

PROCESSING POWER:

HOW INDONESIA USED INDUSTRIAL POLICY TO MOVE UP THE GLOBAL NICKEL VALUE CHAIN



In little over a decade, Indonesia has transitioned from being a major exporter of raw nickel ore into a leading producer of higher-value, refined nickel products. Through a state-led industrial downstreaming policy known as *hilirisasi* - which includes a comprehensive ban on the export of unprocessed nickel ore - the country has rapidly attracted foreign direct investment (FDI), massively increased export earnings, and created new jobs and industries, becoming a commanding player in the critical minerals market and global energy transition. However, evidence increasingly suggests that the policy may have less impact on long-term industrial development and new domestic capabilities than its advocates claim, and has created significant economic, structural, social, and environmental challenges that remain unresolved.

This case study explores the key factors behind the industrial transformation of Indonesia's nickel sector and their implications for other resource-rich countries.

INDONESIA'S NICKEL BOOM

Indonesia is home to the world's largest nickel reserves, estimated in 2026 to hold around 62 million metric tons or approximately 44% of the global total.¹ While these abundant natural resources have long been a source of income, their full value had not been captured. By primarily exporting raw nickel ore - rather than processing and smelting it into higher-value export commodities - Indonesia had not fully leveraged the benefits of domestic production.

To encourage the development of local processing facilities, attract FDI into domestic infrastructure, and generate higher economic value from its nickel exports, starting from 2019 the Indonesian government progressively banned the export of raw nickel ore. In January 2020, two years ahead of the original deadline, then-President Joko Widodo decreed that all Indonesian nickel must be processed domestically into finished, higher-value goods before being exported. Since then, Indonesia has focused on processing raw nickel ore to produce two main higher-value commodities: ferronickel and nickel pig iron (NPI), used to produce stainless steel, and Mixed Hydroxide Precipitate (MHP), used for rechargeable electric vehicle (EV) batteries.

This bold downstreaming strategy has catalysed an unprecedented expansion in Indonesia's nickel processing capacity. In the five years since the ban, dozens of nickel smelters and processing facilities have been built across the country, creating tens of thousands of

jobs, while tax revenues from the downstream nickel industry have increased tenfold. By 2024, Indonesia produced over 60% of global refined nickel, influencing international supply chains and pricing dynamics and reinforcing its strategic position in the global critical minerals market.² Exports of processed nickel products surged from \$5.8 billion in 2020 to \$22 billion in 2023, improving the country's trade balance and helping it move from lower to upper-middle income status by 2023.³ By capturing a larger share of the global supply chain for intermediate products, including stainless steel and EV batteries, Indonesia has diversified its economic foundation away from fossil fuels and developed specialised technical expertise in a key sector for the global clean energy transition.

POLICY QUESTIONS FOR CONSIDERATION

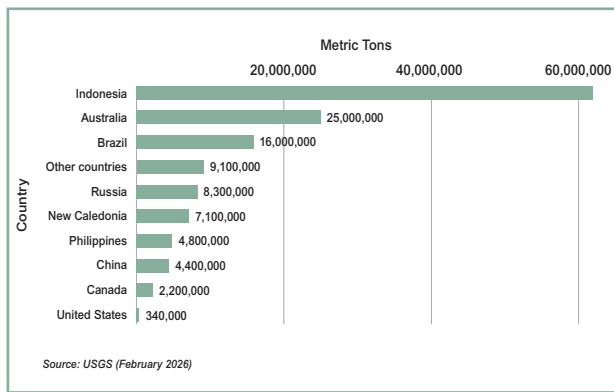
- What is the priority industrial policy measure in your country? Is there a case for greater strategic state intervention in this area?
- What would be the major national and international political and economic constraints to pursuing this policy? How could they be overcome?
- How could your country's government ensure that foreign investment in strategic sectors eventually leads to greater domestic ownership, capabilities, or control?
- How would you assess the relevant trade-offs involved in a policy like this and what might tip the balance one way or another in decision making?

¹ "The World Nickel Factbook 2024" International Nickel Study Group

² Oakes, N. (10 July 2025) "Indonesia's Nickel Nationalism: Sustainability, Sovereignty, and Strategic Industrialisation" *Modern Diplomacy*

³ U.S. Geological Survey (USGS) "USGS Minerals Yearbook: Indonesia 2022" and "USGS Minerals Yearbook: Indonesia 2023"; Warbuton, E. (20 August 2024) "Looking Back at Jokowi's Decade of Resource Nationalism" *The Interpreter*

Chart 1: Distribution of World Nickel Reserves



“NICKEL NATIONALISM”: FROM ORE EXPORTS TO INDUSTRIAL STRATEGY

Indonesia’s nickel boom resulted from a series of coordinated industrial policy decisions taken by the State which brought about a structural shift from enclave extraction toward more integrated industrial development. Following the 1997 Asian financial crisis and the fall of President Suharto in 1998, Indonesia transitioned from authoritarianism to decentralised democracy. This created the conditions for resource nationalism and domestic industrialisation to take hold, driven by competitive electoral politics in which anti-foreign narratives became powerful tools for building popular legitimacy and the rise of a domestic business class with the capital and ambition to take over foreign-dominated extractive industries. There was growing consensus in Indonesia that it was not receiving sufficient benefit from mineral extraction and its heavy dependence on raw commodities was reducing its fiscal stability and keeping it at the bottom of the global value chain.

Drawing on the competitive advantage offered by its vast natural resources, by 2009, the Government had introduced a Mining Law requiring companies to process ore locally before exporting it. This set the stage for a long-term policy shift: after taking office in 2014, then-President Joko Widodo enacted the law through a series of regulations prohibiting the export of over 200 types of mineral ore, including nickel. Companies were only able to export concentrates associated with nickel if they met specific requirements including paying prohibitive export taxes and building smelters in Indonesia.⁴ The objective was to stimulate the creation and scaling up of local smelting and refining operations, thereby enhancing the domestic value captured from Indonesia’s mineral endowments.

The ban faced resistance from foreign-owned firms and from domestic mining companies concerned about short-term revenue losses and the substantial capital required to build processing facilities. The Indonesian Mineral Entrepreneurs Association warned it would “kill” the national mining industry, allowing international miners to build smelters “after looting [Indonesia’s] natural resources and enjoying especially low royalties for decades.”⁵

By 2017, following a sharp drop in nickel production, a budget deficit, and insufficient domestic processing capacity to absorb all ore production due to delays in construction of new smelters, the government temporarily relaxed the ban, permitting limited exports of low-grade ore subject to conditions including a commitment to build domestic smelters within five years.⁶

On 1 January 2020, two years early, the full ban was reintroduced, meaning all nickel had to be processed domestically before being exported as a higher-value commodity.⁷ This strategic decision aimed to expand domestic participation in nickel extraction and processing and accelerate the development of the country’s downstream industry. As a cornerstone of the country’s long-term industrial development strategy, it also aimed to position Indonesia as a key node in the lucrative and growing global EV battery supply chain.

SUCCESS FACTORS AND IMPLICATIONS FOR OTHER COUNTRIES

With many countries frustrated by their dependence on exports of unprocessed primary commodities and seeking, often in face of powerful arguments to the contrary, to find ways to capture more value domestically, Indonesia’s experience with nickel processing is of wide interest. This section explores the factors that enabled Indonesia’s acceleration up the nickel value chain:



Maximising an enabling environment

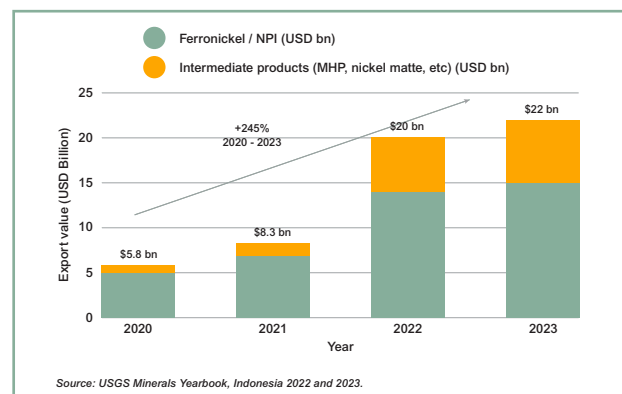
Indonesia’s nickel boom is the result of several unique advantages and favourable external factors not easily replicated elsewhere, combined with deliberate policy choices, diplomatic strategy, and strategic timing.

First, Indonesia’s unrivalled reserves of high-quality nickel provided the State with powerful leverage, allowing it to assert strategic control over its resources and extend its resource nationalism policy within the nickel sector. The importance of market dominance in nickel is highlighted by the contrasting outcome of Indonesia’s bauxite export ban. With less than 5% of global bauxite reserves, the State lacked the same leverage. With significantly less incentive to invest in Indonesia, international buyers shifted to alternative suppliers, causing a 33% decline in the export value of bauxite-containing products.⁸

Second, the State’s geopolitical acumen allowed it to align its downstream agenda with China’s overseas industrial expansion, including under the Belt and Road Initiative (BRI). While BRI-linked investment had flowed into Indonesia since 2013, the 2020 nickel export ban made Chinese investment in Indonesian processing not merely attractive, but essential. To ensure continued access, large-scale Chinese investment subsequently streamed into the sector, often supported by development finance and state-backed financing channels.

Third, while the origin of Indonesia’s policy was domestic, it coincided with favourable global market conditions. Sustained growth in global stainless steel production and rising international focus on green energy generated a massive and growing need for nickel, a vital component in the EV batteries needed for cleaner transportation. From 2020, this was accelerated by the green recovery stimulus measures introduced by the European Union, US, and China during the Covid-19 pandemic. This strengthened the strategic and commercial case for domestic processing and reinforced the incentives for foreign investment.

Chart 2: Indonesia's Processed Nickel Revenues (2020 – 2023)



⁴ Guberman, D., Schreiber, S. & Perry, A. (2024) “Export Restrictions on Minerals and Metals: Indonesia’s Export Ban of Nickel” Office of Industry and Competitiveness Analysis, United States International Trade Commission

⁵ Reuters (6 December 2013) “Indonesia ore export ban will kill off domestic mining”

⁶ Bland, B. & Sanderson, H. (13 January 2017) “Indonesia Eases Ban on Mineral Exports” *The Financial Times*

⁷ *The Jakarta Post* (2 September 2009) “Indonesia to ban nickel exports from January 2020”

⁸ Bosker, M., Van Den Herik, E., Pelzl, P., & Poelhekke, S. (November 2025) “The (un)intended consequences of export restrictions” Centre for Economic Policy Research



Strategic state intervention

State activism via export restrictions, industrial policy, and regulatory tools was crucial in driving Indonesia’s downstreaming. Through a coordinated mix of resource nationalist policies, the government shaped the nickel sector assertively and intentionally. Despite initial resistance from industry, the policy succeeded because it compelled mining companies to invest in domestic processing via smelters and refineries, increasing value capture within the national economy.

This dynamic was made possible by Indonesia’s dominant position in global nickel supply, which limited alternative sources for investors. The expansion of domestic processing capacity lowered local nickel ore prices, creating additional incentives for downstream industrial development.

In addition to export bans and processing and refining requirements, the government conducted a review of the nickel value chain to identify Indonesia’s competitive advantages within the sector.

This guided a targeted strategy to localise the sector via partnerships with state-owned and domestic private enterprises.⁹ The government moved its mining company shares into a state-owned holding company, MIND ID, which became a major shareholder in Indonesia’s largest mining entities, including Freeport Indonesia and Vale Indonesia, in which the State purchased a 20% stake.¹⁰ The government also established the Indonesia Battery Corporation (IBC), a joint venture between four state-owned enterprises, to develop an EV ecosystem focusing on nickel-based battery production.

The State’s willingness to actively manage the sector was further demonstrated when it accelerated the timeline of the export ban, forcing faster investment in domestic processing and securing Indonesia’s position in global nickel supply chains while its leverage was at its peak. The rapid proliferation of smelter licences, driven partly by politically connected domestic business groups, had meanwhile raised separate concerns about the long-term sustainability of ore supply relative to growing processing capacity. Structural economic vulnerabilities, dependence on raw commodity exports, and intensifying global competition for critical minerals created additional pressure for decisive action. By moving early, Indonesia leveraged its nickel endowment to build domestic processing capacity and move from raw ore exporter to a central player in the emerging clean energy economy.

The government’s downstreaming strategy was reinforced by Indonesia’s business tycoons, whose economic stakes in the nickel sector aligned with domestic processing goals. Over half of the country’s 50 richest billionaires have investments linked to nickel, and several prominent business magnates have served as cabinet ministers.¹¹ These elites played a key role in partnering with foreign investors, particularly Chinese firms such as Tsingshan Holding Group, to finance and construct smelters and industrial parks.



Stimulating foreign investment and linkage development

Incentivising investment from foreign companies and developing strategic partnerships with lead firms in the global value chain have been crucial to the success of Indonesia’s nickel downstreaming project. To attract investors, the government introduced extensive fiscal incentives including tax holidays of up to 20 years, VAT and import duty exemptions, and Research and Development (R&D) tax deductions. Concurrently, the export ban itself reshaped market

incentives by forcing nickel ore to be sold domestically, lowering local ore prices relative to international markets, and improving the commercial viability of domestic processing. Energy subsidies further reduced production costs for nickel processing firms. Combined with non-fiscal incentives including simplified permit procedures, tailored labour regulations, and land-use policies adapted to investors’ needs, Indonesia has offered a stable investment environment for nickel firms.¹² This has attracted billions of dollars of FDI, particularly from China, the world’s largest EV producer. In 2023, Indonesia was also the largest recipient of investments from China’s BRI, with most of the \$7.3 billion received channelled into Indonesia’s nickel.¹³

Through these partnerships, large-scale, vertically integrated nickel processing facilities have been built, establishing the domestic infrastructure to process nickel ore at scale. These include Weda Bay Industrial Park in North Maluku, eastern Indonesia, and the Morowali Industrial Park (IMIP) in Central Sulawesi province. The largest of its type in the world, IMIP hosts more than 50 partner companies; employs 90,000 people;¹⁴ and received \$8 billion in investments by 2023.¹⁵

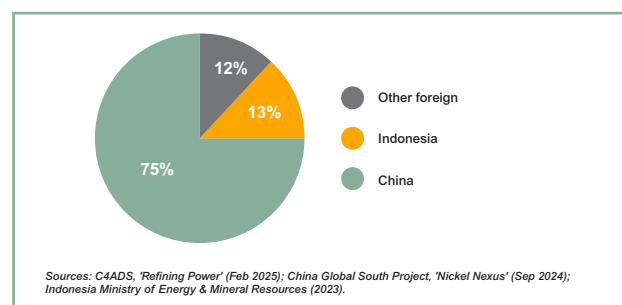
These industrial parks have been central in enabling the technology transfer required to establish the advanced facilities and techniques needed for high-value processed nickel products. Integrating mining, smelting, and manufacturing, they create a self-reinforcing industrial ecosystem and integrated value chain, connecting upstream mining to downstream processing; creating further downstream linkages to stainless steel and EV battery production; and providing backward and horizontal linkages through power plants, transport infrastructure, and local services. This vertical integration helps secure supply chains, ensure quality control, optimise costs, and enable economies of scale.



Creating a compelling narrative

Indonesia’s nickel ban initially faced widespread opposition from domestic mining companies concerned about short-term revenue and job losses and the costs of investing in smelters and refineries. Serikat Pekerja Nasional, Indonesia’s union of miners, launched protests and called for workers to “swarm the presidential palace if the government goes ahead.”¹⁶

Chart 3: Beneficial Ownership of Nickel Refining Capacity in Indonesia (2023)¹⁷



While the government responded via gradually implemented policy measures, including phased enforcement and partial relaxations, it also allayed concerns through the deliberate use of narrative strategy. It communicated downstreaming as *nilai tambah*,¹⁸ or value adding, a strategic response to the global energy transition that would develop domestic industrialisation, generate jobs, and accelerate long-term economic growth.

⁹ African Development Bank (2025) “Advancing from Nickel Mining to Downstream Processing: Lessons Learned from the Indonesian Experience”

¹⁰ Kim, K. “Indonesia’s Resource-Based Industrialization: Achievements and Challenges” *Global Asia*, Vol. 19, No. 2, June 2024

¹¹ Wijaya, T. & Jones, L. (26 February 2025) “Indonesia, nickel, and the political economy of polyalignment in the Second Cold War” *Third World Quarterly*

¹² Syarif, A. (18 February 2025) “The Nickel-based Industrial Paradox: Indonesian Resources, Chinese Profits” *The Diplomat*

¹³ Lee, K. & Kamiya, M. (4 March 2025) “Indonesia’s Incomplete Industrial Strategy” *Project Syndicate*

¹⁴ “Indonesia Morowali Industrial Park (IMIP)” *Nickel Industries*

¹⁵ Tritto, A. (11 April 2023) “How Indonesia Used Chinese Industrial Investments to Turn Nickel into the New Gold” *Carnegie Endowment for International Peace*

¹⁶ Reuters (12 January 2014) “Indonesia bans mineral ore exports, all eyes on nickel impact”

¹⁷ Figures on China include facilities with varying ownership structures: some involve Indonesian minority stakes through joint ventures (notably IMIP, the largest facility, where Indonesian partners hold ~50%), but Chinese entities hold majority control in virtually all cases

¹⁸ Warburton, E. “Nationalist enclaves: Industrialising the critical mineral boom in Indonesia” in *The Extractive Industries and Society*, Vol. 20, 2024, 101564

The State also emphasised local ownership, framing the policy as a matter of national pride and economic sovereignty. “We want the wealth that exists in this country to be managed and used [...] for the benefit of the people. We have therefore taken back our assets [...], which for decades have benefited foreign parties,” stated President Widodo.¹⁹ Nickel downstreaming was also billed as central to the government’s larger ‘Golden Vision’ of transforming Indonesia into a high-income country by 2045, when it will celebrate 100 years of independence.

The Covid-19 pandemic, which began just two months after the ban was introduced, and the resultant global economic crisis, reinforced the government’s narrative on supply chain resilience and domestic industrial capacity.

TOWARDS A SUSTAINABLE FUTURE?

Indonesia’s resource-based industrialisation has demonstrated the power of assertive state-led upgrading but has come with significant trade-offs. While *hilirisasi* successfully relocated nickel processing to Indonesia, Chinese firms still control more than three-quarters of Indonesia’s nickel capacity and two early investors, Tsingshan Holding Group and Jiangsu Delong Nickel Industry Co Ltd., together account for more than 70%.²¹ While some joint ownership and skills development have occurred, Indonesia did not attach sufficiently strong conditions to these investments to ensure meaningful technology transfer and the development of genuinely independent domestic industrial capacity. With profits concentrated among foreign firms and political elites, the industry instead resembles the extractive enclaves that resource nationalism originally sought to overcome. The long-term fiscal picture also remains uncertain: while export revenues have surged, most foreign processing facilities benefit from 20-year tax exemptions, raising questions about whether these gains translate into durable revenues for the Indonesian state.²²

Heavy reliance on China also creates strategic vulnerabilities amid intensifying global competition for critical minerals and the US-China rivalry. In response, the government is seeking to diversify its market, deepening ties with US, South Korean, Japanese, and European firms. In February 2026, Indonesia formalised a critical minerals trade framework with the US, reflecting both Indonesia’s strategic push to leverage its nickel resources and Washington’s interest in securing diversified supply chains.²³ In November 2025, the government also introduced new restrictions for smelters that only produce intermediate products, reflecting an ongoing shift toward deeper downstreaming.²⁴

Indonesia’s rapid expansion of nickel extraction and processing has meanwhile generated substantial socio-environmental costs. Paradoxically, while nickel is a key component in EV batteries essential for the global clean energy transition, nickel processing is itself highly energy intensive: by 2023, nickel smelting alone generated 170.2 million tons of greenhouse gas emissions.²⁵ Mining expansion has caused deforestation, land degradation, water pollution, health impacts, and displacement.

Recognising these impacts undermined Indonesia’s competitiveness in the green economy, in June 2025 Indonesia’s national planning ministry, Bappenas, launched a National Nickel Industry Decarbonisation Roadmap aimed at reducing carbon emissions by 81% by 2045.²⁶ Indonesia’s challenge now is whether it can align industrial upgrading with environmental sustainability and inclusive development, potentially offering a model for other resource-rich countries.

THE MIXED SUCCESS OF EXPORT BANS

Although mineral export restrictions are becoming more popular as a domestic industrialisation policy tool, they are an extreme measure. Their success varies depending on factors such as a country’s share of global supply and resulting market leverage; the structure of downstream value chains; and the strength of global demand, which affect investor confidence and the economic feasibility of local processing. These help determine whether a ban spurs domestic industrialisation or simply diverts trade and investment elsewhere.

Despite its nickel success, Indonesia’s 2014 export ban produced uneven results for other minerals. With bauxite, where Indonesia holds less than 5% of global reserves, the ban led to a dramatic fall in production, job losses, and the diversion of foreign investment - particularly from China - to alternative suppliers. With copper, stringent downstream requirements generated regulatory uncertainty that led to economic losses.²⁰

Export bans also carry risk of international trade disputes. The EU launched a legal case against Indonesia in response to its nickel ban, arguing it violated World Trade Organisation (WTO) rules prohibiting quantitative export restrictions. The WTO ruled in the EU’s favour in 2022, a decision Indonesia appealed; as of January 2026, the dispute remained unresolved. Paradoxically, the WTO’s protracted dispute process effectively allowed Indonesia to maintain its ban and secure domestic downstream investment regardless, illustrating how export bans can achieve domestic objectives while also generating trade tensions.

Resource-rich countries considering export bans should assess market conditions, ensure any policy is part of a clear development strategy, and consider whether alternative instruments (export quotas, export taxes, targeted subsidies etc.) could achieve similar objectives while maintaining revenue flows and trade relationships.

FURTHER READING

- African Development Bank (2025) “[Advancing from Nickel Mining to Downstream Processing: Lessons Learned from the Indonesian Experience](#)”
- Gray, R. & Nguyen, D.M.N (2025) “[Indonesian Industrialization: Downstreaming Up the Value Chain](#)” Center for Strategic and International Studies (CSIS)
- Lo, G.Y.M., Supitana, J. & Struebig, M. (16 January 2025) “[Weighing the green cost: How nickel mining in Indonesia impacts forests and local communities](#)” *The Conversation*

ABOUT SOAS DEVELOPMENT LEADERSHIP DIALOGUE

Economic and social development requires many actors: however, typically these have operated in separate spheres, not understanding each other well and even seeing each other as adversaries. In a world characterised by profound changes and heightened uncertainties, overcoming this ‘silo-isation’ and the lack of mutual understanding it leads to is ever more important. DLD brings people and disciplines together to generate more creative and strategic solutions to difficult development challenges. DLD is generously supported by Hyundai Motor Group UK Ltd. and Kia UK Ltd.

April 2026

¹⁹ Widodo, J. (2024) “[State of the Nation Address](#)”

²⁰ African Development Bank (2025) “[Advancing from Nickel Mining to Downstream Processing: Lessons Learned from the Indonesian Experience](#)”

²¹ Reuters (5 February 2025) “[Chinese firms control around 75% of Indonesian nickel capacity, report finds](#)”

²² Syarif, A. (18 February 2025) “[The Nickel-based Industrial Paradox: Indonesian Resources, Chinese Profits](#)” *The Diplomat*

²³ Jakarta Globe (21 February 2026) “[Indonesia, US, Sign Major Deal on Energy, Critical Minerals](#)”

²⁴ Karyza, D. (16 November 2025) “[Existing investors demand exemptions from nickel smelter restrictions](#)” *The Jakarta Post*

²⁵ Rahmaditio, R., & Wang, K. (October 2024) “[Nickel’s Climate Cost and Indonesia’s Push for Cleaner Production](#)” World Resources Institute

²⁶ World Resources Institute (June 2025) “[The Ministry of National Development Planning \(PPN\)/Bappenas and WRI Indonesia Ensure Integration of Nickel Industry Decarbonization for Low-Carbon Development](#)”