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POLICY BRIEF

Toward a More Responsible Critical Minerals Supply Chain Supporting Indonesia's Energy Transition

Implementing environmental, social, and governance standards for the nickel industry

Martha Maulidia
Richard Bridle
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Key Messages

- Indonesia's nickel supply chain is central to the global energy transition, offering substantial opportunities for economic development and industrial growth.
- International frameworks for responsible mining have advanced significantly, providing Indonesia with clear standards that can be adhered to by implementing and enforcing compatible environmental, social, and governance (ESG) regulations, drawing on global best practices and lessons from other countries.

Key policy recommendations from this brief include:

- Strengthen environmental safeguards, such as biodiversity monitoring and circular economy incentives
- Promote human rights and free, prior, and informed consent protocols, including due diligence and legal recognition of community consent
- Expand climate and governance frameworks, with requirements for ESG disclosures, anti-corruption policies, and decarbonization planning

Introduction

The purpose of this policy brief is to review the current status of regulations and private sector practices to manage risks related to environmental, social, and governance (ESG) in Indonesia's nickel sector. It also identifies critical policy gaps that may hinder the transition to responsible and sustainable mining practices. By mapping existing regulations against international standards and highlighting areas for improvement, this brief aims to provide evidence-based recommendations that support stronger governance, environmental stewardship, and social safeguards in the industry.

To meet clean energy targets, global demand for critical minerals is expected to double by 2030 and quadruple by 2040. After a 10% contraction to USD 325 billion in 2023, the energy transition mineral market is projected to rebound in 2024 (International Energy Agency, 2024). Investment continues to pour into the sector, with companies like Volkswagen, Tesla, and CATL increasingly securing upstream supply through direct involvement in mining and processing.

Expanding mineral supply chains—particularly mining and processing—offer significant opportunities, including poverty reduction and economic development. However, this expansion also brings serious socio-environmental risks. The key challenge lies in ensuring that practices are efficient and high yielding while also being environmentally responsible and respectful of community and Indigenous rights. To meet this challenge, it is crucial to identify responsible global mining best practices, diagnose implementation gaps, and define responsive measures.

Indonesia is a dominant player in the global nickel industry, accounting for 54% of nickel pig iron (NPI) production and hosting 74% of the world's NPI smelters. Its export value rose from USD 1.4 billion in 2020 to USD 6.8 billion in 2023 across 40 operational smelters (Perkumpulan Aksi Ekologi dan Emansipasi Rakyat [AEER], 2023). However, this growth is accompanied by serious ESG challenges: Indonesian nickel companies' average carbon intensity varies between 29 and 70 tonnes of CO_2 per tonne of nickel, with the most carbon-intensive being more than double the least (Peh, 2024). Between 2019 and 2025, there were 104 workplace accidents at nickel smelters, leading to 107 deaths (CNV Internationaal, 2025).

Social conflicts are also on the rise. One study reports that agrarian disputes tied to nickel mining have doubled on average since 2021. In 2023, 15 of 32 mining-related conflicts were linked to nickel expansion—a 114% increase over 2022 (Konsorsium Pembaruan Agraria, 2024).

Amid these pressures, momentum for improved sustainability is growing. The 2020–2024 National Mid-Term Development Plan promotes responsible mineral downstreaming, while the National Energy Policy outlines decarbonization pathways (Government of Indonesia, 2020). Pilot projects—including a 365-MW hydropower plant and early-stage carbon capture and hydrogen initiatives—signal Indonesia's efforts to improve compliance with ESG standards in certain segments, enhance profitability, and support its 8% national growth target.

Responsible Mining and Processing Practice

Mining activities, by nature, result in long-term environmental and social impacts. As the global demand for minerals intensifies, sustainability concerns in the mining sector have gained unprecedented urgency. In response, the international community has advanced numerous frameworks to promote more responsible practices—among them: The Copper Mark and its specific nickel certification, the Nickel Mark (The Copper Mark, n.d.); the Initiative for Responsible Mining Assurance (IRMA) certification program (IRMA, 2018); the Mining Principles of the International Council on Mining and Metals (ICMM) (2022); and the Consolidated Mining Standard Initiative (CMSI) (n.d.). These initiatives reflect a growing global consensus that mining must be conducted in ways that are not only environmentally sound and socially just, but also economically inclusive.

Indonesia's aggressive push to scale up nickel production—especially in value-added products—has triggered the rapid expansion of mining and processing operations. This momentum creates socio-environmental pressure points that require stronger policy oversight. Without appropriate safeguards, such expansion risks undermining the very development goals it aims to support. More responsible practices can only be realized through clearly defined and enforceable regulations that protect community rights and environmental integrity, while ensuring that economic gains are equitably shared.

This is where strong mining codes, robust environmental and social impact assessments, and clearly defined post-mining rehabilitation policies become critical. Effective enforcement of these instruments—alongside constructive engagement with local communities—can enable a mutually beneficial model between companies and stakeholders.

Nickel mining practices in Indonesia are carbon-intensive, due in part to the use of fossil fuels for power-intensive extraction and processing, rather than renewable energy. Mining is also land-intensive, with impacts on biodiversity. In the upstream mining sector, laterite nickel extraction generally uses open-pit mining methods in forested areas. In Indonesia, such nickel mining practices were already prevalent before the nickel downstream agenda. In Morowali in Central Sulawesi, frequent overlaps occur between Nickel Mining Business Permit (Izin Usaha Pertambangan) holders and tropical forest concessions. Without adequate mitigation, this overlap threatens biodiversity and damages the environmental resilience of tropical forests.

As the basis for analysis, we use some elements of the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) Mining Policy Framework (MPF), as laid out in Table 1 (IGF, 2023). The MPF articulates international good practices for sustainable mining governance, focusing on six key pillars: legal and policy frameworks, financial benefit optimization, socio-economic benefit sharing, environmental management, post-mining transition, and artisanal and small-scale mining (ASM). It provides a reference framework to help governments assess and strengthen mining governance in line with international good practices and national sustainable development objectives.

Table 1. IGF MPF for responsible mining and sustainable development

Pillar	Focus areas	Objectives
Legal, policy, and institutional frameworks	Laws, policies, institutions	Ensure transparent and effective regulation of the mining sector
Financial benefits	Revenue distribution, taxation, investment	Maximize and equitably share financial gains from mining
Socio-economic benefits	Local communities, gender equality, vulnerable groups, value addition	Promote inclusive growth and address social inequities
Environmental management	Water resources, biodiversity, waste management	Minimize ecological damage across the mining life cycle
Post-mining transition	Closure planning, land rehabilitation	Ensure environmentally sound closure and support sustainable social and economic transition after mining
ASM	Integration into formal sectors, livelihood support	Support ASM's role in sustainable development

Source: IGF, 2023.

Historically, mining has been a cornerstone of industrial development, providing essential materials for infrastructure and energy. However, it has also been associated with environmental degradation and social inequalities. Over the past 50 years, concepts related to responsible mining have evolved, developed by the mining industry, government, and civil society. In order to operate, the mining industry must retain political support, comply with legal requirements, and, less concretely, be granted a social licence to operate (Stuart et al., 2023). Regulatory regimes and mining industry practice, such as the MPF, have evolved to support the industry as it transitioned from a regulatory compliance and risk mitigation approach in the 1970s to a voluntary corporate responsibility approach between the 2000s and 2015. In the latter approach, mining operations must operate with a degree of transparency and accountability, demonstrating their contribution to the economy and documenting their impacts with respect to ESG factors. From the industry perspective, these frameworks support investment decision-making processes. Projects that are assessed to deliver real socio-economic benefits and that face few environmental management challenges are now becoming more attractive for investment.

Figure 1. Evolution of sustainability in the mining sector

Source: Authors.

In 2015, the global market started mandating ESG frameworks as a requirement for market access. ESG was seen as a competitive advantage and business strategy. A distinct example of this era is the European Union Battery Passport introduced in 2024, which enforces accessible carbon footprint data and 90% nickel recovery from waste batteries. More recently, there has also been a degree of backlash against the term ESG, and to some extent, the principles underpinning it. In the United States in particular, firms have started to rebrand their responsible practices or reduce their prominence in communications (London Business School, 2025). It remains to be seen whether this shift will be sustained and expand, and the extent to which changes in corporate communications are also going to present changes in the practical application of the underlying principles.

Regulatory Review, Fiscal Policy, and Mapping ESG Standards

Various regulations regulate mineral and coal mining in Indonesia (Figure 7). Law 11 of 1967[1] concerning Basic Mining Provisions (the latest amendment is the Law on Mining in 2025) states that mining products must be processed and refined within the country (Government of Indonesia, 1967). However, in Law Number 11 of 1967, there are no specific regulations regarding domestic processing and refining clauses, including in related technical government regulations.

The government has increased regulation of the downstream industry policy by issuing Law Number 4 of 2009 concerning Mineral and Coal Mining. Law Number 4 of 2009 aims to increase the economic value of mining products that Indonesia can obtain from exploiting its natural resources by requiring mining companies to increase the economic value of mining products before they are exported (Government of Indonesia, 2009b). The law has subsequently been amended four times. The most recent amendment, in 2025, enshrined priority for domestic users of mineral production and established priorities related to permitting for certain actors, including state-owned companies (Hakim, 2025).

This law also imposes obligations on business actors with Nickel Mining Business Permits and Work Contract (Kontrak Karya) holders to establish smelters, namely industrial facilities,

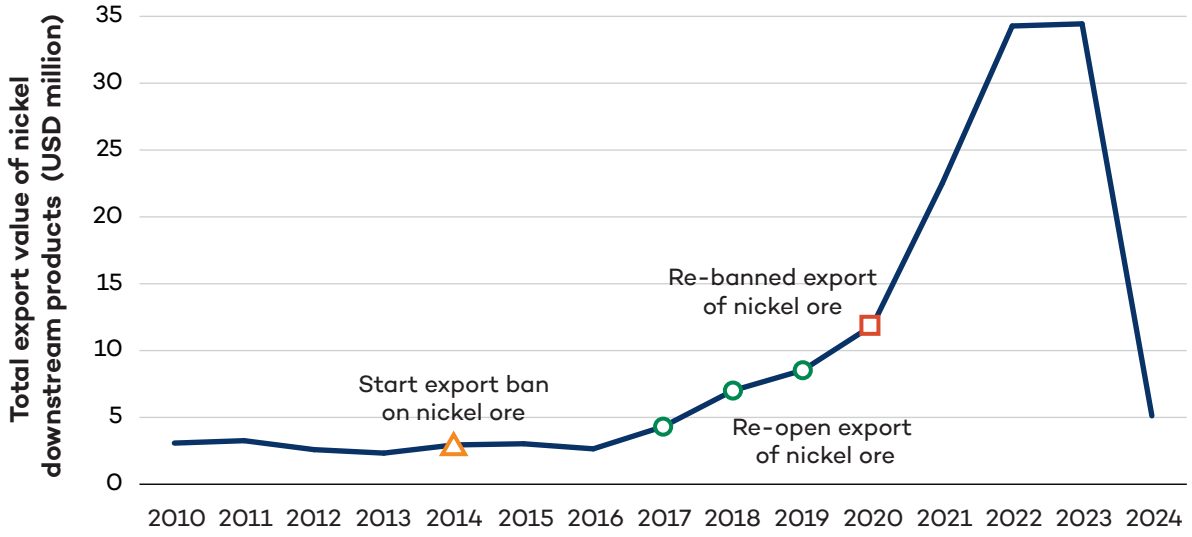
[1] https://natlex.ilo.org/dyn/natlex2/natlex2/files/download/77114/IDN.77114.pdf

to process raw materials from mining products to become semi-finished products. This regulation was then amended by Law Number 3 of 2020 and Law Number 11 of 2020 concerning Job Creation.

The Indonesian government initiated its downstream strategy with the 2014 nickel ore export ban, enforcing Law No. 4 of 2009 on Mineral and Coal Mining (Government of Indonesia, 2009b). The ban, effective January 12, 2014, prohibited raw mineral exports to encourage domestic processing. However, in response to a budget deficit in 2016 and declining nickel export revenues, the policy was temporarily relaxed in 2017. This relaxation was formalized through a revision of Government Regulation (PP) No. 1 of 2014, led by Acting Minister of Energy and Mineral Resources Luhut Binsar Panjaitan. It reopened exports of several minerals—including nickel, bauxite, and rare earth elements—through 2021.

A second, more selective export ban followed in 2020, prohibiting nickel ore exports with a grade below 1.7%. This measure, outlined in Presidential Regulation No. 55/2019 on accelerating the battery electric vehicle program, became effective January 1, 2020. This resulted in a leap in export value of 28% from 2019 to 2020 (Figure 2).

Figure 2. Indonesia's export value of downstream products, including increases along with the export ban policy

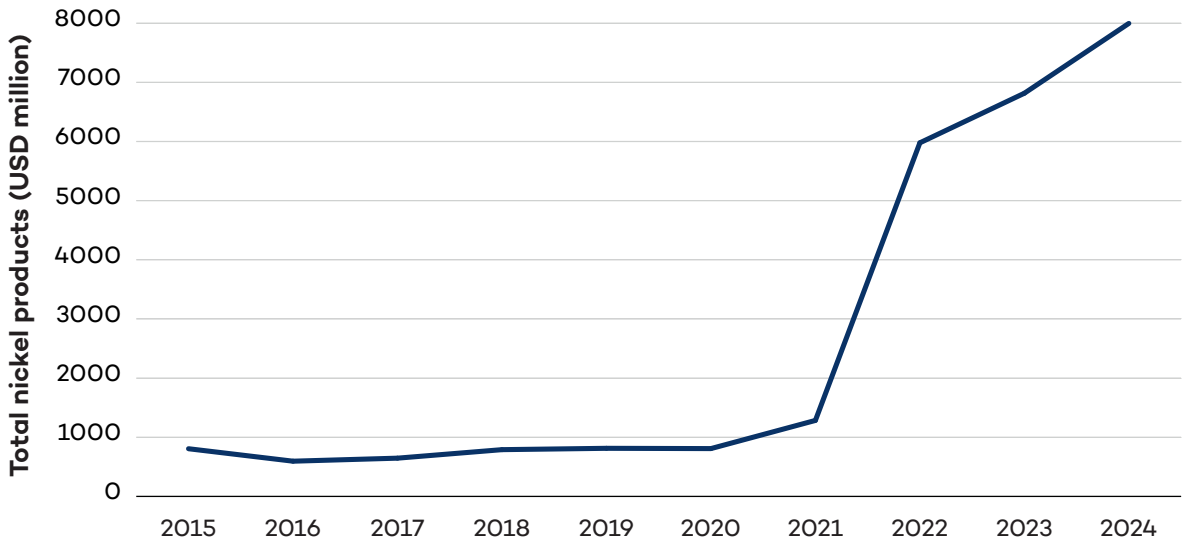


Source: Data from Seto, 2024.

Alongside regulations, to encourage investment in the nickel downstream, the government has provided an array of fiscal incentives, such as tax allowances, tax holidays, and a corporate income tax reduction for the smelter and processing industry. Companies in special economic zones are eligible for income tax relief up to 100% for a duration of 10 to 20 years, depending on their investment level. The combination of the raw ore export ban policy and the downstreaming policy has enabled Indonesia to reap significant benefits in terms of non-tax state revenue, export value, and regional economic growth. The country's non-tax state revenue from nickel increased by 15 times in 6 years, from USD 49 million (IDR 0.7

trillion)[2] in 2016 to USD 487 million (IDR 7.2 trillion) in 2022. Meanwhile, the export value increased by 10 times in 6 years, from USD 596 million (IDR 8 trillion) in 2016 to USD 6.82 billion (IDR 104.1 trillion) in 2023 (UN Comtrade, 2025) (Figure 8). Over the 5-year period to 2023, the regional GDP of nickel-rich provinces North Maluku and Central Sulawesi increased by more than 2.5 times the national figure (Statistics Indonesia, 2024). The shift from raw material exports (valued at IDR 15 trillion [USD 1 billion]) to processed products has increased nickel's export value to IDR 360 trillion (USD 23.6 billion), with value-added gains of from 10 times to 19 times, depending on the final product. However, the increases in the value of the export have required significant investments and entailed environmental and social impacts in affected areas.

Figure 3. Indonesia's export value of nickel



Source: Trade Map, 2025.

Table 2. Fiscal and non-fiscal incentives for nickel downstreaming

	Types of incentives	Description
Fiscal incentives	Tax allowance for Investment in special economic zones (SEZs)	Tax relief up to 100% for 10 to 20 years.
	Tax allowances	**Tax allowance on corporate income tax:** (a) net income deduction by 30% of the total investment value, charged at 5% per year for 6 years, in the form of tangible assets, including land. (b) accelerated depreciation of tangible assets and accelerated amortization of intangible assets acquired for investment.

[2] All currency conversion rates from World Bank (2025).

	Types of incentives	Description
	Tax holidays	**Corporate income tax holidays for 10–20 years:** For business entity taxpayers: (a) IDR 100 billion (USD 7 million): 10 years (b) IDR 100–500 billion (USD 7–35 million): 10 years **For individual taxpayers:** (a) IDR 500 billion–1 trillion (USD 35–70 million): 15 years (b) Over IDR 1 trillion (USD 70 million): 20 years
	Regional taxes and retributions	Regional tax and retribution holidays and allowances, depending on applicable laws and regulations (50%–100% tax reduction).
	Other regional facilities/incentives	Additional incentives may be provided by regional governments beyond standard tax and retribution holidays.
	Import and excise duties	Exemption of import duties, tax on importation, and excise duties for capital goods used in SEZ construction or development for 5 years.
	Value-added and sales tax on luxury goods	Exemption of value-added and sales tax on luxury goods for import and delivery of taxable goods into/within SEZs.
Non-fiscal incentives	Ease of permit applications	Online single-submission system for streamlined permit applications.
	Building approval	Exemption from the requirement to obtain building approval (Persetujuan Bangunan Gedung).
	Land acquisition	Land-use rights and building-use rights are valid up to 80 years, with accelerated procedures for acquisition.

Note: These incentives are regulated by Law No. 39 Year 2009 on Special Economic Zones and Government Regulation No. 40 Year 2021 on The Implementation of Special Economic Zones.
Sources: GOI, 2009a, 2021.

With the current fiscal incentives alone, smelters and processing facilities located in SEZs can reduce their operational expenditures. Combined with other incentives, nickel producers in Indonesia can maximize profits and benefit from the exceptionally high global price of nickel (it peaked in 2022 before it fell back due to oversupply starting in 2023 to rates that were still high by historical standards, though significantly lower than the peak).

Indonesia is the world's largest producer of nickel, extracting 1.6 million tonnes in 2022 (Ranggasari & Arkyasa, 2023). Reserves are distributed across Sulawesi, Maluku, and Papua. According to the Central Statistics Agency (Badan Pusat Statistik), Indonesia exported 777,400 tonnes of nickel in 2022—a 367% increase year-on-year—valued at USD 5.97 billion.

China was the top importer, followed by Japan, South Korea, Malaysia, and several other countries. Looking ahead, Indonesia's battery demand by 2030 is projected at 108.2 GWh, with total electric vehicle (EV) battery needs reaching 780 GWh. However, current domestic production capacity stands at only 373 GWh, highlighting a 407 GWh investment gap in the EV battery sector (Southeast Asia Iron and Steel Institute, 2024).

Mapping Available ESG Frameworks

This policy brief focuses on high-priority ESG criteria that receive significant attention from the international community. **ESG indicators** are used as benchmarking tools to evaluate business performance relative to sustainability metrics. They assess both a company's impact on people and the planet and its capacity to mitigate related risks.

The next section presents a comparative table that maps key ESG criteria from international standards against existing Indonesian regulations. This mapping identifies policy gaps—including instances where regulations exist but there are enforcement challenges—and informs tailored recommendations to strengthen Indonesia's ESG governance landscape.

Governments play a role in the operationalization of ESG standards by requiring or encouraging compliance through regulation and incentives. For example, some activities may be regulated or banned altogether, and disclosures may be mandatory or linked to fiscal incentives. Government policy has important implications for influencing corporate behaviour and fostering broader economic and social development. For example, China's 2025 ESG disclosure mandate, issued by the China Securities Regulatory Commission, requires all A-share listed companies to report on key ESG metrics starting in 2026, including greenhouse gas (GHG) emissions and anti-corruption measures. The regulation aims to improve corporate governance and performance by aligning executive incentives with ESG outcomes and enhancing transparency across capital markets (The ESG Institute, 2024).

Additionally, commercial pressure—for example, from procurement officers and investors in the EV industry—has promoted strengthened due diligence across the nickel supply chain to mitigate risks associated with negative publicity from environmental and social harm.

ESG indicators serve as tools to assess business performance in relation to sustainability considerations, enabling stakeholders to evaluate a company's alignment with ESG principles. Various ESG standards—such as the Extractive Industry Transparency Initiative, Global Reporting Initiative (GRI), Responsible Business Alliance (RBA), ICMM, The Copper Mark, and the Responsible Minerals Initiative—offer different frameworks for reporting and benchmarking.

These standards differ in terms of audit and certification processes, reporting levels, the number of aspects or indicators covered, and general requirements for compliance. They often include a specific focus on areas such as environmental impact, legal compliance, biodiversity protection, waste and pollution management, mine closure planning, climate change mitigation, stakeholder engagement, and respect for human rights.

Table 3. Key ESG criteria from international standards compared to existing Indonesian regulations

	Aspect	Summary of international standards	Indonesian regulations	Gaps
Social indicators	Stakeholder engagement and free, prior, and informed consent	All standards emphasize stakeholder engagement; IRMA and CMSI require FPIC.	Companies must share project info and develop public involvement plans.	Encourage meaningful engagement and benefit sharing.
	Grievance mechanisms	IRMA and CMSI require formal grievance systems and access to remedies.	Project-affected people can submit recommendations; grievance channels must be established.	Standardize grievance, accessibility, and transparency mechanisms.
	Indigenous Peoples	GRI, ICMM, IRMA, and CMSI require respect for Indigenous rights and FPIC.	Indigenous rights are recognized in law.	Improve benefit-sharing frameworks and enforcement of Indigenous rights.
	Human rights	ICMM, IRMA, and CMSI require human rights due diligence and security protocols.	No mandatory human rights due diligence.	Mandate human rights due diligence and reporting.
	Labour rights and occupational safety	GRI, ICMM, IRMA, and CMSI cover fair labour, gender equity, and safety.	Labour rights and safety systems are mandated.	Improve enforcement and monitoring. Expand protections for vulnerable groups.
	Community health and safety	IRMA includes community health and safety.	Environmental documents must consider public health; the safety of infrastructure is regulated.	Strengthen health impact assessments and community safety protocols.

	Aspect	Summary of international standards	Indonesian regulations	Gaps
Economic and governance indicators	Transparency and accountability	All standards require financial transparency, contract disclosure, and stakeholder engagement.	Limited sustainability reporting; SIMBARA and Minerba One Data systems exist.	Make sustainability reporting mandatory. Improve data accessibility.
	Anti-corruption	All standards require anti-bribery policies and beneficial ownership disclosure.	Policies are recommended but not mandatory.	Make effective anti-corruption policies and whistleblower systems mandatory.
	Supply chain and traceability	IRMA and CMSI require chain of custody and due diligence.	Domestic supply prioritization is mandated.	Develop traceability systems and due diligence requirements for supply chains.

Source: Authors' analysis.

International Examples of Sustainability Regulations

We analyzed the sustainability regulatory frameworks of Canada, Australia, Chile, and the Philippines to identify common features that support responsible mineral development. These examples offer practical insights into how countries embed environmental and social safeguards into mining governance. Based on this analysis, we have developed a list of typical features found across these systems and provided some examples of policies that support their implementation.

Strategic Planning and ESG Standards

Long-term strategies often include ESG goals—for example, Canada's Critical Minerals Strategy emphasizes water stewardship, biodiversity protection, and GHG reduction (Government of Canada, 2022). Australia's 2023–2030 strategy embeds ESG leadership and First Nations engagement (Department of Industry, Science and Resources, 2023). Chile's National Mining Policy 2050 integrates circular economy principles, water conservation, and inclusive development (Invest Chile, 2024).

Enforcement and Accountability

Canada regulates mining activities through dual federal-provincial governance, including the Canadian Environmental Protection Act and the Impact Assessment Act (Government of Canada, 2024). Canada mandates emission reporting through its Greenhouse Gas Reporting Program and imposes penalties for violations (Natural Resources Canada, 2024). Australia applies a federal-state dual system, with tailored oversight and tools like the Mining Awards Corruption Risk Assessment to reduce corruption (Transparency International Australia, 2020). Australia also uses independent site-level ESG verification. Chile anchors its mining governance in constitutional law and the Mining Code, with centralized oversight by the Ministry of Mining (Invest Chile, 2024).

Investment and Innovation

Grants and finance facilities to promote innovation are used by several countries. For example, Canada invests in artificial intelligence, geographical information systems, and renewable-powered mining technologies (Natural Resources Canada, 2025). Australia supports midstream processing and green tech through the Commonwealth Scientific and Industrial Research Organisation and an AUS 2-billion Critical Minerals Facility managed by the Export Finance Australia agency (Export Finance Australia, 2025). The Philippines, with support from the Asian Development Bank and the U.S. Agency for International Development, is promoting clean technologies and energy efficiency in the sector.

Social Stewardship and Indigenous Inclusion

Canada engages Indigenous communities through benefit-sharing and reconciliation efforts aligned with the United Nations Declaration on the Rights of Indigenous Peoples. The Philippines enforces FPIC and Indigenous rights under the IPRA Act of 1997 (Republic of the Philippines, 1997). Chile promotes inclusive job creation and community partnerships (Invest Chile, 2024).

Recommendations

Building on the analysis presented, this final section of the brief outlines a series of actionable recommendations designed to address the key ESG gaps identified in Indonesia's nickel sector. These proposals aim to strengthen environmental protections, enhance social safeguards, and improve governance frameworks, ensuring that the country's mineral development aligns with both national priorities and international sustainability standards.

Strengthen Environmental Safeguards

Indonesia should introduce mandatory ecosystem service assessments and biodiversity monitoring protocols. Regulation of deep-sea tailing and hazardous waste practices must be strengthened. Additionally, circular economy policies should be developed and linked to fiscal incentives to promote sustainable resource use. This project identified some challenges around the non-enforcement of existing regulations. Indonesia should conduct a deeper assessment to understand potential non-enforcement challenges, which can be hard and sensitive to track, but can be a major barrier to sustainability. A review should identify actions to improve enforcement and, therefore, environmental outcomes.

Promote Human Rights and FPIC Protocols

FPIC should be promoted for projects affecting Indigenous communities. Human rights due diligence and reporting must be mandated for all mining operations to ensure ethical practices and community protection. This project also identified some non-enforcement challenges around regulations linked to social well-being. A deeper assessment of non-enforcement challenges can also help identify actions that will improve social outcomes.

Expand Climate and Governance Frameworks

Indonesia needs to establish climate governance systems and require decarbonization plans for high-emission entities. Mandatory ESG disclosures and anti-corruption policies should be implemented for all mining companies, supported by expanded sustainability reporting and improved data platforms. To strengthen Indonesia's ESG regulatory landscape, align national guidelines more closely with international frameworks and best practices, enhance clarity and consistency in reporting requirements, and improve monitoring mechanisms to ensure compliance and accountability.

Establish Collaborative Forums With Industry

Structured forums should be created to engage mining companies in dialogue about their internal ESG processes. These forums can help identify perceived barriers to sustainable mining and co-develop practical implementation pathways.

Empower Civil Society and Local Communities

Capacity within civil society should be increased to monitor ESG compliance, identify gaps, and propose solutions. Transparency and public access to mining-related data and impact assessments must be promoted to ensure accountability.

Build International Partnerships and Market Incentives

Indonesia should collaborate with downstream markets to create demand pools for responsibly mined commodities. Working with international partners to establish ESG norms that reflect global best practices will help align domestic regulations with international expectations.

Conduct Further Analysis

A detailed feasibility study should be undertaken to assess options for implementing international ESG standards, such as IRMA, ICMM, and CMSI, in the Indonesian context. This study should include a cost-benefit analysis, stakeholder consultations, and pilot programs to test compliance mechanisms.

Enhance Benefit-Sharing Mechanisms

Institutionalized benefit-sharing frameworks should be developed to ensure that local communities—especially those directly affected by mining and processing operations—receive tangible, long-term benefits. These could include revenue-sharing agreements, community development funds, or equity participation models embedded in law and linked to licensing conditions.

Mobilize Sustainable Finance and De-Risking Instruments

Blended finance mechanisms and de-risking tools should be introduced to attract private investment into responsible mining. Public-private partnerships, guarantees, concessional finance, and ESG-linked credit enhancements can lower the cost of capital for ESG-compliant projects and encourage broader adoption of sustainable practices.

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Head Office

111 Lombard Avenue, Suite 325
Winnipeg, Manitoba
Canada R3B 0T4

Tel: +1 (204) 958-7700
Website: iisd.org
𝕏: @IISD_news

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