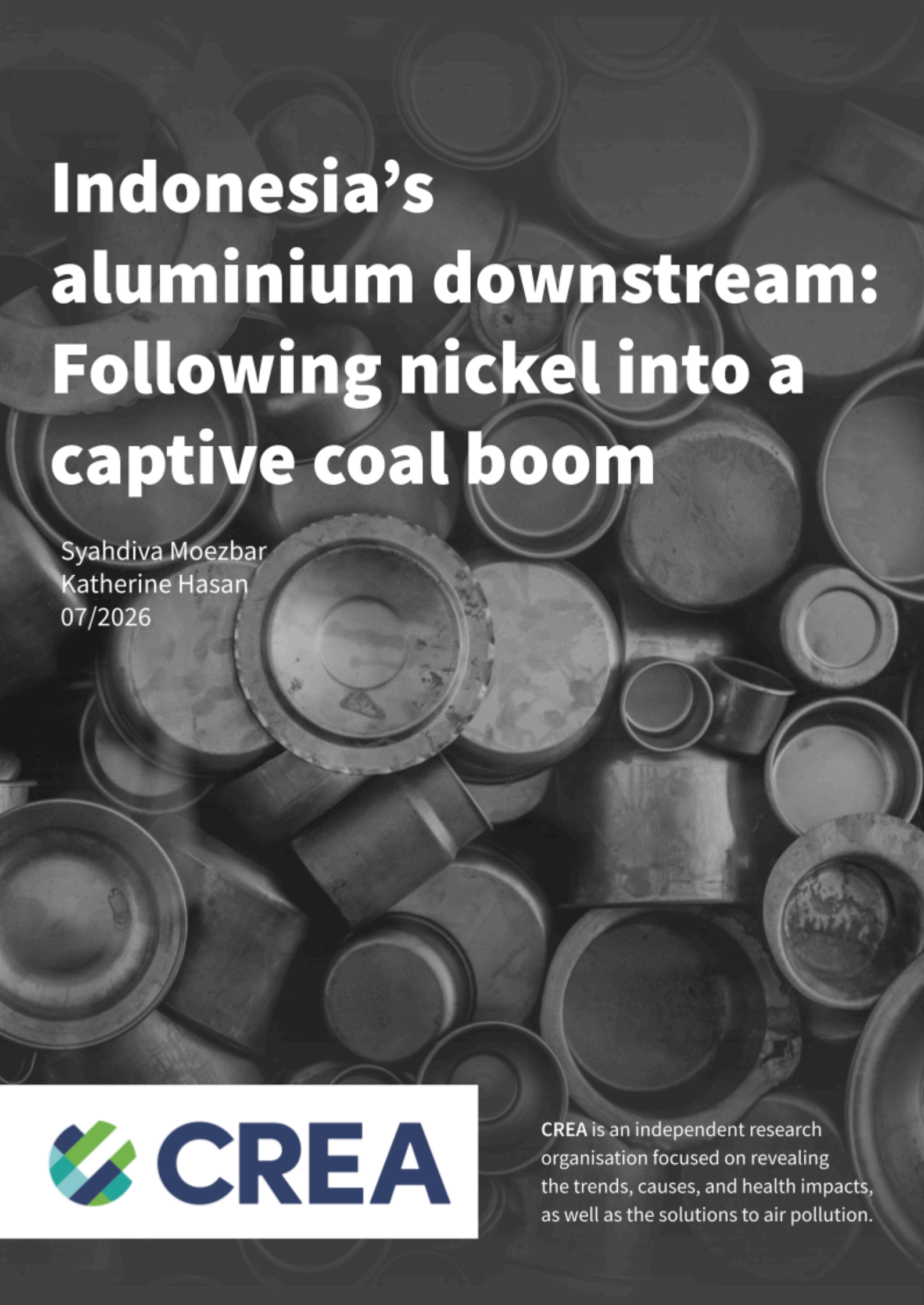

Indonesia's aluminium downstream: Following nickel into a captive coal boom

Syahdiva Moezbar
Katherine Hasan
07/2026

CREA

CREA is an independent research organisation focused on revealing the trends, causes, and health impacts, as well as the solutions to air pollution.

Indonesia's aluminium downstream: Following nickel into a captive coal boom

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About CREA

The Centre for Research on Energy and Clean Air (CREA) is an independent research organisation focused on revealing the trends, causes, and health impacts, as well as the solutions to air pollution. CREA uses scientific data, research, and evidence to support the efforts of governments, companies, and campaigning organisations worldwide in their efforts to move towards clean energy and clean air, believing that effective research and communication are the keys to successful policies, investment decisions, and advocacy efforts. CREA was founded in Helsinki and has staff in several Asian and European countries.

Key findings

- Under Indonesia's downstreaming mandate, total alumina production capacity is projected to quadruple from 7 million tonnes in 2025 to 32.5 million tonnes by 2030, driven almost entirely by Smelter-Grade Alumina. Meanwhile, Chemical-Grade Alumina remains flat at 300,000 tonnes, proving investments target primary metals over high-value specialty products.
- This rapid expansion risks both immediate feedstock gridlock and long-term exhaustion: slow-scaling mining cannot instantly match skyrocketing demand, which is estimated to jump from 14 to 65 million tonnes of bauxite ore annually and potentially deplete Indonesia's proven 1 billion tonne reserve base in under 12 years.
- Indonesia’s aluminium downstreaming is set to be powered with 9.8 GW of captive coal power capacity, with 1.8 GW operational and a further 8 GW highly likely linked to 32 prospective projects, repeating a similar lock-in legacy the nickel boom brings.
- Roughly 75% of Indonesia's domestic alumina and aluminium projects are tied to Chinese backing. This inflow is driven by China's strict output cap reaching its threshold, forcing Chinese industrial giants to offshore capital.
- The government's push for domestic aluminium self-sufficiency is shown in a massive expansion in Mempawah, West Kalimantan, to be fully funded by state-owned superholding Danantara. The project is opting for 1.25 GW of captive coal over cost-effective clean energy such as solar and storage, a pivot from the global shift toward low-carbon commodities that could permanently derail the sector's emission trajectory.

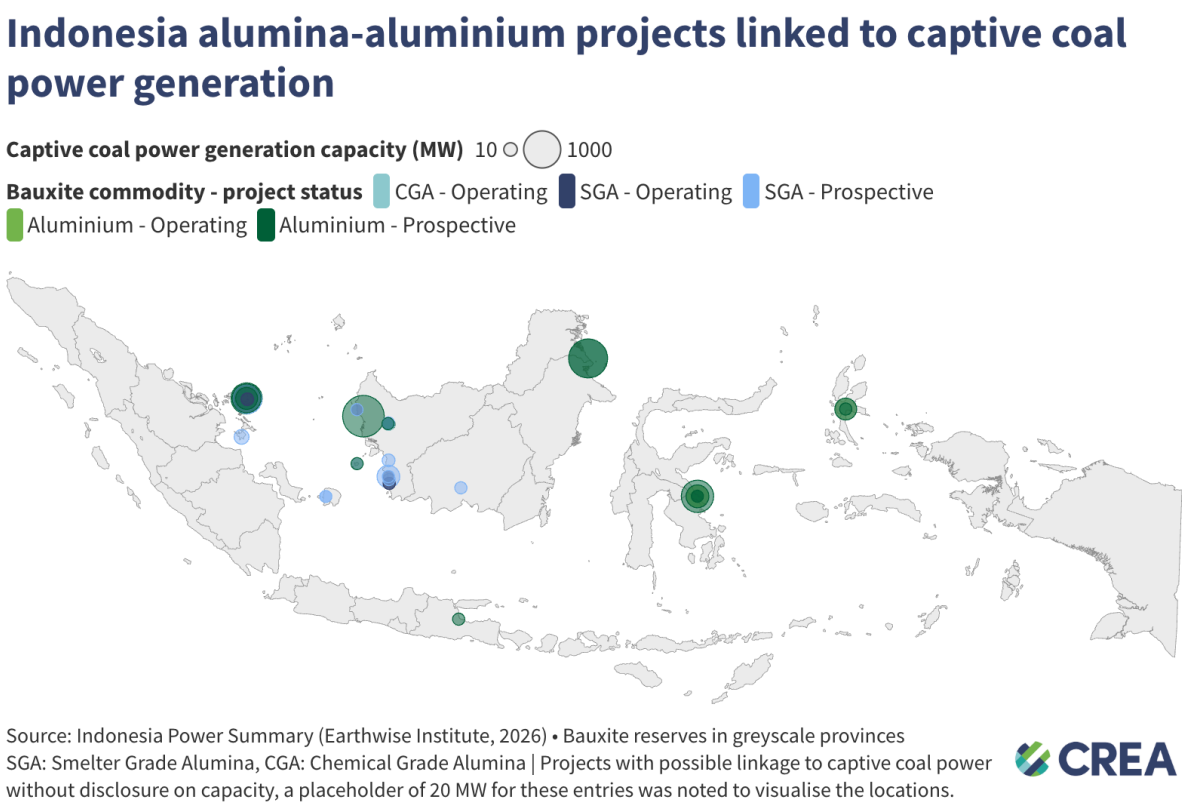


Figure KF1 — Distribution of captive coal power generation that have been identified to be linked to alumina and aluminium projects in Indonesia

Contents

The big picture

Indonesia's rapid bauxite and aluminium expansion — driven by Chinese capital escaping domestic production caps — risks turning the country into an outsourced, energy-burdened processing base. Once all pipelines proceed, **Indonesia's alumina production capacity will reach 32.5 million tonnes — more than four-fold of today's capacity, and primary aluminium smelting will hit 14.5 million tonnes by 2030 — fourteen-fold of today's capacity**. Domestic narratives around downstreaming often emphasise higher value-added industry, import substitution, and job creation. While these benefits are important, unrestrained expansion may create new vulnerabilities related to resource security, energy supply, and institutional readiness.

One major risk is that the planned downstream capacity may outpace the country's ability to supply bauxite ore. If all projects proceed, Indonesia's alumina refining capacity could rise from around 9 million tonnes in 2025 to more than 32 million tonnes annually, while aluminium smelting capacity could increase from around 1 million tonnes to over 14 million tonnes per year. As 2 tonnes of bauxite ore are required to produce 1 tonne of alumina (Dardor et al., 2025), this would mean a massive increase in bauxite demand from 14 million tonnes to approximately 65 million tonnes per year by 2030 —within these anticipated capacity expansions, Indonesia's proven reserve base of 1 billion tonnes would only last only approximately 12 years.

At the same time, the Ministry of Energy and Mineral Resources (MEMR)'s adjustments to bauxite production quotas (*Rencana Kerja dan Anggaran Biaya,* RKAB) may raise concerns about whether **Indonesia's mining output could keep pace with the refinery and smelter pipeline.** These concerns have been voiced by a state-owned aluminium firm, calling out the government to halt new refineries to ensure bauxite reserves last through the smelter's lifetime (Bloomberg Technoz, 2026a; Mining, 2026).

The expansion of alumina refineries and aluminium smelters also raises significant energy and emissions concerns. Many proposed projects continue to rely on captive coal-fired power plants to meet the substantial electricity demands, with limited integration and planning of renewable alternatives. If all planned capacity proceeds, aluminium downstreaming could lead into another industrial captive coal boom, undermining national decarbonisation targets, locking industrial growth to a carbon-intensive pathway, and further imposing environmental and public health costs on communities.

In addition, the risks facing Indonesia's aluminium sector are driven not solely by foreign investors but also by domestic governance and policy weaknesses. Rapid downstream expansion has often outpaced institutional coordination, with frequent changes to RKAB approvals, licensing, and industrial policies, creating uncertainty over long-term resource planning and supply security. Rapid industrial expansion without sufficient institutional and regulatory capacity would create a structurally fragile model that is vulnerable to policy changes and market volatility (AIIA, 2026). These risks are further compounded by a workforce dominated by contractual labour with limited skills transfer (Rohmatika & Paksi, 2026). Although downstream expansion may increase export revenues, domestic workforce absorption remains limited, while local communities continue to bear significant environmental and social costs (Energy Shift Institute, 2026).

The buildout of the alumina and aluminium supply chain in Indonesia

Bauxite reserves concentrated in three Indonesian provinces

Indonesia's aluminium ambitions are fundamentally anchored in its bauxite resource base. Globally, bauxite reserves are estimated at around 32 billion tonnes, with Indonesia accounting for roughly 10%. As of 2025, MEMR estimated that Indonesia's total crude bauxite resources sit at about 7.8 billion tonnes. Of this broad resource base, 2.8 billion tonnes (36%) are classified as total reserves (*total cadangan*), split into two distinct categories (MEMR, 2025).

Proven reserves (*cadangan terbukti*) amount to 1.01 billion tonnes of crude bauxite ores, containing 194 million tonnes of aluminium metal equivalent. The remaining 1.86 billion tonnes of crude bauxite ore, containing 359 million tonnes of aluminium metal equivalent, is probable reserves (*cadangan terkira*). While downstream calculations often cite the broad 2.87 billion-tonne reserve figure, **readily accessible ores amount to merely slightly over one-third of the national total reserve base, accessible for fast-tracked refining capacity** (Petromindo, 2026)**.**

Almost 65% of Indonesia's bauxite reserves are high-grade as they contain more than 46% alumina (MEMR, 2025). This distribution reflects both industrial strength and systemic uncertainty — while the reserve base is considerable, a large share still depends on further feasibility assessments.

Geographically, Indonesia's bauxite reserves are highly concentrated across West Kalimantan, the Riau Islands, and Central Kalimantan, with minor deposits in Bangka Belitung. **West Kalimantan dominates the landscape, making up 83% of the national reserves (460 million tonnes out of 552 million tonnes national total).**

This evolving resource picture sits alongside a major policy shift, notably Indonesia's bauxite export ban that came into effect in June 2023 (CNBC, 2023). The ban has accelerated a wave of investment in domestic alumina refineries, particularly near mining hubs in West Kalimantan. This downstream push is further reinforced under President Prabowo's Asta Cita mandate, which aims to drive economic growth through massive industrial downstreaming. As a result, Indonesia is rapidly transitioning from a raw bauxite exporter to a dominant refinery hub in the global aluminium value chain.

China's domestic production cap on aluminium as a catalyst

Global dynamics also play a major role in Indonesia's downstreaming expansion of bauxite. In 2017, China implemented a national production ceiling for primary aluminium of **45 million tonnes per year** to curb overcapacity and fulfil its carbon reduction commitment (Discovery Alert, 2025). China's production utilisation rate has remained critically high, inching over its self-imposed ceiling at **45.05 million tonnes in 2025**.

With the cap strictly imposed, major Chinese industrial players have no choice but to build aluminium value chains outside China (Bloomberg, 2025). Indonesia has emerged as the ideal destination for this outward capital flight, supported by large bauxite reserves and supportive policies for industrial downstreaming. Furthermore, the massive influx of Chinese capital investment into Indonesia's nickel sector over the past decade has already established the necessary ecosystems, logistic networks, captive power assets, and heavy infrastructure that can be easily integrated to support alumina and aluminium production (UMD-CGS, 2023).

Despite ranking sixth globally in raw bauxite reserves, Indonesia has become the most eyed destination for Chinese aluminium investments. **About 75% of all bauxite and aluminium projects in Indonesia are linked to Chinese capital (34 out of 45 projects)**, in the form of a direct link to Chinese firms or as joint ventures between Chinese and Indonesian companies (Earthwise Institute, 2026).

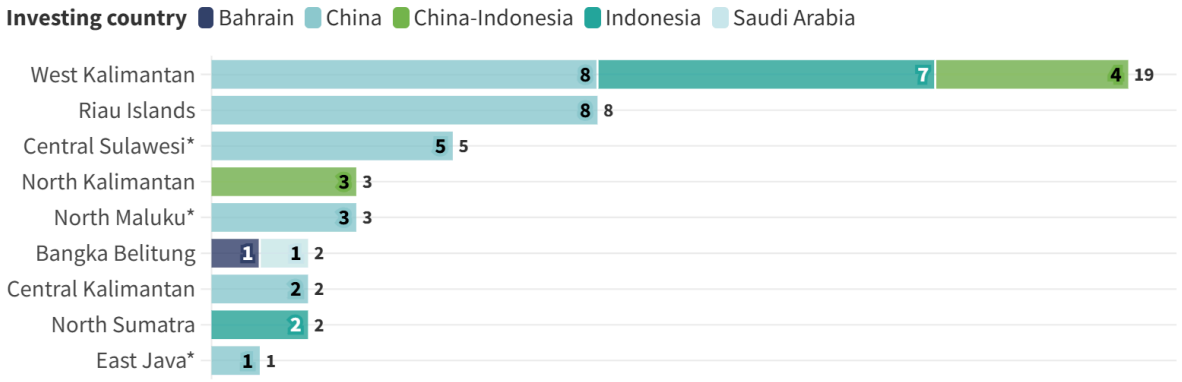
Figure 1 and Figure 2 below illustrate the number of projects by the country from which the foreign investor originates, and its distribution across the provinces where bauxite reserves are located and where massive industrial hubs are located.

Indonesia bauxite refinery project count distribution by investing country

Source: Indonesia Power Summary (Earthwise Institute, 2026)

Figure 1 — Distribution of bauxite refinery projects based on investing country by count

Indonesia bauxite refinery project count distribution by provincial location



Source: Indonesia Power Summary (Earthwise Institute, 2026) • *Provinces where major industrial hubs have been established

Figure 2 — Distribution of bauxite refinery projects based on investing country by location across key Indonesian provinces

Massive sovereign wealth investments from Danantara also target aluminium expansion

Legacy ecosystems established by Chinese investment provide the essential foundation for scaling up aluminium processing and manufacturing. Total realised investment across active projects has reportedly already reached **USD 5.5 billion to 6 billion**, with total committed capital pipelines expected **to surge past USD 30 billion by 2030** (Petromindo, 2026). The off-take from these bauxite downstreaming projects is expected to be exported back to mainland China, integrating Indonesia directly into Chinese supply chains.

This shifting landscape is no longer just driven by foreign capital — it is being formally institutionalised under Indonesia's new sovereign wealth architecture. Early this year, Danantara — formally launched its first phase of downstream developments, breaking ground on a USD 7 billion (IDR 118 trillion) infrastructure portfolio. This state-backed intervention explicitly targets domestic aluminium expansion, supporting the multi-billion dollar master pipeline under the state mining holding company, MIND ID, through a recent announcement for **full financing of two massive, interconnected projects in Mempawah, West Kalimantan** (Kompas, 2026).

First, the Mempawah Primary Aluminium Smelter complex is a USD 2.4 billion facility owned by PT Indonesia Asahan Aluminium (Inalum), scheduled **to begin operations in 2028 with a targeted primary aluminium capacity of 600 thousand tonnes per annum**. In February 2026, Inalum released a statement for a total capacity target of 900 thousand tonnes per annum — 300 thousand tonnes from optimised Kuala Tanjung operation (10% increase), and 600 thousand tonnes from Mempawah expansion (Inalum, 2026; CNBC, 2026a). Previously, in November 2025, Inalum announced a higher ambition for Kuala Tanjung, mentioning a near doubling from the currently operating 275 thousand tonnes to 520 thousand tonnes (Warta Ekonomi, 2025). Assuming the higher ambition plan remains, Inalum's total primary aluminium capacity would reach 1.12 million tonnes per annum.

Second, the Smelter-Grade Alumina Refinery (SGAR) Phase 2 is a USD 890 million expansion operated by PT Borneo Alumina Indonesia — a strategic state joint venture between Inalum (60%) and upstream bauxite miner PT Aneka Tambang Tbk (Antam) (40%). Following the 2025 commissioning of Phase 1 at 1 million tonnes of Smelter Grade Alumina (SGA) production, **Phase 2 will double total SGA production to 2 million tonnes when it comes online in 2029** (Bloomberg Technoz, 2026b).

Anticipating significant power demand, Danantara announced a strategy to bypass traditional grid constraints by tasking state-owned PT Bukit Asam Tbk (PTBA) to build

on-side dedicated, coal-fired power infrastructure. By opting for an independent business area (*Wilayah Usaha* or Wilus) scheme, the complex is set to rely on **a 1.25 GW captive coal power system near the Kijing coastal port area in West Kalimantan** (Bloomberg Technoz, 2026d).

As of April this year, PTBA is reported to be actively finalising a joint venture agreement with potential technology partners from China, South Korea, and Japan to lock in a guaranteed supply of 6.9 million tonnes of coal per year over a 30-year horizon, with construction slated to begin in early 2027 (Dunia Energi, 2026; Indonesia Miner, 2026). While Danantara has major stakes in changing the playing field, **this decision enforces the notion that clean energy has little room to compete in Indonesia's industrial landscape** — the project's aggressive 4–5 USD cents per kWh target deliberately favors coal as cost-viable (SWA, 2026; KabarBursa, 2026).

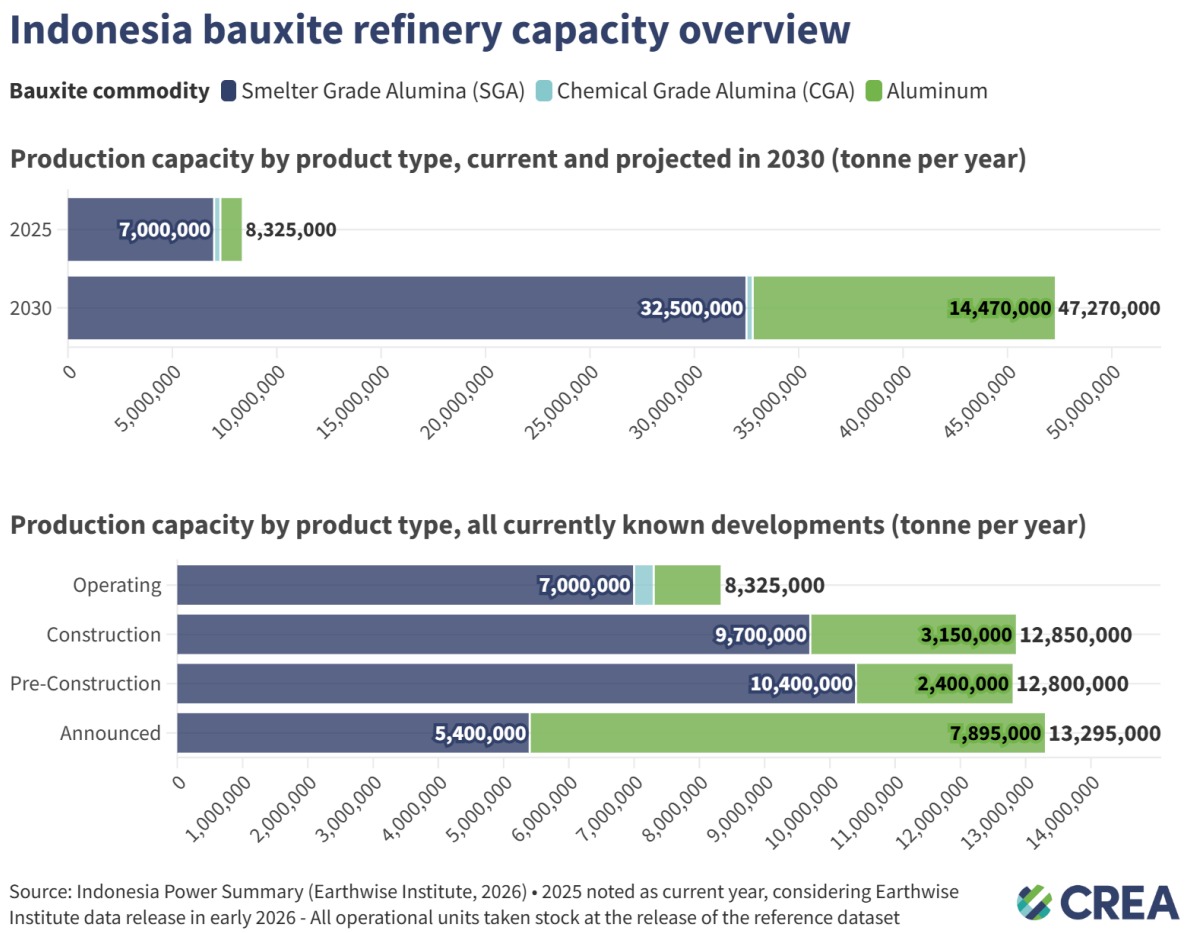
This priority aligns with a broader mining and mineral processing strategy aimed at securing fast-tracked industrial expansion through centralized control. By June 2026, the government appointed **Danantara Sumberdaya Indonesia (DSI)**, a sovereign export holding mandated to act as the gatekeeper for strategic commodities. DSI's initial mandate strictly enforces a one-gate export system for coal, crude palm oil, and 15 specific ferroalloy tariffs, predominantly tracking processed nickel (Bloomberg Technoz, 2026c). Bauxite ore or its downstream products have not been explicitly covered under this framework. Nevertheless, **the long-term centralisation of strategic commodity flows under this state vehicle could fundamentally reshape broader downstream product flows and trades in the near future** (CNBC Indonesia, 2026b; Danantara Indonesia, n.d.).

At the same time, rising global demand for lightweight automotive chassis, solar panel framing, and electrical grid infrastructure continues to boost long-term aluminium demand (IEA, 2025). Industry giants such as Tsingshan Holding Group, China Hongqiao Group, and Shandong Nanshan Aluminium are turning to Indonesia for investments in new smelters and refineries. Aggressive projections from Goldman Sachs estimate that **Indonesian aluminium production will rise fivefold by 2030** (The Straits Times, 2025).

Most recently, Indonesia's aluminium expansion has gained strategic importance due to conflict in the Middle East. Recent military escalations affecting Iran have forced major regional aluminium smelters — including facilities operated by Emirates Global Aluminium (EGA), Aluminium Bahrain (Alba), and Qatalum — to significantly reduce production due to logistics issues and power risks. This has driven global buyers to accelerate alternative sourcing in Southeast Asia, turning Indonesia's big aluminium bet into a vital buffer for the global supply chain (Indonesian Mining Association, 2026; Discovery Alert, 2026a).

Indonesia's dramatic leap: four-fold for alumina, fourteen-fold for aluminium

The following section examines Indonesia's aluminium industrial landscape, including existing and planned capacities for alumina and aluminium smelting, as reported in [Earthwise Institute's Indonesian Power Summary Database] (Earthwise Institute, 2026). Figure 3 provides a breakdown of Indonesia's alumina and aluminium projects based on their products and status, **showing that the bulk of Indonesia's aluminium downstreaming expansion is currently still in development**. The top figure shows the current capacities and future projection in 2030, while the bottom figure illustrates known capacities by status – operational and prospective.



Source: Indonesia Power Summary (Earthwise Institute, 2026) • 2025 noted as current year, considering Earthwise Institute data release in early 2026 - All operational units taken stock at the release of the reference dataset

Figure 3 — Indonesia's bauxite refinery capacities, current in 2025 and projected in 2030 (top) and all known developments by current project status (bottom)

Current total operational capacities at nearly 8.3 million tonnes per annum will increase by 47.3 million tonnes per annum from all prospective developments.

Total alumina processing capacity is projected to grow fourfold from 7 million tonnes in 2025 to 32.5 million tonnes in 2030. This expansion is driven almost entirely by the expansion of Smelter Grade Alumina (SGA) production. While SGA is a metallurgical feedstock produced exclusively to be smelted into primary aluminium metal, Chemical Grade Alumina (CGA) is a specialty, non-metallurgical commodity used in commercial ceramics, abrasives, and refractories. In contrast, CGA capacity remains unchanged at 300,000 tonnes, suggesting that current investments are focused on supplying feedstock for aluminium smelting rather than higher-value specialty products.

While the 2023 bauxite export ban initially led to concerns over domestic oversupply due to delayed refinery development (Discovery Alert, 2026), the growing pipeline of alumina projects suggests stronger future demand for domestic feedstock. However, as a significant share of these projects remain under construction, pre-construction, or only announced, limited transparency and the lack of publicly available project updates leave considerable uncertainty around their implementation progress, commissioning timelines, and eventual capacity additions.

A matching trend is observed in primary aluminium smelting. While approximately 1 million tonnes of capacity is already operational in the first half of 2026, 5.5 million tonnes are still under construction, and nearly 8 million tonnes have just been announced with no publicly available updates yet. This means Indonesia's primary aluminium production is expected to grow from 1 million tonnes per annum to 14.5 million tonnes very rapidly — representing an unprecedented 1,295% growth curve executed in a compressed timeline.

Illustrated in Figure 4, the geographic distribution of Indonesia's bauxite refinery and aluminium smelting capacity highlights a heavy concentration across key provinces. West Kalimantan decisively anchors the country's active value chain, commanding 5.05 million tonnes per year of SGA capacity. **The Riau Islands** follow closely as the second-largest operational refinery hub with 4.0 million tonnes per year of active SGA capacity. In contrast, current primary aluminium smelting operations are smaller and more fragmented across the archipelago, led by **Central Sulawesi** (0.5 million tonnes), **North Sumatra** (0.27 million tonnes), and **North Maluku** (0.25 million tonnes).

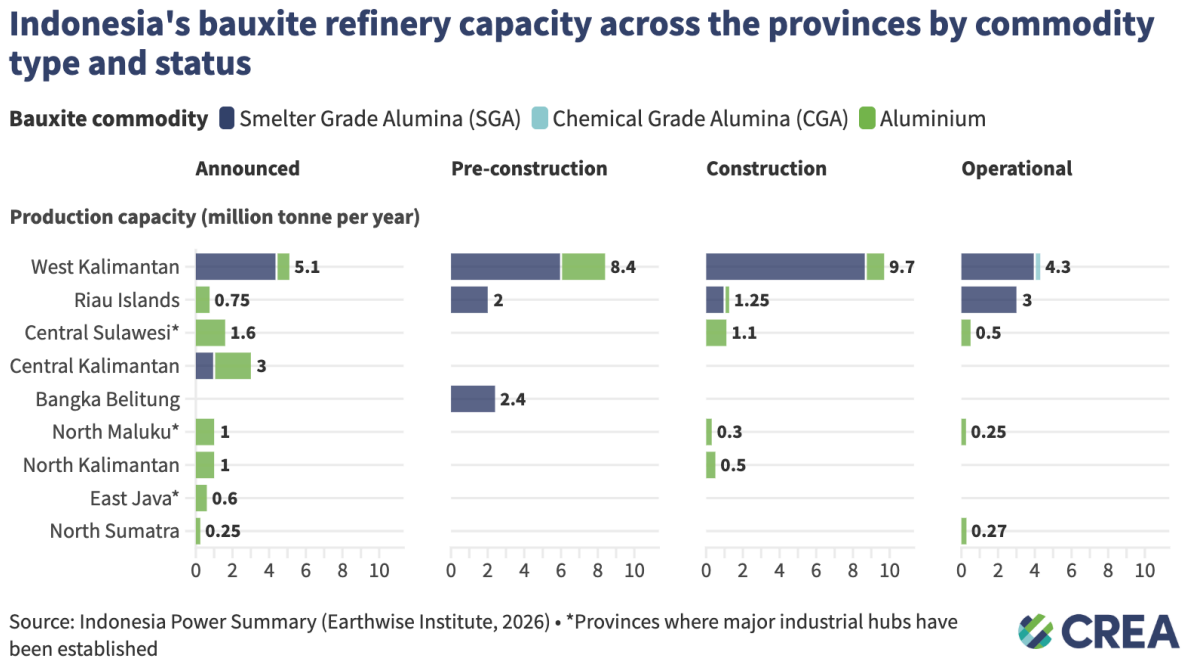


Figure 4 — Distribution of Indonesia's bauxite refinery capacity by commodity type across the key Indonesian provinces

Conversely, the multi-billion dollar prospective pipeline is set to shift the global landscape completely. The majority of prospective projects are located close to bauxite reserves — West and Central Kalimantan, Riau Islands, and Bangka Belitung.

West Kalimantan is the primary target for this growth, holding a staggering 9.7 million tonnes under active construction, 8.4 million tonnes in pre-construction, and 5.1 million tonnes in the announced stage — making up a total of 23.2 million tonnes of prospective additions in this province alone. Up next, **the Riau Islands'** prospective pipeline reaches a total of 4 million tonnes of capacity in total, which includes 1.0 million tonnes under construction and 2.0 million tonnes of pre-construction SGA capacity, alongside 0.25 million tonnes under construction and 0.75 million tonnes of announced primary aluminium capacity. **Central Kalimantan** has 3.0 million tonnes of announced capacity, 1 million tonnes for SGA and 2 million tonnes for primary aluminium. In Bangka Belitung, there is 2.4 million tonnes of SGA capacity in pre-construction.

Beyond these hubs near the reserves, other new metallurgical corridors are emerging. Tagging onto existing nickel infrastructure, there are 2.7 million tonnes of prospective aluminium smelting in **Central Sulawesi** and 1.3 million tonnes in **North Maluku**. **North Kalimantan** is rising as another key industrial hub with its Kalimantan

Industrial Park Indonesia, with 1.5 million tonnes of prospective aluminium capacity. Furthermore, **East Java** shows 0.6 million tonnes of announced capacity, while **North Sumatra** 0.6 million tonnes. To note, all these provinces do not have bauxite reserves.

This aggressive refinery expansion will intensify the competition for domestic bauxite supply, both among the refineries and resource availability. In response, rather than allowing market forces to determine production volumes, **the Indonesian government has decisively increased control over ore supply and pricing**.

Since October 2025, the government has shifted bauxite ore mining quota (*Rencana Kerja dan Anggaran Biaya,* RKAB) approvals from a three-year system to annual cycles. This decision, combined with the implementation of SIMBARA (*Sistem Informasi Mineral dan Batubara Antar Kementerian/Lembaga*) — a digital monitoring system for ore flows — has strengthened oversight across the bauxite supply chain. The set quota of 18 to 22 million tonnes of bauxite ores, against projected domestic demand of 25 million tonnes in 2026, is expected to create supply uncertainties for operational refineries, making them increasingly dependent on state allocations rather than market demand (Bloomberg Technoz, 2025; SMM, 2026).

These pressures are compounded by **structural mismatch between mining and refining development timelines**. New bauxite mines typically take up to eight years to progress from exploration to shipment due to permitting, annual RKAB approvals, and infrastructure requirements, whereas alumina refineries can be built in just two to three years (SMM, 2026). This has enabled refining capacity to expand much faster than upstream supply, creating a structural feedstock bottleneck.

In parallel, the government has simultaneously expanded its influence over price formation. Under Ministerial Decree of Energy and Mineral Resources No. 144 Year 2026, bauxite's reference pricing (*Harga Patokan Mineral*, HPM) was revised to a wet metric tonne basis while also incorporating ore quality parameters, including silica impurities, into the pricing formula. These changes have effectively raised the domestic benchmark price, with higher-quality bauxite commanding higher prices (MEMR, 2026; IMA, 2026; Al Circle, 2026a). Combined with the 2023 export ban, these policies demonstrate Indonesia's efforts in institutionalising a state-managed bauxite supply chain.

A warning call extends to questioning proper management of Indonesia's bauxite reserves, where under the current projection of feedstock demand reaching 65 million tonnes, **the nation's proven reserve is expected to be fully depleted in approximately 12 years**. This echoes warnings from Inalum, which cautioned the aggressive capacity expansion could lead to a much shorter ore supply than the 30-year operational assets lifespans,

ultimately forcing the country to rely on imported bauxite and absorb the associated costs (SMM, 2026). Although Indonesia holds around 2.8 billion tonnes of bauxite reserves, the key challenge lies in how quickly economically viable deposits can be permitted, financed, and operating (Discovery Alert, 2026a).

Indonesia's alumina-aluminium sector is following nickel into captive coal power

The paradox of Indonesia's metals downsteaming is the concurrent, unprecedented growth of localised captive coal power development. Driven by the industrial rush for critical minerals, Indonesia's operational captive coal power capacity has expanded nearly tenfold in a decade, from less than 2 GW in 2015 to 19.3 GW in 2025. With nearly 12 GW additions in the pipeline, the total captive coal power capacity will reach over 31 GW — matching the entire operational coal fleet of Germany (CREA, 2026a).

The nickel industry is the largest driver of this off-grid fossil fuel growth, commanding 15.4 GW in operation and 2.5 GW under construction. Currently, captive facilities linked exclusively to nickel processing make up 80% of Indonesia's total operational captive coal capacity (CREA, 2026a). While this massive carbon footprint is heavily marketed under a "green" banner, there is a profound structural mismatch. A staggering 83% of Indonesia's nickel production remains stalled in **the traditional, heavy-emitting stainless steel sector,** with merely 17% actually entering the electric vehicle (EV) battery supply chain (CREA, 2026b).

This narrative diverges sharply for aluminium, a base metal fundamentally oriented toward building the physical infrastructure of electrification as a core component in solar PV frames, regional electricity transmission grids, and structural EV light-weighting.[1]

Unlike isolated nickel reserves that are concentrated in remote and fragmented islands in Sulawesi and North Maluku that completely lack access to grid infrastructure, bauxite reserves are geographically clustered in West Kalimantan and the Riau Islands, with **far greater potential for regional grid integration and adjacent untapped renewable energy resources**, such as North Kalimantan's mega-hydropower projects and high-yield

[1] Breakdowns of aluminium's role in clean energy infrastructure: aluminium makes up over 85% of total hardware weight of **solar PV frames** (World Bank, 2023); **overhead high-voltage transmission** relies almost entirely on aluminium cables (Chen et al., 2022); EVs use heavy amounts of aluminium body sheets and castings to lower weight and increase driving range—i.e. **EV light weighting** (Mining Technology, 2022).

solar corridors. The geographic potential is becoming increasingly more feasible, as recent modelling shows that utility-scale solar PV paired with battery storage could potentially be cost-competitive against captive coal generation in Kalimantan, with levelised cost of electricity (LCOE) of 7.9-8.3 cents/kWh under current financing conditions and the potential to reach as low as 5 cents/kWh by 2030 under preferential financing and regulatory support (Chojkiewicz et al., 2025).

Consequently, while the nickel boom remains locked into isolated, captive coal hubs, the aluminium sector possesses both the utility and geographic positioning to increasingly decouple from permanent fossil-fuel dependencies.

The latest tally, based on Global Energy Monitor (GEM)'s Global Coal Plant Tracker July 2025 release, shows that **after nickel, the aluminium industry is a notable emerging captive coal user — with 0.78 GW in operation, and 2.2 GW in the pipeline**. In this section, CREA aims to provide an update based on potential new linkage of previously unknown aluminium projects with new captive coal power development using Earthwise Institute's Indonesian Power Summary Database (Earthwise Institute, 2026).
Figure 5 shows how the profile of Indonesia's aluminium sector is undergoing a stark divergence. Historically, the sector has been anchored in hydro-powered processing, namely Inalum's legacy North Sumatra smelter powered by 317-MW Tangga hydroelectric plant and 286-MW Sigura-Gura hydroelectric plant (GEM, 2026a; GEM, 2026b). However, future development is moving in the opposite direction.

Out of 45 projects evaluated, a staggering 24 have confirmed linkage to captive coal power plants, and 18 are flagged as potentially reliant on it. The remaining three are shown to rely on grid integration or renewable systems, instead of dedicated on-site captive power.

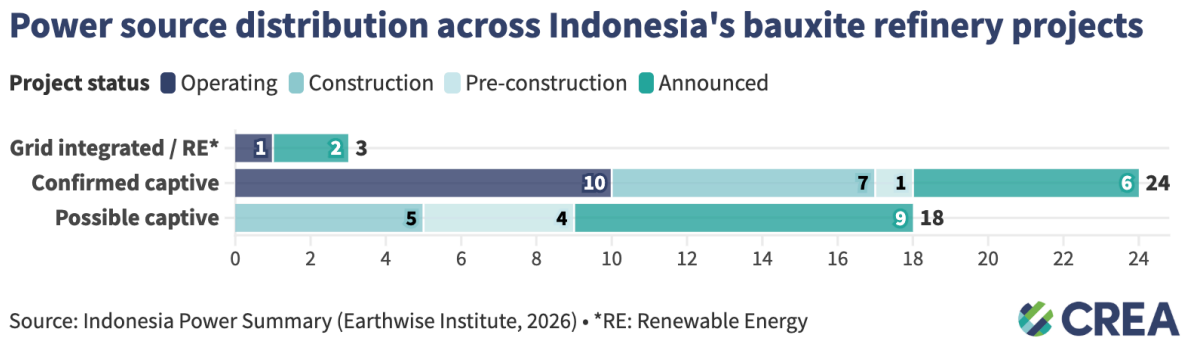


Figure 5 — Count of bauxite projects linked to captive coal power, grouped by certainty

While it is noteworthy that some forward-looking developments are attempting to break this pattern, the overarching momentum remains overwhelmingly tethered to captive coal power generation. The prime example of this structural mismatch is PT Kalimantan Aluminium Industry's (KAI) mega-smelter project in Kalimantan Industrial Park Indonesia (KIPI) located in North Kalimantan, backed by PT Alamtri Resources Indonesia Tbk (Alamtri, formerly PT Adaro Minerals Indonesia Tbk) (GEM, 2026c). Despite being marketed as a green milestone tied to the 1,375-MW Mentarang Induk hydropower plant, slated to operate in early 2031, Alamtri's phased development strategy reveals a heavy reliance on fossil fuels: Phase 1 (500 thousand tpa) is now confirmed to rely entirely on 1,060 MW of captive coal power, while the identical Phase 2 expansion (1.1 GW captive coal power capacity) remains highly ambiguous (Adaro Minerals Indonesia, 2022; GEM, 2025a).

Since its 2022 announcement, the project's trajectory has been radically reshaped, beginning with Hyundai terminating its procurement intent after strong pushbacks from consumer groups, leading to a late 2024 corporate spin-off and rebrand from PT Adaro Minerals Indonesia Tbk (IEEFA, 2025; Mongabay, 2024). Furthermore, global coal exit policies have blocked financial close, leaving Phase 2 short of USD 1.1 billion with zero confirmed lenders. Amid this dynamic, the most recent satellite imagery shows a new 150-MW unit in construction, introducing uncertainty around Phase 2 expansion (GEM, 2026c; BankTrack, 2025; Market Forces, 2023).[2]

Out of the 11 currently operating facilities, 10 are already tethered to captive coal power. With 17 more projects currently in construction or pre-construction and another 16 announced, the vast majority of Indonesia's expanding aluminium capacity is poised to mirror the nickel sector's reliance on captive coal power rather than utilising regional grids.

[2] GEM GCPT Jan 2026 release marks AlamTri Phase 2 to be linked to 1.1 GW of captive coal power capacity, with 150 MW in construction and the remaining as announced. Earthwise Institute tracks AlamTri Phase 2 project as canceled, noting linkage to 150 MW of captive coal capacity.

Figure 6 shows that fossil fuels heavily dominate the mix for bauxite refineries, with **captive coal power plants accounting for 78% of the total power generation capacity across operating and prospective power systems — 9.8 out of 12.6 GW**.

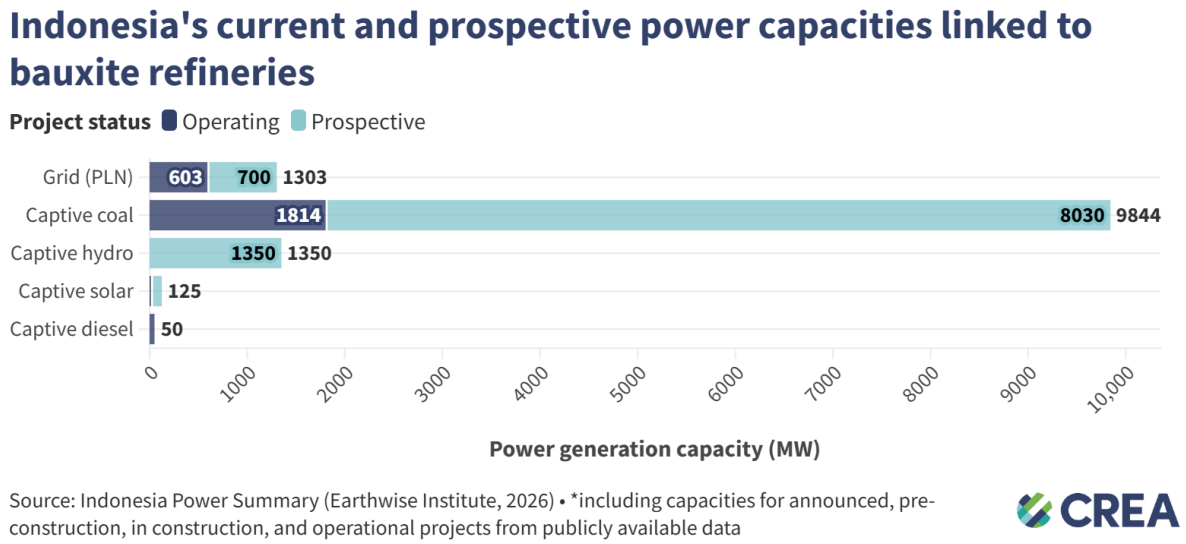


Figure 6 — Ratio of alumina and aluminium production power sources

Utility grid integration via Indonesia's state-owned electricity provider, Perusahaan Listrik Negara (PLN) comprises around 10% (1.3 GW) of the overall footprint, which includes 603 MW of Inalum's grid-linked hydropower capacity alongside, 400 MW of grid electricity associated with Inalum's Phase 2 expansion in Kuala Tanjung, North Sumatra, and a prospective 300 MW grid integration from CMOC Group's project in Central Kalimantan. [3]

Captive renewable energy alternatives represent a smaller share of the future pipeline, led by prospective captive hydropower at 1.35 GW (Alamtri). Shares of captive solar and diesel power comes from select projects reported to incorporate hybrid systems. PT Kemajuan Aluminium Industry utilises a 100 MW diesel emergency unit and a 50 MW solar plant and energy storage (CN AL, 2025). PT Bintan Electrolytic Aluminium is reportedly integrating a 100 MW solar power facility and supplementary grid electricity to complement its power supply mix (Indonesia Business Post, 2023a).

It is clear that these clean energy insertions remain miniscule compared to the sheer scale of coal infrastructure being deployed.

[3] For the purposes of this report, Tangga and Sigura-gura hydropower plants in the Asahan 2 complex are classified as grid-connected hydropower. Although the facilities are owned and operated by Inalum and primarily supply electricity to its aluminium smelter, Inalum has reported distributing surplus electricity from the complex to PT PLN (Persero), indicating operational linkage with the grid (CNBC, 2022).

Figure 7 provides a mapping of project count, production capacity, and linkage to captive coal power generation of all operational bauxite refineries. Reliance on captive coal power is completely non-existent for North Sumatra (Inalum's hydropower-based processing), and noticeably smaller for West Kalimantan of slightly over 300 MW where processing is the largest for SGA. Meanwhile, the Riau Islands already show signs of dependency on captive coal power.

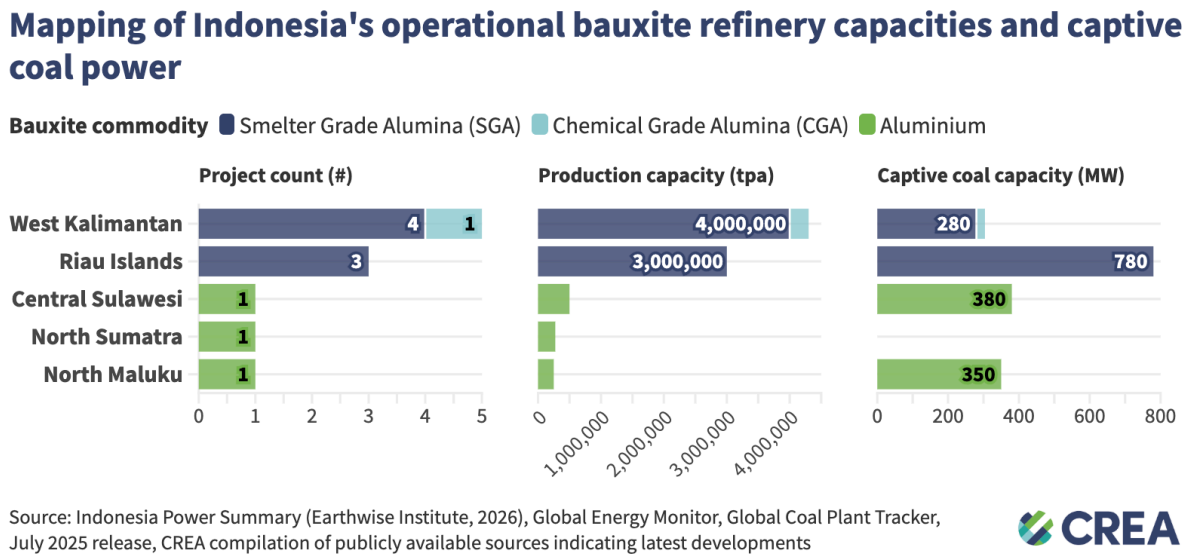


Figure 7 — Operating bauxite refinery capacities and its linkage to captive coal power generation, mapped across provinces

Figure 8 provides a similar mapping for all prospective projects. From this visual, it is apparent how centered captive coal power development is in specific provinces only — namely, the projected 2.2 GW total for AlamTri aluminium smelting in North Kalimantan.

Several aluminium projects are located within established Chinese-backed industrial parks, namely PT Hua Chin Aluminium Indonesia in Indonesia Morowali Industrial Park (IMIP) and PT Kemajuan Aluminium Industry in Indonesia Weda Bay Industrial Park (IWIP). Operational capacities of these projects are linked to 730 MW captive coal power, and prospective expansions are anticipating linkage to 1.5 GW in existing major complexes (the 3.36 GW Sulawesi Labota captive power station and the 4.54 GW Weda Bay power station, respectively) (GEM, 2025b; GEM, 2026d).

As for West Kalimantan, with a significant number of prospective projects for SGA (10 projects, totaling 19.1 million tpa) and primary aluminium production (4 projects, making up 4.1 million tpa), known captive coal power linkages currently tally up to 1.93 GW,

including the 1.25 GW captive coal power to support Inalum's Phase 3 aluminium smelter development in Mempawah, built by PTBA.

Out of all 14 prospective projects in West Kalimantan, five are confirmed to be linked to captive coal power use, and nine are without certainty whether grid integration is feasible or, in the best case scenario, captive renewables systems. Inalum's expansion in Kuala Tanjung, Batu Bara, and North Sumatra is reported to also rely on grid integration, on top of the existing 520 MW of hydroelectric supply from the Asahan 2 Scheme Complex — 400 MW short from the anticipated 920 MW power needs (InvestorTrust, 2025).

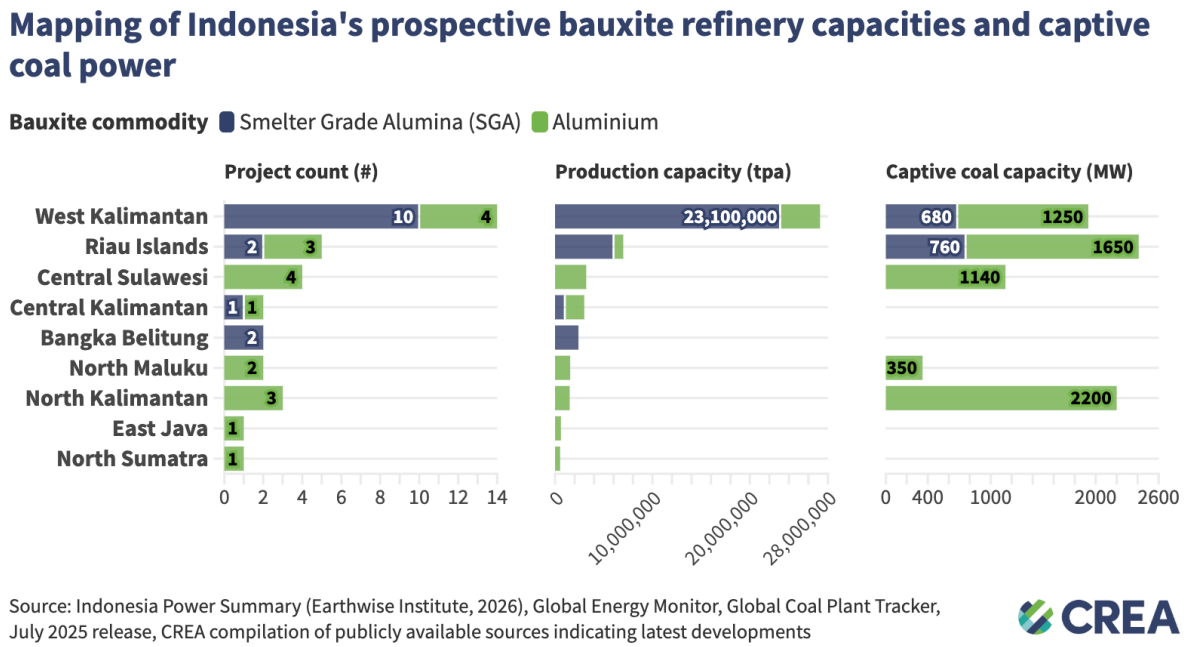


Figure 8 — Prospective bauxite refinery capacities and its linkage to captive coal power generation, mapped across provinces

Bauxite refineries progressing at a rapid clip, mismatching power infrastructure development

Earthwise Institute highlights a mismatch between the projected power requirements for upcoming bauxite downstreaming projects and the development pace of refineries and smelters, advancing faster than the available power infrastructure required to sustain it. Project-level disclosures show that all aluminium-related projects would require 18.5 GW of power demand; however, under optimistic assumptions that all disclosed power supply can materialise and can be freely accessible, only amount to 14.5 GW. This means a structural electricity gap of at least 4 GW remains to exist between projected demand and identifiable supply plans, representing both a risk and a pivot point — either reverting Indonesia into captive fossil power dependency or serving as a catalyst for clean energy integration in its national aluminium blueprint (Earthwise Institute, 2026a).

To contextualize this gap, the projected jump shown in Figure 3, from an operating baseline of roughly 8.3 million tonnes of bauxite products in 2025 to a staggering 47.6 million tonnes by 2030, introduces an unprecedented structural electricity demand.

Indeed, chemically refining raw bauxite into alumina relies mostly on thermal heat and requires a modest mechanical electricity load of **0.2 to 0.4 MWh per tonne** (Javier Sáez-Guinoa, 2024; Vecchi & Brear, 2026). Reaching the anticipated **32.5 million tpa of SGA capacity** in the near future will thus require up to **14 TWh of annual power supply**. In the domestic context, this roughly matches observed industrial benchmarks where a standard 1 million tpa Indonesian refinery requires an energy input equivalent to roughly 611 thousand tons of coal, with mechanical electricity supplied by dedicated 75 MW captive units (Liun & Nurlaila, 2021).

The bigger catch is that the subsequent smelting of alumina into primary aluminium is one of the most electro-intensive industrial processes, requiring **14 to 15 MWh of electricity per single tonne of aluminium** (Boudreau et al, 2024). This means scaling **primary aluminium smelting** capacity up to **14.5 million tpa** will demand **a staggering 215 TWh of electricity**. Combined with raw ore refinement, Indonesia's bauxite downstreaming ambitions will require **up to 229 TWh annually, equivalent to Indonesia's total coal-based power generation, or nearly 64% of the national power production at 350 TWh in 2024** (Ember, n.d.).

There is a very urgent risk with the high energy demand associated with alumina and aluminium processing. **If Indonesia's aluminium smelters reach the planned capacity, the industry would need north of 190 TWh of electricity for smelting alone** (Al Circle, 2026b). Meeting this multi-hundred TWh gap in power demand would likely be achieved by expanding large-scale captive coal-fired power plants, given cost and reliability considerations. Especially with the proposed revision to Presidential Regulation No. 112 Year 2022, exempting captive coal plants for National Strategic Projects from emissions reduction requirements, the potential for another major expansion of captive coal power capacity remains high. **It is also safe to assume that the 9.8 GW of captive coal capacity already identified in Figure 6 is merely the first wave of locked-in fossil fuel infrastructure.**

Recent developments also highlight **how energy availability is becoming a critical bottleneck for industrial expansion**. Tsingshan has reportedly reduced several of its nickel pig iron (NPI) producers in Weda Bay Industrial Park to divert electricity supply towards aluminium production as aluminium prices soared due to the US-Iran conflict (Mining, 2026a). This demonstrates that access to reliable electricity is shaping industrial priorities, and may incentivise further expansion of captive coal use, especially for these vertically integrated industrial players.

Indonesia risks missing the rising tide of green aluminium

Green aluminium is emerging as a major trend in the global aluminium market, driven by tightening carbon-lined trade measures and sustainability-linked pricing mechanisms. The London Metal Exchange (LME) has introduced plans for low-carbon aluminium pricing and requires producers to disclose emissions data to align with carbon border policies such as the European Union's Carbon Border Adjustment Mechanism (CBAM), at a threshold of 8 tonnes carbon dioxide per tonne of aluminium (LME, n.d.a). At the same time, premiums for low-carbon aluminium in Asia have recently risen, reflecting stronger market appetite for cleaner supply chains (S&P Global, 2025).

As market expectations mature, the Aluminium Stewardship Initiative (ASI) has established itself as the premier global sustainability standard for the sector, providing third-party validation of a company's Environmental, Social, and Governance (ESG) performance across the entire value chain. This framework relies on the Performance Standard (PS) for responsible production and the Chain of Custody (CoC) standard for responsible sourcing (ASI, n.d.a).

Although most Indonesian aluminium products are likely to be exported to China, where low-carbon aluminium standards remain relatively limited, developing green aluminium capacity and pursuing global certifications for instance from ASI, could provide a strategic hedge against evolving global market requirements. As carbon disclosure, border adjustment mechanisms, and sustainability-linked procurement become more widespread, producers with lower emissions profiles may be better positioned to capitalise on the green premium.

This momentum is increasingly evident in the domestic landscape, driven by state entities, midstream fabricators, and the massive local footprints of global Chinese giants. State-owned Inalum secured the official ASI Performance Standard certification for its Kuala Tanjung operation to protect its active LME brand listing and target low-carbon export markets (ASI, n.d.b; LME, n.d.b). In the downstream sector, PT Indoaluminium Intikarsa Industri joined ASI to satisfy rigid ESG mandates from automotive and packaging buyers, showing how compliance pressures cascade down to domestic component manufacturers (ASI, n.d.c).

This shift now extends to massive Chinese operations, as seen with Shandong Nanshan Aluminium's local subsidiaries, PT Bintan Alumina Indonesia and PT Bintan Electrolytic Aluminium in the Galang Batang Special Economic Zone in Riau Islands, which officially joined ASI as a production member in 2018 to benchmark its multi-million-ton alumina refining capacity against global ESG standards (ASI, n.d.d; Seetao, 2026). Similarly, China Hongqiao Group, an active global ASI member since 2021, spearheads the landmark PT Well Harvest Winning Alumina Refinery in Ketapang, demonstrating that international traceability standards are crucial for mega-scale Chinese players routing local materials into premium value chains (ASI, n.d.e).

Meanwhile, PT Hua Chin Aluminium Indonesia, a joint venture between joint venture by Huafon Group (ASI member in 2022) and Tsingshan Holding Group, one of the tenants of IMIP located in Morowali, Central Sulawesi is currently pursuing LME approval — a process deeply intertwined with ESG transparency and standards similar to ASI (HCAI, n.d.; ASI; n.d.f). Once obtained, the company would become the second Indonesian producer of high-grade primary aluminium after state-owned Inalum (Al Circle, 2026c).

Several leading aluminium-producing countries are already accelerating the transition towards green aluminium by decarbonising their electricity generation. Since electricity accounts for around 80% of primary aluminium production emissions (RMI, 2025), decarbonising electricity supply has become the primary pathway towards producing green aluminium and meeting rigorous certification standards.

Producers in countries such as Norway and Canada have leveraged hydropower-dominated electricity systems in their aluminium production, resulting in aluminium with a carbon footprint of less than 75% than the global average (Aluminium International Today, 2025; Aluminium International Today, 2026). Other producers in Australia and the United Arab Emirates are increasingly integrating utility-scale solar power into aluminium operations such as the Emirates Global Aluminium and the 1.1 GW solar farm project by Rio Tinto in Australia (IRENA, 2025).

Furthermore, IRENA estimates that renewable electricity could supply more than 90% of the energy required by the aluminium sector in 2050, highlighting that future competitiveness will depend on producers' ability to align with low-carbon value chains rather than solely on access to raw materials (IRENA, 2025). **For Indonesia, whose aluminium expansion is projected to be heavily anchored to coal power, this raises the risk of being left behind in the future low-carbon aluminium market trends.**

Recommendations

Indonesia is presented with a pivotal moment to become an important player in the global aluminium market, but its long-term success depends on whether the expansion is supported by strong governance and transparent planning. These recommendations highlight priority areas to ensure Indonesia's ambition can be achieved:

- **Prevent another wave of captive coal expansion.** Indonesia's ambition in the aluminium sector should be supported by proper early planning. The government should mandate comprehensive energy forecasting during the early development phase, prioritizing grid integration and captive renewable energy (such as hydro and solar) over captive coal power plants.
- **Deploy cost-competitive solar-plus-storage solutions.** The government should prioritise the adoption of captive and grid-connected renewable sources to meet the energy demand from this fast-tracked aluminium supply chain buildout. Unlike remotely-located nickel reserves in Sulawesi and North Maluku, bauxite reserves and aluminium project pipelines are clustered in Kalimantan and the Riau Islands, creating an ideal layout for regional grid integration that can easily tap into adjacent large-scale clean energy projects. Having consistent, year-round solar generation means costly seasonal storage can be avoided, making it technically feasible for solar-plus-storage to serve as a reliable baseload source.
- **Align expansion with resource availability.** Indonesia should ensure the alumina and aluminium project pipelines are developed based on realistic assessments of bauxite reserves and supply. Enforcement of ore production quotas and a long-term aluminium downstreaming strategy should be strengthened to ensure resource security and industrial longevity.
- **Improve inter-agency governance.** The government needs stronger coordination among the Ministry of Industry, MEMR, PLN, and the Ministry of Environment to achieve robust planning, bring transparency to the project pipeline, and better anticipate energy demands.
- **Shift the industrial strategy from volume to value.** Downstreaming should not only focus on increasing capacity but most importantly, ensure the delivery of broader value creation, which entails domestic technological capability and resilience, while balancing environmental and resource pressures.

Methodology

This study utilises comprehensive datasets and publicly available information to map and analyse Indonesia's alumina and aluminium industry developments, associated power generation, and project progress.

Earthwise Institute's Indonesia Power Summary – The Earthwise Institute's Indonesia Power Summary: Part 2 – Captive Coal Projects and Owners serves as the primary dataset for identifying bauxite downstreaming projects in Indonesia and their associated power infrastructure. The database compiles information on project owners, project capacity, power source, project location, and project status up to 31 December 2025. Information is compiled from open-source materials, including company disclosures, government documents, industry reports, news articles, and other publicly available sources. Each entry undergoes a structured manual validation process, where records are reviewed against original references and cross-checked with independent sources where available.

Global Coal Plant Tracker (GCPT) by Global Energy Monitor (GEM) – GEM's Global Coal Plant Tracker (GCPT) January 2026 release is used to verify captive coal-fired power plants associated with Indonesia's bauxite downstreaming projects. The GCPT provides information on coal-fired generating units worldwide with capacities of 30 MW and above, including operating, announced, permitted, under-construction, and retired units. Coal plant information is compiled from government documents, company disclosures, industry reports, news sources, satellite imagery, and local verification, providing an independent reference to validate captive power capacity, project status, and ownership associated with alumina and aluminium developments.

Ministry of Energy and Mineral Resources (MEMR) Geological Agency — Indonesia's bauxite resource and reserve estimates are based on the Neraca Sumber Daya dan Cadangan Mineral, Batubara, dan Panas Bumi Indonesia Tahun 2025 published annually by the Geological Agency's Center for Mineral, Coal, and Geothermal Resources (PSDMBP). The publication compiles the latest national resource and reserve inventory using data from government geological surveys and exploration reports submitted by mining licence holders, with periodic verification and updates to reflect the most recent information available. This study uses the publication as the primary reference for Indonesia's bauxite resource and reserve figures.

CREA analysis and project verification – CREA compiled and validated Indonesia's bauxite downstreaming project inventory by integrating information from the Earthwise dataset, GCPT, and the latest project progress from publicly available sources. In addition, the study reviews Indonesia's domestic policy and regulatory landscape relevant to bauxite downstreaming, industrial development, captive coal power to assess the policy environment shaping the sector. The analysis also evaluates global market developments and trade measures such as the carbon pricing mechanisms and green aluminium standards that may affect Indonesia's aluminium industry.

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Appendix

Appendix A1. Key SGA and CGA producers in Indonesia

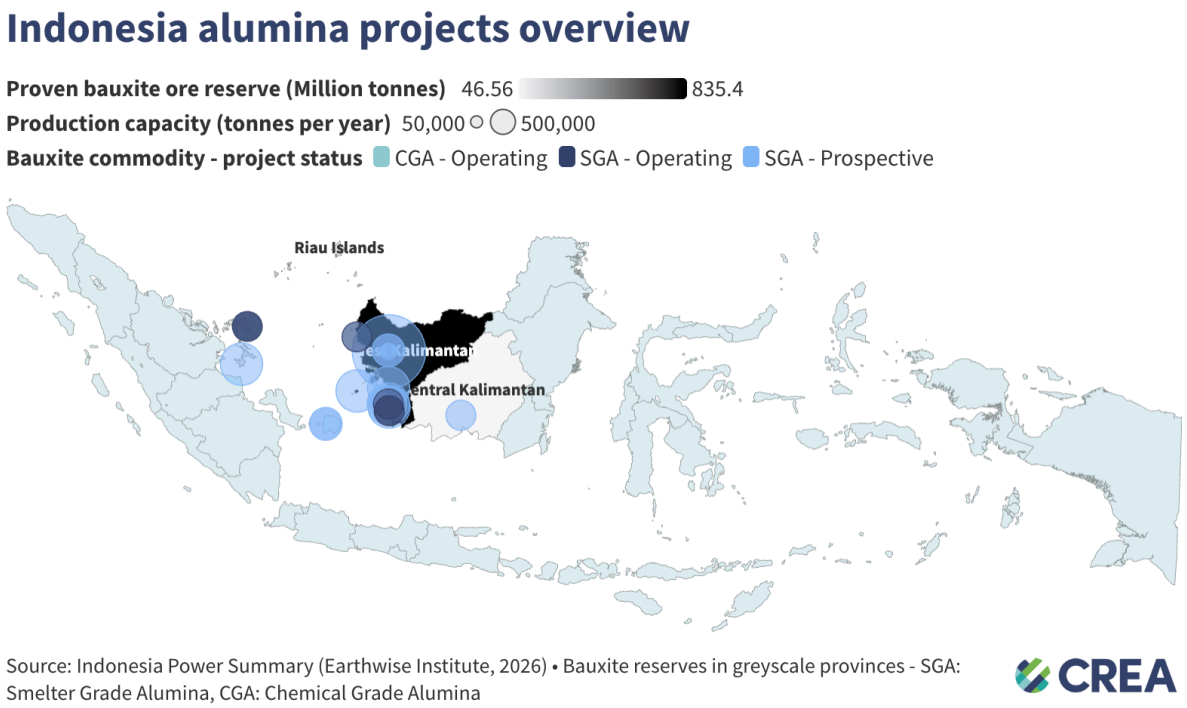

Figure A1 — Distribution map of Indonesia's operational and prospective alumina production facilities

Indonesia's Smelter-Grade Alumina (SGA) and Chemical-Grade Alumina (CGA) production capacities are heavily clustered around key bauxite-rich provinces. Operational and prospective facilities are primarily concentrated across West Kalimantan, Central Kalimantan, and the Riau Islands, aligning directly with the country's domestic bauxite reserves.

One of the biggest smelter-grade alumina producers currently operating is **PT Borneo Alumindo Prima (BAP)**. BAP is currently phasing out the operation of a smelter-grade alumina (SGA) refinery in Ketapang Industrial Estate, West Kalimantan. It is owned by Well Full Investments Ltd, along with HC-Asia Pacific Holdings Pte Ltd. and Top Celestial Holdings Pte Ltd., both of which are subsidiaries of Hangzhou Jinjiang Group Ltd (Petromindo, 2026). The project is planned to have a total capacity of 6 million tonnes per annum (Mtpa) of SGA (Bloomberg Technoz, 2026e), with approximately 1 Mtpa of capacity

currently operating from 2025. The refinery is powered by the Jinjiang captive coal power plant in West Kalimantan, with an operating power demand of approximately 87.8 MW.

Similarly, **PT Bintan Alumina Indonesia** is another major player located in Galang Batang Special Economic Zone (SEZ), Bintan, Riau Islands, with a total capacity of 2 million tonnes of SGA in operation. PT Bintan Alumina Indonesia is owned by Global Aluminium International Pte Ltd (GAI) and PT Mahkota Karya Utama (Kompasiana, 2022). GAI is an indirect subsidiary of Nanshan Aluminium International Holdings Limited. The company is undergoing a significant expansion, adding 2 Mtpa of SGA capacity in 2026. Existing operations are supported by a 160 MW captive coal-fired power plant, while future expansion plans have reportedly powered through grid supplied by PLN alongside the plan to install solar panels for future energy demand (CE, 2025).

Well Harvest Winning Alumina Refinery, a joint venture of Hongqiao Group Co. Ltd, PT Cita Mineral Investindo Tbk (Harita Group), Winning Investment (HK) Company Limited, and Shandong Weiqiao Aluminium & Electricity (WHW Alumina, n.d.), began operations in 2016 with a capacity of 1 Mtpa of SGA and later expanded to 2 Mtpa in capacity by 2021. Well Harvest Winning Alumina Refinery is located in Ketapang, West Kalimantan and is powered by 240 MW of captive coal power plant.

In Mempawah, **PT Borneo Alumina Indonesia** has been operating since 2025 with output capacity of 1 Mtpa of SGA, powered by a 75MW capacity of captive coal power. The company is a joint venture between PT Inalum and PT Antam, integrating PT Antam's bauxite mining upstream and refinery by PT Inalum downstream. A second phase of the operation is already planned, adding an additional 1 Mtpa of SGA capacity. The refinery is powered by 75 MW of captive coal power plant.

Currently**, PT Indonesia Chemical Alumina** is the only producer for chemical-grade alumina (CGA) in Indonesia. Beginning operations in 2013 in Sanggau, West Kalimantan, Indonesia Chemical Alumina has 300,000 tonnes per annum in CGA production capacity. ANTAM, as its majority shareholder, also supplies bauxite ore mined from Tayan bauxite mine as its primary feedstock.

Indonesia's downstream alumina pipeline continues to expand rapidly across West Kalimantan, the Riau Islands, Central Kalimantan, and Bangka Belitung.

Major developments include the 6 Mtpa capacity by **PT Westerfield Alumina Indonesia**, owned by the Chinese conglomerate East Hope Group, in Pontianak. In Pulau Penebang industrial area, West Kalimantan, **Shandong Innovation Group** is constructing a 2 Mtpa SGA capacity which is scheduled to finish by the end of 2026. Alongside this, **PT Dharma**

Inti Bersama, a subsidiary of Harita Group, is developing a 2 Mtpa refinery in the same industrial cluster aimed to operate by 2027**. PT Kalimantan Alumina Nusantara**, a joint venture of Press Metal Aluminium Holdings Berhad (Malaysia), PT Alakasa Alumina Refinery, and PT Dinamika Sejahtera Mandiri is developing a 1.2 Mtpa refinery in West Kalimantan for the first phase, with another 1.2 Mtpa capacity planned in the future to supply alumina into its announced 100 tmtpa aluminium smelter.

PT Tianshan Alumina Indonesia is commencing a 2 Mtpa capacity SGA project in Lingga, Riau, through long term investment worth USD 1.6 billion. Additionally, Aluminium Bahrain B.S.C. is conducting a feasibility study for a 2.4 Mtpa alumina capacity in Bangka Belitung under **PT Green Indonesia Alumina**.

Several additional alumina refinery projects have also been announced as part of Indonesia's bauxite downstreaming pipeline, such as **PT Progressive Indonesia Alumina**, established by China's Sichuan Tianfu Xinchuang Group has also announced plans to develop a 1 Mtpa refinery in Central Kalimantan, with investments of over USD 540 million.

A number of planned alumina refinery projects in Indonesia were shelved or stalled. Projects owned by PT Quality Sukses Sejahtera, PT Dinamika Sejahtera Mandiri, PT Parenggean Makmur Sejahtera, PT Persada Pratama Cemerlang, PT Sumber Bumi Marau, PT Laman Mining, PT Kalbar Bumi Perkasa, PT Shaanxi Youser, and Bosai Minerals Group Alumina Project have experienced significant delays or suspension, primarily due to financing and regulatory constraints (Indonesia Business Post, 2023b).

Appendix A2. Key primary aluminium producers in Indonesia

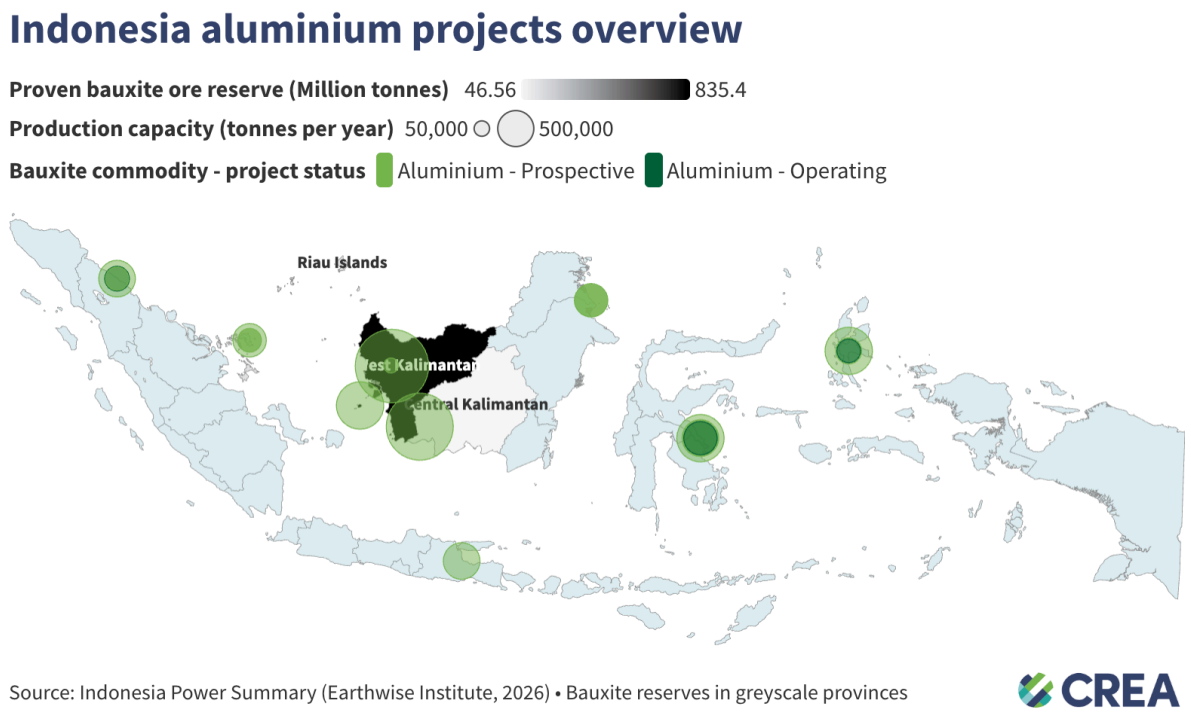

Figure A2 — Distribution map of Indonesia's operational and prospective primary aluminium smelting facilities

Indonesia's primary aluminium smelting infrastructure spans several key geographic corridors, bridging established operations with major upcoming industrial zones. The map highlights that while long-standing production has historically been anchored in North Sumatra, the current operational expansion and robust pipeline of prospective projects are increasingly clustering around the bauxite-rich and heavily industrialised regions of Kalimantan, Central Sulawesi, the Riau Islands, and North Maluku.

There are three aluminium smelters currently operating in Indonesia. The oldest one is **PT Indonesia Asahan Aluminium (Inalum)** which has been operating since 1976 in Kuala Tanjung, North Sumatra. Inalum is fully owned by the Indonesian government through the state-owned mining holding company MIND ID. Inalum's current aluminium capacity of 275 thousand tonnes per annum (tpa) is powered by the Siguragura Hydropower Plant with the capacity of 286 MW and the Tangga Hydropower Plant of 317 MW. Several expansion projects have been announced with 245 thousand tpa additional capacity planned to be added by 2031 in Kuala Tanjung (Warta Ekonomi, 2025), and another 600

thousand tpa smelter in Mempawah by 2028. To support the Mempawah expansion, PT Bukit Asam (PTBA) is reportedly developing a 1.25 GW captive coal-fired power plant (Bloomberg Technoz, 2026d).

PT Hua Chin Aluminium Indonesia in Indonesia Morowali Industrial Park (IMIP) in Central Sulawesi, has been operating a 500 thousand tpa aluminium smelter since 2024, powered by a 760 MW captive coal power plant. PT Hua Chin Aluminium Indonesia is a joint venture between Huafon Group Co., Ltd., and Tsingshan Holding Group Co., Ltd. Petromindo (2025) reported that the aluminium produced from this smelter is directly exported to China as part of the company's operational model. The company has also announced a 1 million tonne per annum expansion of its smelter.

PT Kalimantan Aluminium Industry is owned by **PT Alamtri Resources Indonesia Tbk (AlamTri)** in partnership with Harita Group and Chinese nickel producer, Lygend, has started a phase operation of its aluminium smelter in Kalimantan Industrial Park Indonesia (KIPI), North Kalimantan. The first phase is operating at 500 thousand tpa capacity, and it is planned to ramp up to full production capacity of 1.5 Mtpa in 2027. The first phase of the project utilised a 1,060 MW of captive coal to power its operation. However, there are plans by PT Alamtri Resources Indonesia to integrate a 1,350 MW of hydropower capacity for the next phase of the project to capitalise on the growing trend of low-carbon aluminium premiums (Alamtri, 2023; S&P Global, 2025).

Lastly, **PT Kemajuan Aluminium Industry** which is located in the Weda Bay Industrial Park, North Maluku, has started operating its 250 thousand tpa aluminium smelter since the end of 2025. The project is a collaboration between Xinfa Group and Tsingshan Group, plans an expansion of 300 thousand tpa in the second phase, and 1 million tonnes in the third phase. The smelter is powered mainly by its 700 MW capacity captive coal plant, supported by a 100 MW diesel power plant, and a 50 MW solar power plant.

In addition to building a 6 Mtpa SGA refinery, **PT Westerfield Alumina Indonesia,** owned by East Hope Group, plans to further integrate its processing capabilities through a 2.4 Mtpa aluminium smelter. Located in Pontianak, West Kalimantan, the project aims to leverage its proximity to port facilities and bauxite mines to establish an efficient, closed-loop aluminium processing system. It is reported to be powered by its own captive power plant but reports suggest PLN's involvement in supporting its power supply (ANTARA Kalbar, 2025).

Similarly, Harita and Weiqiao's **PT Dharma Inti Bersama** is planning an integrated aluminium processing plant alongside its announced 1 Mtpa aluminium smelter in the Pulau Penebang Industrial Zone, with production expected to start in 2027. There is

currently no information on the power source of Dharma Inti Bersama's aluminium plant. However, due to its location on a separate island, it is highly likely that a captive coal power plant will be used to power this project.

China's Liaoning Rongxin Xingye Electric Power Technology Co., Ltd., a subsidiary of Tianjin Benefo Tejing Electric Co. Ltd., is constructing a 600 thousand tpa aluminium project in Indonesia Morowali Industrial Park (IMIP), Central Sulawesi. Reports have highlighted the company's emphasis on continuing building a highly integrated industrial capability in Indonesia. There are currently no reports on the power source of the project, but it is likely that it will utilise existing captive power plant capacity in IMIP.

Nanshan Aluminium Singapore Co Pte Ltd (Nas) and Prime Aluminium International Pte Ltd are planning to expand their investments in Galang Batang SEZ, Riau Islands into an aluminium complex. Through **PT Bintan Electrolytic Aluminium (BEA)**, Nanshan is currently building a 250 thousand tpa aluminium smelting unit, the first phase of a 1 Mtpa aluminium plant by 2028. It is reported to share the power generation capacity from its feedstock refinery, PT Bintan Alumina Indonesia, using a captive coal power plant, grid power, and solar capacity for supporting activities.

Lastly, the **CMOC Group Aluminium Project**, owned by Cathay Fortune and CATL, has announced the development of a 2 Mtpa aluminium smelter in Central Kalimantan.