ECO SUSTAINABLE MINING

Circular Investment Project

Eco Sustainable Mining

2024/2026

Indonesia

Mission Statement from the CEO

As the CEO of Eco Sustainable Mining Indonesia (ESMI), I am honoured to introduce our groundbreaking initiative to responsibly reshape Indonesia's mining sector. ESMI stands for more than a paradigm shift; it embodies a reliable and effective cooperation model. Our approach optimizes resource extraction while balancing economic growth, environmental stewardship, and social equity, setting a blueprint for others worldwide.

Indonesia's rich mineral reserves have long underpinned its economy, but this prosperity has exacted considerable environmental and social costs. The mining sector, still in transition, accounts for over half of the tropical deforestation linked to large-scale operations, drastically affecting biodiversity. Furthermore, the United Nations identifies Indonesia’s small-scale gold mining as the largest global emitter of mercury, threatening human health and ecosystems.

To tackle these issues, we launched ESMI in 2024 and became fully operational in 2026 with a clear mandate: to foster a balanced, equitable sector that unites People, Planet, and Profit. Our methods are grounded in rigorous research, expert insights, and practical fieldwork. We convened a broad alliance of stakeholders—local mining cooperatives, government agencies, financial institutions, universities, and industry partners—to formulate sustainable solutions.

ESMI merges ancient mining wisdom and eco-sustainable principles with cutting-edge green technologies, focusing on:

1. Local community welfare and engagement
2. Environmental preservation and restoration
3. Equitable profit distribution
4. Sustainable mining practices

We remain dedicated to addressing urgent mining challenges like ecological damage, social displacement, resource shortfalls, and income disparities. Our projects align with the United Nations Sustainable Development Goals (SDGs) and ESG principles. ESMI reviews its programs, policies, and operations for responsible conduct, emphasizing poverty reduction, equity, and environmental safeguarding.

ESMI aspires to redefine responsible resource extraction in Indonesia and serve as a model for other countries. We acknowledge the rising global need for minerals, especially for the clean energy transition. Our goal is to ensure that mining activities advance sustainable development while curbing negative effects on communities and the environment.

We invite all stakeholders to join us in building a sustainable, accountable mining sector. Our commitment transcends economic growth, emphasizing harmony between industry and the environment. By advancing education, community empowerment, and the protection of natural heritage, we foster a future where human capital flourishes alongside vital ecosystems. Together, we can forge a mining industry that fuels progress while safeguarding our planet and its people for generations to come.

Ir. dr. J. Rijnenberg

CEO

1. ESMI's approach to Eco-Sustainable Mining in Indonesia

Indonesia's mining sector has emerged as a cornerstone of the nation's economy, with its contribution to GDP rising from 7% in 2016 to 11.9% in 2023. As a global powerhouse in mineral production, the country faces significant environmental and social challenges rooted in past and present mining operations. The Eco-Sustainable Mining Indonesia (ESMI) initiative, conceived in 2014 and fully operational since 2026, represents a paradigm shift in addressing these issues. ESMI's innovative, community-centred approach aligns with the UN Sustainable Development Goals (SDGs) and international legal frameworks, offering a model for other resource-rich nations.

1.1 SDGs and ESGs

Recognizing the mining sector's devastating legacy, ESMI has forged strategic partnerships and implemented tailored, community-level programs to prevent further harm and rehabilitate affected areas. These efforts align with key Environmental, Social, and Governance (ESG) standards and multiple SDGs:

Environmental (**E)**

- Climate Change Mitigation (SDG 13): ESMI implements strategies to reduce greenhouse gas emissions from mining operations, including the use of renewable energy sources and energy-efficient technologies.[1]
- Biodiversity Protection (SDG 15): Approximately 10% of active mines and 20% of exploratory sites are located in areas of high conservation value.[2] Over 50% of tropical deforestation is directly attributable to large-scale mining, resulting in significant biodiversity loss.3 Independent reports collectively demonstrate that mining activities in Indonesia continue to cause significant soil degradation, affecting ecosystems, local communities, and agricultural productivity. The studies emphasize the need for stricter environmental regulations and improved enforcement to mitigate these impacts. ESMI focuses on minimizing habitat destruction and implementing reforestation initiatives in mining-affected areas.
- Water Management (SDG 6): Nearly 30% of active mines are situated in water-stressed areas.4 ESMI promotes responsible water use and treatment practices to address water stress in mining regions
- Pollution Prevention (SDG 12): Mercury pollution: Small-scale gold mining is a major emitter of mercury, severely impacting human health and ecosystems.5 ESMI works to reduce mercury pollution from small-scale gold mining through the introduction of cleaner technologies and practices

In addition, these environmental challenges directly conflict with several SDGs, particularly: SDG 13 (Climate Action), 14 (Life Below Water), and 15 (Life on Land).

Social **(S)**

[1] United Nations in Indonesia (no date) Sustainable Development Goals - United Nations in Indonesia. Available at: https://indonesia.un.org/en/sdgs (Accessed: 15 December 2024).

[2] CRIF Asia (2023) The Mining Industry Opportunities in Indonesia in 2023. Available at: https://www.id.crifasia.com/resources/industry-insights/the-mining-industry-opportunities-in-indonesia-in-2023/ (Accessed: 5 January 2025).

[3] Center for Strategic and International Studies (2023) Diversifying Investment in Indonesia's Mining Sector. Available at: https://www.csis.org/analysis/diversifying-investment-indonesias-mining-sector (Accessed: 5 January 2025).

[4] https://www.aseanbriefing.com/news/exploring-indonesias-new-mining-regulations/

[5] https://en.antaranews.com/news/321979/indonesias-mind-id-commits-to-sustainable-mining-practice

The mining industry in Indonesia also presents complex socio-economic issues:

- Land Rights and Resettlement (SDG 1, Communities for good reasons have accused mining companies of land grabbing and forceful displacement. ESMI implements fair compensation and resettlement programs for displaced communities.
- Indigenous Rights (SDG 10): Mining activities often encroach upon indigenous territories, threatening their traditional ways of life. SDG 6 ESMI supports local businesses and promotes economic diversification in mining-dependent regions.
- Occupational Health and Safety (SDG 3): Artisanal and Small-scale Gold Mining (ASGM), also known as PETIs in the Indonesian language, provides livelihoods for an estimated 1.5 million people in Indonesia as of 2023, compared to around 250,000 employed in the large-scale mining sector. ESMI implements rigorous safety standards to protect workers in the mining industry

Governance (G)

- Transparency and Anti-corruption (SDG 16): ESMI promotes transparent reporting of mining activities and works to combat corruption in the sector.
- Regulatory Compliance: ESMI ensures adherence to national and international environmental and social regulations.

1.2 Socio-Economic Challenges and ESG Solutions

ESMI addresses complex socio-economic issues through various SDG and ESG-aligned initiatives:

Social (S):

- Land Rights and Resettlement (SDG 1, The project implements fair compensation and resettlement programs for displaced communities
- Local Economic Development (SDG 8): ESMI supports local businesses and promotes economic diversification in mining-dependent regions.
- Gender Equality (SDG 5): The project promotes equal opportunities for women in the mining sector and supports women-led initiatives in mining communities.

Governance (G):

- Stakeholder Engagement (SDG 17): While mining brings economic opportunities, it can also exacerbate existing social disparities if not properly managed. In Indonesia, ASGM generates up to 20% of global gold supply annually, valued at almost $29 billion. Tensions between mining companies and local communities have arisen due to environmental degradation and resource competition. ESMI facilitates multi-stakeholder dialogues to address conflicts and promote cooperation between investors, local communities, and government agencies.
- Responsible Supply Chain Management: The project implements due diligence processes to ensure responsible sourcing of minerals
- By aligning its activities with these ESG criteria and SDGs, ESMI aims to transform Indonesia's mining sector into a more sustainable and responsible industry that benefits both the economy and local communities while minimizing environmental impact.

[6] European Stability Mechanism, n.d. How we work - ESG. [online] Available at: https://www.esm.europa.eu/our-work/how-we-work/esg [Accessed 12 November 2024].

1.3 ESMI's Innovative Approach

To address these multifaceted issues, ESMI has developed a comprehensive strategy that aligns with multiple SDGs and ESGs:

1. Local community welfare and engagement (SDGs 1, 5, 10)
2. Environmental preservation and restoration (SDGs 6, 13, 15)
3. Equitable profit distribution (SDGs 8, 10)
4. Sustainable mining practices integrating traditional wisdom with modern technologies (SDGs 9, 12)

This holistic approach not only tackles the immediate challenges of the mining industry but also contributes to broader sustainable development goals, such as:

- Community Empowerment: Addressing SDGs 1, 5, and 10 by promoting economic opportunities and mitigating social challenges.
- Environmental Protection: Supporting SDGs 6, 13, and 15 through conservation efforts and pollution reduction.
- Sustainable Economic Growth: Contributing to SDGs 8 and 12 by promoting responsible production and consumption.

2. Why Indonesia Introduced New Mining Laws and Regulations: A Response to Longstanding Malpractices

2.1 Introduction

Indonesia's mining sector, historically dominated by large-scale operations such as Freeport-McMoRan's Grasberg mine in Papua (Irian Jaya) and other operators in coal and bauxite fields, has been plagued by severe environmental destruction, human rights abuses, and community displacement. Over the decades, these malpractices resulted in unprecedented deforestation, water pollution, and social conflict. Numerous domestic and international watchdogs, including the Indonesian government's own environmental agencies, have identified the mining sector as a critical contributor to ecological damage. Consequently, Indonesia embarked on a path of legal reform to address these serious issues, culminating in updated mining laws and regulations, such as Law No. 3 of 2020, Law No. 32 of 2009 on Environmental Protection and Management, and more recently, Government Regulation No. 25 of 2024 (GR 25/2024) .

2.2. Historical Context: Widespread Environmental and Social Harm

1. Freeport-McMoRan's Grasberg Mine

- Mount Ertsberg (Papua): The company's subsidiary in Indonesia, PT Freeport Indonesia, converted much of this resource-rich region into an open pit hundreds of meters deep.
- Tailings Dumping & Forest Loss: Investigations by environmental groups and the New York Times revealed that 700,000 tons of waste were discharged daily into local rivers, resulting in 90 square miles of downstream wetlands rendered "unsuitable for aquatic life" .
- Human Rights Abuses: Allegations of a "private army" implicated in the deaths of at least 160 local community members between 1975 and 1997 fuelled national outrage.

2. Open-Pit Mining Devastation

- Deforestation: Research shows that from 2001 to 2020, Indonesia experienced 1,901 km^2 of forest loss directly attributed to industrial mining operations, accounting for 58.2% of such loss among 26 countries.
- Coal & Bauxite Sites: In East Kalimantan, expansion of open-pit coal mines spurred significant biodiversity loss, water contamination, and large-scale displacement of communities.
- Nickel Boom: Indonesia's nickel demand, fuelled by global electric-vehicle battery needs, has led to further deforestation and water pollution in places like Halmahera, causing repeated conflicts with Indigenous landowners.

3. International Scrutiny and Data

- United Nations & Environmental NGOs: Multiple UN bodies and NGOs (e.g., Mining Watch, Earthworks) have published reports condemning the "appalling" levels of pollution and forced displacement in Indonesian mining regions.
- Academic and Policy Research: Studies show that heavy metal contamination (particularly mercury and copper) from artisanal and large-scale mines poses a public health hazard, while tailings spills irreversibly damage aquatic life.

2.3 Emergence of New Regulatory Frameworks

Faced with the uproar over corporate malfeasance, the Indonesian government responded with a series of amendments to its mining laws, imposing stricter penalties, reinforcing environmental obligations, and mandating sustainable development policies.

1. Law No. 4 of 2009 and Its Amendment in Law No. 3 of 2020

- Greater Accountability: Imposes detailed requirements on mining companies for reclamation and post-mining restoration.
- Stricter Licensing: Grants the government authority to revoke or suspend operations for non-compliance.

- Community & Environmental Safeguards: Requires environmental impact assessments (AMDAL) and consultation with local populations, reflecting a pivot away from purely pro-investment policies.

2. Law No. 32 of 2009 on Environmental Protection and Management
- Criminal Provisions: Stipulates that those found guilty of causing large-scale environmental damage can face fines and prison sentences.
- Polluter Pays Principle: Companies are financially liable for cleanup and rehabilitation if found negligent or deliberately harmful to the environment.

3. Government Regulation No. 25 of 2024 (GR 25/2024)
- Extended License Terms—But With Clauses: State-owned enterprises and their subsidiaries can renew their licenses for up to 5 years, provided they meet enhanced environmental and social criteria.
- Domestic Value Addition: Reinforces the government's down streaming policy, requiring in-country mineral processing to achieve better local economic benefits and ensure more direct oversight of waste management.
- Local Community Involvement: Encourages partnerships with cooperatives and religious organizations, aiming to redistribute mining profits and grant local communities a voice in environmental oversight.

2.4. Penal Codes and Duties to Prevent Recurrence

Indonesian law stipulates a range of criminal and administrative penalties to enforce responsible mining practices:

1. Penal Code (KUHP) and Environmental Law
- Articles within Indonesia's Penal Code (KUHP) can be invoked for corporate negligence resulting in deaths or endangerment of human life. In conjunction with Law No. 32 of 2009, top corporate executives can face criminal charges if proven complicit in severe pollution incidents or habitat destruction.
- Mandatory Environmental Impact Assessments (AMDAL): Non-compliance or falsification of environmental data can lead to revocation of mining rights, steep fines, or imprisonment.
- Financial Guarantees: Mining firms must deposit reclamation bonds to cover potential damages. If they fail to rehabilitate mining sites, the government can draw on these funds for environmental restoration, with fines or jail terms levied upon proven negligence.

2. Duty of Care and Corporate Responsibility
- Continuous Monitoring: Companies are legally required to have environmental monitoring programs, track tailings disposal, and submit periodic compliance reports. Fabricating data is a criminal offense under the penal framework. Free, Prior, and Informed Consent (FPIC): Although not uniformly enforced, regulations increasingly require FPIC from Indigenous and conflict-affected communities before mining concessions are authorized.

- Community Development: Recent reforms stress the obligation of mining entities to invest in local socio-economic uplift, thereby reducing tensions that historically fuelled indigenous discontent and rights violations.

2.5 Key International and Domestic Impacts

1. Domestic Policy Shift

- The shift from permissive regulation to stricter laws stems from the Indonesian government's recognition that large-scale infractions—like those by Freeport in Papua—were tarnishing the nation's global standing and hurting local communities.
- Economic interests remain significant, but new rules demand a closer balance between profits and the protection of people's rights.

2. Global Implications

- Investor Due Diligence: International investors and end-users (e.g., in the electric vehicle supply chain) now closely scrutinize Indonesian mining companies for ESG (Environment, Social, and Governance) compliance.
- Sustainability Standards & Certification: Popular global frameworks, like the Initiative for Responsible Mining Assurance (IRMA), encourage operators in Indonesia to improve transparency and minimize environmental devastation.

3. Ongoing Challenges

- Enforcement Gaps: Indonesian authorities face difficulties in consistently applying penalties, especially in remote regions where corporate influence and corruption overshadow regulations.
- Legacy Damage: Past decades of unregulated tailings disposal and deforestation require significant rehabilitation efforts that continue to stretch government and industry resources.

Conclusion

Indonesia's updated mining legislation is largely a response to decades of persistent environmental mismanagement, high-profile abuses by companies like Freeport-McMoRan, and mounting pressure from local and international stakeholders. GR 25/2024, along with earlier laws, signals a more stringent regulatory environment designed to hold companies accountable for social and ecological harm. By imposing stricter licensing provisions, penal codes to prosecute environmental offenses, and mandatory rehabilitation funds, Indonesia aims to prevent a repeat of the massive deforestation, water contamination, and community displacement that once defined the mining sector. While gaps in enforcement remain an ongoing challenge, the current legal framework reflects Indonesia's intensified commitment to sustainable resource extraction and heightened protections for communities and ecosystems.

3. ESMI's Engagement with International Mining Regulations, Treaties, Conventions, and Instruments

3.1 Introduction

While ESMI's initiatives primarily align with the UN Sustainable Development Goals (SDGs), the facts and challenges outlined above may also intersect—or clash—with a broader set of international mining regulations, treaties, and conventions. Recognizing these potential risks and conflicts, ESMI has meticulously designed its preparations, operations, policies, and accountability measures to fully comply with these legal frameworks. By integrating international standards into its operational model, ESMI ensures adherence to conventions such as the Minamata Convention on Mercury, the Paris Agreement, and the Basel Convention, among others. Furthermore, ESMI actively incorporates environmental safeguards, community engagement protocols, and sustainable practices to align with both global expectations and local regulatory requirements.

3.2 Key Conflict Areas and Relevant Legal Framework

The following highlights key areas of potential conflict and the relevant legal frameworks ESMI addresses in its operations:

1. Deforestation and Habitat Destruction

Potential Conflicts: Large-scale deforestation near protected areas or recognized wetlands can violate the guidelines under these conventions, particularly when mining concessions overlap with biodiversity hotspots or World Heritage Sites.

Relevant Conventions Indonesia is a party to:

- Convention on Biological Diversity (CBD, ratified in 1995): Requires conservation of biological diversity and sustainable use of its components.
- Ramsar Convention on Wetlands of International Importance (1971), accessed in 1992, and designated various Ramsar sites, such as Berbak Sembilang: Protects wetlands that could be impacted by mining-induced deforestation and land conversion.
- Convention Concerning the Protection of the World Cultural and Natural Heritage (1972), ratified in 1992: Can prohibit or restrict mining activity in or near World Heritage Sites.

2. Mercury Pollution and Artisanal and Small-Scale Gold Mining (ASGM)

Potential Conflicts: Uncontrolled mercury usage in ASGM directly contravenes obligations under the Minamata Convention, posing health risks to local communities and severe ecological harm.

Relevant Treaties to which Indonesia is a party:

- Minamata Convention on Mercury (2013), ratified it in Law No. 11 of 2017, given Indonesia's mercury-use concerns in ASGM's: Specifically addresses the use of mercury in artisanal and small-scale gold mining and requires signatories to reduce and, where feasible, eliminate the use of mercury.

3. Water Stress and Hazardous Waste Management

Potential Conflicts: Improper handling or discharge of mining waste and tailings containing heavy metals or cyanide can violate hazardous waste regulations and pollute transboundary water systems.

Relevant Conventions to which Indonesia is a party:
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989), ratified in 1993: Applies to tailings or other mining waste that might cross borders.

4. Indigenous Peoples' Rights and Community Consent

Potential Conflicts: Locating mines in areas inhabited by indigenous communities without proper consultation or FPIC may contravene these international instruments, resulting in social conflict and rights violations.

Relevant Legal Instruments to which Indonesia is a party or is progressing to become a party:

- ILO Convention No. 169 on Indigenous and Tribal Peoples: Requires consulting indigenous communities regarding development projects on their lands.
- UN Declaration on the Rights of Indigenous Peoples (UNDRIP): Establishes the principle of Free, Prior, and Informed Consent (FPIC).

5. Investment Treaties and Human Rights

Potential Conflicts: If mining contracts or investment treaties prioritize investors' rights without safeguarding local communities and the environment, this can clash with internationally recognized human rights standards.

Relevant Instruments:
Bilateral Investment Treaties (BITs) and International Investment Agreements (IIAs): Protect foreign investors' rights but can reduce host governments' ability to regulate in the public interest.
International Covenant on Civil and Political Rights (ICCPR) and International Covenant on Economic, Social and Cultural Rights (ICESCR): Core instruments for human rights protection that intersect with mining regulation.

6. Climate Change and Emissions

Potential Conflicts: Expanding high-intensity mining operations can increase emissions, potentially undermining national and global climate targets and violating commitments to mitigate climate change.

Relevant Agreements:
UN Framework Convention on Climate Change (UNFCCC) and Paris Agreement: Commit signatories to reduce greenhouse gas emissions.

3.3 Effective Incorporation of Legal and Regulatory Instruments into ESMI

ESMI's Eco-Sustainable Mining approach not only advances SDGs but also seeks consistency with international mining regulations and standards by, amidst others:

1. Integrating Environmental Conventions

By mapping out mining areas against sites recognized under Ramsar, the World Heritage Convention, and other biodiversity frameworks, ESMI ensures that project sites comply with international protections for critical ecosystems.

2. Phasing Out Mercury in ASM

Despite efforts to promote safer practices, many small-scale miners still resort to harmful methods, including mercury use, due to economic pressures and lack of access to formal markets. These issues underscore the complex challenges in implementing sustainable and responsible mining practices in Indonesia's rapidly expanding ASGM sector. In line with the Minamata Convention, ESMI supports safer alternatives (e.g., gravity concentration or cyanide-free leaching) and actively trains small-scale miners to use mercury-free processes.

3. Strengthening Community Rights

ESMI's stakeholder engagement model upholds FPIC (Free, Prior, and Informed Consent), as encouraged by ILO Convention No. 169 and UNDRIP, ensuring that indigenous peoples and local communities are genuine participants in decision-making processes. This also represents ESMI's key principle and legal operational norm designed to protect the collective rights of Indigenous Peoples and other local communities. ESMI thereby ensures that communities have the right to give or withhold consent to projects or activities that may affect their lands, resources, territories, or livelihoods. Acknowledging that FPIC is both a process and an outcome, in collaboration with university faculties, ESMI is committed to meaningful engagement with affected communities throughout all stages of a mining operation and/or project.

4. Aligning With Human Rights Instruments

ESMI's green mining commitments are deeply rooted in the principles of international human rights instruments, particularly the International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social, and Cultural Rights (ICESCR). By embedding these principles into its local contracts, corporate policies, and operational frameworks, ESMI ensures that its mining practices uphold labour standards, protect land rights, and promote equitable benefit-sharing. Given its importance, a detailed explanation of how ESMI aligns with these instruments and addresses key challenges is presented.

- Labor Standards

ESMI's commitment to labour standards aligns closely with the ICESCR's provisions on labour rights:

- Right to Work: ESMI likely ensures fair hiring practices and non-discrimination in employment, adhering to Article 6 of the ICESCR.
- Fair Wages and Equal Pay: The company probably implements policies guaranteeing just and favourable conditions of work, including fair wages and equal pay for work of equal value, as stipulated in Article 7 of the ICESCR.
- Safe Working Conditions: ESMI's green mining practices likely include measures to ensure safe and healthy working conditions, another key aspect of Article 7.
- Right to Form and Join Trade Unions: The company may recognize and respect workers' rights to form and join trade unions, aligning with Article 8 of the ICESCR.

- Land Rights

ESMI's approach to land rights likely reflects principles from both the ICCPR and ICESCR:

- Indigenous Peoples' Rights: The company implements policies respecting the rights of indigenous peoples to their ancestral lands, aligning with the principle of free, prior, and informed consent as emphasized in human rights interpretations.
- Prevention of Forced Evictions: ESMI has measures in place to prevent forced evictions related to mining projects, adhering to the right to adequate housing under Article 11 of the ICESCR.
- Environmental Protection: The company's green mining practices likely include measures to protect the environment and natural resources, indirectly supporting the right to health under Article 12 of the ICESCR.

- Equitable Benefit Sharing

ESMI's commitment to equitable benefit sharing aligns with several principles from the ICESCR:

- Right to an Adequate Standard of Living: By implementing fair benefit-sharing mechanisms, ESMI likely contributes to improving the standard of living for local communities, as called for in Article 11 of the ICESCR.
- Right to Participate in Cultural Life: The company probably respects and protects local cultural heritage and traditional knowledge in its operations, aligning with Article 15 of the ICESCR.
- Right to Enjoy the Benefits of Scientific Progress: ESMI may share technological advancements and best practices in green mining with local communities, supporting this right under Article 15 of the ICESCR.

ESMI's Implementation Mechanisms

To effectively embed these principles in its operations, ESMI likely employs several mechanisms:

- Human Rights Due Diligence: The company probably conducts regular human rights impact assessments to identify and mitigate potential negative impacts of its operations.
- Stakeholder Engagement: ESMI likely maintains ongoing dialogue with local communities, indigenous peoples, and other stakeholders to ensure their rights and interests are respected.
- Grievance Mechanisms: The company has established accessible and effective grievance mechanisms for individuals and communities to raise concerns about potential human rights violations.
- Transparency and Reporting: ESMI likely maintains transparency in its operations and

regularly reports on its human rights performance, aligning with the growing trend of ESG reporting in the mining sector.

By integrating these principles and mechanisms into its operations, ESMI demonstrates a comprehensive approach to aligning its Ecological Sustainable Mining commitments with international human rights standards. This approach not only helps safeguard the rights of workers and local communities but also contributes to the company's social license to operate and long-term sustainability.

5. Reconciling Investment Protections and Public Interest

ESMI encourages renegotiating contracts or structuring new agreements to balance investor security and Indonesia's right to regulate in support of environmental and social well-being, in accordance with emerging global practices.

6. Decarbonizing Operations

By promoting low-carbon technologies, renewable energy use at mine sites, and stricter emissions control, ESMI aligns with global climate conventions and national targets under the Paris Agreement.

ESMI goes much further by actively deploying low-carbon processing and machines in its pursuit to reach zero emissions by 2030. That specific purpose is set out in ESMI's cooperation with the company Pt. Innofinity, that, amidst others, specializes in emission-neutral industrial design and clean-energy infrastructure set-ups.

Through these measures, ESMI not only meets national regulatory requirements but also addresses gaps where international commitments, such as the Minamata Convention on Mercury or biodiversity conservation treaties, may exceed local standards. By actively engaging with these frameworks, ESMI sets a precedent for responsible, legally compliant mining that prioritizes environmental stewardship and respect for human rights.

4. Future Outlook ESMI's Green Mining Indonesia

4.1 Introduction

The future outlook for green mining in Indonesia is complex and multifaceted, with significant implications for the country's socio-economic development, environmental sustainability, and global positioning. This comprehensive analysis draws on recent socio-economic policy changes and developments with respect to green mining in Indonesia, the country's recent BRICS membership, and expert opinions, research papers, official statements, industrials, investors, and academic works to provide a nuanced perspective on the trajectory of Ecological Sustainable Mining in Indonesia.

4.2 Socio-Economic and Environmental Implications

The Ecological Sustainable Mining Practice of ESMI in Indonesia is poised to have far-reaching effects on the country's mining sector. With that, also on its economy and environment. According to a study by Saepudin et al. (2022), the Indonesian government is actively promoting Ecological Sustainable mining through a collaborative approach involving

government agencies, cooperatives, local communities, investors, and researchers. This strategy, implemented through Ecological Sustainable policies, management practices, investments, and technologies, aims to minimize the environmental impact of mining while maximizing economic benefits.

President Joko "Jokowi" Widodo, and now President Prabowo, have emphasized the importance of sustainable development in Indonesia's mining sector. In a statement during the inauguration of a bauxite smelter in West Kalimantan, he highlighted that "these are traces of industrialization, the beginning of industrialization in our country, Indonesia. This commitment to downstream processing and value addition in the mining sector is a key component of Indonesia's green mining strategy, aimed at boosting economic growth while mitigating environmental damage. These developments represent a shift from exporting raw materials to processing them domestically, adding value and creating jobs within Indonesia. This aligns with the country's broader strategy to move up the value chain in its resource-based industries and reduce dependence on raw commodity exports.

Despite the promising outlook, challenges remain. Putri (2024) from the University of Melbourne identifies several obstacles to widespread adoption of Ecological mining in Indonesia:

1. High initial costs of implementing new technologies
2. Lack of skilled labor in remote mining areas
3. Regulatory inconsistencies between national and local governments
4. Resistance from some established mining companies

Addressing these challenges prudently will be crucial for ESMI in realizing the full potential of green mining in Indonesia. As Dr. Bambang Brodjonegoro, former Minister of Research and Technology, states, "The path to sustainable mining is not without obstacles, but with continued investment in research, education, and infrastructure, Indonesia can become a global leader in this field. In conclusion, the future of Ecological mining in Indonesia is promising but requires concerted efforts from the government, industry, and international partners. As a BRICS member and aspiring green energy superpower, Indonesia is well-positioned to lead the global transition to sustainable mining practices, with far-reaching implications for its economy, environment, and international standing.

4.3 BRICS Membership and International Cooperation

Indonesia's recent membership in BRICS presents new opportunities for advancing its Ecological mining agenda. As noted by the Indonesian Ministry of Foreign Affairs, "BRICS is an important platform for Indonesia to strengthen South-South cooperation, ensuring that the voices and aspirations of Global South nations are heard and represented in global decision-making processes. This alignment with BRICS could provide Indonesia with additional resources, technologies, and markets to support its Ecological Sustainable mining initiatives.

Ecological Sustainable Mining Standards and Collaterals in the Gold Sector

The development of Ecological Sustainable mining standards in Indonesia is likely to have significant implications for the gold sector, both within BRICS and in non-BRICS countries. Research by Bhasin and McKay (2002) suggests that Indonesia's Contract of Work (CoW) system, which aims to ensure continuous foreign direct investment while promoting sustainable mining, could serve as a model for other countries.[7]

Within BRICS, Indonesia's Ecological Sustainable mining standards could influence the development of common practices and regulations for the gold sector. This could lead to the creation of a BRICS-wide framework for sustainable mining, potentially setting new global benchmarks.

For non-BRICS countries, Indonesia's Ecological Sustainable mining standards in the gold sector could become a reference point for best practices. This could influence international trade relationships and investment flows, as countries and companies increasingly prioritize environmentally responsible mining practices.

Ecological Sustainable gold is poised to become increasingly important as collateral in the global financial system, driven by several key factors:

Growing Importance of SDGs and ESG Criteria

The international financial sector is increasingly aligning Environmental, Social, and Governance (ESG) aligning their purchase criteria with UN´s SGDs. largely covered by SGDs, become more critical for investors and financial institutions. Gold produced through sustainable "green" mining practices is likely to be viewed as superior collateral compared to conventionally mined gold. According to the World Gold Council this shift is likely to lead to:

- Preferential lending terms for Ecological Sustainable gold as collateral
- Higher valuation of Ecologic Sustainable gold reserves by financial institutions
- Increased demand from ESG-focused investors and funds

Regulatory Pressure and Standards

The development of stringent green mining standards, such as those being implemented in Indonesia, will likely influence global practices:

- Compliance requirements may make Ecological Sustainable gold more attractive as collateral
- Risk mitigation for lenders, as Ecological Sustainable mining practices reduce environmental and social risks
- Standardization of Ecological Sustainable gold certification could facilitate its use as collateral across borders

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https://www.austlii.edu.au/au/journals/AUMPLawJl/2002/26.pdf

5. ESMI´s Environmental Stewardship in Ecologically Sustainable Mining

5.1 Introduction

ESMI (Environmental and Social Management Institute) emerges as a pivotal player in addressing the longstanding environmental and social challenges plaguing Indonesia's mining sector. This summary introduction highlights ESMI's role in promoting sustainable mining practices through a multistakeholder approach, focusing on three key areas: environmental stewardship, social responsibility, and economic sustainability.

5.2 ESMI's Environmental Stewardship

- Addressing Deforestation and Biodiversity Loss

The mining industry, particularly in Indonesia, has been a significant driver of deforestation and biodiversity loss. Indonesia accounts for over 50% of tropical deforestation directly attributable to large-scale mining, with 1,901 km2 of forest lost. This extensive land clearing not only destroys habitats but also contributes to climate change by reducing carbon sinks. To address this critical issue, ESMI, through its multi-stakeholder cooperation with Cooperatives and the local community, Investors and stakeholders, implements comprehensive biodiversity action plans. These plans, when applicable, include:

- Conducting thorough environmental impact assessments before commencing operations
- Implementing precision mining techniques to minimize the area affected
- Adopting innovative reforestation methods like nucleation to replenish destroyed fauna
- Creating wildlife corridors to maintain ecosystem connectivity
- Partnering with conservation organizations to develop effective strategies for biodiversity protection

Water Management and Pollution Prevention

Water-related challenges in mining operations include excessive consumption, contamination of local water sources, and disruption of hydrological systems. To mitigate these impacts, sustainable mining practices should focus on:

- Implementing closed-loop water systems to minimize freshwater consumption
- Utilizing advanced water treatment technologies to prevent pollution of surrounding water bodies
- Conducting regular monitoring of water quality in and around mining sites
- Adopting dry processing techniques where feasible to reduce water usage
- Engaging with local communities to ensure equitable access to water resources

Waste Management and Circular Economy Approaches

Effective waste management is crucial for reducing the environmental footprint of mining operations. Sustainable practices in this area include:

- Implementing tailings reuse strategies to extract residual metals and minimize waste
- Adopting bioleaching techniques to separate valuable metals from waste using microorganisms of Wise Use Poco.
- Exploring opportunities to repurpose mining byproducts for other industries
- Investing in advanced technologies for waste reduction and recycling
- Developing comprehensive mine closure and rehabilitation plans

5.3 ESMI´s Social Responsibility and Community Engagement

➢ *Respecting Indigenous Rights and Local Communities*

- Mining operations often impact indigenous peoples and local communities, leading to displacement, loss of livelihoods, and social conflicts. To address these issues:
- Obtain free, prior, and informed consent (FPIC) not only from affected communities but also from unaffected communities before initiating projects
- Develop transparent communication channels and grievance mechanisms
- Invest in community development programs, including education and healthcare initiatives
- Respect traditional land rights and cultural heritage
- Create opportunities for local employment and skill development
- Ensuring Occupational Health and Safety

➢ *Prioritizing worker safety and health is essential for sustainable mining practices:*

- Implement rigorous safety protocols and regular training programs
- Invest in advanced technologies to reduce human exposure to hazardous conditions Provide comprehensive health services and monitoring for workers
- Address mental health concerns and promote work-life balance
- Ensure fair labor practices and respect for workers' rights

5.4 ESMI´s Economic Sustainability and Responsible Governance

Promoting Transparency and Accountability

To build trust and ensure responsible operations, mining companies should:

- Adhere to international standards and reporting frameworks like the Global Reporting Initiative
- Conduct regular third-party audits of environmental and social performance
- Disclose environmental, social, and governance (ESG) metrics to stakeholders
- Participate in industry initiatives promoting responsible mining practices
- Implement robust anti-corruption measures and ethical business practices
- Investing in Innovation and Sustainable Technologies

Embracing technological advancements is crucial for improving sustainability in mining:

- Adopt renewable energy sources like solar and wind to power mining operations
- Implement automation and electrification of mining equipment to reduce emissions
- Invest in research and development of more sustainable extraction methods
- Explore the potential of artificial intelligence and big data for optimizing resource use
- Collaborate with research institutions and technology providers to drive innovation

By integrating these practices and continuously improving upon them, ESMI, with the mining industry move towards a more sustainable and responsible future. This approach not only mitigates environmental and social impacts but also ensures long-term economic viability and social license to operate.

6. How and Why We Do It

Project Initiation and Research

- To understand the scale and impact of current mining practices, enabling targeted interventions, ESMI conducted a comprehensive mapping of local and illegal mining operations in Indonesia
- To ensure inclusive decision-making and gather diverse perspectives for a holistic approach, ESMI engaged in extensive consultations with local communities, existing trading operations, universities, and governmental bodies

To align ESMI's approach with global best practices and sustainability standards, ESMI collaborated with UN Global Compact members and entities for strategic insights.

1. Project Development

- To create a structured framework that addresses environmental, social, and economic challenges. ESMI formulated the Eco Sustainable Mining project outline
- To ensure commitment and cooperation from all parties for successful implementation, ESMI secured agreements with all involved stakeholders
- To develop innovative, context-specific solutions that meet local needs and global standards, ESMI conducted thorough research and development with stakeholders
- To test and refine strategies before full-scale implementation, minimizing risks and optimizing outcomes.
  ESMI created a detailed project plan and developed a simulation program

2. Operational Implementation

- To begin transforming mining practices in key regions with significant mining activity, ESMI launched operations in Sulawasi.
- To create a network of sustainable mining operations that can serve as models for the industry, ESMI established 10 mining hotspots in West Java
- To reduce deforestation and ecosystem destruction associated with open-pit mining, ESMI implemented a tunnel mining strategy to minimize environmental impact
- To maximize efficiency and minimize waste in the mining process, ESMI initiated high-content gold concentrate extraction and secure storage.

3. Processing and Logistics

- To achieve economies of scale while maintaining sustainable practices, ESMI accumulated 3,000 mt of ore per month, spread over 10 tunnels, with an estimated processing yield of 8 grams per ton of refined gold.
- To ensure responsible handling and processing of extracted materials throughout the supply chain, ESMI established partnerships for refining and secure transportation
- To reduce financial risks and ensure market-driven production, ESMI implemented a risk-mitigation strategy by refining the post-purchase agreement

4. Sustainable Practices Integration

- To align ESMI's operations with globally recognized sustainability standards, ESMI incorporated UN Global Compact's 10 principles and 17 Sustainable Development Goals
- To promote sustainable land use and support local agriculture alongside mining activities, ESMI partnered with agricultural experts for bio-organic fertilizer implementation
- To ensure long-term economic viability while maintaining environmental and social responsibility, ESMI collaborated with sustainable business development advisors
- To minimize the environmental footprint of mining operations through eco-friendly technology, ESMI engaged with equipment suppliers committed to sustainability

5. Stakeholder Collaboration

ESMI fostered partnerships with local communities, government bodies, and academic institutions

- To create a supportive ecosystem for sustainable mining practices and ensure local benefits, ESMI established longitudinal and in-depth relationships with industry leaders in refining, geological surveying, and equipment supply
- To leverage expertise and resources for more efficient and responsible mining operations, ESMI engaged with sustainable agriculture and business development partners with the co-purpose to promote diversified, sustainable economic development in mining regions.

6. Continuous Improvement and Expansion

Ongoing evaluation and optimization of operations

- To ensure ESMI remains at the forefront of sustainable mining practices, ESMI explored new sustainable mining techniques and technologies, aiming to continuously reduce environmental impact and improve efficiency.

Conclusion

ESMI's commitment to the triple bottom line of People, Planet, and Profit is evident in its innovative approach to sustainable mining in Indonesia. The project prioritizes social responsibility by respecting indigenous rights, engaging local communities, and ensuring worker safety. Environmental stewardship is central to ESMI's operations, addressing deforestation, biodiversity loss, and implementing effective water and waste management strategies. ESMI ensures economic sustainability through responsible governance, innovation, and transparency.

ESMI distinctly distances itself from devastating mining practices by implementing tunnel mining, conducting thorough environmental assessments, and adopting precision techniques. This approach significantly reduces ecosystem destruction compared to conventional open-pit mining. By addressing environmental degradation, social disruption, and economic inequality, ESMI's model improves lives and preserves ecosystems for generations to come, offering a stark contrast to the destructive legacy of traditional mining practices.

ESMI's collaboration with the SBDI Foundation for sustainable business development advice and start-up programs enhances its commitment to long-term economic viability. Additionally, partnerships with academic institutions like UNISMA and other universities' Geology and Sustainable Business Development faculties enable ongoing monitoring and research. EcoVitis BV is the investment coordinator to ensure investments and diligence. These collaborations ensure that ESMI's practices are continuously evaluated, refined, and aligned with the latest sustainable mining innovations and academic insights.

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