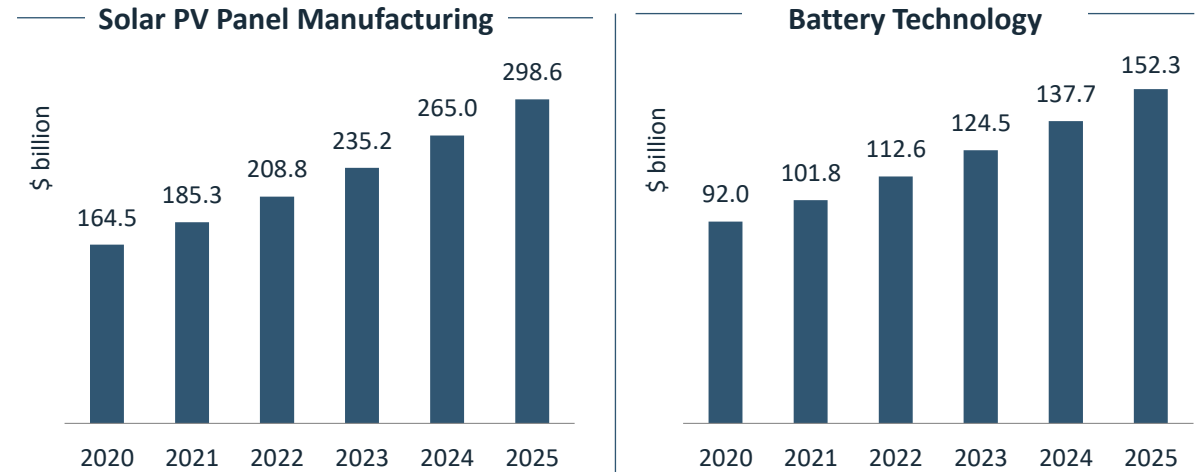
Aluminum Foil Packaging Market ^(a)



Increasing demand for suitable packaging materials for multiple industries is driving the aluminum foil packaging market.

- Aluminum foil is available globally in varying levels of thickness based on its requirements. The food and beverage segment accounted for the largest share of the market, followed by pharmaceutical products in 2020. Increasing demand for food and beverage through online platforms is further expected to support the market growth. The online food delivery services market is expected to reach \$192.16 billion by 2025, growing at a CAGR of 11.0% during 2021-2025.
- Multiple regions are increasing their aluminum production due to the rising demand for recyclable and organic products. The increasing awareness about environmental pollution caused by plastics is also prompting the packaging companies to replace plastics with aluminum packaging.

Other Innovative Markets ^(b)



With its widespread availability and use, aluminum is being increasingly used in new and innovative technologies.

- As per estimates, more than 85% of solar photovoltaic (PV) components are made from aluminum. According to the National Renewable Energy Laboratory, more than 80% of wind turbines are made up of recyclable materials such as steel, iron, copper, and aluminum. The solar PV panel manufacturing market is projected to grow at a CAGR of 12.7% during 2020-2025, creating growth opportunities for the aluminum market.
- Currently, lead-acid and lithium-ion batteries are the most widely used battery types globally. However, as per estimates, the global aluminum-based battery market is expected to grow at a CAGR of 2.7% during 2021-2027. Also, the aluminum ion battery market is anticipated to exhibit a healthy growth between 5% and 6% during the tenure of 2021 to 2031.

a) Source: WBOC - <https://www.wboc.com/story/44574469/aluminum-foil-packaging/>.

b) Source: Report Linker - [Solar Photovoltaic Panel Manufacturing Global Market Report](#).

Table of Contents

1

Market Size and Growth Prospects

- » Production
- » Consumption
- » Regional Focus
- » Aluminum Plate
- » COVID Impact

2

Product Markets

- » Value Chain
- » Key End-use Markets

3

Effect of Tariffs

- » Effect of Tariffs by the US Government

4

Market Drivers and Trends

- » Key Market Drivers
- » Key Market Trends and Recent Developments

5

Outlook

- » Production Projection
- » Consumption and Price Projection

Effect of Tariffs Imposed by the U.S. Government and Timeline

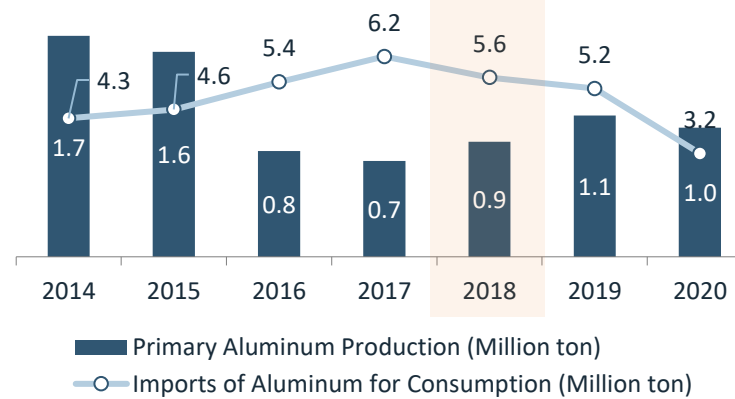


Background of the US Section 232 Import Measures

- To boost domestic production and national security, the US government imposed an additional import duty of 10% on several aluminum product groups in 2018, directly affecting the global trade flows of around ~\$133 billion. They also indirectly affected the producers and traders along the worldwide aluminum supply chains, impacting many industries worldwide.
- The import duty requirements for aluminum products were effective for all countries except Canada and Mexico, owing to their close economic links and interdependence in security matters with the US.

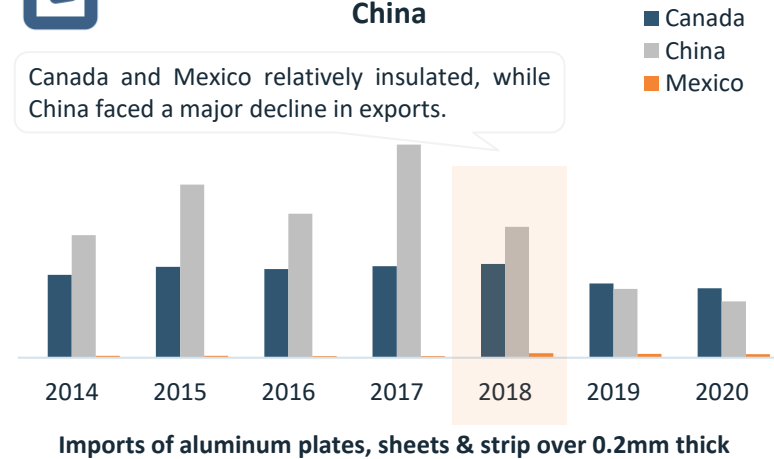


Primary Aluminum Production and Imports in the US



US Imports from Canada and China

Canada and Mexico relatively insulated, while China faced a major decline in exports.



Timeline of Key Events for US Trade Actions Impacting the European Union (EU)



a) Source: [jrc124803_aluminium_tariffs_online_final](https://tse.export.gov/tse/MapDisplay.aspx).
 b) Source: <https://tse.export.gov/tse/MapDisplay.aspx>.

Table of Contents

1

Market Size and Growth Prospects

- » Production
- » Consumption
- » Regional Focus
- » Aluminum Plate
- » COVID Impact

2

Product Markets

- » Value Chain
- » Key End-use Markets

3

Effect of Tariffs

- » Effect of Tariffs by the US Government

4

Market Drivers and Trends

- » Key Market Drivers
- » Key Market Trends and Recent Developments

5

Outlook

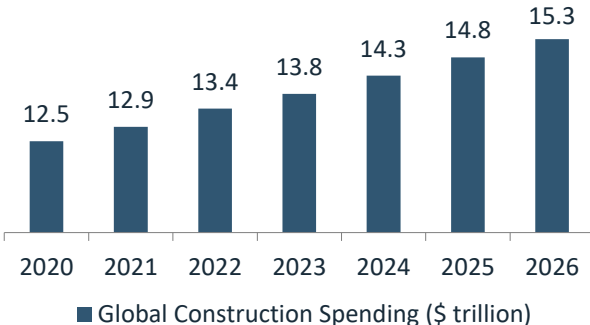
- » Production Projection
- » Consumption and Price Projection

Key Market Drivers

Multiple drivers support the primary aluminum market growth, such as rising disposable incomes, increasing population, rising urbanization, growing demand from downstream industries, rising demand from construction and transport industries, among others.

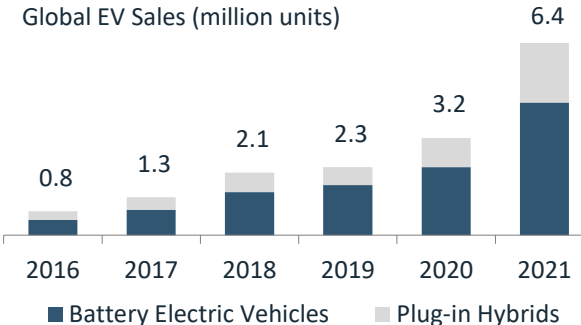
Construction spending is driving the market demand

- The growth in population, middle-class incomes, and urbanization have increased the demand for hotels, shopping malls, high-rise buildings, and stadiums, which, in turn boosted the construction industry, driving the demand for aluminum.
- The global construction industry grew to a spending value of ~\$12 trillion before the onset of the COVID-19 and is expected to grow at a CAGR of 3.5% during 2021-2026.



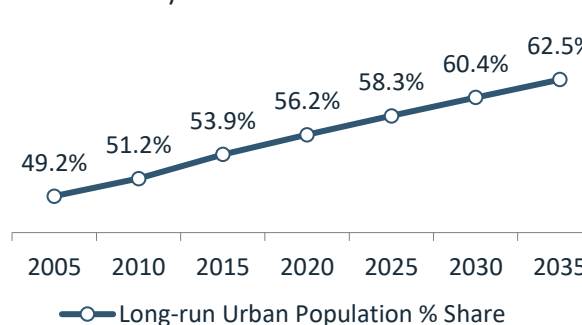
Sales of electric and hybrid vehicles drive demand

- Aluminum is one of the major materials, along with composites, adopted by OEMs to help reduce the weight of a vehicle.
- As per ING Research estimates, demand for aluminum from EVs could grow from about 500kt currently to 2.3 million tons by 2025 and more than 17 million tons by 2030, resulting in massive demand for aluminum.



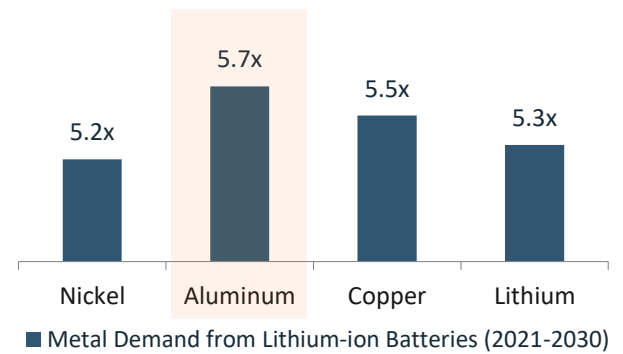
Increasing urbanization bolstering the overall demand

- The demand for aluminum has increased due to rapid urbanization, development of industrial corridors, rural electrification, and smart city projects. This has primarily been led by the emerging markets, including China, Brazil, India, Saudi Arabia, and Indonesia, that have registered robust construction activity. Per the UN World Urbanization Prospects, 68% of the world population is projected to live in urban areas by 2050.



Increase in demand from battery technology

- While battery technology certainly differentiates EVs from traditional vehicles, it also makes vehicles heavier. Replacing steel parts with aluminum parts is a good substitute that can help reduce the vehicle's overall weight.
- By 2030, the use of aluminum in battery technology is expected to increase rapidly compared with other metals.



Key Market Trends and Recent Developments

Key Market Trends



Aluminum alloys in shipbuilding – a fast growing trend.

- Using aluminum in shipbuilding has become a trend in line with other industries such as automobile, construction, packaging, and others. Globally, aluminum is being used not only in the construction of tankers and big ships but also in yachts, motorboats, cutters, and underwater craft.
- Countries such as the Kingdom of Saudi Arabia (KSA) are planning to expand domestic shipbuilding capacity, which is expected to increase demand for specialist and commercial aluminum plates.



Sustainably produced aluminum.

- There is an increase in demand for sustainably produced aluminum, and the trend is expected to grow in the near future.
- Recently, BMW announced that it has begun sourcing and using aluminum that has been produced using solar energy, a move by the German carmaker to cut carbon dioxide emissions from its supply network.



Increasing global production of bauxite.

- Since aluminum does not exist in a pure form, it is sourced from bauxite ore and transformed. It is chemically refined into alumina (aluminum oxide) and then smelted into aluminum through the Hall-Héroult electrolytic reduction process. Global bauxite production is expected to increase by 1.2% to 359.2 million tons in 2020 and by 3.8% in 2021 to 372.8 million tons. Further, global bauxite production is expected to grow at a CAGR of 2.2% during 2021-2025, supporting the growth of the overall aluminum market.



Increasing prices for aluminum.

- Aluminum prices are rising sharply and have been a stark outperformer in the metal pack. The major driving factors for the price increase can be attributable to the supply-side bottleneck in China, which is the largest primary aluminum producer. The emission rules, power shortages, and floods in July 2021 collectively impacted China's production. There has also been a substantial increase in demand for the metal in solar photovoltaic, lighter vehicles, and packaging, supporting aluminum prices.

Recent Market Developments



M&A

In July 2021, KPS Capital Partners, LP acquired Metra Holding S.p.A. and Metra S.p.A., a global manufacturers of extruded aluminum.

Expanding assets in the aluminum sector.



M&A

In April 2020, Novelis Inc., announced the completion of its acquisition of Aleris Corporation, a global supplier of rolled aluminum products.

Diversifying product portfolio with the addition of aerospace.

Enhancing strategic position in Asia.



M&A

In December 2019, Aluminum Corp of China Ltd, acquired a 10% stake in regional aluminum producer Yunnan Aluminum for \$183 million.

Hydropower and aluminum development strategy.

Capacity consolidation in China's aluminum sector.

a) Source: GlobeNewswire - <https://www.globenewswire.com/news-release/2021/02/18/2178042/28124/en/Aluminum-Expected-to-Remain-in-Oversupply-in-2021.html>.

b) Source: Global Mining Review - <https://www.globalminingreview.com/mining/23082021/global-bauxite-production-to-grow-by-nearly-4-percent-in-2021/>.

Table of Contents

1

Market Size and Growth Prospects

- » *Production*
- » *Consumption*
- » *Regional Focus*
- » *Aluminum Plate*
- » *COVID Impact*

2

Product Markets

- » *Value Chain*
- » *Key End-use Markets*

3

Effect of Tariffs

- » *Effect of Tariffs by the US Government*

4

Market Drivers and Trends

- » *Key Market Drivers*
- » *Key Market Trends and Recent Developments*

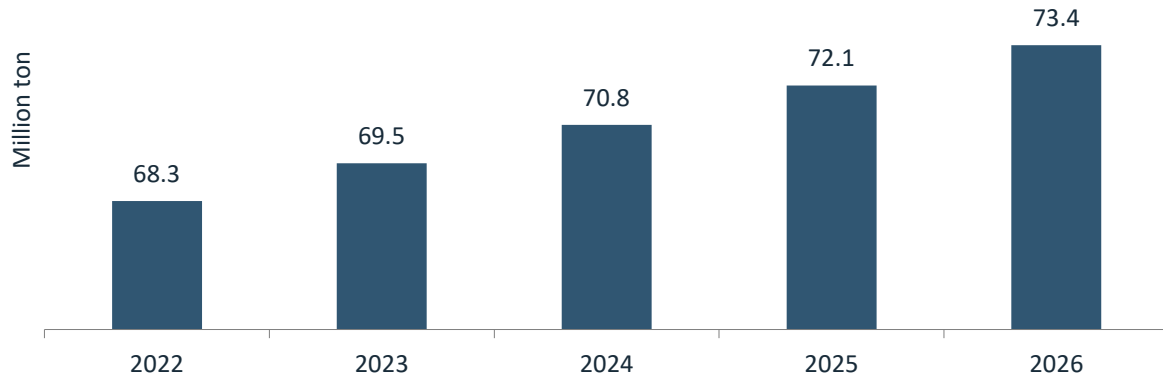
5

Outlook

- » *Production Projection*
- » *Consumption and Price Projection*

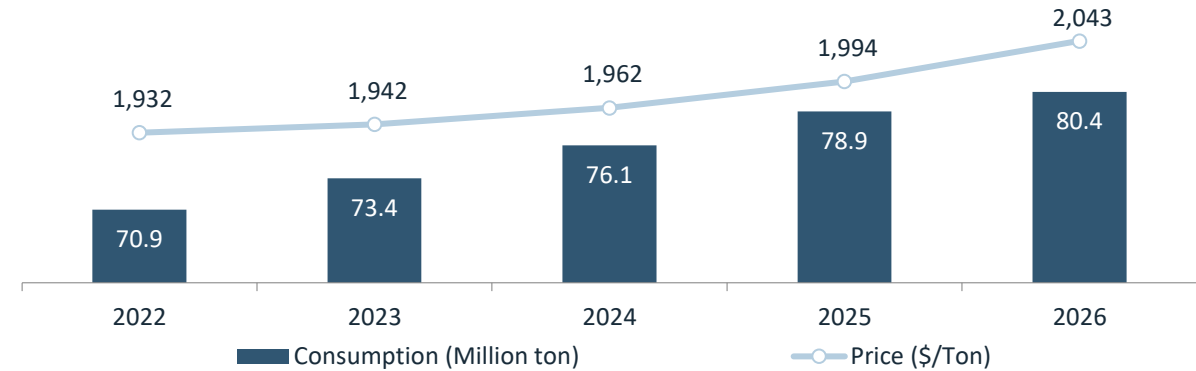
Market Outlook

Global Production Projection (a)



- The global primary aluminum demand is expected to remain high in the coming years, strongly supported by steady demand from Asia, the growing application of aluminum across sectors, and an accelerating shift to a green economy.
- Global production was relatively unimpacted during the COVID-19 pandemic as major producers, such as Australia and China, achieved solid growth. China's growth was primarily led by strong domestic demand, while Australia's low confirmed coronavirus cases did not affect the production volume. Overall, global aluminum production will continue to rise due to higher prices prompting producers to ramp up output.

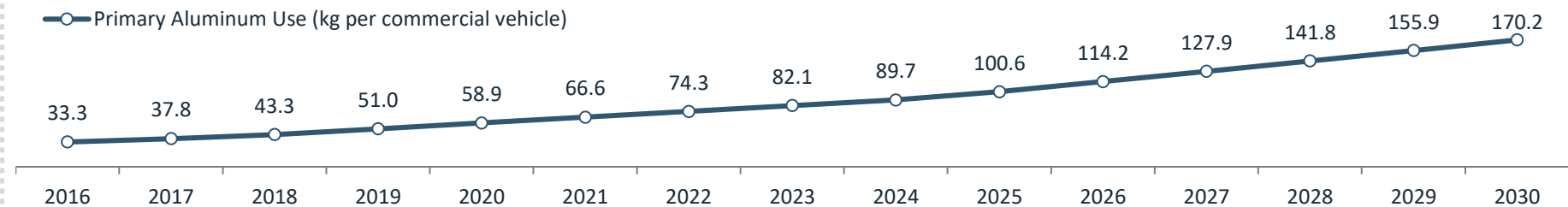
Consumption and Price Projections (a)



- According to the Australian Department of Industry, Science, Energy and Resources's quarterly report, the global primary aluminum consumption is projected to reach 80.4 million tons by 2026, increasing at a CAGR of 3.3% during 2021-2026.
- Aluminum prices have been rising since Spring 2020, or the beginning of the Chinese economic recovery from the COVID-19 pandemic, and prices have continued to gain momentum. Also, protectionist policies in the US may disrupt global aluminum trade flows as the US is the largest global importer of aluminum. In addition, prices may gain rapidly in the future as China's production capacity is being cut due to carbon emission targets.

Growth in Primary Aluminum Usage in Automobile Industry (An example of China's Automobile Industry) (b)

The average usage of primary aluminum in commercial vehicles is expected to register a CAGR of 12.4% during 2020-2030.



a) Source: <https://publications.industry.gov.au/publications/resourcesandenergyquarterlymarch2021/documents/Resources-and-Energy-Quarterly-March-2021-Aluminium.pdf>.

b) Source: <https://international-aluminium.org/wp-content/uploads/2019/02/Report.pdf>.

Appendix

Primary Aluminum Production (in thousand metric ton)

Period	Africa	North America	South America	Asia (ex China)	Western and Central Europe	Russia and Eastern Europe	Oceania	Gulf Cooperation Council	China	Others	World	Annual Growth Rate
2001	1,369	5,222	1,991	2,234	3,885	3,728	2,122	-	3,371	588	24,510	-
2002	1,372	5,413	2,230	2,261	3,928	3,825	2,170	-	4,321	636	26,156	6.7%
2003	1,428	5,495	2,275	2,475	4,068	3,996	2,198	-	5,547	504	27,986	7.0%
2004	1,711	5,110	2,356	2,735	4,295	4,139	2,246	-	6,689	576	29,857	6.7%
2005	1,753	5,382	2,391	3,139	4,352	4,194	2,252	-	7,806	636	31,905	6.9%
2006	1,864	5,333	2,493	3,493	4,182	4,230	2,274	-	9,349	720	33,938	6.4%
2007	1,815	5,642	2,558	3,717	4,305	4,460	2,315	-	12,588	732	38,132	12.4%
2008	1,715	5,783	2,660	3,923	4,618	4,658	2,297	-	13,585	732	39,971	4.8%
2009	1,681	4,759	2,508	4,400	3,722	4,117	2,211	-	13,684	624	37,706	-5.7%
2010	1,742	4,689	2,305	2,500	3,800	4,253	2,277	2,724	17,331	732	42,353	12.3%
2011	1,805	4,969	2,185	2,533	4,027	4,319	2,306	3,483	20,072	576	46,275	9.3%
2012	1,639	4,851	2,052	2,535	3,605	4,323	2,186	3,662	23,534	780	49,167	6.2%
2013	1,812	4,918	1,906	2,439	3,616	3,995	2,104	3,887	26,534	1,080	52,291	6.4%
2014	1,746	4,585	1,543	2,429	3,596	3,764	2,035	4,832	28,317	1,800	54,647	4.5%
2015	1,687	4,469	1,325	3,001	3,745	3,829	1,978	5,104	31,518	1,800	58,456	7.0%
2016	1,691	4,027	1,361	3,442	3,779	3,981	1,971	5,197	32,641	1,800	59,890	2.5%
2017	1,679	3,950	1,378	3,951	3,776	3,999	1,817	5,149	35,905	1,800	63,404	5.9%
2018	1,668	3,774	1,164	4,415	3,733	4,049	1,917	5,331	36,485	1,630	64,166	1.2%
2019	1,643	3,809	1,079	4,395	3,449	4,157	1,916	5,654	35,795	1,760	63,657	-0.8%
2020	1,605	3,976	1,006	4,140	3,334	4,153	1,912	5,833	37,337	2,029	65,325	2.6%
2021 (Till Oct.)	1,321	3,250	964	3,736	2,783	3,449	1,574	4,889	32,639	1,690	56,295	-

a) Source: International Aluminium Institute - <https://international-aluminium.org/statistics/primary-aluminium-production/>.

