



White Paper: Unveiling the Future of Sustainable Business **through** **Empowering Green MSMEs**

2025

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Acknowledgement

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Foreword

Minister of National Development Planning/ Head of the National Development Planning Agency

We extend our profound gratitude to God Almighty, for through His grace and blessings, this White Paper entitled “Unveiling the Future of Sustainable Business through Empowering Green MSMEs” has been successfully prepared as a strategic initiative to support national development goals.

Law No. 59 of 2024 on the National Long-Term Development Plan (RPJPN) 2025–2045 affirms that the pursuit of a Green Economy is a central development agenda in realizing Indonesia Emas 2045. This agenda is not only intended to strengthen policies for reducing greenhouse gas emissions and achieving the Net Zero Emission (NZE) target by 2060, but also to ensure that the transformation we undertake is just, inclusive, and grounded in sustainable development practices.

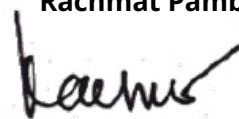
In this context, the role of Micro, Small, and Medium Enterprises (MSMEs) is crucial. MSMEs that transition towards becoming Green Enterprises hold significant potential to drive job creation, foster innovation, and enhance economic resilience, while simultaneously strengthening climate action at the grassroots level. Accordingly, this White Paper has been prepared as a strategic reference for ministries/agencies, local governments, the private sector—particularly MSME actors—investors, development partners, academia, and the wider public to build synergies in accelerating the empowerment of Green MSMEs and realizing Indonesia’s green economic transformation.

It is our hope that this document may serve as an inspiring, practical, and collaborative reference, fostering joint efforts toward a more competitive, equitable, and sustainable Indonesia. With steadfast commitment from all stakeholders, we are confident that the transformative agenda of energy transition and the green economy will stand as a lasting legacy for generations to come.

May the Almighty God continue to bestow His blessings upon our shared pursuit of a better Indonesia.

Jakarta, September 16, 2025

Rachmat Pambudy,



Minister of National Development Planning/
Head of the National Development Planning Agency

Foreword

Deputy for Community Empowerment, Population, and Employment

Indonesia is entering a pivotal phase of national development, where economic resilience and enhanced competitiveness have become top priorities alongside our commitment to environmental sustainability. As outlined in the National Long-Term Development Plan (RPJPN) 2025–2045 and the National Medium-Term Development Plan (RPJMN) 2025–2029, the transition toward a green, inclusive, and low-carbon economy is not a choice, but an imperative.

Micro, Small, and Medium Enterprises (MSMEs)—which account for more than 99% of all businesses in Indonesia and employ over 97% of the workforce—will play a central role in this transformation. While MSMEs serve as the main engine of economic growth and job creation, they also contribute significantly to energy consumption and greenhouse gas emissions. For this reason, the integration of sustainability principles into MSME development is essential if Indonesia is to achieve its net-zero emission target by 2060, or earlier.

The White Paper: Unveiling the Future of Sustainable Business through Empowering Green MSMEs presents a strategic framework to mainstream green and sustainable practices among MSMEs. Developed through collaboration between the Ministry of National Development Planning/Bappenas, the Asian Development Bank (ADB)—with support from the Government of Australia through the Sustainable Infrastructure Assistance Program Phase 2 (SIAP2)—the Institute for Essential Services Reform (IESR), and other stakeholders, this document not only highlights the challenges but also underscores the opportunities to reposition MSMEs as key actors in the green transition and inclusive growth.

The strength of this white paper lies in its clarity of vision and its actionable roadmap. It comprehensively outlines strategic steps for transformation—from establishing a green MSME classification, providing incentives, strengthening capacity, to designing regulatory frameworks—all aligned with Indonesia's climate agenda and development targets. Furthermore, it contributes significantly to the implementation of the RPJMN 2025–2029 by offering concrete policy directions to accelerate the green transition across sectors and regions.

This white paper represents an important milestone in the journey toward realizing Green MSMEs. It provides recommendations for all stakeholders—including government, development partners, the private sector, and MSME actors—to adopt innovative approaches that go beyond conventional paradigms. Collaboration between central and local governments, communities, and businesses will be key to ensuring that no one is left behind in this green transition.

I hope this document serves as a testament to our shared commitment to advancing a national development agenda that is economically inclusive, socially just, and environmentally sustainable.

Jakarta, September 16, 2025

Maliki,



Deputy for Community Empowerment, Population, and Employment
Ministry of National Development Planning/National Development Planning Agency



BADAN PERENCANAAN PEMBANGUNAN NASIONAL

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List of Acronyms

BAPPEDA	Badan Perencanaan Pembangunan Daerah
BI	Bank Indonesia
BKPM	Badan Koordinasi Penanaman Modal
BPD	Bank Pembangunan Daerah
BPS	Badan Pusat Statistik
BSN	Badan Standardisasi Nasional
BUMN	Badan Usaha Milik Negara
ESG	<i>Environmental, Social, and Governance</i> /Lingkungan, Sosial, dan Tata Kelola
GHG	<i>Greenhouse gases</i> /Gas rumah kaca
IAC	<i>Industrial Assessment Centers</i> /Pusat Penilaian Industri
ISSB	International Sustainability Standards Board/Dewan Standar Keberlanjutan Internasional
KADIN	Kamar Dagang dan Industri
KUR	Kredit Usaha Rakyat
LKPP	Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah
M&E	Monitoring and Evaluation/Pemantauan dan Evaluasi
MDB	Multilateral Development Bank/Bank Pembangunan Multilateral
MEPS	<i>Minimum Energy Performance Standards</i> /Standar Kinerja Energi Minimum

NDC	<i>Nationally Determined Contributions</i> /Kontribusi yang Ditentukan Secara Nasional
NSPK	Norma, Standar, Prosedur and Kriteria
OJK	Otoritas Jasa Keuangan
PRI	<i>Principles for Responsible Investment</i> /Prinsip-prinsip Investasi Bertanggung Jawab
RAN-GRK	Rencana Aksi Nasional Penurunan Emisi Gas Rumah Kaca
RPJMN	Rencana Pembangunan Jangka Menengah Nasional
SCGJ	<i>Skill Council for Green</i> /Dewan Keahlian untuk Keberlanjutan
SDG	<i>Sustainable Development Goals</i> /Tujuan Pembangunan Berkelanjutan
SUSENAS	Survei Sosial Ekonomi Nasional
UKM	Usaha Kecil dan Menengah
UMKM	Usaha Mikro, Kecil, dan Menengah
UPT	Unit Pelaksana Teknis

Executive Summary

White Paper: Unveiling the Future of Sustainable Business through Empowering Green MSMEs

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of Indonesia's economy. According to data from Statistics Indonesia (BPS), the number of MSMEs has reached more than 56.14 million business units in 2024, employing approximately 97% of the workforce and contributing 61% of the Gross Domestic Product (GDP). With this scale, MSMEs play a strategic role not only as the foundation of the national economy but also as a driver of transformation toward a green economy aligned with Indonesia's long-term development targets.

However, the vast production activities of MSMEs—which are expected to continue expanding—pose significant risks of increasing energy consumption and carbon emissions. Field research conducted by IESR in 2023 estimated that emissions from the MSME sector reached 216 million tons of CO₂, equivalent to two-thirds of total national industrial emissions. Without an accelerated green transition, MSMEs risk being left behind amid global market shifts increasingly demanding sustainable business practices and may even hinder Indonesia's achievement of its emission reduction targets.

The transition of MSMEs toward a green economy faces several complex challenges:

- 1. Low awareness and adoption of green practices.** Currently, fewer than 5% of SMEs have integrated renewable energy, sustainable procurement practices, or hold environmental certifications.
- 2. Limited access to green financing.** According to data published by OJK in 2024, the MSME financing gap is projected to reach IDR 2,400 trillion by 2026. Most MSMEs are perceived as high-risk by financial institutions, making access to transition credit difficult.
- 3. Lack of specific regulatory frameworks.** There are no national standards for green SMEs, limited ESG (Environmental, Social and Governance) reporting obligations, and insufficient coordination between national and regional policies, making it difficult for MSMEs to navigate business transformation.
- 4. Limited access to technology and market intelligence.** SMEs in remote regions face technology gaps, making it difficult to adopt energy-efficient or low-carbon technologies.
- 5. Lack of technical and managerial capacity.** The majority of SMEs lack sustainability literacy and human resources prepared to meet the green market demands.

Despite these challenges, there are significant opportunities that could catalyse transformation:

- **Rising demand for green products.** International markets, particularly the European Union with its CBAM (Carbon Border Adjustment Mechanism) policy, are increasingly demanding low-carbon supply chains.
- **National policy support.** The **RPJPN 2025–2045**, green economic transformation initiatives, renewable energy policies, and green public procurement provide a strong regulatory foundation that needs clearer implementation down to grassroots levels.
- **International funding flows.** Global financial institutions, including institutional investors and development donors, are increasingly committed to channelling green finance to developing countries.
- **Local technology and innovation.** The emergence of clean energy startups, green fintech, and regional innovation hubs provides opportunities to accelerate the adoption of environmentally friendly technologies.

To bridge these gaps and optimize opportunities, this white paper recommends five strategic priorities:

1. **Green SME Roadmap.** Develop indicators for green SMEs, pilot sectors with high adoption readiness, and set a phased transition schedule until 2045.
2. **Financial and Economic Incentives.** Establish relevant sustainable financing schemes for MSMEs, including performance-based grants, blended finance, transition credit facilities, and green taxes.
3. **Capacity Building and Education.** Establish a national green business academy, sustainability curriculum, regional innovation centers, and mentoring networks for MSMEs.
4. **Technology and Innovation Support.** Develop green innovation hubs, subsidies for adopting low-emission equipment, and regulatory sandboxes for fintech/cleantech solutions.
5. **Proactive Regulatory Framework.** Set national green SME standards, mandate ESG reporting for medium enterprises by 2026, and strengthen regulatory coordination between national and regional levels.

In this white paper, to encourage MSME empowerment through the adoption of green business principles, these short-term (2025–2027) measures are recommended:

- Developing a classification for green SMEs and initiating pilot projects in priority sectors.
- Strengthening coordination between ministries and local governments.
- Creating inclusive innovative financing frameworks.
- Developing a green literacy curriculum for MSMEs.
- Harmonizing national policies with regional initiatives, such as those in ASEAN.

The transformation of MSMEs toward green practices is not only an environmental necessity but also a strategic economic opportunity for Indonesia. With the right policy framework, targeted financial incentives, and robust support for technology and capacity, MSMEs can become the driving force behind inclusive green growth, global competitiveness, and significant contributions to achieving the net-zero target by 2060 or sooner.





Chapter 1

Diagnostic Analysis of the Current Landscape

The Role of Indonesia’s MSMEs in Advancing Economic Growth and Environmental Sustainability

Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in the economies of many countries. They are often considered the backbone of the economy, contributing significantly to job creation and economic growth. MSMEs operate across a wide range of industries, including manufacturing, services, retail, agriculture, and more. According to the World Bank, Small and Medium enterprises (SMEs) represent a substantial portion of businesses worldwide and contribute to more than half of employment. SMEs are also recognized for their ability to create jobs, particularly at the local level.

In Indonesia, MSMEs have become the foundation of the national economy. As illustrated in Figure 1 below, Indonesia’s MSMEs maintained stable Gross Domestic Product (GDP) contributions between 2017 and 2022, accompanied by rapid growth in number. The number of MSMEs increased from 50.5 million in 2021 to 56.14 million in 2024—an average growth of 1.9% per year (BPS, 2025). In 2022, MSMEs accounted for nearly 61% of the country’s overall GDP (around IDR 8,573 trillion, or the equivalent of USD 606 billion¹) (Limanseto, 2022), contributed 15.6% to exports, and employed 97% of the national workforce—around 119.6 million people—albeit with many employment arrangements being informal. The vital role of MSMEs resonates both within and beyond Indonesia’s borders, solidifying their status as a cornerstone of the country’s economic trajectory.

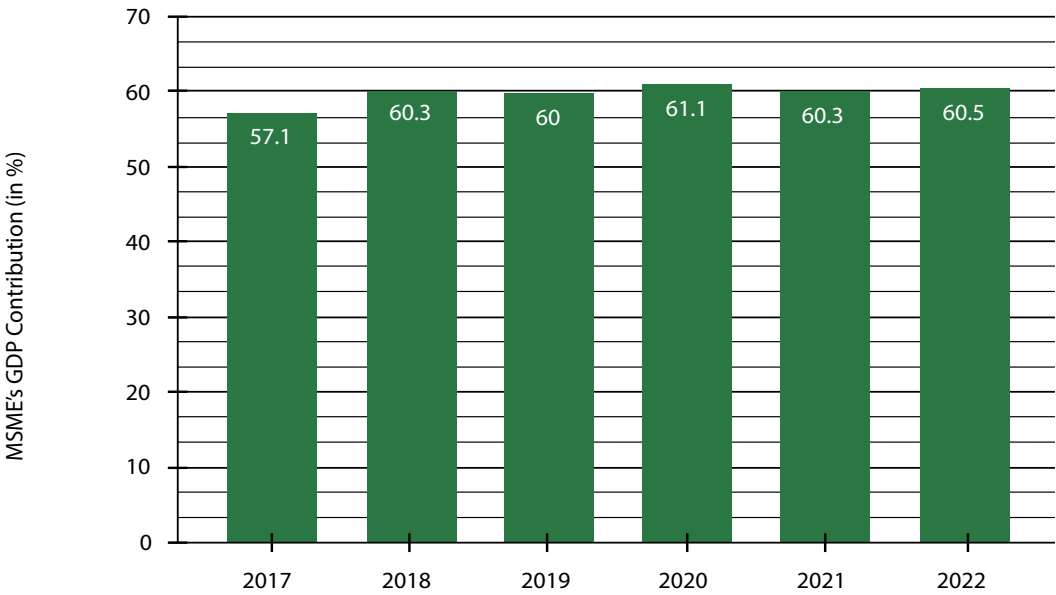


Figure 1. MSME Growth Based on GDP Contribution between 2017 and 2022

Despite their scale, MSMEs face significant challenges in competing within national and global markets. Their competitiveness remains limited, as shown by their low integration into value chains: only 7% of MSMEs are linked to large domestic businesses (BPS, 2016) and they make only a small contribution to export activities. This low level of linkage highlights the urgency of strengthening MSMEs’ capabilities to compete in both domestic and international markets, which are increasingly driven by sustainability concerns.

Furthermore, this economic dynamism coexists with significant environmental challenges. Indonesia is one of the world’s largest emitters of greenhouse gases (GHG), with major sources including land-use change, industrial activity, and dependence on fossil fuels (Climate Transparency, 2023). The large MSME population—diverse in sizes and often subject to less stringent regulatory oversights—poses significant challenges in terms of national energy demand and greenhouse gas

1 2019 exchange rate

emissions. According to Asian Development Bank (ADB)'s Asia Small and Medium-Sized Enterprise Monitor (ASM) 2020, between 2018 and 2020, MSMEs accounted for about 50% of total business energy consumption. Furthermore, studies estimate that MSME emissions reach 216 million tons of CO₂ annually—equivalent to two-third of national industrial emissions (IESR, 2024). Despite these figures, sustainability adoption among MSMEs remains limited. Very few have integrated renewable energy solutions, adopted sustainable procurement practices, or pursued eco-certifications. This highlights a significant gap in the sector's green transformation.

International Pressure Demands a Move Away from Unsustainable Business Practices

Indonesia's rich biodiversity is integral to several of its key industry sectors, underpinning both economic activities and the livelihoods of millions. Forests, covering approximately 88.5 million hectares, are not only home to diverse flora and fauna but also support the subsistence needs of around 40 million rural Indonesians. These ecosystems provide essential resources such as timber, medicinal plants, and non-timber forest products, which are vital to sectors like agriculture, forestry, and traditional medicine.

The marine biodiversity of Indonesia, particularly within the Coral Triangle, also plays a crucial role in the country's economy. This region, often referred to as the "Amazon of the seas," supports fisheries and tourism by providing habitats for a vast array of marine species. The health of these marine ecosystems is essential for food security, employment, and foreign exchange earnings generated through seafood exports and ecotourism.

However, the increasing shifts in global temperature due to anthropogenic activities are jeopardizing ecosystem balance. A study published in 2024 indicates that with a global temperature rise of 3.2°C above pre-industrial levels—resulting from all sectors continuing to operate as business-as-usual—approximately 49% of insect species, 44% of plant species, and 26% of vertebrate species could lose more than half of their geographic range. In contrast, limiting warming to 1.5°C significantly reduces these risks, with projected losses dropping to 6% for insects, 8% for plants, and 4% for vertebrates (Price et al., 2024) Brazil, Egypt, Ethiopia, Ghana and India. This infers that economies that depend on biodiversity and nature such as agriculture and forestry face heightened risks, particularly in countries like Indonesia, where these sectors form the backbone of the economy. These risks, in turn, will have a direct impact on the country's risk ratings and the cost of public funds associated with them. Recognizing this urgency, Indonesia ratified the Paris Agreement in 2016 through the enactment of law no 16/2016 and has since become an active signatory, reporting its climate commitment progress annually to the United Nations Framework Convention on Climate Change (UNFCCC) during the United Nations Climate Change Conference of Parties (COP).

The Paris Agreement plays a pivotal role in steering the global private sector toward net-zero targets, providing an overarching framework that shapes regulatory environments and market expectations. As countries pursue their nationally determined contributions (NDCs) to limit global warming to well below 2 degrees Celsius, SMEs are increasingly affected by policy shifts toward low-carbon economies. Regulations such as carbon pricing (regulated in Presidential Regulation no 98/2021), emission standards such as the green industry standards set by Ministry of Industry (Mol), the Carbon Border Adjustment Mechanism (CBAM), deforestation-free product requirements (Directorate General for Environment EU, 2023), and sustainable procurement standards (Directorate General for Communication EU, 2024)—all stemming from commitments under the Paris Agreement—directly and indirectly influence SME operations. These developments compel businesses of all sizes to adopt greener practices and technologies to remain competitive and compliant within evolving market landscapes.

The Paris Agreement also shifted global investment trends towards greener business models. Average annual climate finance flows nearly tripled, as illustrated in Figure 2, with the number of Environmental, Social, and Governance (ESG) funds reaching nearly 10,000 in 2021, compared to just over 2,500 in 2018. Institutional investors, for instance, the European Investment Bank (EIB), has provided EUR 170 billion in climate funding since 2012, supporting over EUR 600 billion in programs aimed at emission mitigation and sustainability promotion. Similarly, the European Bank for Reconstruction and Development (EBRD) launched a EUR 377 million program in 2023 to boost digital and green technologies for SMEs in the Western Balkans. Green bond issuance also saw a substantial increase, totaling USD 575 billion in 2023—up 10% year-on-year. This surge in sustainable finance reflects a growing commitment from both public and private sectors to support environmentally friendly initiatives.

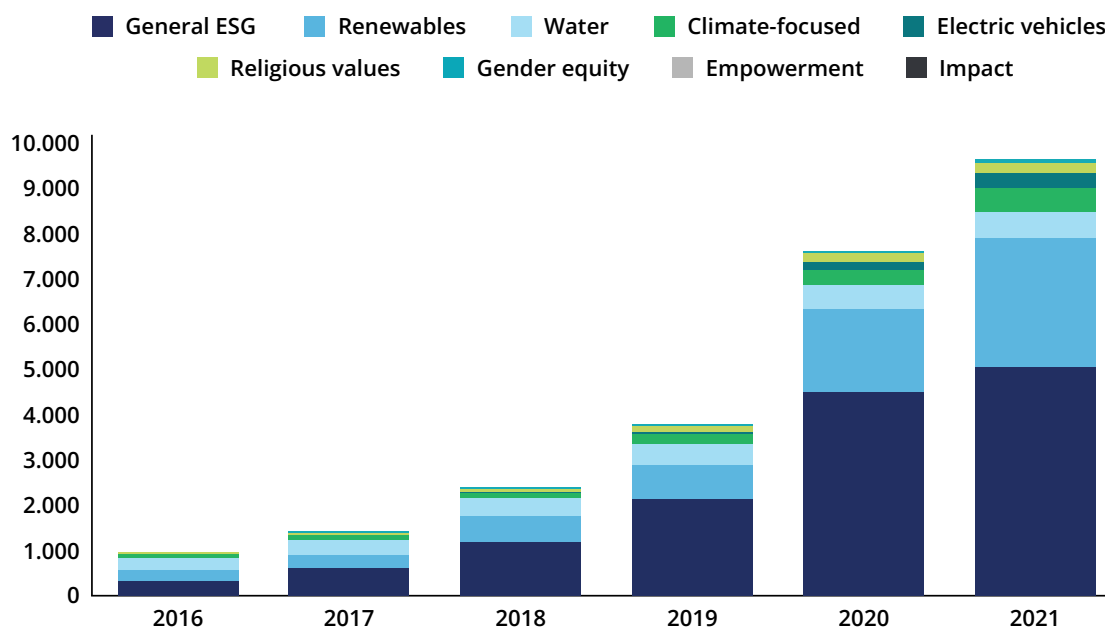


Figure 2. ESG investment growth between 2016 and 2021 (Taşkın & Yılmaz, 2024)

Other than that, as shown in Figure 3, the number of signatories to the United Nations-supported Principles for Responsible Investment (PRI) has increased significantly. By the end of 2023, over 5,300 companies across more than 80 countries signed the PRI, with asset owners collectively managing over USD 65 trillion in assets. This includes some of the world's largest asset holders, such as Norges Bank Investment Management and BlackRock, that are significantly reshaping the global financial landscape by prioritizing environmental sustainability and climate risk management across their portfolios.

BlackRock—the world's largest asset manager, with USD 1.6 trillion in Assets Under Management (AUM) as of the fourth quarter of 2024—has made it clear that climate risk is investment risk. The firm actively advocates for increased corporate transparency on ESG metrics and supports shareholder resolutions aimed at accelerating decarbonization.

Meanwhile, Norges Bank, managing Norway's substantial sovereign wealth fund with USD 1.74 trillion in AUM, similarly leverages its financial clout by engaging directly with companies, voting against boards that fail to address climate concerns adequately, and divesting from businesses that consistently disregard sustainability standards.

This leadership by major asset holders sends a strong market signal, influencing smaller investors and businesses across sectors to proactively integrate green practices and align their operations

with climate commitments. The cascading effect of such large-scale investment shifts creates both urgency and opportunity, incentivizing businesses worldwide to adopt sustainable practices not merely as compliance measures, but as strategic pathways to access investment capital, protect their reputations, and ensure long-term profitability in a rapidly transitioning global economy.

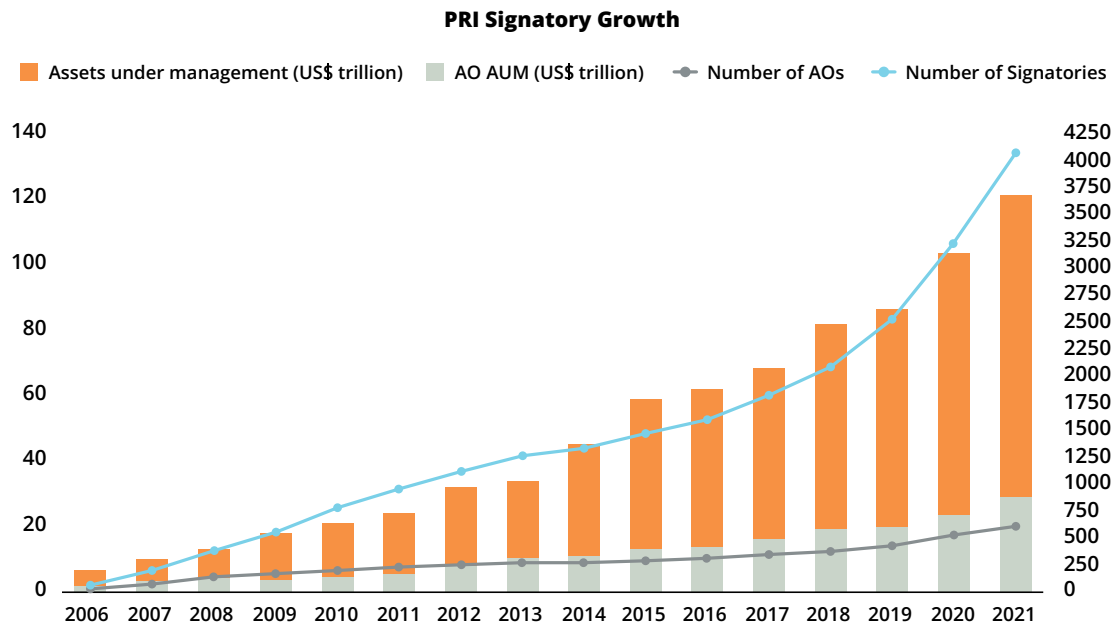


Figure 3. Growth of Assets and Companies under United Nations-supported Principles for Responsible Investment between 2006 and 2021 (Goodwin, 2022)

The flow of money means that supply chains across all sectors are increasingly influenced by sustainability requirements that encapsulate not only environmental concerns but also the social and governance practices of enterprises—both large and small. In Indonesia, this growing emphasis on sustainability is evident as regulators, consumers, and financiers now require sustainability reporting for compliance, which has been mandatory for large public companies since 2020. In just two years of implementation, 44 Indonesian companies listed on the Indonesia Stock Exchange have already submitted their 2022 sustainability reports (PwC Indonesia, 2023).

Vision and Strategic Objectives

The Government of Indonesia affirms its unwavering commitment to achieving net-zero greenhouse gas emissions by 2060 or sooner, aligning its trajectory with global frameworks such as the Paris Agreement and its NDCs. To solidify this commitment, the government has developed the 2025-2045 National Long-Term Development Plan (RPJPN 2025-2045), taking into account the Sustainable Development Goals (SDGs), representing a national development plan focused on economic well-being whilst being consciously aligned with ten global megatrends. The RPJPN encompasses eight interrelated missions, collectively referred to as Indonesia's Golden Vision 2045. These include social transformation, economic transformation, governance transformation, the rule of law, national stability and Indonesia's global leadership, socio-cultural and ecological resilience, equitable and just regional development, high-quality and environmentally friendly infrastructure, and sustainable development. In particular, the link between economic transformation and socio-cultural and ecological resilience is reflected in Indonesia's national targets, which include increasing Gross National Income (GNI) per capita to USD 30,300, raising the share of small and medium enterprises to 5%, increasing the entrepreneurship ratio to 8%, boosting the share of renewable energy to 70%, reducing greenhouse gas emission intensity by 93.5%, and improving the environmental quality index to 83%.

MSMEs—which account for over 99% of Indonesia’s enterprises and contribute more than 60% to the GDP—play a vital and transformative role in this national climate strategy. MSMEs are not merely passive recipients of green policies; they serve as catalytic actors in embedding low-carbon, resource-efficient, and resilient practices into Indonesia’s production base.

Indonesia’s green SME policy framework is anchored in a clear set of strategic objectives aimed at accelerating the sector’s transition toward sustainability. Chief among these is the ambition to achieve a minimum 93.5% reduction in GHG emissions from all activities by 2045, including those from SMEs. To meet this target, the policy prioritizes the adoption of global best practices in sustainable operations—particularly those rooted in circular economy principles, enhanced energy productivity, and climate resilience. Equally critical is the mobilization of climate finance through the deployment of fiscal instruments, blended finance solutions, and innovative financing vehicles designed specifically for SMEs. At the same time, the government aims to establish a harmonized regulatory framework for SME sustainability reporting, fully aligned with international standards such as ISO 14001, IFRS S1 and S2, and the International Sustainability Standards Board (ISSB) disclosure requirements. This integrated approach is expected to create an enabling ecosystem that supports both improved environmental performance and strengthened business competitiveness in the SME sector.



Figure 4. Vision and Strategic Objectives of This Study

To effectively accelerate the transformation of Indonesian MSMEs towards sustainability, the government can prioritize five strategic areas as a strong foundation for rapid implementation and measurable impact. These five priorities include: **the development of a structured MSME transformation roadmap and timeline (Priority 1); the introduction of targeted financial and economic incentives (Priority 2); the design of comprehensive capacity-building and education programs (Priority 3); the establishment of robust technology and innovation support (Priority 4); and the adjustment of proactive legal and regulatory frameworks (Priority 5).** These areas form the focus of this white paper.

It should be noted that due to the limited availability of data on Indonesian MSMEs, expert judgement has been used in some areas of this research. Hence, further refinement in some areas may be required during future implementation phases.

The output of this white paper is intended to serve as a foundational guidance and provide actionable recommendations for policymakers, SMEs, industry associations, and the public in supporting the future governance and implementation of green and sustainable MSME practices. This white paper provides a multidimensional, cross-sectoral policy roadmap that integrates climate, economic, and industrial transformation objectives. It emphasizes the need for systematic change, institutional coherence, and long-term investment in capacity building and innovation—positioning SMEs at the heart of Indonesia’s inclusive green growth agenda.



Chapter 2

Gap and Opportunity Analysis

Understanding the Awareness Level of Green and Sustainability Practices among Indonesia’s MSMEs

Currently, the level of awareness and the implementation of green and sustainability practices among Indonesian MSMEs remains generally limited. Findings from Institute for Essential Services Reform (IESR)’s preliminary MSMEs survey (Annex 2) indicate several key insights, as illustrated in Figure 5 and Figure 6 below.

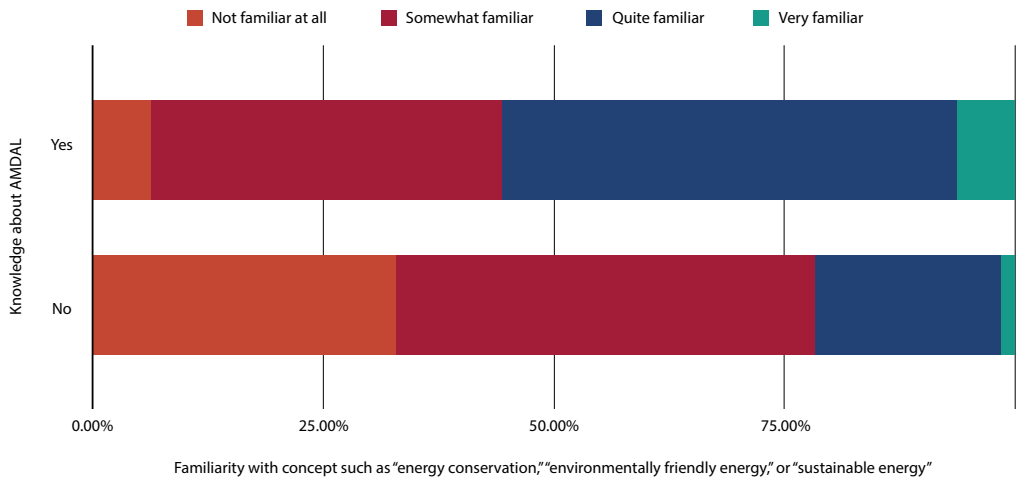


Figure 5. Cross-tabulation of AMDAL Knowledge and Familiarity with Environmental Energy Concepts

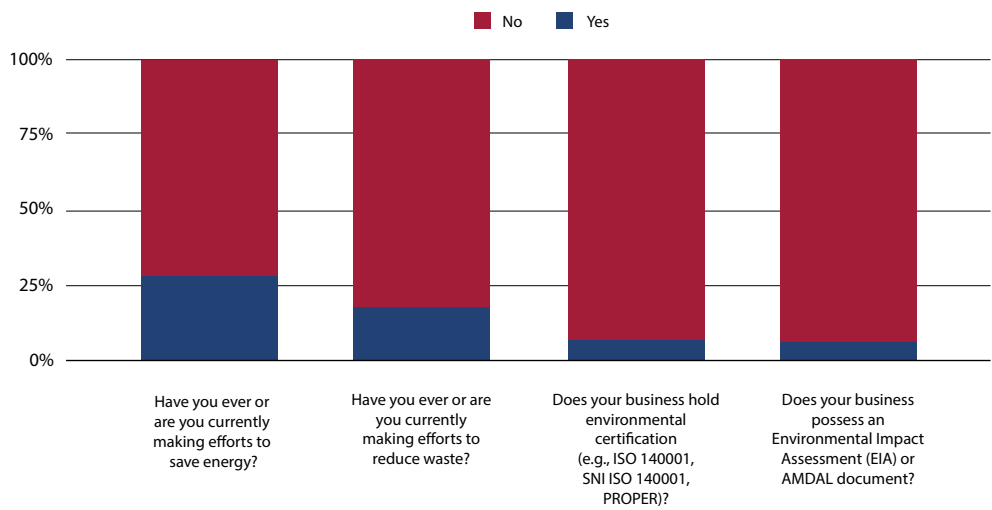


Figure 6. Distribution of Environmental Certification Ownership by Enterprise Size Category

Awareness is generally higher in conceptual areas—such as knowledge of energy conservation and available environmental certifications—than in practical implementations, such as energy and water saving measures or the actual adoption of certifications. A targeted study of 397 SMEs in Bali similarly found that awareness of sustainability reporting was “still low,” with few firms even considering the publication of environmental reports. In short, MSMEs tend to be “reactive” toward environmental issues—they recognize their importance but often lack in-depth knowledge of specific sustainable business practices (Astuti et al., 2023).

Despite growing awareness, the actual implementation of green practices by Indonesian MSMEs has been modest. In one interview-based survey of 74 small firms in South Sulawesi, 74% reported having no formal green processes, while only 26% had adopted any green business practices (Arifah et al., 2024).

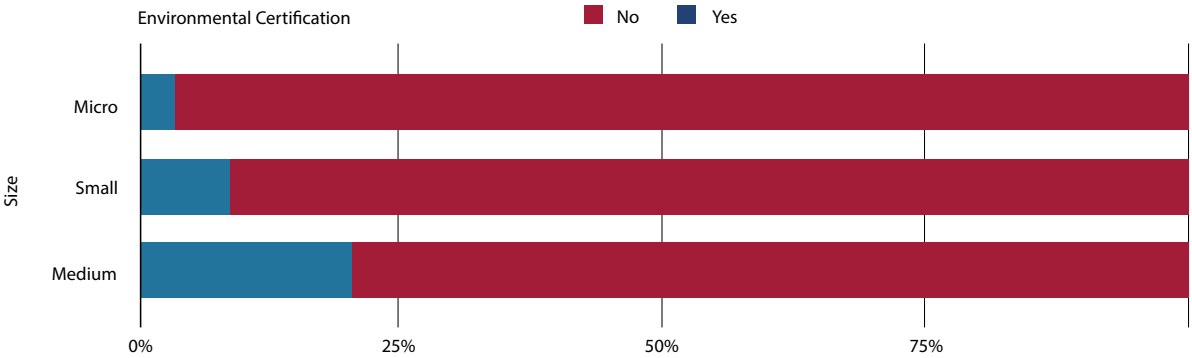


Figure 7. Distribution of Environmental Certification Ownership by Enterprise Size Category

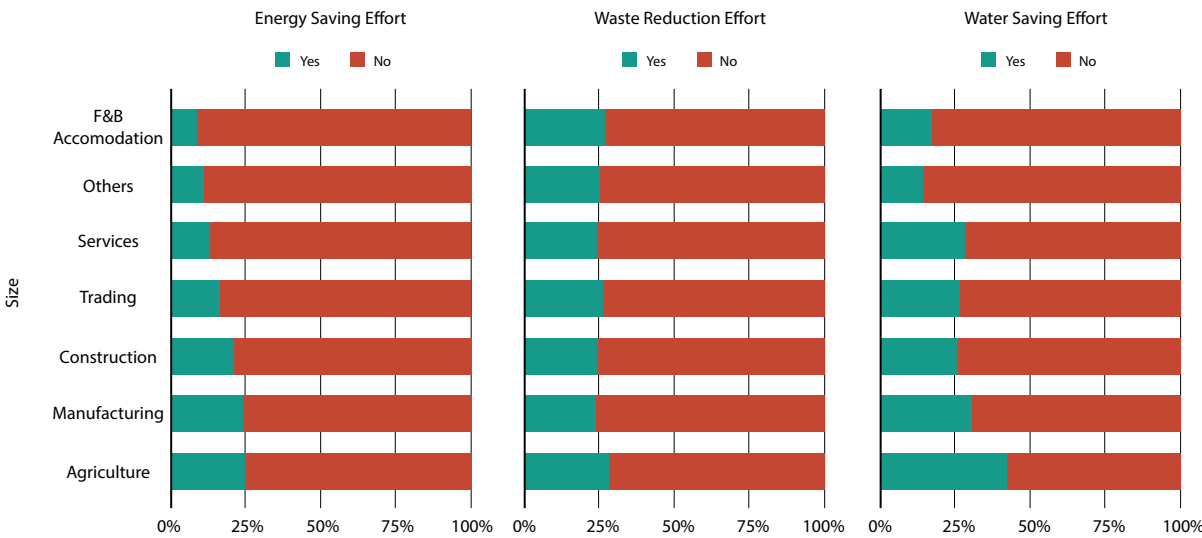


Figure 8. Sectoral Distribution of Environmental Efforts in Energy, Waste, and Water Management

Figure 7 shows that medium-sized enterprises demonstrate the highest awareness of sustainability concepts, practices, and frameworks, followed by small and micro enterprises. In terms of sectors, manufacturing shows the highest awareness of sustainability concepts and frameworks; however, implementation varies, as illustrated in Figure 8.

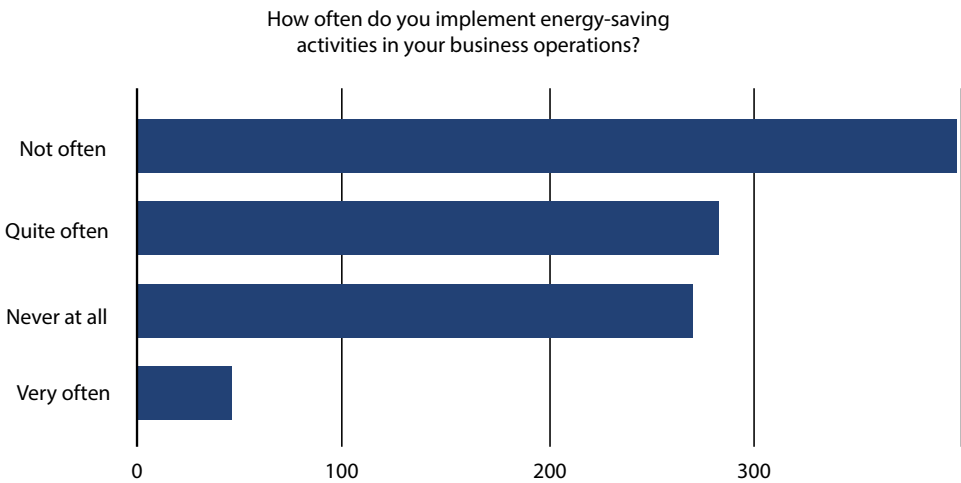


Figure 9. Frequency of Energy-saving Practice Implementation in Business Operations

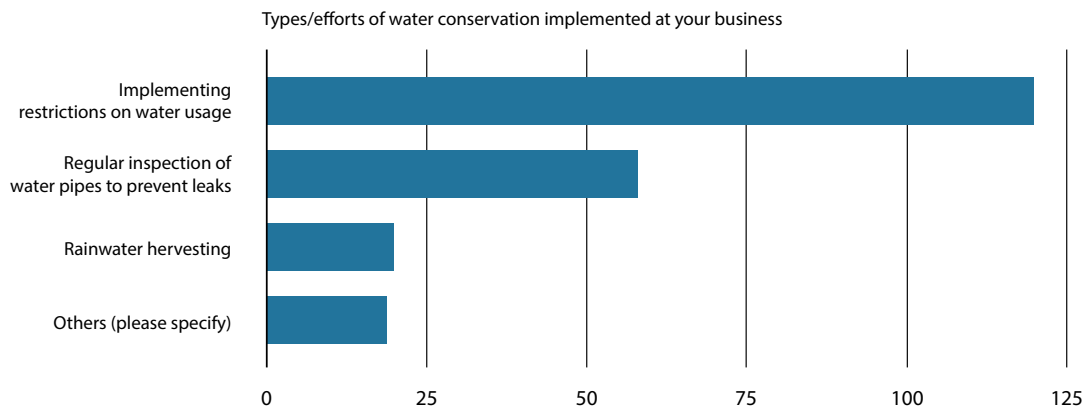


Figure 10. Types of Water Conservation Measures Implemented at Business Premises

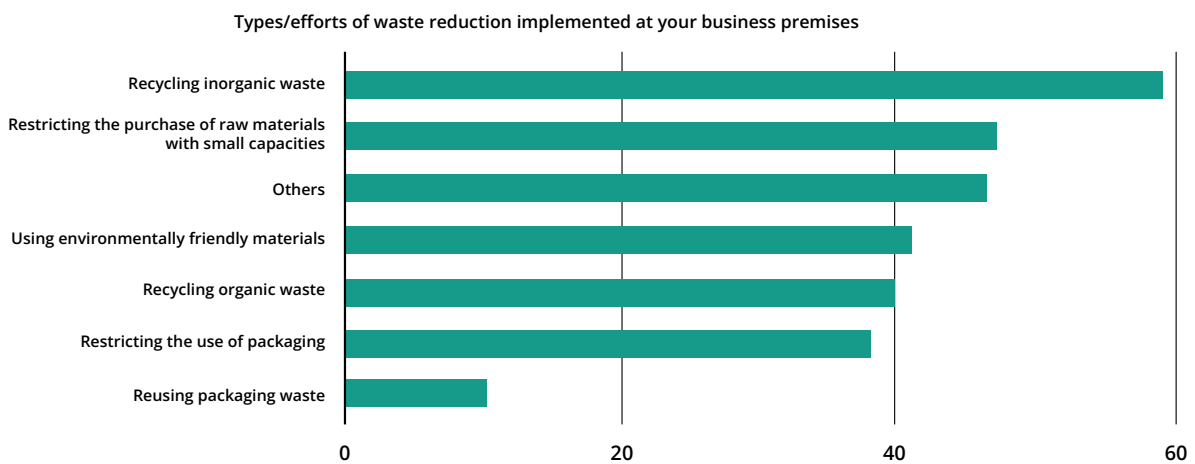


Figure 11. Types of Waste Reduction Measures Implemented at Business Premises

There are no discernible variations in action and awareness across specific environmental domains such as energy, waste, and water. However, in terms of the type of action, those that are easier to implement and offer clear economic benefits—such as reducing unnecessary materials use and limiting water consumption—are more widely adopted.

On a broader scale, a Southeast Asia regional study found that 84% of MSMEs surveyed had adopted at least one ESG practice, though mostly in the social (labor) domain. The most common environmental action reported was improved waste management (CIIP, 2025).

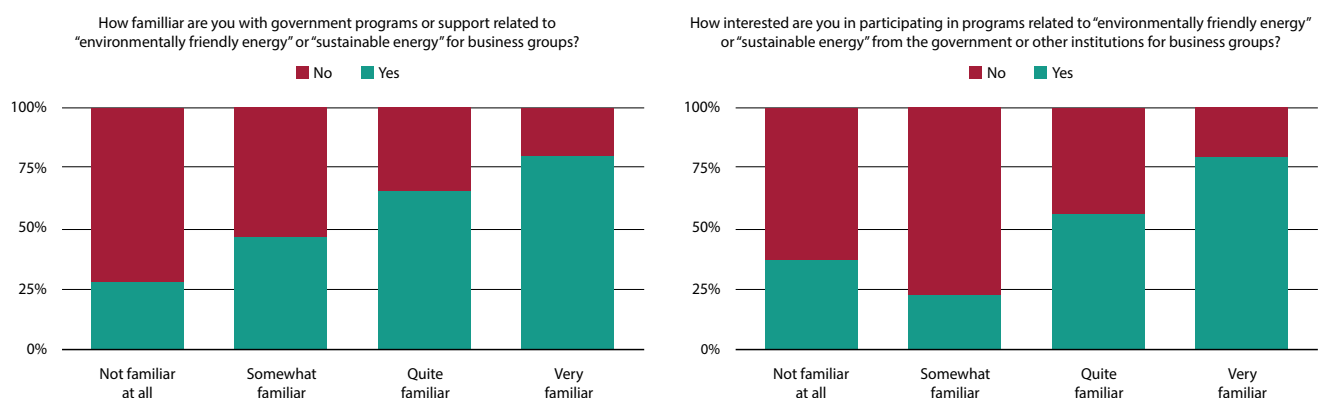


Figure 12. Familiarity and Interest in Government or Institutional Programs on Environmentally Friendly or Sustainable Energy

Despite low future plans for implementing sustainable practices in energy and waste among Indonesian MSMEs, interests in government actions remain relatively high, particularly in the energy sector.

Market Interest is Increasing, but No Regulation Oversees the Growth

The growth of green MSMEs and startups has been driven not only by the global shift in investment trend and pressing environmental concerns, but also by increasing market demand for sustainable products within the country, as well as global initiatives that position MSMEs worldwide as key levers in achieving Sustainable Development Goals (SDGs).

For example, Partnering for Green Growth and the Global Goals 2030 (P4G), established in 2017, aims to foster public-private partnerships to drive green growth and support the achievement of the SDGs. In Indonesia, this initiative has spurred the growth of partnerships between local businesses and South Korean companies to address pressing environmental challenges in 2024: waste management and the transition to greener energy sources. Two Indonesian companies, PT Wasteforchange Alam Indonesia and PT Comestoarra Bentarra Noesantara, were chosen as partners by two renowned South Korean companies, Daehan ENC and HS Solar, to lead these green initiatives, respectively (KemenkopUKM, 2023).



Figure 13. Green MSME/Start Up in Indonesia Focuses on Various Subjects including Municipal Waste Management

Independent efforts have also been growing, led by researchers, inventors, or businesses that see opportunities within the sustainability sector and decide to transform. A study in Indonesia reveals a growing number of cleantech, sustainable, or green startups concentrated in five regions of the country—namely, West Java (38 startups), Yogyakarta (10 startups), Bali (11 startups), Jakarta (24 startups), and East Java (25 startups) (New Energy Nexus Indonesia, 2024). Most of these startups are working to decarbonize the transport, power, industry, and building sectors through various innovative approaches.

Efforts by ANGIN through the Wirausaha Hijau program also aim to increase investment-readiness of green solutions from small businesses. The Temasek CIIP SDG Venture Scaler program, in partnership with UNDP, seeks to enhance capacity and open access to capital for fast-growing

SMEs in sustainable sectors. Many similar programs exist in Indonesia, including women-specific programs such as MELATI Nusantara, supported by the UN Capital Development Fund, which introduces green business models to over 6,000 MSMEs across the country. Other programs include Bisnis Lestari by UNDP and APINDO, among others.

Despite this growth, green and sustainable startup businesses—whether initiated independently or with international cooperation—still struggle to gain traction in Indonesian market outside of urban centers, where the population is more exposed to new concepts.

Gap in Financial and Economic Incentives for Going Green

Financial aspects are one of the crucial components of MSME performance as business entities, especially when expectations for a green transition require the replacement of equipment and facilities, including asset shifts toward greener buildings and technologies, and the development of new business plans aligned with sustainable practices. A healthy financial flow leads to strong business performance, growth, and the ability of the enterprise to sustain itself in the long run.

Ensuring the financial health of MSMEs is particularly important, as they play a significant role in Indonesia's economy, contributing around 60% to the national GDP and accounting for 90% of employment (International Monetary Fund, Asia and Pacific Dept, 2024). However, MSMEs face various financial constraints in practice that hinder their growth and development. Limited access to finance and the lack of economic incentives to support businesses remain among the most pressing issues in Indonesia.

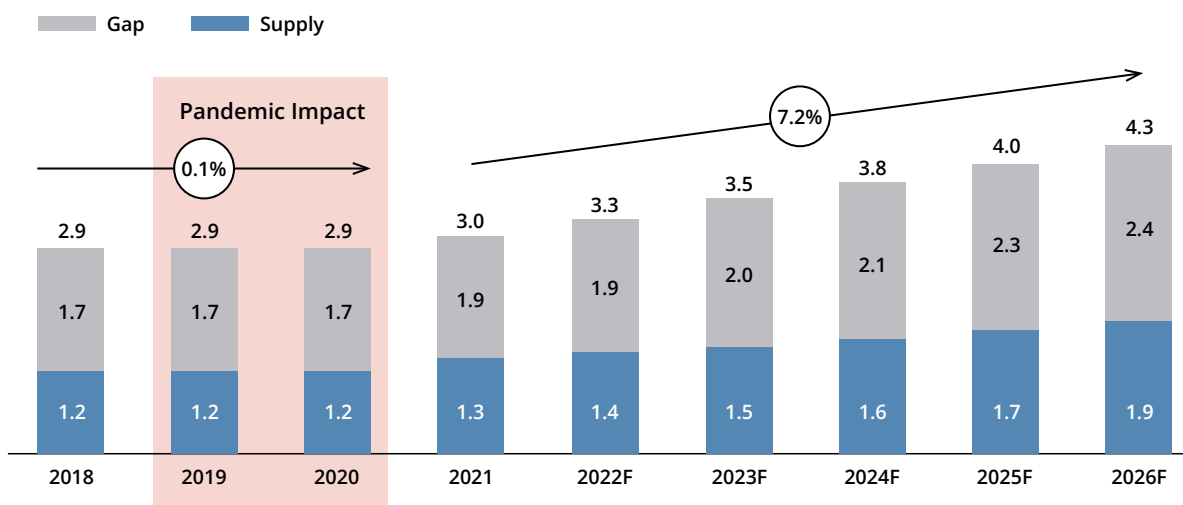


Figure 14. Supply and Demand Gap Projection of MSME Financing Needs between 2018 to 2026 (OJK, 2024)

As illustrated in Figure 14 above, the growing number of MSMEs has led to an increase in demand for financing, which in turn has created a gap in financial access due to limited available funds. The financing needs of MSMEs are projected to reach IDR 4,300 trillion by 2026, but only around IDR 1,900 trillion—less than half the amount—is expected to be available (OJK, 2024). This leaves a financing gap of IDR 2,400 trillion that must be addressed.

Beyond the figures, the underlying issue remains within the financial system itself, which hampers access to funding for many businesses. The first major challenge is the difficulty in accessing financing options that are appropriately tailored to the sectoral diversity and varying sizes within the MSME landscape (OECD, 2024). Most MSMEs in Indonesia—particularly micro and small enterprises operating informally and with limited capital—struggle to meet banking requirements such as providing collateral and formal financial records to access loans. As a result, banks are

often reluctant to finance this segment, perceiving it as high risk. This is reflected in the credit portfolio of banks, particularly state-owned banks with development mandates, where only about a quarter of credit is channeled to MSMEs (Araral & Chairunissa, 2024).

In the context of greening, the ability to integrate sustainable business practices and instigate changes in MSME operations has the potential to improve business processes, which in turn will contribute to greater profitability. Reducing energy use, water consumption, or material waste are some of the immediate green-productivity efforts that MSMEs can implement. However, the capital required to adopt new equipment and processes is not readily accessible, as service providers often lack understanding of the diverse needs of MSMEs and the green transformation options available for financing.

The status of MSMEs presents another major challenge, as most operate within the informal sector and lack the necessary licensing. According to the International Monetary fund (IMF) (IMF, 2024), approximately two-thirds of MSMEs in Indonesia are not legally registered and lack formal financial records, accounting practices, and proper tax compliance. This informal status excludes them from accessing government assistance schemes and financial products that require formal documentation, such as Kredit Usaha Rakyat (KUR). Even though KUR is a subsidized loan program provided by the government through national banks, the application process can be complicated due to bureaucratic procedures. Many business owners have limited information about the application stages and face unclear eligibility requirements, which further restricts their access to financing.

In many cases, private or philanthropy-led green change-makers—through incubators and accelerators—require businesses to formalize as part of good governance. However, the complexity of the formalization process hinders many MSMEs, causing them to miss opportunities to obtain structured technical assistance.

Financial literacy poses another obstacle that contributes to the financing gap. Studies show that the average financial literacy score among MSME owners remain well below the national average (Idrus & Rastina, 2025). Coupled with inadequate managerial and entrepreneurial skills, this situation limits their ability to assess available financial products, prepare loan applications, and maintain proper financial records as required by banks. Without these skills, many business owners turn to informal lenders instead of formal financial institutions, exposing themselves to high-interest debt and increasing their financial vulnerability over time.

Furthermore, digitalization and the use of technology present another challenge for MSMEs. While digital tools have the potential to significantly improve competitiveness and expand market access, only 16% of Indonesian MSMEs have meaningfully adopted such technologies (Idrus & Rastina, 2025). According to a Mastercard report (2024), 64% of micro and small business owners are uncertain about which digital solutions are most suitable for their operations (Mastercard, 2024). Additionally, many MSMEs have not yet adopted technologies that could streamline business processes and improve efficiency. This gap in digital literacy and limited technology adoption not only hinders their participation in e-commerce and digital payment systems but also restricts their ability to reach broader markets. When it comes to climate alignment, digital skills are becoming increasingly important, as transparency is enabled through digital solutions—for example, in mapping traceability, ensuring transaction transparency, and other similar functions.

To address these challenges, a clear and accessible policy framework is urgently needed. First, business finance education must be prioritized. In practice, the government should provide tailored training programs for MSMEs, rather than relying on one-size-fits-all approaches. These

programs should be designed according to the size of the enterprise and the real-world experiences of MSME operators. When business owners possess adequate knowledge of technology options and basic financial tools—such as how to select appropriate technologies, prepare comprehensive financial records (including profit and loss statements, cashflow reports, and balance sheets), and develop actionable business plans—they are better positioned to engage with banks and access funding. A study found that MSMEs that received proper financial training were more effective in managing their cash flow and more confident in applying for loans (Suidarma et al., 2024).

Second, the process of formalization and licensing needs to be simplified and made more attractive. Many informal business owners avoid registration not out of resistance but because the process is complicated and offers few immediate benefits. Simplifying procedures, reducing costs, and linking formal status with tangible incentives—such as access to credit or business development services—could encourage more MSMEs to formalize. Importantly, once formalized, businesses should be automatically linked to existing government financing schemes to reduce the burden of navigating complex programs.

Third, financial institutions must be encouraged to revise the way they assess and serve MSMEs. Traditional lending methods, which emphasize collateral and long credit histories, do not reflect the reality of how many MSMEs operate in Indonesia. New approaches—such as character-based lending, cash flow analysis, and group guarantees—could help reduce existing barriers and promote more inclusive financing.

Moreover, green financing can serve as both a viable and an innovative option for supporting the national green economy agenda. Financial institutions play a critical role in this transition by enabling MSMEs to adopt environmentally sustainable practices. While financial institutions are increasingly gaining access to concessional funds to support the green transformation of SMEs, there is still a lack of coordinated efforts within these institutions to effectively deliver these financial products to MSMEs. Strengthening the capacity of financial institutions on issues related to the green economy and a just transition is essential to enhance their ability to assess and support MSMEs in their green transition efforts. Thus, the gap in financial and economic incentives for MSMEs in Indonesia is both real and multifaceted. It extends beyond access to finance and includes the knowledge and capacity of business owners to navigate available financial products and services. Bridging this gap requires more than policy reform; it demands capacity building for MSME operators and a shift in how financial institutions perceive and treat the small businesses that play a crucial role in driving Indonesia's economy.

Gap in Overarching Policies that Limit the “Green” Scope and Target Definition

The second challenge is the absence of definitive regulations and targets for green MSMEs, which undermines the government's focus on designing proper and streamlined policies to support the achievement of national climate goals, as well as to prevent business overclaiming and greenwashing in society. Currently, the lack of integration among policies, government programs, and private initiatives at both subnational and national levels has made MSME empowerment efforts ineffective.

The absence of clear development targets has also resulted in many MSME-governing institutions failing to design proper fiscal and non-fiscal incentives for business pioneers who are already paving the way, further slowing growth. For example, many capacity-building efforts for MSMEs—whether directly related to the circular economy or not—as well as business incubation and acceleration programs, remain concentrated on the island of Java. Annex 3 provides details of the government institutions involved in the MSME regulatory framework as of 2025.

To ensure effective policymaking, Indonesia may benefit from many international best practices in greening MSME programs. Table 1 highlights how various countries across Asia, Africa, Latin America, and Europe are incentivizing their SME sectors to adopt sustainable practices. These include tax exemptions, green credit schemes, sector-targeted programs, and national-level climate strategies. While definitions of SMEs differ across jurisdictions (see Annex 1 for MSME definition and size thresholds), the overarching policy intent remains consistent: to enable small businesses to become active contributors to the low-carbon economy.

Table 1. International Benchmarking on MSME Green and Sustainable Transition Across the Globe

Country	Fiscal Incentives	Program Name	Target Sectors	SME Size	Policy Documents
Malaysia	Green Investment Tax Allowance (GITA), Green Income Tax Exemption (GITE)	Green Technology Financing Scheme (GTFS)	Renewable energy, energy efficiency, waste management	Small and Medium	Green Technology Master Plan (2021–2030); Sustainable and Circular Economy Roadmap (2023–2040) Circular Economy Framework
Thailand	BOI Incentives, SEZ Tax Benefits	TGO Support	Energy, manufacturing	Small and Medium	Thailand Climate Change Master Plan (2015–2050); TGO Strategy Plan
Vietnam	CIT Incentives, Import Duty Exemptions	Vietnam Energy Efficiency Program (VNEEP)	Manufacturing, construction	Small and Medium	Vietnam National Energy Efficiency Program (VNEEP)
Mauritius	Investment Tax Credit, Accelerated Depreciation	MARENA Initiatives	Energy, agriculture	Micro, Small, and Medium	Mauritius National Environmental Policy 2020
Kenya	Tax Deductions for Green Investments, Import Duty Exemptions	Kenya Climate Innovation Center (KCIC)	Agriculture, water, energy	Micro, Small, and Medium	Kenya Green Economy Strategy and Implementation Plan (GESIP)
Uganda	Income Tax and VAT Exemptions	Uganda Green Enterprise Finance Accelerator (UGEFA)	Renewable energy, waste management	Small and Medium	Uganda Climate Change Policy 2015
Colombia	Environmental Tax Credits, Accelerated Depreciation	Colombia Productiva – Green Productivity	Manufacturing, agriculture	Small and Medium	Colombia National Development Plan 2018–2022
Mexico	Fiscal Stimuli for Renewable Energy, VAT Exemptions	Eco-Crédito Empresarial	Various	Micro and Small	General Law on Climate Change; National Climate Change Strategy
Uruguay	Investment Promotion Law Benefits, Accelerated Depreciation	Uruguay Energy Efficiency Program	Industry, services	Small and Medium	Uruguay Energy Policy 2005–2030

Country	Fiscal Incentives	Program Name	Target Sectors	SME Size	Policy Documents
Germany	KfW Energy Efficiency Program, Tax Deductions	KfW Energy Efficiency Program	Building, manufacturing	Small and Medium	German Climate Action Plan 2050
France	CITE Tax Credits, Reduced VAT	BPI France – Green Loan	Various	Small and Medium	Energy Transition for Green Growth Act 2015
Sweden	Klimatklivet Grants, Tax Reductions	Swedish Energy Agency Support	Energy, manufacturing	Small and Medium	Swedish Climate Policy Framework
China	Reduced CIT, VAT Exemptions	China Green Finance Pilot Zones	Various	Small and Medium	China's 14th Five-Year Plan; Green Development Guidelines
South Korea	Tax Exemptions for SMEs, Investment Tax Credits	Korea Energy Agency's SME Support	Manufacturing, services	Small and Medium	Korean Green New Deal Policy
Japan	Tax Incentives for Energy Efficiency, Renewable Subsidies	SME Support, Japan – Energy Efficiency	Various	Small and Medium	Japan Strategic Energy Plan 2021

Furthermore, an evaluation to assess the readiness level of Indonesian MSMEs in adopting green and sustainability principles is necessary in order to gain insights into existing gaps and identify which sectors may be more relevant as pioneers.

Figure 15 below summarizes the results of readiness-relevance evaluation of thirty-six main business sectors in Indonesia, including agriculture, forestry, fishery, mining, and various manufacturing industries. The **relevance** axis reflects the necessity for each business sector to start its sustainability journey based on existing regulations and national planning, and its environmental impact. The **readiness** axis, on the other hand, represents market conditions, enterprise capacity, access to finance, and technological preparedness of each business sector to implement green initiatives. Further details of this readiness-relevant matrix can be found in Annex 6.

Based on the analysis, thirteen business sectors are identified as highly relevant and relatively more ready to adopt sustainability practices compared to others. These include the manufacturing industries of food, garments, beverages, basic metals, leather and leather goods, rubber and plastic products, non-metallic minerals, chemicals, furniture, transport equipment, printing and media production, paper and paper goods, as well as electrical and electronic products.

In contrast, sixteen business sectors have been included in national planning targets to reach a certain level of environmental impact but currently demonstrating low readiness for implementation. These include nature-based businesses (agriculture, fisheries, forestry), mining and refinery industries (coal and lignite mining, metal ore mining, mining support activities, other mining and excavation activities), other manufacturing industries (textile, wood, cork and bamboo product, coal and petroleum refinery products), construction (civil engineering, building construction), and services (accommodation, and repair and installation of machinery and equipment). Meanwhile, six business sectors are classified as low relevance but high readiness, and only one group—other manufacturing industries—is considered low in both relevance and readiness.

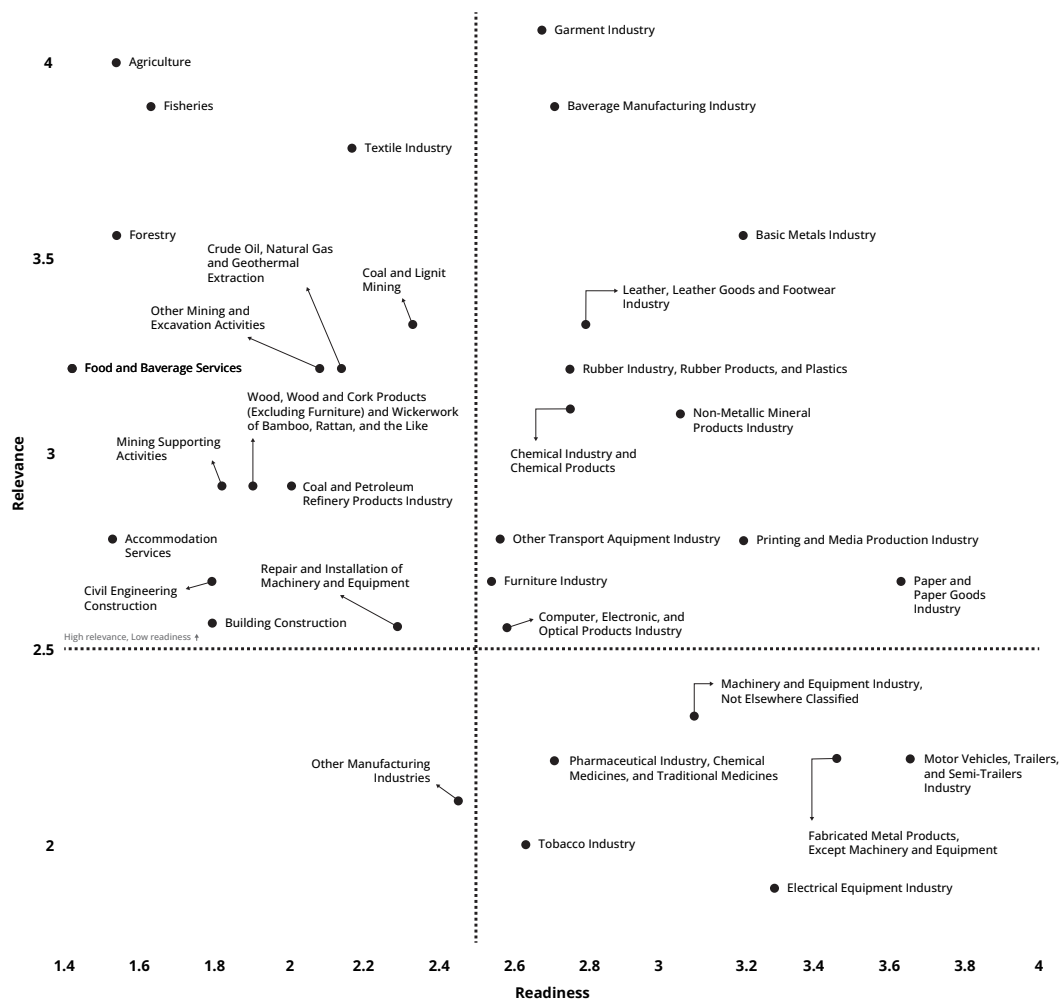


Figure 15. Relevance-Readiness Matrix of Thirty-Six Micro, Small to Medium Enterprises in Indonesia Towards Adopting Green and Sustainable Business Principles

Gap in Enabling Environment (Technology Development and Deployment, Capacity and Ecosystem Building)

Third, limited access to technology—as well as low understanding of market trends and segmentation—hinders MSMEs from achieving economies of scale in production and limits their sales. The pervasive technological asymmetries between MSMEs in rural and remote regions further exacerbate inequalities in accessing affordable, energy-efficient, and low-carbon technologies (Amalia et al., 2025). These constraints collectively highlight the urgent need for an integrated policy response to unlock the green potential of Indonesia’s SME sector.

According to data from the Ministry of MSMEs (MoMSME), fewer than 10% of MSMEs have adopted advanced tools in their business operations, including semi-automated machinery and digital technologies. This limited technological integration restricts productivity, innovation, and cost efficiency—key factors necessary to scale production and compete in broader value chains. The situation is further exacerbated by technological asymmetries between MSMEs in urban centers and those in remote or rural regions.

Many rural enterprises have little to no access to affordable, energy-efficient, and low-carbon technologies, a challenge highlighted in UNESCAP’s 2023 report. This technological divide reinforces existing inequalities and limits MSMEs’ ability to contribute meaningfully to Indonesia’s green transition.

Moreover, MSMEs often lack insights into market trends, consumer segmentation, and demand forecasting, which hampers their ability to tailor products to changing preferences—especially those of sustainability-conscious consumers. This gap is particularly pronounced in green sectors, where demand for low-carbon and eco-certified products is growing, but MSME supply remains limited due to insufficient market intelligence and technical capability. While these dynamic datapoints are available and various ecosystems of market data providers and customer trend reports exist, these resources remain underutilized by MSMEs, largely due to a lack of business acumen, further compounding the challenge.

Collectively, these constraints underscore the urgent need for an integrated policy response—one that enhances technology access, fosters market intelligence, and promotes inclusive innovation. Such interventions are crucial not only to unlock the untapped green potential of Indonesia's MSME sector but also to ensure MSME's resilience and competitiveness in a future low-carbon economy.

Transition Opportunities based on the Existing Framework

Table 2 outlines key national policy instruments and enabling conditions that shape Indonesia's approach to sustainable enterprise development. By mapping each policy's relevance to the SME sector, this overview presents a clear picture of how Indonesia is localizing global best practices while adapting to its distinct environmental, economic, and institutional contexts. The green transformation of MSMEs can be supported by leveraging existing policies and initiatives, with necessary adjustments tailored to the sector's unique characteristics. These initiatives include fiscal incentives, regulatory frameworks, and cross-sectoral strategies that align SME development with national climate commitments and sustainable development goals.

Table 2. Landscape of Key National Policy Instruments on Sustainable Development

Policy/ Initiative	Description	Sector	Relevance for Indonesian SMEs
Policy and National Planning			
Green Economy Transformation	Part of Indonesia's vision for 2045, focusing on transitioning to a low-carbon, circular, and blue economy to achieve sustainable development	Cross-sectoral	Encourages innovation and green entrepreneurship among SMEs in circular economy sectors
Emissions Trading System (ETS)	A market-based approach to control greenhouse gas emissions by providing economic incentives for emission reductions	Energy & Industry	Limited direct participation for SMEs; indirect effects via supply chains
Carbon Tax Implementation	Introduced in 2022, targeting sectors with high carbon emissions to encourage reduction and fund sustainable initiatives	Energy & Industry	May raise costs for carbon-intensive SMEs; incentive to adopt greener practices
Green Public Procurement (GPP)	Policies mandating the inclusion of environmental criteria in public sector procurement to promote sustainable products and services	Public Sector Procurement	Creates market opportunities for SMEs producing green goods and services
Green Industry Standardization	Regulations promoting sustainable industrial practices, including resource efficiency and environmental management systems	Manufacturing & Industry	Supports SME compliance through green standards and industrial certification schemes

Policy and National Planning			
Renewable Energy Mix Policy	Aiming to increase the share of renewables in the national energy mix to 23% by 2025, focusing on geothermal, biofuels, and other renewable sources	Energy	Enables SME participation in renewable energy supply chains and adoption
Biodiesel Blending Mandate (B40/B50)	Policies mandating the blending of biodiesel with conventional diesel to reduce fossil fuel dependence, with targets of 40% (B40) and plans for 50% (B50) blending	Energy & Agriculture	Relevant for agro-SMEs; impacts input sourcing and energy use
Green Financing Instruments	Development of financial instruments like green bonds and sustainability-linked loans to fund environmentally friendly projects and encourage sustainable business practices	Finance	Highly relevant—SMEs can access green loans and climate-aligned financial products
Sustainable Forest Management Certification (IFCC-KSK)	Implementation of forest certification schemes to promote sustainable forest management and responsible sourcing of forest products	Forestry	Applies to forestry-linked SMEs and eco-label product exporters
Green Job Roadmap	Strategic pathways and policy directives to ensure selected critical sectors for green economy development have access to a sufficient and appropriately skilled workforce to support their development and transformation.	Energy, Forestry, Agriculture, Industry, Waste Management, Transport, Tourism, & Marine and Coastal	Supports MSMEs in relevant sector to gain better access to green skills
Green Economy Index	A framework to measure progress in low-carbon and green economy initiatives, assessing various indicators related to sustainability	Cross-sectoral	Helps benchmark SME performance on sustainability indicators
Supporting Initiatives on Green Growth			
OECD Green Growth Policy Review	An assessment providing recommendations for Indonesia to integrate environmental considerations into economic policies and promote green growth	Cross-sectoral	Provides policy guidance to improve SME ecosystem alignment with green growth
Low Carbon Development Initiative (LCDI)	A roadmap integrating low-carbon strategies into national development planning, aiming to balance economic growth with environmental sustainability	Cross-sectoral	Provides strategic direction for integrating low-carbon practices into SME planning and support programs
Just Energy Transition Partnership (JETP)	A USD 20 billion agreement with G7 countries to support Indonesia's transition from coal to renewable energy sources, targeting net-zero emissions in the power sector by 2050.	Energy	Indirect benefits; future access to green energy infrastructure could lower SME costs.

Indonesia has implemented various programs to strengthen MSME capacity and support ecosystem development, with backing from both the government and the private sector. For instance, Mol offers several initiatives targeting MSMEs, including the Technical Service Unit (UPT), the Link and Match program, and the Equipment Revitalization scheme. The UPT supports small businesses in obtaining product certifications and developing essential manufacturing skills. The Link and Match program connects MSMEs with potential buyers—primarily large domestic firms—to expand market access. Meanwhile, the Equipment Revitalization program provides financial assistance for MSMEs to upgrade machinery for more efficient production. Similar initiatives have also been introduced by other ministries across different sectors. However, most of these programs lack the integration of environmental sustainability in their design, overlooking the opportunity to support MSMEs in accessing emerging green markets.

Policy
Process
Procedure

Chapter 3

Policy Recommendation

Eligibility Criteria for Classifying MSMEs as Green Enterprises

While sectoral efforts have signaled the emergence of green businesses across various sectors—including MSMEs and startups—this paper argued that, based on existing policies and practices in Indonesia, a framework outlining eligibility criteria for classifying MSMEs as green is needed to enable policy coordination. Some MSMEs offer sustainable products and services as their outputs, while others originate from conventional businesses but have adopted green practices in their operations.

To effectively identify and define green or sustainable MSMEs in Indonesia, a clear set of parameters should be established—one that aligns with international sustainability standards while also reflecting the country's unique economic, environmental, and regulatory context. An MSME can potentially be classified as green or sustainable if it meets at least 5 of the 12 parameters outlined in Table 3 below, with at least one parameter falling under each of the Environmental, Operational, and Financial/Governance categories.

Table 3. Criteria Recommendation for Green and Sustainable SMEs in Indonesia and its Definition

1. Environmental Performance Criteria	
Parameter	Definition/Indicator
GHG Emission Reduction	Demonstrates measurable efforts to reduce Scope 1, 2, and/or 3 emissions in operations or supply chain
Energy Efficiency	Implements technologies or practices that improve energy productivity (e.g., ISO 50001 certified, MEPS ² -certified)
Renewable Energy Use	Uses solar, wind, biomass, or other renewable sources for >25% of energy consumption
Water & Waste Management	Has a system in place for waste segregation, recycling, and/or water reuse (e.g., Zero Waste Policy)
Pollution Control	Adopts pollution prevention technologies and complies with local/national emissions standards
2. Operational Sustainability Practices	
Parameter	Definition/Indicator
Eco-certification	Possesses recognized certifications (e.g., ISO 14001, SNI Eco-label, FSC, Organic Certification)
Sustainable Procurement	Sourced from environmentally and socially responsible suppliers or cooperatives (e.g., recyclable packaging procurement)
Circular Economy Integration	Engages in product lifecycle extension, upcycling, repair-based business models, or material reuse
Green Innovation	Develops or utilizes green technologies, products, or services (e.g., bioplastics, plant-based inputs)
Sustainable Product Portfolio	At least 50% of sales come from products or services classified as sustainable or low environmental impact

² MEPS or Minimum Energy Performance Standard (or SKEM -Standar Kinerja Energi Minimum- in Bahasa) is a label that follows SNI 04-6957-2003 on Electric Power Utilizers for Household and Similar Purposes. Products that have this label have lower energy use compared to similar products with the same power output.

3. Financial and Governance Indicators	
Parameter	Definition/Indicator
Access to Green Finance	Has received or applied for green loans, ESG funds, or participated in green bond schemes
Sustainability Reporting	Prepares ESG or sustainability reports, even in simplified form (aligned with ISSB, GRI, or local tools)
Board/Owner Sustainability Goals	Owner or board has publicly stated environmental or climate-related business goals
4. Social and Community Impact	
Parameter	Definition/Indicator
Local Environmental Stewardship	Participates in or funds local conservation, agroforestry, or eco-education efforts
Local Community Empowerment	Participates in local community empowerment program or efforts (e.g., social entrepreneurship program)
Fair Labor and Equity Practices	Provides fair wages, safe working conditions, and ensures gender and minority inclusion in decision-making

Tiering the green classification of MSMEs based on the criteria above would be helpful for more effective policy targeting. Table 4 presents recommended classification tier along with its corresponding scoring criteria.

Table 4. Recommendation of Green MSME Classification Tier based on Defined Scoring Criteria

Classification Tier	Scoring Criteria
Leading Green SME	Score ≥ 10 and at least 1 in each category
Emerging Green SME	Score 5–9 and at least 1 in Environmental and Operational
Potential Green SME	Score 3–4 with partial fulfilment across any two categories
Not Yet Green	Score < 3 or all parameters from one category only

While this tiering is only an illustration of potential efforts, policies also need to consider the ease of data collection to obtain this information. These parameters should be embedded, for example, in the formalization process so that disaggregated data can be collected without requiring MSMEs to manually fill in forms or navigate the already burdensome bureaucratic processes. The data needs of policymakers should not overwhelm MSMEs. The goal is to make the transition for MSMEs easier, not more difficult.

Classifications of green MSMEs are not intended for certification purposes. A self-declaration of current green business practices by MSMEs should be sufficient. If the market requires specific certifications, MSMEs are free to pursue the necessary certifications issued by their respective market or sector authorities, according to buyers requirements. The purpose of this classification is to support coordinated and streamlined policymaking—not to introduce new certification systems.

Priority 1: Structured MSME Transformation Roadmap and Timeline

Multi-phased Approach & Roadmap

To operationalize Indonesia’s vision for a sustainable and inclusive economy, the transition of micro, small and medium-sized enterprises (MSMEs) toward green practices must be guided by a structured, multi-phase roadmap. This transition aligns with national development priorities articulated in the *Rencana Pembangunan Jangka Menengah Nasional* (RPJMN) and the long-term *Indonesia Emas 2045* vision. Recognizing the pivotal role of SMEs in both economic output and employment, the timeline shown in Table 5 below outlines key milestones that correspond with national climate targets, economic transformation strategies, and international sustainability commitments. The framework also integrates subnational policy coordination and maps existing mandates across relevant line ministries, ensuring policy coherence and facilitating decentralized implementation. This approach enables a scalable pathway for transforming Indonesia’s SMEs into engines of green innovation and low-carbon growth.

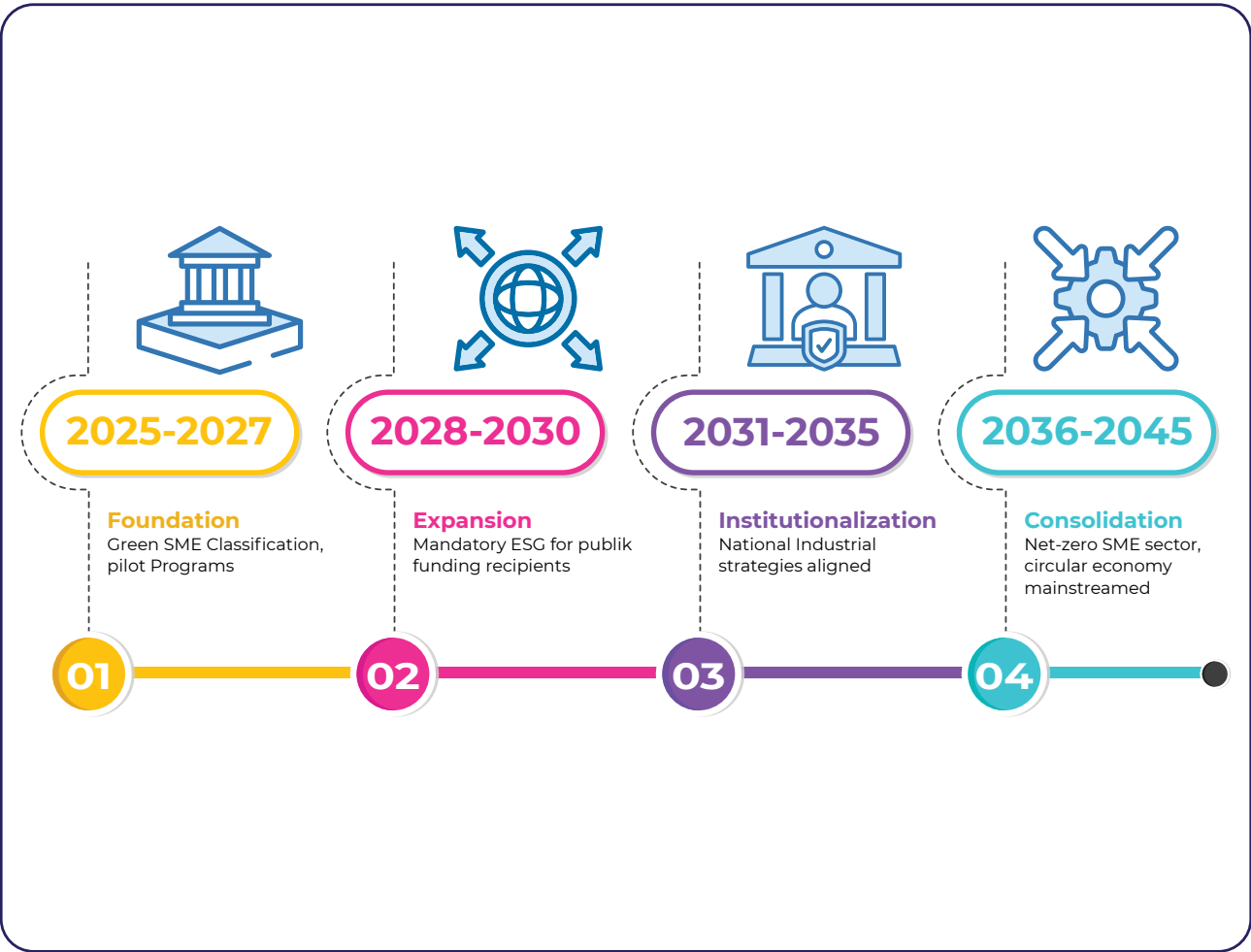


Figure 16. Multi-phased Approach and Roadmap for Development of Well Established Green MSME Ecosystem in Indonesia

Table 5. Recommendation of Roadmap Development Necessary for Green MSME Transformation and its Coordinating Ministries

Year/ Period	Milestone	Alignment	Subnational Policy Integration	Key Government Stakeholders & Existing Policies and Programs
2025	Adoption of Green SME classification framework, pilot implementation in priority sectors (textile, agriculture, fisheries), and development of sustainability guidance book for priority sectors	RPJMN 2020–2024 (transition period) / Preparation for RPJMN 2025–2029	Pilot programs coordinated with provincial governments (e.g., West Java, Central Java) to test classification tools in local cooperatives and industries.	CMEA: SME green transformation roadmap; MoMSME: Bisnis Lestari-GUSTI ³ ; MoEnv: PROPER rating system adaptation for SMEs; BI: Green MSME Guidance.
	SME data collection with a scope aligned to the green SME classification, and expanding the consumption survey to include green product demand	RPJMN 2020–2024 (transition period) / Preparation for RPJMN 2025–2029	Survey and data collection coordinated with provincial governments to gain maximum reach to entity-level data in city-level or in smaller level	BPS: Susenas (National Socio-Economic Survey); MoMSME: SIDT-UMKM ⁴ survey
2026–2027	Expansion of green finance access for SMEs, including green credit and sustainability-linked loans	RPJMN 2025–2029: Economic Transformation and Inclusive Growth	Local financial institutions are enabled to co-finance SME green initiatives through matching grant schemes. Local government to align its work to terms on green finance for MSME and green MSME classification	MoF: Green taxonomy and blended finance guidelines; OJK: Sustainable finance roadmap and green loan promotion. MoMSME: NSPK ⁵ adoption following the green MSME classification; MoM: NSPK for green job
2028–2029	Mandatory green performance reporting for SMEs receiving public contracts or green subsidies	RPJMN 2025–2029: Strengthening green infrastructure and public sector reform	Regional procurement policies are revised to include green SME eligibility requirements and eco-label preferences.	LKPP: Green Public Procurement guidelines; MoEnv: Eco-label policy and verification systems
2030	Achieve 40% GHG emission reduction target for SME sector	2030 Agenda for Sustainable Development / NDC target milestone	Provincial emission monitoring systems are integrated with SME reporting, especially in industrial zones.	BAPPENAS: Monitoring and evaluation of NDC and GHG targets; MoEnv: Provincial climate action integration
2031–2035	Full integration of SME green standards into national industrial strategy and export promotion programs	RPJMN 2030–2034 / Pre-Indonesia Emas Phase	Provincial export facilitation agencies promote certified green SMEs in local trade fairs and international delegations.	Mol: Green Industry certification and SME guidance; MoTrade: Export-readiness programs for green SMEs

3 Bisnis Lestari-GUSTI is a business model that is not only profitable but also empowers and improves the welfare of employees and the surrounding community, while being environmentally friendly. The framework is established by the MoMSME and UKM Indonesia

4 SIDT-UMKM is a program that monitors MSME economic activity initiated by the MoMSME. As of 2023, the program has gathered 13,400,605 units of MSME data across Indonesia.

5 NSPK stands for Norms, Standards, Procedures and Criteria. It is a set of guidelines used in various fields, especially in government administration, to ensure uniformity, fairness, efficiency, and quality in the implementation of certain tasks and functions.

Year/ Period	Milestone	Alignment	Subnational Policy Integration	Key Government Stakeholders & Existing Policies and Programs
2036- 2039	Institutionalization of Green SME Standards across domestic value chains and compliance systems, Strengthen green business audit mechanisms and penalties/incentives	Long-term alignment with Indonesia Emas vision and Circular Economy Roadmap, Prepare SMEs for international compliance (e.g., EU CBAM, global eco-labels)	Provincial business licensing and industrial estate permits require adherence to green SME classification and reporting systems. Require green certifications for industrial zone tenancy and cooperative registrations	MoLHR: SME compliance codification; CMEA: Circular economy mainstreaming; MoEnv: Monitoring SME contribution to circularity metrics
2040- 2045	SME sector achieves net-zero readiness; Indonesia Emas vision consolidates circular and low-carbon economy	Indonesia Emas 2045 Vision: Sovereign, Advanced, Fair and Prosperous Nation	Provincial planning boards align spatial and infrastructure planning with circular economy clusters and net-zero industrial parks.	BAPPENAS: Indonesia Emas Vision implementation; MEMR: Net-zero transition roadmap and incentives for industry clusters

Priority 2: Introducing Targeted Financial and Economic Incentives

Policy framework for SMEs Green Competitiveness

To accelerate the green transition of Indonesia's SME sector, a robust mix of financial and economic incentives is essential. These instruments not only reduce the cost barriers associated with sustainability investments but also signal the government's strong commitment to long-term green growth. Drawing on existing fiscal regulations and proposed mechanisms under the Green SME Transition Facility, Table 6 outlines a comprehensive suite of targeted incentives, including tax allowances, super deductions, results-based grants, and blended finance solutions. Designed to address the diverse needs and risk profiles of small and medium enterprises, these measures are tailored to encourage innovation, scale the adoption of clean technologies, and reward verified decarbonization outcomes. Together, they form a critical pillar in Indonesia's strategy to align its SME sector with national and global sustainability goals.

Table 6. Targeted Incentive and Policy Reform for Green MSME Transition According to the Existing Framework

Policy Pillar	Action/Initiative	Instrument/Reference
Regulatory and Legal Frameworks	Develop and implement a Green SME National Standard including climate risk disclosure, efficiency benchmarks, and governance	Proposed standard aligned with ISSB, ISO 26000, OECD
	Mandate ESG and climate disclosure for medium-sized enterprises by 2026	ISSB, ISO 26000, OECD Due Diligence
	Promote incentivized ESG scoring for micro and small enterprises via partnerships with ESG rating agencies.	Voluntary mechanisms; public-private partnership
	Anchor legal reforms in existing national policies	Pres. Reg. No. 98/2021, MOEF Reg. No. 21/2022, LCDI 2045

Policy Pillar	Action/Initiative	Instrument/Reference
Fiscal and Market-Based Incentives	Establish a national Green SME Transition Facility funded by state banks, blended finance, and MDBs	Facility to be established
	Expand green tax incentives: 30% tax allowance, 300% super deduction for R&D, tax holidays, VAT exemptions	PMK 130/2020, PP 45/2019
	Mainstream results-based finance (RBF) for SME decarbonization performance	RBF performance metrics
Capacity Development and Institutional Learning	Launch National Green Business Academy with training, digital tools, and diagnostics	National initiative
	Integrate sustainability in entrepreneurship and vocational programs	MoE, MoMSME, vocational training programs
	Establish provincial Green Innovation Hubs with local governments and chambers	Provincial public-private collaboration
Ecosystem Development and Innovation	Develop green SME clusters in strategic sectors and locations	Cluster-based policy
	Launch Green SME Challenge Fund with donor—private co-financing	Challenge Fund model
	Greening supply chains through buyer-supplier platforms	Focus on manufacturing, agriculture, and textiles
	Support regulatory sandboxes for insurtech, cleantech, and fintech.	OJK and regulatory innovation environments
Partnerships and Global Knowledge Exchange	Facilitate PPPs for low-carbon tech, logistics, and packaging solutions	PPP model for tech transfer
	Engage with GCF, ACGF, JETP to secure concessional finance	International platforms
	Create national registry of SME green finance and technical assistance programs	Registry under national SME authority

A core enabler of SME participation in Indonesia's green economy is the strategic deployment of fiscal incentives. By leveraging the national tax system, the government can direct capital flows toward environmentally responsible investments while reducing the financial burden on early adopters. Existing instruments—such as PMK 130/2020 and PP 45/2019—already provide substantial benefits for eco-investments and green R&D, while targeted tax holidays and import duty exemptions further incentivize clean technology adoption and domestic production. These fiscal levers—combined with emerging proposals such as results-based financing—form a foundational element in de-risking green innovation for SMEs and fostering a competitive, low-carbon business ecosystem. Table 7 below presents key fiscal measures and their relevance to different SME segments across sectors.

Table 7. Recommendation of Financial Incentive Packages for Supporting Green SME Transformation

Incentive Type	Policy Instrument	Incentive Description	Target SME Segment	Implementation Entity
Tax Incentive	PMK 130/2020	30% tax allowance for investments in environmentally friendly technologies and green infrastructure	Small and Medium Enterprises	MoF
Tax Incentive	PP 45/2019	Up to 300% super deduction for R&D in green and low-carbon innovations	Small and Medium Enterprises engaged in R&D	MoF
Tax Incentive	BKPM/MoID	Tax holidays for pioneer low-carbon and green manufacturing industries (up to 20 years)	High-potential SMEs in clean manufacturing	BKPM/MoID
Tax Incentive	Customs and Excise Regulation	VAT exemptions and import duty relief for green capital goods and technologies	SMEs adopting imported green technologies	Directorate General of Customs and Excise
Proposed Incentive Type				
Incentive Type	Policy Instrument	Incentive Description	Target SME Segment	Implementation Entity
Results-Based Finance (RBF)	Green SME Transition Facility (proposed)	Performance-linked grants and subsidies based on verified GHG emission reductions	SMEs demonstrating measurable decarbonization outcomes	Green SME Facility / MoF
Blended Finance / Loans	Green SME Transition Facility (proposed)	Access to low-interest loans, equity co-investments, and risk guarantees for green transitions	Transitioning SMEs with viable green business plans	State Banks, BPD, MDBs, and Development FIs

Priority 3: Comprehensive Capacity Building and Education Programs

Capacity Building Alignment for MSMEs

Building institutional capacity and entrepreneurial readiness is critical to ensuring that Indonesia's SMEs can meaningfully engage in the green transition. Beyond financial incentives and regulatory frameworks, targeted education and training programs are essential to equip business owners, workforce actors, and local institutions with the knowledge and tools needed for sustainable transformation. Table 8 below outlines a comprehensive suite of capacity-building initiatives designed to support this effort. These programs are strategically aligned with existing mandates from key ministries—including Ministry of Development Planning, National Development Planning Agency (BAPPENAS), Ministry of MSME (MoMSME), Ministry of Primary and Secondary Education (MPSE), Ministry of Higher Education, Science, and Technology (MHEST), **Ministry of Education, Culture, Research and Technology** (MoECRT), and provincial authorities—ensuring both policy coherence and nationwide applicability. Together, they form the foundation for an inclusive, skilled, and innovation-driven green SME ecosystem.

Table 8. Recommendation of Suite of Capacity-Building Initiatives for Green SME Transformation

Program Component	Description	Target Audience	Delivery Mode	Lead Institutions	Alignment with Existing Policies
National Green Business Academy	Centralized training hub offering tiered curricula to develop aligned skills required for green MSME transformation, digital tools, diagnostics, and certification for green business skills	SME owners, managers, and technical staff	Online and in-person via regional training centers	MoMSMEs, BAPPENAS, MPSE, MHEST	Aligned with BAPPENAS Green Economy Roadmap and MoMSME 2020–2024 Strategic Plan
Sustainability Curriculum in Vocational and Entrepreneurship Programs	Integration of climate resilience, circular economy, and ESG topics into existing vocational, entrepreneurship, and microfinance education	Students, early-stage entrepreneurs, microenterprises	Formal education system, vocational institutions	MoECRT, MoM, MoMSMEs	Supports MoECRT Kurikulum Merdeka and MoM's lifelong learning and upskilling mandates.
Sub-National Green Innovation Hubs	Co-managed hubs providing access to R&D, green tech incubators, mentoring, and policy labs tailored to regional economic priorities	Startups, co-operatives, local SMEs	Physical hubs and mobile outreach in underserved regions	Provincial and city-level Governments, Regional Development Agencies, KADIN, BUMN	Supports regional economic development policies under BAPPEDA and RAN-GRK provincial climate strategies
Green Coach Network	Certified green business coaches and mentors trained to support SMEs in decarbonization strategies and compliance with sustainability standards.	Field advisors, SME consultants, NGO partners	Workshops, field visits, peer-to-peer learning	NGOs, donor programs, SME associations, local universities	Aligned with Ministry of Cooperatives' SME mentoring framework and donor-supported business incubation programs
SME Climate Readiness Bootcamps	Short-term intensive workshops focused on helping SMEs conduct climate risk assessments, adopt eco-standards, and access green finance	High-growth SMEs, sectoral business networks	Sector-specific sessions, public-private co-delivery	KADIN, Industry Associations, MDB technical assistance programs	Linked to OJK's sustainable finance roadmap and climate finance readiness efforts under ADB, GCF technical assistance
Community-Based Capacity Building	Developing the ability and skill in green practices for MSMEs through communities such as cooperatives	Micro and Small Enterprises	Workshops, peer-to-peer learning	MoC, Provincial and Local Governments	Koperasi Desa/ Kelurahan Merah Putih. Applying the green practices in business operations Koperasi Desa Merah Putih

Capacity Building Key Indicators and SDG alignment

To ensure the effectiveness, scalability, and long-term impact of capacity-building programs for green SMEs, a robust monitoring and evaluation (M&E) framework is essential. This framework integrates internationally recognized performance indicators and aligns with key Sustainable Development Goals (SDGs), ensuring that progress is both measurable and meaningful. Each program component is linked with specific outcome metrics, such as the adoption rate of green practices by SMEs, improvements in ESG performance, and access to climate finance. The framework also incorporates digital tracking tools, institutional audits, and impact assessments, providing a strong foundation for evidence-based policy adjustments and stakeholder accountability. Table 9 below outlines the key indicators, SDG linkages, and monitoring mechanisms for each program stream within the national green SME capacity-building agenda.

Table 9. Capacity Building Key Indicators for Green SME Transition, its Alignment to UN Sustainable Development Goals and Recommended Monitoring Tools

Program Component	Key Indicators	SDG Alignment	Monitoring Tools
National Green Business Academy	['Number of SMEs enrolled and certified', 'Improvement in SME ESG performance scores (baseline vs. post-training)', 'Adoption rate of green business practices post-training']	SDG 4 (Quality Education), SDG 8 (Decent Work and Economic Growth), SDG 13 (Climate Action)	Learning management system analytics, pre/post assessments, SME ESG tracking dashboard
Sustainability Curriculum in Vocational and Entrepreneurship Programs	['Curricula integrated with sustainability modules', 'Number of students completing green entrepreneurship modules', 'Increase in climate-literate youth entrepreneurs']	SDG 4 (Quality Education), SDG 12 (Responsible Consumption and Production)	Curriculum audits, graduate tracking surveys, institutional performance reports
Sub-National Green Innovation Hubs	['Number of hubs operational and regions covered', 'Startups and SMEs incubated through green innovation programs', 'Commercialization rate of green technologies supported']	SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities)	Hub activity logs, regional innovation reports, technology adoption metrics
Green Coach Network	['Number of certified green coaches deployed', 'Mentorship hours delivered to SMEs', 'SME progress on sustainability benchmarks through coaching']	SDG 17 (Partnerships for the Goals), SDG 8 (Decent Work and Economic Growth)	Mentor activity logs, SME feedback forms, periodic impact reviews
SME Climate Readiness Bootcamps	['Number of SMEs completing bootcamps', 'SMEs with completed climate risk assessments', 'SMEs securing green finance post-bootcamp']	SDG 13 (Climate Action), SDG 8 (Decent Work and Economic Growth)	Training evaluation forms, finance access tracking, climate compliance checklists

Priority 4: Building Robust Technology and Innovation Support

Technology and innovation are critical enablers of a successful green transition for SMEs in Indonesia. As outlined in the national transition timeline, the progressive stages of policy implementation—from foundational frameworks to full decarbonization—require parallel investments in green technology infrastructure, innovation ecosystems, and enabling digital tools. To meet Indonesia's 2030 emission reduction target and advance the broader *Indonesia Emas 2045* vision, SMEs must have access to tailored technological solutions and robust innovation support systems.

Signals of such activities in Indonesia have started to emerge. The GSMA Mobile Innovation Hub (MIH), in partnership with GIZ, is a program focused on fostering sustainable and inclusive digital transformation in low- and middle-income countries, including Indonesia. MIH aims to leverage mobile technology and digital innovation to address social, economic, and environmental challenges, contributing to the Sustainable Development Goals (SDGs). In 2023, ten companies developing such technologies in Indonesia included Azura Indonesia, Biojel, Catalyzon, Cells, Crustea, Gawirea, e-kanaxin, Kuantek, Water Coin and Rubboto. Startup founders are equipped with training and mentoring focused on scaling up their operations, including developing a go-to-market strategy, establishing a sustainability roadmap, and crafting a compelling pitch deck with a strong value proposition for the wider community.

Corporates such as PT Daya Santosa Rekayasa and PT AGRINDO, along with consortia of climate finance experts, are developing IoT solutions for small agribusinesses to mitigate climate challenges. The Habibie Innovation Incubator is another ecosystem player supporting technology and Innovation for small businesses. In addition, sub-national governments in Indonesia, through initiatives led by LTKL (Lingkar Temu Kabupaten Lestari) brings together local businesses, conservation missions, and enablers to open access to external sources of technology and innovation.

To strengthen robust technology and innovation support, a central element is the establishment of **Sub-National Green Innovation Hubs**, strategically located to reflect regional economic strengths and development priorities. These hubs will function as collaborative platforms that connect SMEs with research institutions, incubators, and government agencies. They will facilitate the adoption and commercialization of climate-smart technologies—such as clean energy solutions, circular economy models, and sustainable manufacturing practices—while providing SMEs with access to technical assistance, mentoring, and funding pipelines.

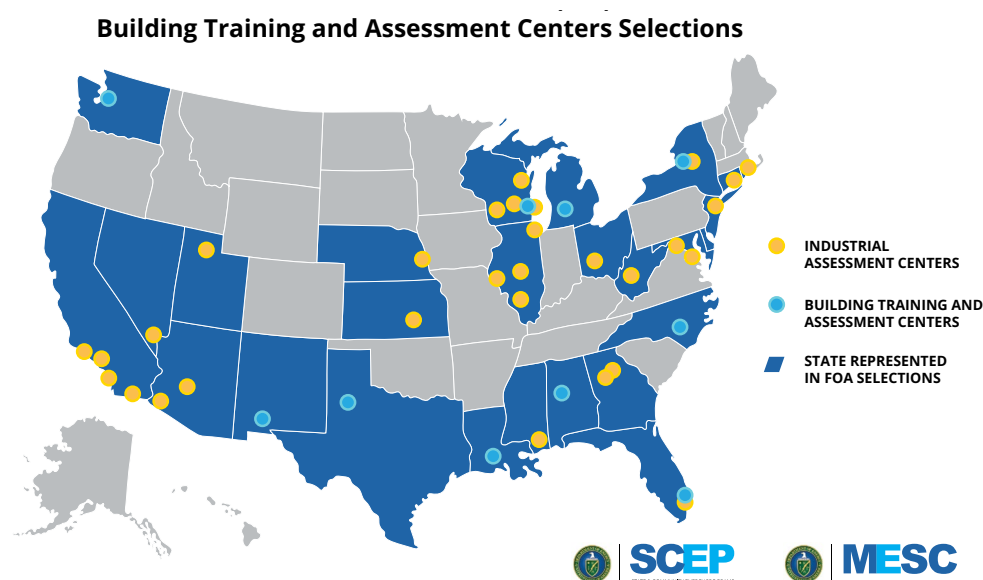


Figure 17. Industrial Assessment Centers (IAC) in Various Locations in the United States

A good example of this initiative is the Industrial Assessment Centers (IACs), a university-led program funded by the United States Department of Energy (DOE). The program is designed with dual purposes: to provide engineers-in-training with practical knowledge and to help SMEs decarbonize and optimize their energy use. To date, the program has enabled SMEs to achieve annual savings of over USD 130,000, with a significant portion of the savings implementable within the first year. In addition, the program helps train future generations of energy-savvy engineers through industry-university collaboration, with over 500 engineering students gaining hands-on experience each year. Currently, there are about 40 centers spread across the United States, as illustrated in Figure 17.

Another example is the Skill Council for Green (SCGJ), established in 2015 by the Government of India—particularly the Ministry of New and Renewable Energy (MNRE) and Confederation of Indian Industry (CII). The program aims to enhance skills in green business industries and integrate environmental awareness into job training across skilling programs. Since its establishment, SCGJ has developed 44 nationally approved qualifications across various subdomains, created training materials, trained over 504,000 individuals, and built a network of over 400 affiliated training institutions/centers and over 4,000 trainers across the country to deliver training in the green business sector.

In tandem, the deployment of a **National Green Business Academy** and the **Green Coach Network** will ensure that SMEs not only gain access to technologies but also possess the knowledge and capacity to integrate them effectively. By linking these institutional initiatives with innovation financing instruments—such as the proposed **Green SME Challenge Fund** and results-based finance mechanisms—Indonesia can cultivate an innovation-driven, low-carbon SME sector that contributes meaningfully to inclusive and sustainable economic growth.

To foster experimentation and inclusive technological development, Indonesia must also expand **sandbox regulatory environments** for clean-tech, fintech, and insurtech applications tailored to SME use cases. These flexible, risk-managed spaces will allow early-stage green solutions to be piloted and refined in real-market conditions, supported by regulatory guidance and performance monitoring.

Together, these integrated efforts will form a robust national system of green innovation support—grounded in local realities, backed by institutional and fiscal mechanisms, and aligned with Indonesia’s national climate commitments and SME development strategies.

An illustration of alignment with current policies is provided in Table 10 below.

Table 10. Technology and Innovation Policy Support for Green SME Transition

Policy Intervention	Strategic Function	National Policy Alignment	Subnational Policy Alignment
Sub-National Green Innovation Hubs	Provide SMEs with access to R&D, green incubators, policy labs, and technical mentoring	LCDI 2045, RPJMN 2025–2029, MoI Industrial Innovation Program	RAN-GRK provincial climate strategies, Regional Innovation Grants (Dana Insentif Daerah)
Green SME Challenge Fund	Mobilize donor and private sector co-financing for SME-led green innovations	MoF Climate Budget Tagging, BKPM green incentives scheme	Local enterprise development programs, BAPPEDA-led SDG acceleration initiatives
National Green Business Academy	Offer training, diagnostics, and certification on green technologies and ESG integration	BAPPENAS Green Economy Framework, MoMSME Development Plan	Provincial SME training and cooperatives programs
Sandbox Environments for Green Innovation	Enable controlled testing of clean-tech, insurtech, and fintech for green SME solutions	OJK Sustainable Finance Roadmap, MoCD tech sandbox policy	Smart City initiatives and digital acceleration programs
Technology Adoption Subsidies	Provide SMEs with grants or tax relief to adopt verified green technologies	PP 45/2019 (Super Deduction), PMK 130/2020 (Eco Investment Tax Incentives)	Provincial tax incentives, green procurement eligibility programs

Priority 5: Adjusting Proactive Legal and Regulatory Frameworks

To effectively transition Indonesia's SME sector toward sustainability, the legal and regulatory environment must evolve to provide clear signals, reduce compliance barriers, and actively incentivize green behavior. A proactive legal framework should not only enforce minimum environmental standards but also serve as a catalyst for innovation, investment, and market access.

1. Establish a Green SME National Standard

Indonesia should formalize a Green SME National Standard, building on international benchmarks such as ISO 14001, ISO 26000, and the International Sustainability Standards Board (ISSB) disclosures, and aligning it with existing national standards such as the eco-label and green industry standard. This standard should define sustainability thresholds based on sectoral performance (e.g., emissions intensity, water consumption, waste management), governance practices (e.g., ESG integration), and climate risk disclosure protocols. It will serve as the backbone for certification schemes, eligibility for incentives, and participation in green supply chains.

2. Mandate of Sustainability Reporting for Medium Enterprises

As a transitional measure, **mandatory ESG and climate risk disclosure** should be introduced for medium-sized enterprises starting in 2026. The disclosure format should align with ISSB S1 and S2, OECD due diligence guidelines, and national carbon pricing regulations. Phased enforcement—starting with state-supported enterprises and public procurement beneficiaries—will allow capacity building and help mitigate compliance shocks.

3. Promote Voluntary ESG Ratings for Micro and Small Enterprises

For micro and small enterprises, Indonesia should encourage **voluntary ESG ratings** supported by fiscal and market-based incentives. Through partnerships with ESG rating agencies, KADIN, and fintech platforms, SMEs could access simplified ESG scorecards that inform investment decisions and enable inclusion in sustainable supply chains. These efforts can be bolstered by linking ESG scores to green procurement programs and concessional finance schemes.

4. Harmonize National-Subnational Regulatory Coherence

Provincial governments play a critical role in SME development, yet fragmented mandates and inconsistent enforcement often undermine policy effectiveness. Therefore, Indonesia should formalize **regulatory coordination mechanisms** between central ministries and provincial governments (e.g., through BAPPENAS-BAPPEDA dialogue forums) to ensure the consistent application of environmental licensing, procurement standards, and fiscal incentives at the local level.

5. Anchor Legal Reform in Existing Climate and Industry Policies

Indonesia already possesses a foundation for climate-aligned regulation through instruments such as **Presidential Regulation No. 98/2021** on carbon pricing, **MOEF Regulation No. 21/2022** on emission mitigation, and the **Low Carbon Development Initiative (LCDI)**. These frameworks must be extended through legal amendments or implementing regulations that specify SME inclusion, define sector-specific baselines, and establish cross-ministry enforcement protocols.

6. Enable Legal Infrastructure for Results-Based Finance and Green Bonds

Lastly, to scale climate finance, legal clarity is required on **results-based finance (RBF)** instruments, green SME credit guarantees, and government-issued green bonds linked to SME activities. Legal and procedural frameworks must be updated to accommodate verification systems, disbursement protocols, and the tax treatment of sustainability-linked investments.

An illustrative policy roadmap is provided in Table 11 below:

Table 11. Result-based Finance and Green Bonds Legal Infrastructure Development Recommendation

Timeframe	Milestone	Lead Institutions	Enabling Instruments
2025	Develop draft Green SME National Standard aligned with ISSB, ISO 26000, and OECD	BSN, MoEnv, BAPPENAS, MoI	LCDI 2045, Pres. Reg. No. 98/2021, MoEF Reg. No. 21/2022
2026	Mandate ESG and climate disclosure for medium-sized enterprises in public procurement or receiving public funds	OJK, LKPP, MoF	ISSB S1/S2, Sustainable Finance Roadmap
2026–2027	Launch voluntary ESG scoring mechanism for micro and small enterprises, linked to fiscal and green procurement incentives	MoC, MoMSME, ESG rating agencies, Local Governments	LKPP GPP Guidelines, MoF Tax Reform Framework
2026–2028	Establish legal protocols for national-subnational regulatory coherence on SME green compliance	BAPPENAS, MoHA, Provincial BAPPEDA	RPJMN 2025–2029, RAN-GRK
2027	Amend key legal instruments to incorporate SME baselines and sectoral compliance into carbon pricing and mitigation regulations	MoEnv, MoI, MoLHR	Pres. Reg. No. 98/2021, MOEF Reg. No. 21/2022
2027–2028	Codify legal basis for SME-aligned results-based finance, green credit guarantees, and green bond eligibility	MoF, OJK, BI	Climate Budget Tagging, Green Bond Framework



Near-Term Key Actions

Near-Term Key Actions

In the near-term, there are five key actions that Indonesia must undertake to ensure a well-coordinated MSME transformation towards sustainability. These are,

1. Follow up on coordination with stakeholders to streamline policies and remove policy barriers for MSMEs' Climate-Aligned Transitions.
2. Review and develop financing and innovation ecosystems, building on existing efforts by multiple stakeholders, and develop innovative financing mechanisms (e.g., introduction of new asset classes, new financial products for financial service providers, climate de-risking mechanisms, parametric insurance, sustainable supply chain finance, and more).
3. Develop a capacity building framework for policy makers at various levels of government to deepen their understanding of both climate challenges and MSME realities. This could be integrated into future public service curricula (for example, via the existing eLearning Platform at the Ministry of Home Affairs on integrating sustainability into public service delivery).
4. Develop a workplan for the first phase: Foundational Phase (2025-2027).
5. Align with regional (ASEAN) initiatives related to MSMEs sustainability transformations.



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Annexes

Annex 1 - MSME Definition in Indonesia

The definitions of MSMEs in Indonesia are established within the existing regulatory framework. First, Government Regulation no 7/2021 holds particular significance, as it introduces revised benchmarks for identifying MSMEs in Indonesia. These criteria have replaced the previous standards outlined in Act No. 20 of 2008, exemplifying the evolving landscape of the MSME sector in the country. The updated classification standards, now implemented in line with the Omnibus Law passed in November 2020, serve as the contemporary framework for defining and categorizing MSME. The classification of MSMEs according to Government Regulation No. 7 of 2021 encompasses three distinct categories:

a. Micro Enterprises

These are productive businesses owned by individuals and/or individual business entities that meet the criteria for Micro Enterprises as outlined in this regulation, with a business capital of up to a maximum of IDR 1 billion (excluding land and buildings used for business operations) and annual sales of up to a maximum of IDR 2 billion.

b. Small Enterprises

Small enterprises are independent and productive economic businesses operated by individuals or business entities that are not subsidiaries or branches of medium or large enterprises. They meet the criteria for Small Enterprises as specified in this regulation, with business capital ranging from more than USD 1 billion to IDR 5 billion (excluding land and buildings used for business operations) and annual sales of up to a maximum of IDR 15 billion.

c. Medium Enterprises

Medium enterprises are independent and productive economic businesses managed by individuals or business entities that are not subsidiaries or branches of small or large enterprises. They meet the criteria for Medium Enterprises as stipulated in this regulation, with business capital ranging from more than IDR 5 billion to IDR 10 billion, and annual sales ranging from IDR 15 billion to IDR 50 billion.

Second, Ministry of Industry Regulation No. 64/M-IND/PER 7/2016 sets out rules and guidelines for classifying sectors according to their investment value and workforce size. Enacted in July 2016, this regulation outlines the criteria for categorizing industrial sectors in Indonesia. Essentially, it divides Industries into three distinct groups, as follows:

a. Small-scale industries, which meet the following criteria:

- i. The investment value is less than IDR 1 billion (excluding the value of land and building for business)
- ii. Small industries employ a maximum of 19 employees.

b. Medium-scale industries, which meet the following criteria:

- i. The investment value ranges from IDR 1 billion to IDR 15 billion
- ii. Employing 20 or more employees or employing up to a maximum of 19 employees provided the investment value exceeds IDR 1 billion.

c. Large-scale industries, which meet the following criteria:

- i. The investment value is more than IDR 15 billion
- ii. Employing 20 or more employees

The law specifically defines the terms ‘industry’ as all economic activities that utilize industrial resources and raw materials to produce goods with higher added value and greater benefits. The term ‘labor force’ in this law refers to full-time, ongoing permanent personnel. Furthermore, the law excludes working capital used for industrial operations and instead uses the term ‘investment value’, which refers to the estimated value of land, buildings, machinery, equipment, facilities, and infrastructure.

Aligned with the criteria outlined by the Ministry of Industry for categorizing small, medium, and large industries, the Indonesia Central Bureau of Statistics (BPS) has also devised classification parameters based on the number of employees. BPS defines industry classification solely by workforce size. Specifically, Micro Industries are businesses employing 1 to 4 individuals, Small Industries consists of enterprises with 5 to 19 employees, Medium Industries employ 20 to 99 personnel, and Large Industries consists of enterprises with 100 or more employees.

In this white paper, the scope extends beyond the manufacturing sector. Accordingly, the term MSME refers to the definition outlined in Government Regulation No. 7 of 2021, encompassing a broader range of sectors. All data presented and analyses conducted in this document adhere to this definition.

Annex 2 - Preliminary MSMEs Green and Sustainability Awareness Survey

A preliminary survey was conducted in 2023 to analyze the energy and environmental potential of Indonesian MSMEs. The survey employed a descriptive approach using a structured quantitative method. Data collection was carried out through a questionnaire administered by trained enumerators who asked a predetermined set of questions to selected respondents. The sample was determined using a purposive sampling technique to ensure data representativeness.

Participants were selected using the same purposive sampling technique to ensure representative data. The survey covered the top 10 provinces in Indonesia in terms of the number of SMEs (Ministry of Cooperatives and SMEs of Indonesia, 2022) which are as follows:

Sectors/ Province	Trading	Agriculture	Service	Food and Beverage Accom- modation Provider	Manufacture	Construc- tion	Others	Total
South Sumatera	10	16	1	66	4	5	7	49
North Sumatera	22	11	10	9	15	4	1	72
West Sumatera	12	14	1	-	5	0	5	37
Jakarta	22	-	8	6	18	11	20	85
Banten	4	-	4	-	46	7	6	67
West Java	58	14	16	32	63	18	3	204
East Java	45	27	11	17	28	6	23	157
Central Java	11	3	47	124	13	45	6	249
West Nusa Tenggara	5	5	-	6	2	11	28	47
South Sulawesi	11	10	2	-	6	3	1	33
Total	200	100	100	200	200	100	100	1000

The distribution of enterprises by scale is as follows:

Provinces	Micro	Small	Medium	Total
South Sumatera	25	17	7	49
North Sumatera	36	25	11	72
West Sumatera	19	13	5	37
Jakarta	42	30	13	85
Banten	34	23	10	67
West Java	102	72	30	204
East Java	78	55	24	157
Central Java	125	87	37	249
West Nusa Tenggara	23	16	8	47
South Sulawesi	16	12	5	33

The allocation of samples per sector was based on the proportional distribution derived from Bank Indonesia's data on MSME loan disbursement by sector (ADB, 2023). The sample error margin was calculated using the standard formula:

Margin of error =

$$Z \sqrt{\frac{px(1-p)}{n}}$$

Z is the z-score for selected confidence level
p is the sample proportion
n is the sample size

With a 95% confidence level ($z = 1.96$), the margin of error in this survey was $\pm 3.1\%$. A smaller margin of error indicates higher accuracy of the survey results in reflecting the broader population.

The questionnaire covered economic, energy, and environmental aspects and consisted of four main sections. The first section, the economic component, contained 13 questions related to the business profile, including sector, revenue, asset value, workforce size, funding sources, initial capital, investments, and market orientation. Respondents were also asked to indicate their engagement in four types of business activities: sourcing, operations, logistics and warehousing, and sales of goods or services. For each activity identified, follow-up questions on energy and environmental practices were subsequently asked. The energy section aimed to identify energy consumption patterns and sources used by MSMEs. It collected data on energy types, fuel quantities and expenditures, and energy-saving measures. Additionally, four items assessed respondents' familiarity with renewable energy and its potential adoption, using a four-point Likert scale (1 = Very Unfamiliar to 4 = Very Familiar). In total, the energy section consisted of 48 questions.

The environmental section examined the types and quantities of waste generated, waste disposal frequency, waste management practices, and the presence of environmental management system certifications. This section included 19 questions.

The final part of the survey collected general information about the respondents and their businesses, such as business name, legal status, and year of establishment. It also included five Likert-scale questions (ranging from 1 = Strongly Disagree to 5 = Strongly Agree) to evaluate respondents' perceptions of business development over the past five years.

Annex 3 - Stakeholder Roles and Coordination Mechanisms

BAPPENAS will chair the National Steering Committee on Green SMEs, which will convene sectoral ministries, sub-national governments, financial institutions, and development partners. The roles of each stakeholder are clearly defined to ensure coherence in implementation.

Agency/Stakeholder	Core Mandate	Coordination Mechanism
BAPPENAS	Strategic planning, inter-ministerial coordination	Green SME Steering Committee
Ministry of Finance	Fiscal policy, incentives, budget integration	Green Budget Tagging and Policy Dialogues
Ministry of MSME	SME empowerment, funding, training delivery	Joint programming with LPDB-KUMKM
Ministry of Industry	Sectoral policy, industrial efficiency	Eco-industrial development forums
Ministry of Environment	MRV, carbon market, climate regulations	DNPI climate governance platform
Ministry of Energy and Mineral Resources	Renewable energy, electrification, off-grid access	Clean Energy Transition Secretariat
OJK	Sustainable finance taxonomy and supervision	ESG regulatory roundtables
Bank Indonesia	Monetary incentives, data provisioning	Macroprudential ESG Council
Subnational Governments (Pemda)	Regional program implementation, infrastructure	RPJMD and regional cluster governance
Universities and Think Tanks	Policy research, monitoring tools, innovation labs	National Green Innovation Network
Business Associations	Implementation partners, feedback and advocacy	Industry policy dialogues and consultations

Annex 4 - Existing Policies, Initiatives, and Programs on Greening MSMEs in Indonesia

5.1 State Effort

Government support for MSMEs is primarily delivered through ministries and institutions, focusing on three main areas: capacity building, financing, and the creation of a conducive business ecosystem, particularly for micro and ultra-micro enterprises.

In the 2019 national budget, the government allocated IDR 168.1 trillion for MSME empowerment, with financing receiving the largest share—IDR 167.3 trillion—across 21 core programs (TNP2K, 2020). This emphasis highlights the government’s recognition of financial access as a key driver of MSME sustainability and growth. One of the main financing instruments is the Community Loan Credit (Kredit Usaha Rakyat – KUR). Details are as follows:

Objectives	Programs
Capacity Building IDR 0.5 trillion	1. Inovasi Desa – Ekonomi Lokal 2. Desa Wisata 3. Sentra Kewirausahaan Pemuda 4. Diversifikasi Usaha Nelayan 5. Tenaga kerja Mandiri 6. Pemberdayaan Pelaku usaha 7. Pendidikan Wirausaha Unggulan 8. Industri Rumahan 9. UMKM Go Online 10. Export Coaching
Financing IDR 167.3 trillion	1. Kredit Usaha Rakyat 2. Bantuan Wirausaha Pemula 3. UMi 4. PNM Mekaar 5. PNM Ulaam 6. Modal Usaha Kelautan 7. Peningkatan Keluarga Sejahtera 8. KUBE
Ecosystem Building IDR 0.3 trillion	1. Pusat Layanan Unit Terpadu (PLUT) 2. Pendaftaran Kekayaan Intelektual 3. Penyusunan Laporan Keuangan

Table 5.1 highlights a gap in government programs, which largely support MSMEs in general but rarely target green and sustainable practices. This limits the growth of green MSMEs, despite their significant energy use. Closing this gap is essential to support a low-carbon transition and enhance MSME resilience.

To address this, the government is promoting green initiatives through national programs and international collaborations. These efforts focus on green jobs, sustainable technologies, and emission reductions. The Coordinating Ministry for Economic Affairs supports MSMEs in adopting circular economy models and sustainable agriculture to boost productivity and reduce waste.

Partnerships such as those between BAPPENAS and GIZ—through the Digital Transformation Center and Knowledge Transfer Initiative—provide technical assistance to green start-ups. These programs help MSMEs adopt low-impact technologies.

The REDD+ program, supported by the World Bank and the Ministry of Environment and Forestry, aims to cut emissions by curbing deforestation. It also promotes ISPO certification, enabling MSMEs to access markets more effectively through sustainable land-use practices.

In addition, several subnational governments have been proactively promoting MSMEs empowerment through various programs, as illustrated in Table 5.2 below.

Policy-focused	Jakarta	West Java	Yogyakarta	East Java	Bali
Fiscal Incentive Program					
Grant	-				Grant, up to IDR 21 million, is given through Start Up Competition (Diskop UKM Bali)
Financing Mechanism	Credit mechanisms are given by subnational governments and local banks with the ceiling ranging from IDR 10 to 100 million				-
Demand-side Incentives	Tax incentive to battery-based EV vehicle registration fee (BBNKB)	Reduction of land and building tax for buildings that apply green building principles	-	Incentive to vehicle tax (PKB) and BBNKB Incentive for any conservation energy initiatives	Electricity charging fee waivers at SPKLU EV purchase subsidy Corporate income tax reduction for EBT adopters
Non-Fiscal Incentive Program					
Business Incubation and Capacity Building	Jakpreneur	UMKM Juara	-	Start-up incubation	Bali Entrepreneur Collaborator
R&D and Collaboration Facility	Jakarta Creative Hub	Cimahi Techno Park, Bandung Digital Valley, IndigoHub Bandung	Jogja Digital Valley, IndigoHub Jogja	Koridor Surabaya	KE[M]BALI Innovation Hub
Business Matchmaking	Jakarta Innovation Days	West Java Energy Forum	Sibakoel Jogja	Gebyar Startup Jatim	Business Matchmaking

5.2 Non-State Program

Non-state efforts refer to initiatives by non-governmental institutions—such as banks, universities, and private organizations—that complement government programs by offering additional resources, expertise, and financial solutions to support MSME growth and resilience.

Financial institutions, particularly national banks, play a key role by developing financial products tailored to MSME needs. In addition to disbursing government-backed Kredit Usaha Rakyat (KUR), many banks offer low-interest loans, digital financial services, and business development support.

Institutions	Programs
BI	1. MKM Go Digital - A program for MSMEs digitalization 2. UMKM Syariah - MSMEs practice based on Shariah rules program 3. UMKM Pendukung Pariwisata - a program to empower MSMEs in tourism sector 4. UMKM Hijau - a program to support green SMES 5. UMKM Go Ekspor - a program to help business to expand its market to international level through export

Institutions	Programs
BRI	1. BRI UMKM EXPO(RT) BRILIANPRENEUR – A business matching program connecting Indonesian MSMEs with international consumers 2. MSME Business Index – An index that assesses MSME business activities 3. Desa BRILiaN – A village-based empowerment program 4. My Cluster, My Life Program – An MSME product development program 5. Local Inspirational Figures (FIL) – A training program for MSME mentors 6. Linkumkm – An online MSME empowerment platform
BNI	1. MSMEs Go Global – MSME empowerment through digitalization of the MSME ecosystem 2. Xpora – A portal for MSMEs to enhance their business capacity
BSI	1. BSI MSME Center – An entrepreneurship empowerment program through training, coaching, and business mentoring 2. BS and BSI Aceh Muslimpreneur Talent Program – A program aims at encouraging young entrepreneurs to scale up their businesses
Bank BJB	MSME Center/PESAT (Integrated Community Economic Empowerment) – A program that facilitates MSMEs in accessing banking services
Pegadaian	Pegadaian Sharia KUR – A financing product for micro-business development using vehicle registration certificates as collateral

Beyond financial support, universities and research institutions contribute to MSME development through capacity-building programs, technical assistance, and innovation-focused collaborations. Many have established entrepreneurship centers and business incubators that provide training in business management, digital tools, and market strategies to enhance MSME competitiveness.

Private organizations and universities also play a growing role in supporting green MSMEs. For example, Du Anyam's Krealogi platform helps small businesses improve operations and access export markets in over 50 countries. Instellar offers business incubation programs that provide mentorship and resources for sustainable enterprise growth. Meanwhile, universities that proactively promote MSMEs and sustainability practices include both public and private educational institutions, such as UI, UNPAD, ITB, Telkom University, UGM, UNY, UII, AMIKOM, UB, ITS, UNAIR, Udayana University, etc.

Annex 5 – Sector-Specific Readiness Measurement for Green and Sustainable MSME

The tool used to evaluate the sector-specific readiness level of Indonesian micro, small, and medium enterprises (MSMEs) in adopting green and sustainable principles is a matrix-based framework. This framework aims to provide analytical insights into several components that reflect preparedness, highlight sectoral trends, and identify critical gaps requiring intervention. The assessment leverages quantitative data sourced from official Indonesian statistics as proxies for multiple sustainability readiness parameters. Subsequently, qualitative data will be incorporated to supplement and contextualize the analysis. The key components, parameters, and proxy data used will be as follows:

I. Key Dimensions and Parameters

A. Parameters of Relevance for Urgency and Impact

This dimension evaluates the relevance and urgency of green and sustainable adoption based on two primary criteria: (1) the sector's significance to the Indonesian MSME landscape and (2) the sector's environmental impact.

Sectoral Relevance is considered critical, as many MSMEs operate in sectors not comprehensively targeted by existing regulations. Promoting sustainability within these enterprises can yield firm-level benefits, including enhanced brand value, expanded market access, and improved resource efficiency.

Environmental Relevance evaluates urgency using sectoral indicators such as emission intensity, water consumption, and waste generation.

Policy Relevance reflects the role of national strategies and regulations, highlighting sectors prioritized in Indonesia's long-term development plans and those with available sustainability standards or certification schemes.

1A. MSMEs Relevance

- a. Number of MSMEs
- b. % Number of MSMEs/Number of Total Enterprises
- c. % Added Value of MSMEs/Added Value of Total Enterprises

1B. Environmental Relevance

- a. Emission Intensity
- b. Water Consumption Intensity
- c. Waste Intensity

1C. Policy Relevance

- a. Inclusion in RPJPN as a priority industry
- b. Inclusion in RPJPN as a green and circular priority industry
- c. Availability of Governmental Sustainability Certificate

B. Parameters on Readiness

This dimension focuses on the current readiness of MSMEs to adopt sustainable business practices, measured through indicators representing market conditions, enterprise capacity, access to finance, and technological preparedness.

Market Readiness is assessed based on the level of demand for sustainable goods in domestic and international markets, proxied by export value and the composition of MSME consumers. An international market orientation serves as a proxy for exposure to higher sustainability standards.

Capacity Readiness reflects internal capabilities to implement sustainable practices, including managerial, technical, and organizational competencies. It is proxied by the educational background of entrepreneurs and the formalization rate of MSMEs.

Financial Readiness assesses financial health and access to capital, particularly regarding investments in eco-friendly technologies. Indicators include profit margins and the availability of funding sources, including access to green financing instruments.

Technology Readiness examines the technological capacity and degree of digital transformation among MSMEs. This includes the adoption of energy-efficient technologies and digital tools to improve resource utilization.

2A. Market Readiness

- a. Commodity Value of Export
- b. Main Consumers as Industrial/Commercial Consumers
- c. Main Marketing Allocation for International Consumers

2B. Capacity Readiness

- a. Educational Level of Entrepreneur
- b. Formalization Rate

2C. Financial Readiness

- a. Profit Margin
- b. Capital Funding Sources

2D. Technology Readiness

- a. Technology Stage
- b. Digitalization

II. Sectors Classification

The sectors selected for this assessment are based on the Indonesian Standard Industrial Classification (KBLI), specifically codes 01–03, 05–09, 10–33, 41–42, and 55–56. These sectors are prioritized based on their economic importance, environmental impact, and potential for product-based sustainability transition.

Sectors excluded from the analysis—such as retail trade, financial services, information technology, and arts—were omitted due to their generally lower environmental impact, service-oriented characteristics, or indirect connection to MSME-led sustainability transitions. Although these sectors are economically significant, they typically involve lower levels of resource utilization, emissions, and waste generation compared to extractive, manufacturing, agricultural, and construction activities.

For example, service sectors—despite opportunities for operational improvements (e.g., energy-efficient HVAC systems)—offer limited potential for sector-wide transformation within a green economy framework. The trade and logistics sectors were also excluded due to the upstream nature of decarbonization interventions (e.g., electric vehicles, low-carbon logistics infrastructure), which are not directly driven by MSMEs. Furthermore, the utilities sector was excluded due to its existing classification under sustainable finance taxonomies and its predominance by large-scale enterprises.

SECTOR		A1	A2	A3	B1	B2	B3	B4	Average Relevansi	Average Readiness	Average Total
No.	KBLI	MSME Relevance	Env. Relevance	Policy Relevance	Market Readiness	Capacity Readiness	Financial Readiness	Tech. Readiness			
1	Agriculture	5.00	4.67	2.33	2.67	1.50	1.00	1.00	4.00	1.54	2.60
2	Forestry	5.00	3.33	2.33	2.67	1.50	1.00	1.00	3.56	1.54	2.40
3	Fisheries	5.00	4.33	2.33	3.00	1.50	1.00	1.00	3.89	1.63	2.60
4	Coal and Lignite Mining	2.00	4.33	3.67	3.33	1.50	2.50	2.00	3.33	2.33	2.76
5	Crude Oil, Natural Gas and Geothermal Extraction	2.00	4.00	3.67	3.33	1.50	2.50	1.50	3.22	2.21	2.64
6	Metal Ore Mining	2.00	4.00	3.67	2.33	2.00	2.50	1.50	3.22	2.08	2.57
7	Other Mining and Excavation Activities	2.00	4.00	3.67	3.00	1.50	2.50	1.50	3.22	2.13	2.60
8	Mining Supporting Activities	2.00	3.00	3.67	2.33	1.50	2.00	1.50	2.89	1.83	2.29
9	Food Manufacturing Industry	4.33	3.00	5.00	4.00	3.00	2.00	2.00	4.11	2.75	3.33
10	Beverage Manufacturing Industry	3.67	3.00	5.00	1.33	4.00	3.50	2.00	3.89	2.71	3.21
11	Tobacco Industry	3.33	1.67	1.00	2.00	1.50	5.00	2.00	2.00	2.63	2.36
12	Textile Industry	3.33	3.00	5.00	2.67	1.50	2.50	2.00	3.78	2.17	2.86
13	Garment Industry	4.33	3.00	5.00	3.67	2.50	2.50	2.00	4.11	2.67	3.29
14	Leather, Leather Goods and Footwear Industry	2.67	2.33	5.00	3.67	3.00	2.50	2.00	3.33	2.79	3.02
15	Wood, Wood and Cork Products (Excluding Furniture) and Wickerwork of Bamboo, Rattan, and the Like	4.67	3.00	1.00	3.00	1.00	2.00	2.00	2.89	2.00	2.38
16	Paper and Paper Goods Industry	1.00	3.33	3.67	4.00	4.50	4.00	2.00	2.67	3.63	3.15
17	Printing and Media Production Industry	3.67	2.33	2.33	3.33	4.50	2.50	2.50	2.78	3.21	3.02

SECTOR		A2	A3	B1	B2	B3	B4	Tech. Readiness	Average Relevansi	Average Readiness	Average Total
No.	KBLI	MSME Relevance	Env. Relevance	Policy Relevance	Market Readiness	Capacity Readiness	Financial Readiness				
18	Coal and Petroleum Refinery Products Industry	3.00	3.33	2.33	1.00	2.50	3.50	2.00	2.89	2.25	2.52
19	Chemical Industry and Chemical Products	2.67	3.00	3.67	3.00	4.00	1.50	2.50	3.11	2.75	2.90
20	Pharmaceutical Industry, Chemical Medicines, and Traditional Medicines	2.33	2.00	2.33	2.33	3.00	3.00	2.50	2.22	2.71	2.50
21	Rubber Industry, Rubber Products, and Plastics	3.00	3.00	3.67	2.00	4.00	3.00	2.00	3.22	2.75	2.95
22	Non-Metallic Mineral Products Industry	2.00	3.67	3.67	2.67	3.50	3.50	2.50	3.11	3.04	3.07
23	Basic Metals Industry	3.00	4.00	3.67	3.33	3.00	3.50	3.00	3.56	3.21	3.36
24	Fabricated Metal Products, Except Machinery and Equipment	2.33	3.33	1.00	3.33	4.00	4.00	2.50	2.22	3.46	2.93
25	Computer, Electronic, and Optical Products Industry	1.00	3.00	3.67	2.33	2.50	3.00	2.50	2.56	2.58	2.57
26	Electrical Equipment Industry	2.33	2.33	1.00	3.67	3.50	4.00	2.00	1.89	3.29	2.69
27	Machinery and Equipment Industry, Not Elsewhere Classified	2.33	2.33	2.33	3.33	4.50	2.50	2.00	2.33	3.08	2.76
28	Motor Vehicles, Trailers, and Semi-Trailers Industry	1.67	2.67	2.33	3.00	4.50	5.00	2.00	2.22	3.63	3.02
29	Other Transport Equipment Industry	3.33	2.67	2.33	2.00	2.50	4.00	2.00	2.78	2.63	2.69
30	Furniture Industry	4.33	2.67	1.00	3.67	2.50	2.00	2.00	2.67	2.54	2.60
31	Other Manufacturing Industries	2.67	2.67	1.00	4.33	2.00	1.50	2.00	2.11	2.46	2.31

SECTOR		A2	A3	B1	B2	B3	B4	Tech. Readiness	Average Relevansi	Average Readiness	Average Total
No.	KBLI	MSME Relevance	Env. Relevance	Policy Relevance	Market Readiness	Capacity Readiness	Financial Readiness				
32	Repair and Installation of Machinery and Equipment	5.00	1.67	1.00	1.67	3.50	2.00	2.00	2.56	2.29	2.40
33	Building Construction	2.00	2.00	3.67	0.67	2.00	2.00	2.50	2.56	1.79	2.12
34	Civil Engineering Construction	2.00	2.33	3.67	0.67	2.00	2.00	2.50	2.67	1.79	2.17
35	Accommodation Services	5.00	2.33	1.00	0.67	3.00	1.00	1.50	2.78	1.54	2.07
36	Food and Beverage Services	5.00	2.33	2.33	0.67	2.50	1.00	1.50	3.22	1.42	2.19
AVERAGE		3.08	2.99	2.89	2.63	2.69	2.60	1.97	2.99	2.47	2.69

