Minerals-Based Industrial Policies in a Fragmenting World: Lessons from Indonesia and Australia

By Madeline Craig-Scheckman[1]

Introduction

As the global economy and geopolitical landscape are increasingly defined by fragmentation, investment and infrastructure around critical resources are in turn becoming defined by great power competition.[2] Industrial policy is resurging as a key way in which states capitalize on resources for emerging technology trends and security needs, especially relating to the renewable energy sector.[3] Industrial policy refers to government actions that intervene in the economy to achieve national goals that markets would not accomplish independently.[4] On one hand, success stories like South Korea, Taiwan, Japan, and China have inspired other low and middle-income countries to pursue industrial policy as a development strategy.[5] On the other hand, China's emerging dominance of supply chains across technologies, from defense to the energy transition, has catalyzed a "derisking" trend in Western countries that now seek to onshore and friendshore across the supply chain in order to rebuild the manufacturing base.[6] Furthermore, the fourth industrial revolution,[7] which encompasses the energy transition, electrification, and AI, is expanding the scope and scale of critical mineral demand.[8] Mineral exporters see an opportunity to capitalize on increased trade potential and new technological frontiers.

Mineral-based industrial policies are transforming the global resource economy across global supply chains. Industrial policies aimed at increasing production are redefining

[1] Madeline Craig-Scheckman is a Fellow in Financing the Energy Transition at the Jain Family Institute and a PhD candidate in Public Policy at Northeastern University.
[2] Seth Schindler and Jessica DiCarlo (Eds.), The Rise of the Infrastructure State: How US–China Rivalry Shapes Politics and Place Worldwide (1st ed.). Bristol University Press (2022). https://doi.org/10.2307/j.ctv2x00vzq
[3] Karl Aiginger and Dani Rodrik, "Rebirth of Industrial Policy and an Agenda for the Twenty-First Century," Journal of Industry, Competition and Trade 20, 189–207 (2020). https://doi.org/10.1007/s10842-019-00322-3
[4] Ken Warwick, "Beyond Industrial Policy: Emerging Issues and New Trends", OECD Science, Technology and Industry Policy Papers No. 2, OECD Publishing, Paris (2013). http://dx.doi.org/10.1787/5k4869clw0xp-en
[5] Bentley Allan and Jonas Nahm, "Strategies of Green Industrial Policy: How States Position Firms in Global Supply Chains," American Political Science Review 119(1): 420–434 (2025). doi:10.1017/S0003055424000364
[6] Aiginger and Rodrik, 2020.
[7] Klaus Schwab, "The Fourth Industrial Revolution," World Economic Forum, 2016. https://www.weforum.org/stories/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/
[8] Bobba, S., Carrara, S., Huisman, J. (co-lead), Mathieux, F., Pavel, C. (co-lead). Critical Raw Materials for Strategic Technologies and Sectors in the EU: A Foresight Study. European Commission, 2020. https://rmis.jrc.ec.europa.eu/uploads/CRMs_for_Strategic_Technologies_and_Sectors_in_the_EU_2020.pdf

the upstream segment, where extraction takes place. Globally, top producers of minerals have increased production significantly in the past two decades (Figure 1). The upstream segment of mineral extraction is tied to specific geographic locations, where the mineral deposits are located and accessed; therefore, most mineral-based industrial policies around the upstream segment are being implemented in mineral-rich countries. The midstream segment refers to processing the raw materials into specific mineral products such as refined nickel, cobalt, or battery-grade lithium. The downstream segment refers to the manufacturing of mineral-based products, such as lithium-ion batteries and permanent magnets. While there are challenges around transportation across large distances, for the most part, the midstream and downstream segments of the supply chain are less reliant on mineral deposit locations. Therefore, nations around the world, even non-mineral-rich countries, are implementing midstream and downstream mineral-based industrial policies. Examples of this include friendshoring and developing trade partnerships with the goals of building industrial capacity for mineral processing and mineral-based technology manufacturing. However, many mineral-rich countries are also pursuing mineral-based industrial policies beyond the upstream segment, with the goal of creating increasingly vertically integrated supply chains within the state.

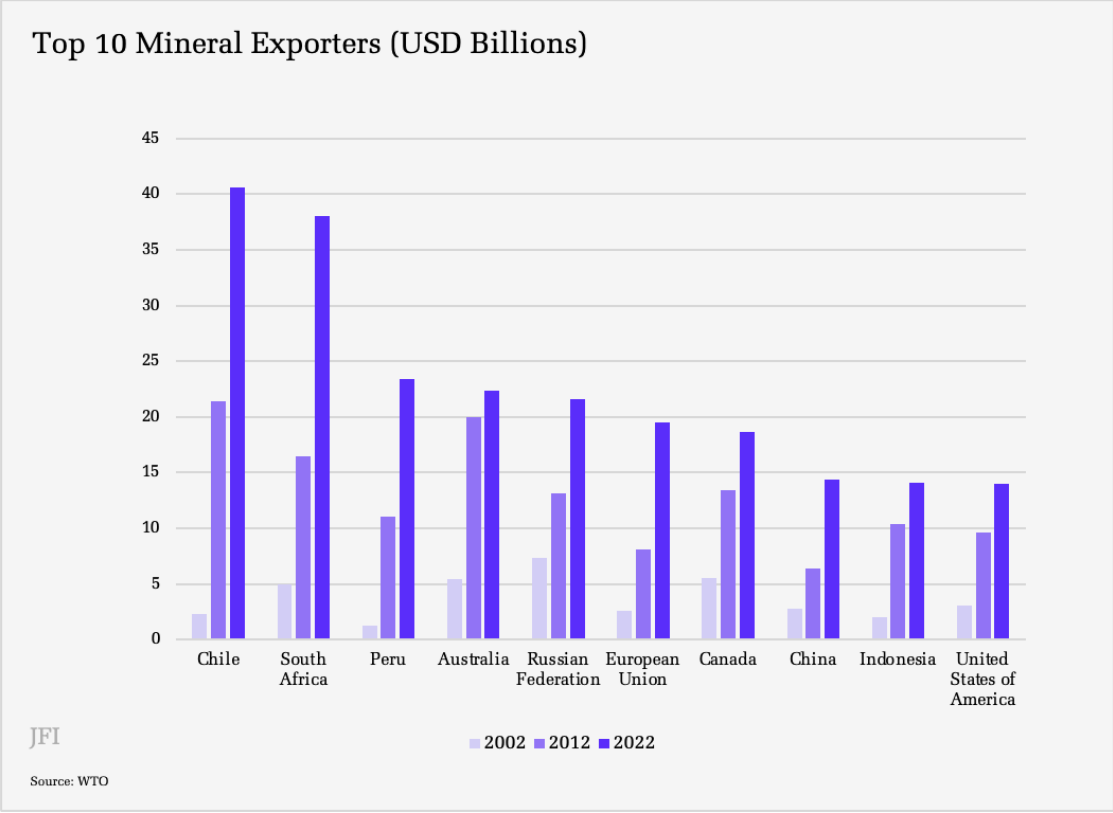

Figure 1

How mineral-producing countries are pursuing these opportunities can vary substantially,[9] and how they perceive, navigate, and capitalize on their mineral sector has key implications for global supply chains. To investigate these dynamics, we plan to explore strategic divergences between mineral-rich countries that are implementing mineral-based industrial policies, using Australia and Indonesia as case studies. In this brief, we set the stage for this project by providing a high-level overview of their production dynamics, policy implementation strategies, and roles in the global mineral supply chain.

Case study selection: Australia and Indonesia

As discussed, mineral-producing countries control the upstream supply chain for mineral-based technologies. The mineral-based industrial policies implemented by producer countries will continue to significantly impact countries and companies that invest in the upstream segment or rely on mineral or mineral product exports at various stages. Mineral-based industrial policies impact global supply, pricing, and the geographic distribution of value-added activities across the supply chain.

Both being in the top ten global producers of minerals, Indonesia and Australia's mineral-based industrial policies have an impact on the global economy. Australia has a nominal GDP of USD 1,796 as of 2024; mining accounts for 12.2 percent of all industrial output, the second-largest sector after Health and Education (13.4 percent).[10] Australia is the world's largest producer of bauxite, iron ore, and lithium (Figure 2). Indonesia is the largest economy in Southeast Asia, with a Nominal GDP of USD 1,396.[11] The industrial sector comprises over 40 percent of Indonesia's GDP.[12] The mining industry is a major component of Indonesia's industrial sector; as of 2023, the mining sector contributed $136 million to GDP.[13] Indonesia is the third-largest global producer of bauxite and nickel, and has the largest nickel reserves in the world (Figure 3).

[9] Allan and Nahm, 2025.
[10] S&P Capital IQ, Country Profile: Australia (subscription database), accessed September 5, 2025. https://www.capitaliq.spglobal.com/web/client?auth=inherit#country/countryProfile?keycountry=AU
[11] S&P Capital IQ, Country Profile: Indonesia (subscription database), accessed September 5, 2025. https://www.capitaliq.spglobal.com/web/client?auth=inherit#country/countryProfile?keycountry=ID
[12] Aaron O'Neill, "Indonesia: Share of economic sectors in the gross domestic product (GDP) from 2013 to 2023," Statista 2025. https://www-statista-com.ezproxy.neu.edu/statistics/319236/share-of-economic-sectors-in-the-gdp-in-indonesia/
[13] Mona Siahaan, "Gross domestic product (GDP) from mining and quarrying in Indonesia from 2014 to 2023," Statista 2025. https://www-statista-com.ezproxy.neu.edu/statistics/1018534/indonesia-gdp-mining-and-quarrying/

Country Mineral Rankings (2024)

Australia

Mineral	Production (% Share)	Production (Rank)	Resources & Reserves (% Share)	Resources & Reserves (Rank)
Aluminum	1.04%	7		
Bauxite	76.83%	1	19.50%	2
Cobalt	2.11%	3	8.14%	2
Copper	3.55%	9	5.42%	4
Iron Ore	47.92%	1	18.55%	1
Lithium	38.38%	1	6.90%	6
Manganese	15.00%	3	19.36%	2
Nickel	7.91%	4	9.82%	3
Lead	17.74%	2	20.62%	1
Zinc	12.24%	2	14.11%	1
Graphite			5.05%	6
Phosphate			3.59%	6
Tin			8.71%	3

Figure 2: 2024 global ranking and market share for Australia across various critical minerals.

The table above shows the 2024 global ranking and market share for Australia across various critical minerals. Production (Rank) and % Share are based on 2024 aggregate production estimates. Resources & Reserves (Rank) and % Share are based on latest estimates for combined resources and reserves. Lower rank numbers indicate a higher global position (e.g., Rank 1 is the largest producer/holder). Percentage shares represent the country's portion of the global total for that specific metric. All shares and rankings for each mineral are derived from S&P Global — except for Aluminum, which comes from USGS data.

Country Mineral Rankings (2024)

Indonesia

Mineral	Production (% Share)	Production (Rank)	Resources & Reserves (% Share)	Resources & Reserves (Rank)
Bauxite	6.31%	3	1.21%	9
Cobalt	0.47%	15	7.64%	4
Copper	4.73%	6	2.99%	10
Nickel	8.72%	3	19.74%	1
Zinc	0.00%	35	0.84%	20
Graphite			0.15%	19
Iron Ore			0.14%	32
Lead			1.42%	16
Manganese			0.02%	21
Tin			5.81%	6

Figure 3: 2024 global ranking and market share for Indonesia across various critical minerals.[14]

Many of the metals and minerals that Australia and Indonesia produce, such as bauxite, cobalt, copper, lithium, manganese, nickel, and graphite, are essential for renewable energy technologies.[15] Table 1 demonstrates the applications for key Australian and Indonesian mineral products in the context of renewable energy technologies.

Table 1: Energy transition uses for relevant minerals

Commodity	Key Energy Transition Uses
Aluminium	Solar PV, CSP, Electricity networks, EVs and Battery Storage
Bauxite	Essential for producing aluminum
Cobalt	EVs and Battery Storage
Copper	Solar PV, Wind, Bioenergy, Electricity networks, EVs and Battery Storage
Graphite (Natural and Synthetic)	EVs and Battery Storage
Iron Ore	Electricity networks, EVs
Lead	Battery storage
Lithium	EVs and Battery Storage
Manganese	Wind, EVs, and Battery Storage
Nickel	Geothermal, EVs and Battery Storage, Hydrogen
Phosphate	Battery storage
Tin	EVs, Wind, Solar PV

CSP = Concentrated solar power
EV = Electric vehicles

[14] The table above shows the 2024 global ranking and market share for Indonesia across various critical minerals. Production (Rank) and % Share are based on 2024 aggregate production estimates. Resources & Reserves (Rank) and % Share are based on latest estimates for combined resources and reserves. Lower rank numbers indicate a higher global position (e.g., Rank 1 is the largest producer/holder). Percentage shares represent the country's portion of the global total for that specific metric. All shares and rankings for each mineral are derived from S&P Global — except for Aluminum, which comes from USGS data. Bauxite Data Note: Production share and production rank values for Bauxite may not be fully representative, as S&P Global may not provide comprehensive production data for all key bauxite producing countries.
[15] International Energy Agency, The Role of Critical Minerals in Clean Energy Transitions. IEA 2021 https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions

PV = Photovoltaic
From Geopolitics of the energy transition: Critical materials (IRENA, 2023) and others.

Australia and Indonesia's mineral production is also informed by their respective geopolitical alignments. Australia's history as a British colony has shaped its unique role as a Western-style democracy in the Indo-Pacific. The Australian government actively collaborates with Western democracies as a staunch ally, participating in international security agreements such as the Australia-United Kingdom-United States Partnership (AUKUS)[16] and the Quad agreement between Australia, India, Japan, and the United States.[17] This pattern expands to its role in international mineral governance. For example, Australia joined the Critical Minerals Mapping Initiative (2018), a trilateral effort with Australia, the US, and Canada, the Sustainable Critical Minerals Alliance (2021), and launched the Net Zero Technology Acceleration Partnership with the US (2021).[18] In 2023, Australia expanded its trade cooperation through the Quad Clean Energy Supply Chains Statement, the Australia-US Critical Minerals Compact, and critical minerals dialogues with France, Germany, and the UK.[19] Indonesia's history of leading the Non-Aligned Movement has shaped its role as a state that resists committing to any single global power, whether China or the United States. In fact, scholars observe that Indonesia is a "strategic hedger."[20] This posture extends to its industrial policy. Thus far, Indonesia has been successful in attracting Chinese investment but is actively seeking more Western engagement.[21] Rather than joining large multilateral supply chain pacts, Indonesia has more frequently opted for bilateral agreements, often with countries like China, South Korea, and Japan.[22] These unique histories and geopolitical alignments play a role in shaping the trajectory and outcome of mineral-based industrial policies in Australia and Indonesia, and will be explored more deeply in the following reports.

Industrial policy and supply chain positioning in Australia

Since the 1970s, the Australian government has implemented 62 mineral-based industrial policies; however, the majority of those policies have been implemented in the past decade, with a steady uptick since 2019 (Figure 4). Key milestones include the 2017–2022 National Minerals Exploration Strategy, the Exploring for the Future program led by Geoscience Australia, the Modern Manufacturing Initiative, and the establishment of the Critical Minerals Facility managed by Export Finance Australia. More recent

[16] Prime Minister's Office, "Factsheet: Implementation of the Australia – United Kingdom – United States Partnership (AUKUS)," accessed September 5, 2025, PDF factsheet. https://pmtranscripts.pmc.gov.au/sites/default/files/AUKUS-factsheet.pdf
[17] Australian Department of Foreign Affairs and Trade, "The Quad," accessed September 5, 2025, Australian Government website, DFAT. https://www.dfat.gov.au/international-relations/regional-architecture/quad
[18] International Energy Agency, IEA Policies Database, accessed September 5, 2025.
[19] Ibid.
[20] David Shambaugh, Where Great Powers Meet: America and China in Southeast Asia (New York: Oxford University Press, 2020).
[21] Lu, Christina. 2024. Can Indonesia's Nickel Industry Break Free From China's Grip? Foreign Policy. https://foreignpolicy.com/2024/08/08/indonesia-nickel-china-us-critical-mineral-inflation-reduction-act/
[22] IEA. IEA Policies Database.

initiatives, such as the 2023–2030 Critical Minerals Strategy and the 2024 National Battery Strategy, reflect a growing emphasis on ESG leadership, Indigenous benefit-sharing, and downstream supply chain integration. The 2025 Future Made in Australia Act marks a significant policy pivot, offering production-based tax credits for hydrogen and critical mineral processing, showing the country's move from exploration to industrial competitiveness.[23]

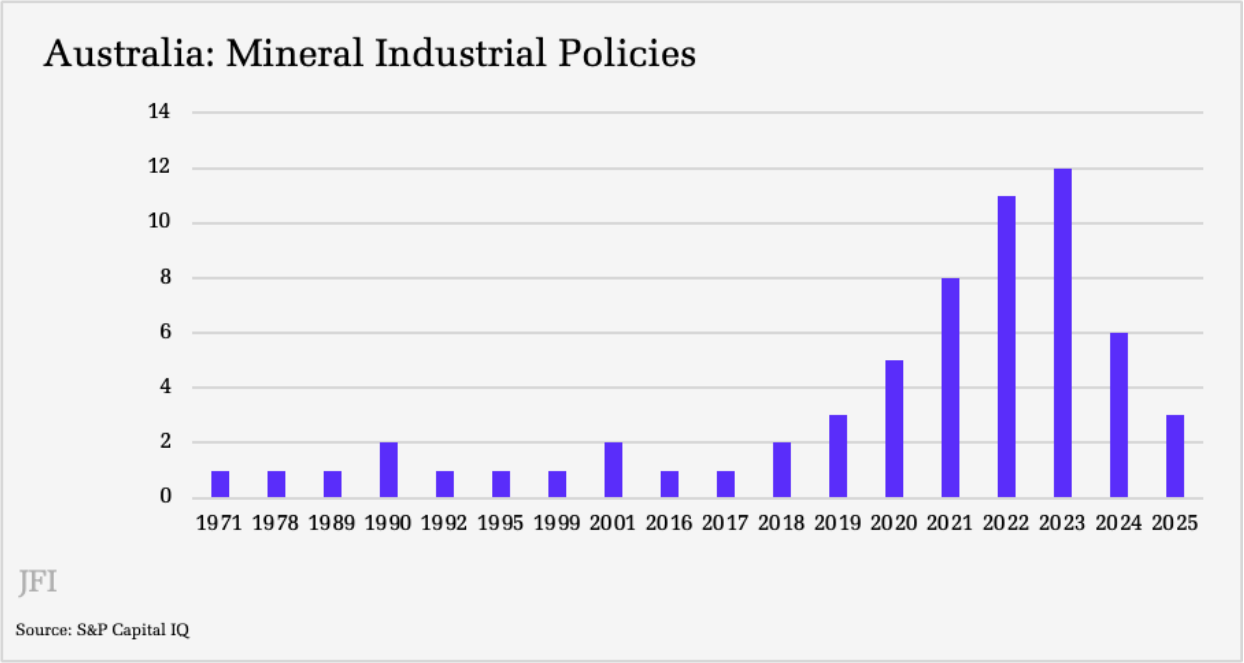

Figure 4: Mineral Industrial Policies in Australia, 1971-2025

Australia's position in green manufacturing supply chains remains heavily weighted toward the upstream, with raw materials dominating its exports, most notably raw lithium (77.9 percent), followed by raw nickel (13 percent) and nickel ore (8.3 percent).[24] Midstream contributions are minimal, with nickel mattes accounting for just 3.79 percent of exports, while downstream outputs such as electric accumulators (0.023 percent), electrolytes (0.097 percent), and batteries (0.016 percent) are negligible, highlighting Australia's continued reliance on resource exports rather than value-added production. On the technology adoption side, Australia is making gradual progress: by 2024, renewable energy supplied 9 percent of national energy consumption,[25] the

[23] IEA. IEA Policies Database.
[24] Percentages refer to percentage of global supply.
[25] Australian Department of Climate Change, Energy, the Environment and Water (DCCEEW), "Australian Energy Statistics—Renewables," accessed September 5, 2025. https://www.energy.gov.au/energy-data/australian-energy-statistics/renewables

country hosted around 4,000 EV chargers,[26] and EVs represented 13 percent of vehicle sales.[27] These trends suggest that while Australia is firmly positioned as a critical supplier of inputs for global green manufacturing, its domestic adoption of transition technologies and limited downstream industrial capacity remain key challenges in capturing greater value within supply chains.

Industrial policy and supply chain positioning in Indonesia

Over the past decade, Indonesia has rapidly advanced a comprehensive critical minerals policy agenda, implementing 29 policies since 2010; mineral policies have increased in the past five years, with 2023 seeing a record eight mineral policies implemented (Figure 5). The centerpiece of this agenda is the downstreaming strategy, mandating domestic processing of raw materials and restricting unprocessed mineral exports to increase domestic economic retention. The 2015 domestic pricing regulations established benchmark prices for key metals. In 2020, the government enacted a nickel ore export ban and passed the revised Mining Law, which centralized license authority at the national level. These were followed by the 2022–2027 National Planning on Mineral and Coal, a five-year strategy to guide sustainable mineral development, and the launch of SIMBARA in 2023, a digital platform for inter-ministerial coordination on mineral tracking. In 2023, a bauxite export ban and new licensing decrees further tightened national control. Most recently, Government Regulation No. 8/2025 requires mineral exporters to retain all foreign exchange earnings domestically for a year, reinforcing state capture of resource revenues.[28] Additionally, Indonesia's mineral taxation regime differs markedly from Australia's in both structure and investor implications. Corporate income tax is federally applied at 22–25 percent, with amortization rates for ore assets ranging from 5–50 percent but tax losses are limited to five years, creating tighter financial constraints compared to Australia's indefinite carryforward. Royalties are also federally set, typically 1–10 percent for nickel, and are deductible for CIT purposes.[29]

[26] Tran, K. 2025. Number of EV charging points APAC 2024, by country. Statista. https://www-statista-com.ezproxy.neu.edu/statistics/1108005/apac-number-of-ev-chargers-by-country/?_gl=1*g2i3jm*_up*MQ..*_gs*MQ..&gclid=CjwKCAjwk7DFBhBAEiwAeYbJsRLm-uWuoTFZWbepq9chBUGaKC5Y-M1qpIDgTz2dHWvk4mYDyhFXFxoCaBMQAvD_BwE&gbraid=0AAAADtyRkskS5LxeThAcRbkv5T3n-PDt

[27] Tran, K. 2025. Number of EV charging points APAC 2024, by country. Statista.

[28] IEA. IEA Policies Database.

[29] PricewaterhouseCoopers (PwC), "Mining Tax Summary Tool," accessed September 5, 2025, https://www.pwc.com/gx/en/industries/energy-utilities-resources/mining-metals/mining-taxes-summary-tool.html

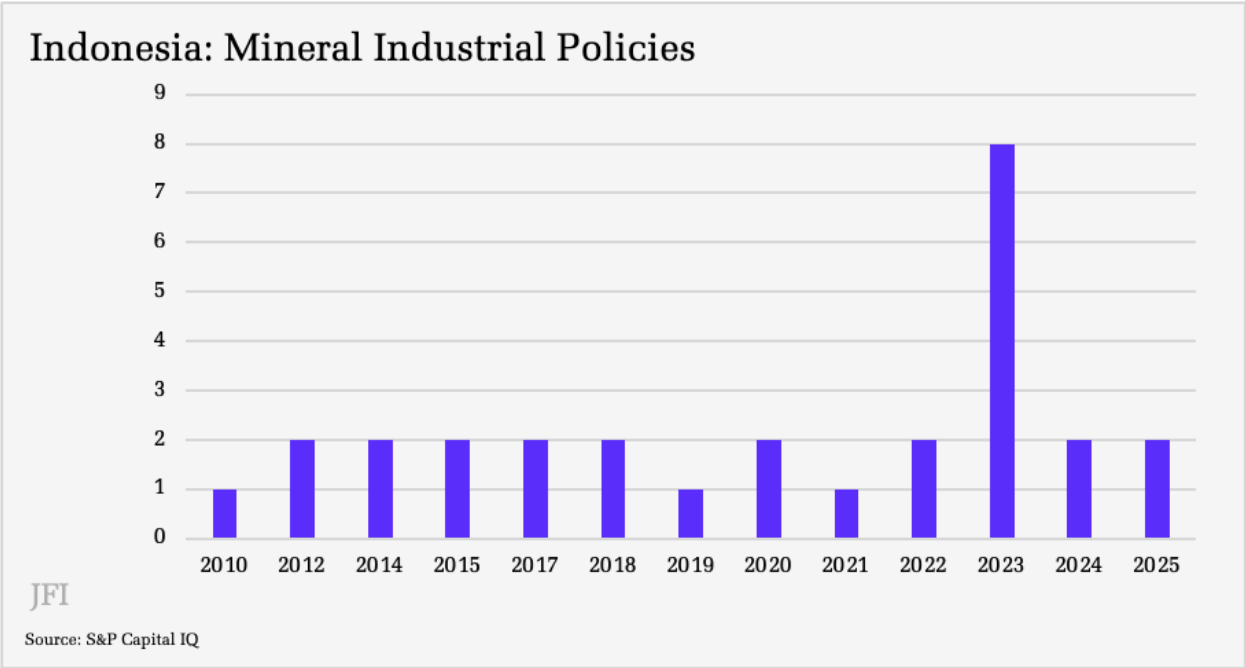

Figure 5: Mineral Industrial Policies in Indonesia, 2010-2025

Indonesia has positioned itself further downstream in green manufacturing supply chains than Australia. Due to upstream export controls, raw material exports remain relatively low: raw nickel (2 percent), nickel ore (0.3 percent), and raw lithium (0.14 percent).[30] The country's strength lies in midstream processing, with nickel mattes comprising 46.2% of exports, while downstream products such as electric accumulators (0.41 percent), electrolytes (1.23 percent), and batteries (0.039 percent) signal a growing, though still limited, role in value-added production. While Indonesia is seeking to build out more downstream capacity, many downstream products are still imported, especially from China.[31] On the domestic side, Indonesia has a higher share of renewables in its energy mix (14.5 percent in 2024)[32] but a smaller EV adoption base, with just 3,240[33] chargers nationwide and EVs accounting for 7 percent of vehicle sales in 2024 (2.4% penetration in 2023, projected to reach 50% by 2035).[34] This trajectory illustrates Indonesia's strategy to leverage its mineral base to move downstream and target greater value capture, even as domestic technology adoption lags behind its industrial ambitions.

[30] Percentages refer to percentage of global supply.
[31] IEA. Countries: Indonesia. IEA. Accessed on September 5, 2025. https://www.iea.org/countries/indonesia
[32] Energy Tracker Asia, "Renewable Energy in Indonesia – Current State, Opportunities and Challenges," Energy Tracker Asia, accessed September 5, 2025. https://energytracker.asia/renewable-energy-in-indonesia/
[33] Tran, K. 2025. Number of EV charging points APAC 2024, by country. Statista.
[34] Statista Research Department. 2024. Penetration rate of BEVs SEA 2023, by country. Statista. https://www-statista-com.ezproxy.neu.edu/statistics/1482294/sea-penetration-rate-of-bevs-by-country/?_gl=1*t8pxl*_up*MQ..&gclid=CjwKCAjwk7DFBhBAEiwAeYbJsRLm-uWuoTFZWbepq9chBUGaKC5Y-M1qpIDgTz2dHWvk4mYDyhFXFxoCaBMQAvD_BwE&gbraid=0AAAADtyRkskS5LxeThAcRbkv5T3n-PDt

Conclusion

Australia and Indonesia are both key players in global mineral production, which are increasingly implementing mineral-based industrial policies. Indonesia's raw nickel export bans and downstreaming push are actively reshuffling supply chains and have forced both domestic and global companies to re-evaluate sourcing strategies and trade routes. While Australia hasn't implemented export bans, recent policy shifts signal a clear intent to support midstream and downstream capabilities, which will impact global trade around minerals, especially lithium. As demand for critical minerals accelerates in the context of the energy transition and great power competition, the choices these countries make will influence not only their domestic development trajectories but also global supply security, trade relationships, and the balance of value capture across the supply chain.

This overview highlights important questions for further investigation: What types of policies are most common or preferred, and why? Which policies appear most effective in achieving national goals? How does each country's domestic context shape its broader mineral governance framework? And how do trade and investment flows influence Australia and Indonesia positioning themselves in the global sphere? These questions will guide the following briefs, where we will examine each country's approach in greater depth.