Indonesian Bauxite and Aluminum Outlook

by: Pandu Setiabudi

Global Bauxite Overview



Overview of Aluminium Value Chain



1. CRU: Developments in bauxite to aluminium value chain, (https://www.crugroup.com/en/)

Global Bauxite Demand



Indonesian Bauxite Potential

Bauxite	Inferred Resource	Indicated Resource	Measured Resource	Probable Reserve	Proven Reserve	Total Resource	Total Reserve
Ore	2,042,279,591	2,414,254,759	1,754,742,938	2,207,884,254	927,893,427	6,211,277,288	3,135,777,681
Metal	309,533,692	457,866,804	356,236,200	359,859,708	174,032,245	1,123,636,696	533,891,953

Indonesia has a total bauxite ore resource of 6.2 billion tonnes (including 1.1 million tonnes of metal), as well as total bauxite ore reserves of 3.1 billion tonnes (including 534 million tonnes of metal).

Indonesia's bauxite reserves are distributed across only three provinces. West Kalimantan has most of the reserve with 82.8%. The others are Riau Islands (13.3%) and Central Kalimantan (3.9%).



Bauxite Reserve by Province

West Kalimantan

82.8%

Source 1. Geoportal Minerba ESDM 2. Processed by Petromindo

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Indonesian Bauxite Industry by Region *Kalimantan*



Bulungan 1 Under-construction Smelter

In Kalimantan, there are 74 IUP OPs covering a total mining area of 708,895 Ha, almost all of which are located in West Kalimantan, except for East Kotawaringin (2 IUP OPs) in Central Kalimantan, Additionally, there are 4 operational alumina refineries and 1 alumina refinery under construction in West Kalimantan, as well as 1 aluminum smelter under construction in North Kalimantan.

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1. Geoportal Minerba ESDM 2. Processed by Petromindo

Indonesian Bauxite Industry by Region Sumatera



In the Sumatera region, bauxite mining is only found in the Riau Islands province, with a total of 3 IUP OPs. Two IUP OPs are located in Lingga, covering a total area of 4,375 Ha, and one IUP OP is in Karimun, covering 148 Ha. Meanwhile, in Bintan, there is one operational alumina refinery and one aluminum smelter under construction. Additionally, an operational aluminum smelter is located in North Sumatra, in Batu Bara Regency.

Source 1. Geoportal Minerba ESDM 2. Processed by Petromindo

Indonesian Bauxite Industry by Region Sulawesi

Morowali

1 Operational Smelter

The final region hosting the bauxite processing industry is Sulawesi, specifically in Morowali. In the Indonesia Morowali Industrial Park (IMIP), there is currently one operational aluminum smelter with a capacity of up to 500,000 tpa of aluminum. There are no bauxite mining areas or alumina refineries in Sulawesi.

Source 1. Geoportal Minerba ESDM 2. Processed by Petromindo

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Indonesian Ban on Bauxite Ore Export

According to data from the Ministry of Energy and Mineral Resources (MEMR), as reported by Bloomberg Technoz, Indonesia's bauxite production continued to increase year by year until 2022, before dropping by approximately 38% in 2023. Law No. 3/2020 (the Mining Law) was the main cause of this drastic decline, as it implemented a ban on bauxite ore exports starting in June 2023 by the Indonesian government. This law "forces" bauxite mining companies to sell ore to domestic smelters or even encourages them to invest in building alumina refineries.

As of 2023, there are only four alumina refineries operating in Indonesia: PT Well Harvest Winning Alumina Refinery (2 refineries), PT Bintan Alumina Indonesia, and PT Indonesia Chemical Alumina. These refineries can process 12.25 million tons per annum (tpa) of bauxite and produce a total of 4.3 million tpa of alumina.

Nevertheless, the bauxite-to-alumina processing industry continues to grow, creating the potential for a better match between bauxite supply and absorption by alumina refineries.



Alumina Refineries in Indonesia



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Product: Chemical Grade AluminaLocation: Sanggau, West KalimantanInput Capacity: 850,000 tpaOutput Capacity: 300,000 tpaInput Source: PT ANTAMCOD: 2015Investment: US\$490 MPower Source: Coal

PT Indonesia Chemical Alumina, located in Tayan, Sanggau, West Kalimantan, is the only refinery in Indonesia that produces chemical-grade alumina (CGA). This smelter has been operational since 2015. PT ICA is fully owned by PT ANTAM, which also supplies bauxite ore from its mine located next to the refinery.

The refinery processes 850,000 tpa of bauxite and produces 300,000 tpa of CGA, which is marketed to South Korea, Japan, China, Malaysia, Thailand, the Philippines, Vietnam, India, Pakistan, New Zealand, Saudi Arabia, and the United Arab Emirates.



PT Well Harvest Winning Alumina Refinery



Product: Smelter Grade AluminaLocation: Ketapang, West KalimantanInput Capacity: 5,400,000 tpaOutput Capacity: 2,000,000 tpaInput Source: PT Cita MineralCOD: 2016 & 2022 (Expansion)Investment: US\$1,300 MPower Source: Coal (220 MW)

PT Well Harvest Winning Alumina Refinery, located in Ketapang, West Kalimantan, is a joint venture comprising China Hongqiao Group (56%), PT Cita Mineral Investindo Tbk (Harita Group) (30%), Winning Investment (9%), and Shandong Weiqiao Aluminium & Electricity (5%).

WHW Refinery has been operational since 2016 with a production capacity of 1 million tpa and later expanded by building a second refinery with a capacity of 1 million tpa in 2022.

The bauxite ore supply comes from the mines owned by PT Cita Mineral, which is also one of the shareholders of the company, with a supply volume reaching 5.4 million tpa. In its operations, the refinery uses energy from its own Ketapang coal-fired power plant with a capacity of 220 MW.



PT Bintan Alumina Indonesia



Product: Smelter Grade AluminaLocation: Bintan, Riau IslandsInput Capacity: 6,000,000 tpaOutput Capacity:2,000,000 tpaInput Source: PT Mahkota Karya UtamaCOD: 2022Investment: US\$1,150 MPower Source: Coal (160 MW)

PT Bintan Alumina Indonesia, located in Bintan, Riau Islands, began producing smelter-grade alumina (SGA) in 2022. PT Bintan Alumina Indonesia is owned by Global Aluminium International Pte Ltd (GAI) (99% interest) and PT Mahkota Karya Utama (MKU) (1%). The shareholders of GAI are Chinese firms Nanshan Aluminium Singapore Co Pte Ltd (95%) and Redstone (5%).

The refinery has a production capacity of 2 million tpa of SGA, consuming 6 million tpa of bauxite. PT BAI sources 90% of its raw materials from Kalimantan, which includes its own mining operations (PT Mahkota Karya Utama), supplies from other bauxite mining companies, and a small contribution from PT Aneka Tambang Tbk. The remaining 10% is obtained from the nearby Riau Islands. PT MKU has commited to supplying 3 million tons of bauxite in 2025 and increase the supply to 4.5 million tons in 2026. PT BAI has a sales agreement with Press Metal for 1.5 million tpa until 2040.

Currently, PT BAI plans to increase its production capacity by 1 million tpa in 2025 and another 1 million tpa in 2026, bringing the total capacity to 4 million tpa of SGA.

PT Borneo Alumina Indonesia



Product: Smelter Grade AluminaLocation: Mempawah, West KalimantanInput Capacity: 3,300,000 tpaOutput Capacity: 1,000,000 tpaInput Source: PT ANTAMCOD: 2025Investment: US\$830 MPower Source: Coal

PT Borneo Alumina Indonesia, located in Mempawah, West Kalimantan, is a joint venture between PT INALUM (60%) and PT ANTAM (40%). PT BAI began commissioning operations in Q4 2024 and is targeted to be fully operational by Q1 2025.

PT BAI will produce smelter-grade alumina (SGA) with a capacity of 1 million tpa, consuming 3.3 million tpa of bauxite supplied by PT ANTAM from its mine in Mempawah. Of the SGA produced, 600,000 tpa will be purchased by PT INALUM in Asahan, North Sumatra.

The second phase of the smelter's development has already been planned, with an additional production capacity of 1 million tpa of SGA and an estimated investment value of US\$870 million.







Product: Smelter Grade AluminaLocation: Ketapang, West KalimantanInput Capacity: 18,000,000e tpa (3,000,000e tpa @Phase1)Output Capacity:6,000,000 tpa (1,000,000 tpa @Phase1)Input Source: N/ACOD: 2025e (1st phase)Investment: US\$3,000 MPower Source: Coal

PT Borneo Alumindo Prima (BAP) is currently constructing an alumina refinery in Ketapang, West Kalimantan. The company is owned by HC-Asia Pacific Holdings Pte Ltd (80%) and Top Celestial Holdings Pte Ltd (20%), both subsidiaries of Hangzhou Jinjiang Group Ltd from China.

The refinery is planned to be built in five phases with a total target production capacity of 6 million tonnes per annum (tpa). The total investment is estimated at US\$3 billion, positioning BAP to become the largest alumina producer in Indonesia.

Phase I is under construction by 23rd Metallurgical, a subsidiary of China Minmetals, with a planned production capacity of 1 million tpa. The construction is expected to be completed by 2025, although the commissioning timeline has not been confirmed yet.



PT Kalimantan Alumina Nusantara



Product: Smelter Grade AluminaLocation: Sanggau, West KalimantanInput Capacity: 3,600,000e tpaOutput Capacity: 1,200,000 tpaInput Source: N/ACOD: 2027eInvestment: US\$750 MPower Source: Coal

PT Kalimantan Alumina Nusantara (KAN) is a joint venture between Press Metal Aluminium Holding Berhad (80%), PT Alakasa Alumina Refinery (19.77%), and PT Dinamika Sejahtera Mandiri (0.23%). PT KAN plans to build an alumina refinery in Sanggau, West Kalimantan.

The alumina refinery will have a production capacity of 1 to 1.2 million tpa in the first phase, with potential for future expansion. The estimated investment for the first phase of the refinery construction is US\$750 million. PT KAN is currently carrying out preliminary work to establish supporting infrastructure for the project.

This project is part of Press Metal Aluminium's strategy to solidify its position as the largest aluminum smelter in Southeast Asia. The construction of this alumina refinery will ensure a stable alumina supply for their smelter, reducing reliance on third-party suppliers.





PT Tianshan Alumina Indonesia



Product: Smelter Grade AluminaLocation: Lingga, Riau IslandsInput Capacity: 6,000,000e tpaOutput Capacity:2,000,000 tpaInput Source: N/ACOD: N/AInvestment: US\$1,560 MPower Source: Coal (160 MW)

PT Tianshan Alumina Indonesia is a subsidiary of Tianshan Aluminium Group, a major aluminum producer from China. PT Tianshan Alumina Indonesia is currently in the process of obtaining approval for the construction of an alumina smelter in the Riau Islands.

The refinery is planned to have a production capacity of 2 million tonnes, with an estimated investment value of US\$1.56 billion. Tianshan Aluminium Group indirectly controls four mining companies in Indonesia: PT Inti Tambang Makmur, PT Persada Buana Gemilang, PT Persada Pratama Cemerlang, and PT Paloan Maju Abadi.

Stalled Alumina Refinery Projects

In fact, there are seven planned integrated alumina refinery projects with mining operations that have stalled and shown no progress. This is due to funding issues. The high capital required to build alumina refineries, combined with declining revenues for mining companies following the bauxite export ban, has caused these projects to come to a halt.

Company	Product	Location	Input Capacity	Output Capacity
PT Laman Mining	SGA	Ketapang, West Kalimantan	2,850,000 tpa	1,000,000 tpa
PT Kalbar Bumi Perkasa	SGA	Sanggau, West Kalimantan	4,200,000 tpa	1,500,000 tpa
PT Sumber Bumi Marau	SGA	Ketapang, West Kalimantan	2,600,000 tpa	1,000,000 tpa
PT Persada Pratama Cemerlang	SGA	Sanggau, West Kalimantan	2,500,000 tpa	1,000,000 tpa
PT Parenggean Makmur Sejahtera	CGA	East Kotawaringin, Central Kalimantan	3,000,000 tpa	986,000 tpa
PT Dinamika Sejahtera Mandiri	SGA	Sanggau, West Kalimantan	5,200,000 tpa	2,000,000 tpa
PT Quality Sukses Sejahtera	SGA	Sanggau, West Kalimantan	3,500,000 tpa	1,500,000 tpa

Source 1. Petromindo

2. Sucofindo

3. CNBC Indonesia

Indonesian Alumina Production Capacity until 2030

Currently, Indonesia has four companies operating alumina refineries, with three running at full capacity and one in the commissioning phase. In 2025, there will be one new company build alumina refineries with 1 million tpa, but total indonesian production capacity of the operational refinery will increase by 3 million tpa.

Beyond the current operations, one alumina refinery company with a planned total capacity of 6 million tpa will still in the Phase 1 construction (of 5 phases). Additionally, two other companies are planning to build alumina refineries with a combined capacity of 3.2 million tpa.

If these projects are completed before 2030, Indonesia's total alumina production capacity will reach 17.5 million tpa. This capacity increase will further boost the absorption of Indonesia's bauxite ore. Moreover, the alumina produced can be exported or used as input for domestic aluminum smelters.



Indonesian Aluminium Consumption

Aluminum is used across various industries such as transportation, automotive, construction, energy, and others. Based on data from Badan Pusat Statistik, aluminum consumption by industries in Indonesia is currently still dominated by imports, as the country has only one aluminum smelter dedicated to serving domestic demand, INALUM, with a production capacity of 250,000 tonnes per annum. Another aluminum smelter, owned by PT Hua Chin, has a production capacity of 500,000 tpa; however, all its aluminum products are exported to China, the parent company's country of origin.

The development of aluminum smelters in Indonesia is currently being promoted to meet domestic demand and reduce imports. At present, there is one operational smelter and three new smelters under construction.

Indonesian Aluminium Composition



Aluminium Smelters in Indonesia



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PT Indonesia Asahan Aluminium



Product: Primary AluminiumLocation: Batu Bara, North SumateraInput Capacity: 500,000 tpaOutput Capacity: 250,000 tpaInput Source: PT Borneo Alumina IndonesiaCOD: 1976Investment: JP¥ 411 BPower Source: Hydro (603 MW)

PT Indonesia Asahan Aluminium (INALUM), located in Kuala Tanjung, Batu Bara, North Sumatra, was established in 1976 by the Indonesian government in collaboration with Nippon Asahan Aluminium. Currently, INALUM is wholly owned by the Indonesian government through the state-owned holding company MIND ID. INALUM operates the only aluminum smelter in Indonesia that is currently in operation.

INALUM's aluminum smelter processes 500,000 tpa of SGA into 250,000 tpa of primary aluminum, powered by the Siguragura Hydropower Plant (286 MW) and the Tangga Hydropower Plant (317 MW). Until 2024, INALUM uses SGA sourced from Australia. However, with the establishment of an alumina refinery by its subsidiary, PT Borneo Alumina Indonesia (BAI), 600,000 tpa of alumina will be supplied by PT BAI.

INALUM is currently planning an expansion with a target to increase capacity by 600,000 tpa by 2028 and an additional 600,000 tpa by 2030.





PT Hua Chin Aluminium Indonesia



Operation

Product: Primary AluminiumLocation: Morowali, Southeast SulawesiInput Capacity: 1,000,000 tpaOutput Capacity:500,000 tpaInput Source: N/ACOD: 2025Investment: US\$921 MPower Source: Coal

PT Hua Chin Aluminium's aluminum smelter is located in the Indonesia Morowali Industrial Park (IMIP) in Southeast Sulawesi. The project is a collaboration between Huafon and Tsingshan, with ownership stakes of 65% and 35%, respectively.

The smelter reached full production in 2024, with a capacity of 500,000 tonnes per annum (tpa) of aluminum, consuming approximately 1 million tpa of alumina. The aluminum smelter project is estimated to have an investment value of US\$921 million.

The aluminum produced from this smelter is not marketed in Indonesia but is directly exported to China. This arrangement is part of the company's operational model, as it is a subsidiary of a Chinese corporation.

adaro PT Kalimantan Aluminium Industry Under Construction



Product: Primary AluminiumLocation: Bulungan, North KalimantanInput Capacity: 2,000,000e tpaOutput Capacity: 1,000,000 tpaInput Source: PT Well Harvest WinningCOD: 2025e & 2030eInvestment: US\$4,000 MPower Source: Coal (1,100 MW) & Hydro (1,375 MW)

PT Kalimantan Aluminium Industry (KAI) is currently constructing an aluminum smelter located in the Kalimantan Industrial Park (KIP), Bulungan, North Kalimantan. PT KAI is a joint venture between Adaro Minerals (65%), Aumay Mining (22.5%), and Cita Mineral Investindo (12.5%).

The KAI smelter's Phases I, II, and III will each have a production capacity of 500,000 tpa of aluminum, with an investment value of US\$2 billion per phase. These phases were initially targeted to begin operations in 2025, 2026, and 2030, respectively. However, according to Wito Krishnahadi (President Director of KAI), Phase II will not be carried out and will skip directly to Phase III.

The alumina supply is planned to be supported by PT Well Harvest Winning Alumina Refinery, which is partly owned by CITA. For Phase I, the smelter will be powered by a coal power plant jointly owned by Adaro Energy and CITA, with a capacity of 1,100 MW. Meanwhile, Phase III will use energy from a 1,375 MW hydropower plant jointly owned by Adaro Energy, Sarawak Energy, and Kayan Patria Pratama.



PT Bintan Electrolytic Aluminium

Under Construction



Product: Primary AluminiumLocation: Bintan, Riau IslandsInput Capacity: 2,000,000e tpa (500,000e tpa @Phase1)Output Capacity1,000,000 tpa (250,000 tpa @Phase1)Input Source: PT Bintan Alumina IndonesiaCOD: 2025e @Phase1 & 2027e @Phase2&3Investment: US\$830 MPower Source: Coal

PT Bintan Electrolytic Aluminium (BEA) is currently constructing an aluminum smelter in the Galang Batang Special Economic Zone, Bintan, Riau Islands. BEA is a subsidiary of Shandong Nanshan, which also operates an alumina smelter in Bintan through PT Bintan Alumina Indonesia (BAI).

Phase I of the smelter has a production capacity of 250,000 tonnes per annum (tpa) and is targeted for completion in 2025 with an investment value of US\$878 million. Phases II and III will have capacities of 250,000 tpa and 500,000 tpa, respectively, with completion targeted for 2027. Alumina supply will be provided by PT BAI, which currently has a production capacity of 2 million tpa of SGA.

Source 1. Petromindo

Aluminium Production Capacity until 2030

As of 2024, Indonesia has only two operating aluminum smelters: PT INALUM and PT Hua Chin, with a total production capacity of 780,000 tonnes. INALUM is the sole smelter supplying domestic primary aluminum, while Hua Chin exports all its products to China.

In 2025, two new smelters will begin operations: PT Kalimantan Aluminium Industry and PT Bintan Electrolytic Aluminium, adding 750,000 tonnes of capacity, bringing the total to 1,530,000 tonnes. The production capacity of these four companies will continue to grow through 2030. INALUM will increase its capacity by 1,200,000 tpa, Kalimantan Aluminium Industry by 500,000 tpa, and Bintan Electrolytic Aluminium by 750,000 tpa.

By 2030, Indonesia's total aluminum production capacity will reach 3,980,000 tpa, a 410% increase from the 2024 capacity.



Indonesian Aluminium Producers

Alumina Refinery Absorption for Bauxite Ore

Overall, there are three alumina refineries operating at full capacity in Indonesia: PT Indonesia Chemical Alumina, PT Well Harvest Winning Alumina Refinery, and PT Bintan Alumina Indonesia, with a total production capacity of 4.3 million tpa of alumina. Also a alumina refinery still in the commissioning, PT Borneo Alumina Indonesia, with production capacity of 1 million tpa and PT Borneo Alumindo Prima with capacity of 1 million tpa is still in the trial running phase. Production capacity is projected to increase to 7.3 million tpa by 2025.

This production capacity will increase the required input of bauxite ore from 12.25 million tpa to 21.55 million tpa. However, this figure is still insufficient to absorb Indonesia's bauxite production compared to the last full year before the export ban (2022), which stood at 31.8 million tpa.



Indonesian Alumina Producers





Alumina Supply to Aluminium Smelter by 2025

By 2025, alumina refineries in Indonesia are projected to have a total production capacity of 6.3 million tons, consisting of 300,000 tons of CGA and 6 million tons of SGA. CGA is exclusively produced by PT Indonesia Chemical Alumina and is marketed both domestically and for export. Meanwhile, SGA is produced by PT Borneo Alumina Indonesia, PT Bintan Alumina Indonesia, and PT Well Harvest Winning, and is also marketed domestically and for export.

Of the total SGA, 2.1 million tons are designated for domestic aluminum smelters, and 2.5 million tons are planned for export. However, the destination for the remaining 1.4 million tons of SGA is still unknown. The domestic demand for SGA for aluminum smelters is estimated at 3.1 million tons, supplied by 2.1 million tons produced domestically (600,000 tons from PT Indonesia Asahan Aluminium, 500,000 tons from PT Bintan Electrolytic Aluminium, and 1 million tons from PT Kalimantan Aluminium Industry) and 1 million tons from an unknown source, which will supply PT Hua Chin Aluminium Indonesia.

Overall, this indicates that Indonesia will experience a surplus of alumina in 2025, allowing for export opportunities while still meeting the domestic alumina demand for smelters, even if PT Hua Chin Aluminium Industri utilizes domestically produced alumina.



Alumina Refinery Absorption for Bauxite Ore

Based on MEMR's data, Indonesia's primary aluminum demand in 2023 reached 752,845 tonnes, with the automotive sector accounting for the largest share at 41.8%, followed by sheet/plate (18.5%) and cables (18.4%).

The Indonesian government has set specific targets to accelerate the transition from ICE vehicles to EVs and from conventional energy sources to renewable energy, particularly solar PV panels. On average, each EV contains approximately 250 kg of aluminum, mainly used in lightweight body structures, battery enclosures, and electrical components. Meanwhile, the construction of 1 MW of solar PV capacity requires about 21 tonnes of aluminum, particularly for panel frames, mounting systems, and structural supports. The government aims to increase the number of BEVs from 15,000 in 2023 to 600,000 by 2030 (source: CNBC Indonesia), and to boost solar PV capacity by an additional 1.4 GW by 2030 (based on the 2024–2033 RUPTL draft via IESR). Thus, these two sectors alone could drive an additional aluminum demand of 175,650 tonnes (23%) by 2030.

With this assumption and without accounting for changes in other sectors, Indonesia could experience an aluminum surplus of 3.05 million tonnes by 2030. This also implies that Indonesia would not need to import aluminum from other countries to meet its demand, as long as the domestic market becomes the priority for aluminum products from smelters.



Forecast of Indonesian Aluminium by 2030



2. CNBC Indonesia

Source

4. Processed by Petromindo

^{3.} Indonesia Energy Transition Outlook 2025 by IESR

Key Takeaways

Indonesian Bauxite: With 1.12 billion tonnes of resources and 534 million tonnes of reserves, Indonesia has great potential to continue the growth of bauxite-based industries such as alumina or aluminum, considering that current production is still relatively small.

Impact of the Ore Export Ban: The 2023 bauxite export ban has driven investments in domestic refineries, boosting value-added production, but financial constraints have delayed many projects and strained mining companies' revenues.

Alumina Outlook: The projected rise in alumina production from 4.3 million tpa today to 17.5 million tpa by 2030 will enhance domestic aluminum smelter supply, reduce reliance on imports, and position Indonesia as a key player in global alumina markets.

Aluminum Outlook: The rise in aluminum production from 780,000 tpa in 2024 to 3.98 million tpa by 2030 will eliminate the need for imports, fully meet domestic demand, and create surplus opportunities for export.



Industry Challenges: Key challenges include the high capital required for refinery and smelter projects, energy-intensive production processes, and stalled projects due to funding constraints.



Industry Potential: Indonesia has significant potential in the aluminum industry, driven by the growing demand from the electric vehicle and solar PV sectors, which could boost domestic production and open up export opportunities by 2030.