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CIRCULAR ECONOMIC DEVELOPMENT PLANNING TO SUPPORT GREEN INDUSTRY IN INDONESIA

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Abstract: This study explores the circular economy as a crucial strategy to promote the growth of environmentally friendly industries in Indonesia. Using a qualitative descriptive methodology (desktop study), it was found that shifting to a circular model, through the 5R principle, is crucial for optimizing resources, reducing waste, and lowering carbon emissions. Implementing this concept increases economic efficiency, creates green jobs, and strengthens national competitiveness. However, its implementation is hampered by inadequate infrastructure, weak policy coordination, and minimal green investment. An integrated strategy involving all stakeholders (government, industry, and community) is needed to strengthen the green industrial system. The circular economy is emphasized as a new economic development paradigm that balances ecology, society, and the economy, essential for Indonesia to achieve a Green Economy and the 2060 Net Zero Emission target.
Keywords: *Circular Economy, Green Industry, Sustainable Development*

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INTRODUCTION

Economic development in Indonesia currently faces increasingly complex challenges in its efforts to achieve a balance between economic growth, social welfare, and environmental protection. Development approaches that have focused primarily on increasing industrial output and utilizing natural resources often neglect environmental sustainability. A linear economic model based on the "take, make, dispose" principle has long been the primary structure for production and consumption activities in the country. However, this system is now showing various weaknesses, such as increasing waste, air and water pollution, land degradation, and carbon emissions that exacerbate global climate change..(Saepudin, M., Rahman, A., & Fauzi, 2020)

The negative impacts of a linear economic approach not only endanger environmental sustainability but also reduce people's quality of life and create socio-economic pressures, especially for vulnerable groups dependent on natural resources. In various regions in Indonesia, problems such as declining agricultural yields, coastal ecosystem damage, and rising waste management costs are clear evidence that traditional development methods are no longer suitable to meet the demands of the times. (Hasibuan & Sitep, 2025)

Furthermore, rapid population growth, urbanization, and increasing consumption of energy and industrial goods are further exacerbating the imbalance between human needs and nature's ability to regenerate itself. If this pattern continues, the likelihood of resource crises, environmental conflicts, and economic injustice will increase in the future. Therefore, Indonesia must make a fundamental shift in the direction of its economic development, shifting from an exploitative system to one that is more regenerative, inclusive, and ecologically just.

One increasingly popular way to address these challenges is the circular economy. This idea emphasizes the importance of maintaining the value of products, materials, and resources for as long as possible by applying the principles of reduce, reuse, recycle, recovery, and repair (5R), thereby reducing waste and forming a closed production cycle. (Tanti Kirana Utami, Azzahara

Salsabila Ramadani, 2025) By implementing a circular economy, industrial activities are not only aimed at achieving financial gain, but also at preserving the environment and improving social welfare.

The Indonesian government has affirmed its commitment to implementing the circular economy concept through a number of policies, such as the National Action Plan for Circular Economy (RANES) and the incorporation of sustainable development goals (SDGs) into the 2020–2024 National Medium-Term Development Plan (RPJMN) (Winda Fandira, Monik Solistiyowati, 2023). These initiatives are crucial elements for realizing a sustainable industry, which is a production system that is environmentally conscious, energy efficient, and able to provide additional economic value without damaging natural resources.

In addition to contributing to waste management and emission reduction, the implementation of a circular economy has significant potential to drive economic growth at the national level. Research shows that implementing this concept in Indonesia could generate more than 3 million new jobs and increase Gross Domestic Product by up to 200 trillion rupiah by 2030, while also reducing greenhouse gas emissions by 29–41%. Therefore, development planning based on a circular economy is not only an environmental strategy but also a strategic step towards developing an inclusive and disaster-resilient economy. (Iwan Harsono, 2025)

However, the implementation of a circular economy in Indonesia still faces various challenges, including low public understanding of sustainability principles, a lack of investment and technology in recycling, and weak policy integration between the central and regional levels of government. Therefore, comprehensive circular economy development planning is needed, involving collaboration between the government, industry, academia, and the community to realize the transition to a green, competitive, and sustainable industry. (Kristianto, H. & Nadapdap, 2021)

Based on this foundation, the research entitled "Circular Economy Development Planning to Support Green Industry in Indonesia" is highly relevant and important to implement. This study is expected to identify concrete

strategies for integrating circular economy principles into national development policies, with the goal of producing an industrial system that is efficient, environmentally friendly, and focused on the well-being of future generations. (Handini, T., Rahayu, P., & Wibowo, 2025)

LITERATURE REVIEW

A circular economy is an economic model that emphasizes efficient resource use and waste reduction by applying the principles of reduce, reuse, and recycle. This model emerged as a shift from a linear economy that previously focused on production and consumption without considering the long-term environmental impact. In a circular economy, production and consumption processes are designed to maintain the value of raw materials for as long as possible by maximizing waste utilization and extending the product's lifespan (Irawan, 2024).

Empirical research in Indonesia, particularly in large cities and islands such as Sumatra, shows that the implementation of a circular economy can increase economic growth while supporting sustainable development through more efficient and environmentally friendly resource management. Empirical studies in Indonesia, particularly in large cities and islands such as Sumatra, show that the implementation of a circular economy can encourage economic growth while supporting sustainable development through more efficient and environmentally friendly resource management. (Handini, T., Rahayu, P., & Wibowo, 2025) This research underscores the importance of developing industrial sectors such as food and beverages, textiles, construction, electronics, and plastics as priority and strategic sectors in the implementation of a circular economy to achieve efficiency and significantly reduce waste. In addition, the integration of a circular economy in national policies such as the RPJMN and RAN shows that this concept is not just a theory, but has become an important aspect in strategic tools to achieve emission reduction targets and sustainable development in Indonesia (B. Judijanto, 2025).

Studies on the fundamentals of sustainable product design and service-oriented business models emphasize that the circular economy is not only concerned with waste management, but also with innovation that generates new value and creates more environmentally friendly business opportunities (Forestry, 2022). Furthermore, the government is proactive in designing roadmaps and organizing green industry forums, which encourage intersectoral collaboration to accelerate the transition to a low-carbon economy and the implementation of a circular economy across various industrial sectors.(Zul Ammar, M. Irwan, 2024)

METHODOLOGY

This study uses a qualitative descriptive approach with library research methods to examine circular economy planning that supports environmentally friendly industries in Indonesia (Dendi Eka Muda Sitepu, 2025). This method was chosen because of its ability to provide in-depth insights into complex phenomena such as the circular economy in the context of regional development, taking into account various perspectives and the national context. Data collection was conducted by searching the latest scientific literature, including academic journals, books, research reports, policy documents, and case studies published in the last five years (Bappenas, 2021). These sources were found through systematic searches in academic databases such as Google Scholar and Web of Science.

Data analysis was conducted through several steps. First, all relevant references were grouped according to key themes such as policy implementation, technological innovation, socio-economic challenges, and regional case studies (Sari, D., Nabila, R., & Yusuf, 2025). Second, a content analysis was conducted to identify patterns, trends, and gaps in recent research on circular economy development planning across various national contexts. Third, a comparative analysis was conducted to assess various approaches, challenges, and strategies for circular economy development planning to support environmentally friendly industries in Indonesia (Sufitrayati, N., Amalia, D., & Prasetyo, 2025). A

limitation of this study lies in its focus on secondary literature analysis, which may not fully reflect current conditions in the field.

However, by considering the international reach and uniqueness of the sources used, this study is expected to be able to present a comprehensive view of circular economic development planning as a step in sustainable regional development in various national situations.

RESEARCH RESULT AND DISCUSSION

RESEARCH RESULT

Based on the results of the study, Indonesia is still in the early stages of implementing a circular economy and has not yet fully embraced this concept within the national industrial framework. The principle of extraction, production, and disposal, which requires the extraction of natural resources, the manufacture of goods, and their subsequent disposal, forms the basis of the linear economic model still followed by many industrial sectors (UNDP, 2022). High levels of resource exploitation, increasing carbon emissions, and the accumulation of industrial waste are the impacts of this pattern. However, in recent years, positive indications have emerged that the government and business leaders are beginning to consider a circular economy in their sustainable development agenda (L. Judijanto, 2025). With programs such as the Green Industry Certification and the Indonesian Green Industry Awards, which aim to increase efficient energy use, use environmentally friendly materials, and reduce waste from production, the government, through the Ministry of Industry and the Ministry of Environment and Forestry, has made green industry a key focus of the country.

According to this study, several industrial sectors have begun to adopt the circular economy concept, albeit on a small scale. For example, the automotive industry has implemented remanufacturing and recycling of car parts, which has been shown to significantly reduce industrial waste and save up to 30 percent of energy. On the other hand, the textile industry has begun to implement the eco-fashion concept by using low-carbon production methods and recycled materials. The Extended Producer Responsibility (EPR) initiative, which requires manufacturers to collect and recycle their product packaging, has shown

progress in waste and plastic management. These results indicate that there are many opportunities for growth in the implementation of a circular economy in Indonesia, especially with the inclusion of tax incentive programs, intersectoral collaboration, and support for environmentally friendly technologies (Saepudin et al., 2020).

A circular economy requires a comprehensive plan that considers human resources, technology, policies, and environmentally friendly infrastructure from a development planning perspective. This research identified three important ways this can be done at the national level. First, to ensure more precise and measurable policies for building a sustainable industry, the concept of a circular economy needs to be incorporated into national development planning documents such as the National Medium-Term Development Plan. Second, there needs to be a development of an innovation ecosystem and research into recycling technology through collaboration between various government agencies, universities, research centers, and companies. The transition to a low-carbon industry will be accelerated if we promote growth in biotechnology, renewable energy, and advances in environmentally friendly production. Third, to assist small and medium-sized enterprises (SMEs) seeking to transition to sustainable production methods, green finance programs such as sustainability loans, green bonds, and green financing should be expanded (Handini et al., 2025).

From an economic perspective, the implementation of a circular economy demonstrates increased efficiency in production costs, opens up new job opportunities, and increases the value of local products through recycling and material innovation. This approach contributes to environmental protection by reducing carbon emissions, waste, and the use of non-renewable natural resources. As a result, the circular economy serves as a new tool for economic development that can strengthen the competitiveness of domestic industries on the international stage, while also serving as a strategy for environmental protection..(Sufitrayati et al., 2025).

However, this study also identified several challenges currently facing Indonesia in implementing a circular economy. Key challenges include a lack of collaboration between ministries in promoting environmentally friendly industrial policies, limited facilities for recycling and waste management, and low understanding and knowledge among industry players regarding the concept of circularity. Furthermore, barriers to accelerating industrial transformation include limited financial support and incentives for environmentally friendly technological innovation. It is crucial to enhance human resource capacity through education and training on sustainable industries, develop environmentally friendly industrial areas by implementing integrated circular systems, and strengthen cooperation between the public and private sectors in promoting sustainable innovation to address these challenges (Bank., 2023).

By evaluating various factors, the results of this study support the view that planning for circular economic development is crucial for Indonesia's transition to an environmentally friendly economy. Reducing dependence on primary resources, strengthening the country's economic resilience, and supporting the achievement of the Sustainable Development Goals (SDGs) and the Net Zero Emissions target by 2060 are benefits of integrating the concept of circularity into the industrial system (Winda Fandira, Monik Solistiyowati, 2023). Therefore, the circular economy must be positioned as a new development paradigm that sustainably balances social welfare, environmental protection, and economic development, not simply as an environmental concept.

DISCUSSION

This study confirms that the shift tocircular economyis a strategic imperative for Indonesia, not only an environmental solution, but alsonew development paradigm to support Green Industryand achieve the targetNet Zero Emission 2060. Application of the principle5Rproven to be essential inoptimizing resources, reduce waste, And increase economic efficiency, as demonstrated by the initiative*remanufacturing*in the automotive sector and*eco-fashion*in the textile sector. However, this transition is hampered byweak policy coordination, limited recycling infrastructure, And lack of green investment. Therefore, it is necessaryintegrated strategywhich includes mainstreaming

circularity inRPJMN, developmentrecycling technology innovation ecosystem, and expansion of the schemeGreen Financeto support SMEs. By addressing these challenges through multi-stakeholder collaboration, Indonesia can strengthen industrial competitiveness, creategreen jobs, and realize development that fundamentally balances economic, social and ecological dimensions.

CONCLUSION AND RECOMMENDATIONS

The implementation of a circular economy is a crucial strategy for Indonesia to support the development of environmentally friendly industries and achieve sustainable development goals. Shifting from a linear economic system to a circular economy has been proven to improve resource efficiency, reduce waste, and suppress carbon emissions, a major contributing factor to climate change. By implementing the 5R principle (reduce, reuse, recycle, recover, and repair), industrial activities can generate new, environmentally friendly economic value and be globally competitive. However, the implementation of a circular economy in Indonesia still faces various obstacles, such as a lack of synergy between government agencies, minimal recycling infrastructure, low public awareness, and a lack of investment in green projects. Therefore, it is crucial to strengthen planning for the development of a circular economy through policy integration within the National Medium-Term Development Plan (RPJMN), increased research and innovation in environmentally friendly technologies, and financial support for small and medium-sized enterprises. Overall, this research demonstrates that the circular economy serves not only as an environmental approach but also as a new paradigm for development that integrates economic, social, and ecological aspects in a sustainable manner. With the right planning strategy, Indonesia has the opportunity to accelerate the transition to a greener economy, create sustainable jobs, and achieve its Net Zero Emission target by 2060

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BIBLIOGRAPHY

(Bappenas), National Development Planning Agency (2021). National Action Plan

Circular Economy (RANES) 2021–2030. In Jakarta: Bappenas. Jakarta: Bappenas.

(UNDP)., UNDP (2022). *Circular Economy and Sustainable Industrial Transformation in Indonesia.* New York: UNDP Publications.

Bank., W. (2023). *Indonesia Green Economy Transition*: Circular Economy Opportunities and Policy Roadmap. Washington, DC: The World Bank Group.

Dendi Eka Muda Sitepu, BH (2025). The Impact of Green Economy on Economic Growth and the Environment in Indonesia. *Journal of Economics & Business Students, 5(2).*

Handini, T., Rahayu, P., & Wibowo, S. (2025). Implementation of Green Finance in the Sustainable Manufacturing Industry in Indonesia. *Journal of Environmental Economics, 14(2), 101–115.*

Handini, N., Darwina, M., & Pangestoeti, W. (2025). The Role of Regional Government in Optimizing Local Economic Potential Through Innovation in Sustainable Development Policies. *Jurnal Ilmiah Nusantara, 2(5), 964–986.*

Hasibuan, B., & Sitep, DEM (2025). The Impact of Green Economy on Economic Growth and the Environment in Indonesia. *Journal of Economics & Business Students, 5(2).*

Irawan, D. (2024). Circular Economy Approach as a Sustainable Development Strategy in Indonesia. *E-Journal of Resources and Environment*.

Iwan Harsono, HS (2025). Circular Economy as a Sustainable Regional Development Strategy: A Comparative Study of Implementation in Developing and Developed Countries. *Journal of Education* and Development, *South Tapanuli Institute of Education,* 13, 141.

https://doi.org/10.37081/ed.v13i1.6581

Judijanto, B. (2025). Integration of Circular Economy in National Industrial Policy. *Indonesian Journal of Sustainable Development*, 9(1), 45–59.

Judijanto, L. (2025). Regulation And Policy For Circular Economy: A Global And Local Literature Review. Jebiman: *Journal of Economics, Business, Management and Accounting*, 3(3), 9–16.

Forestry, Ministry of Environment and Forestry. (2022). *National Report on the Implementation of Circular Economy and Environmental Policy*. Jakarta: Ministry of Environment and Forestry.

Kristianto, H. & Nadapdap, F. (2021). Circular Economy 101: Reviewing Definitions, Practices, and Policy Implications in Indonesia. *Journal of the Faculty of Social and Political Sciences*, UGM.

Saepudin, M., Rahman, A., & Fauzi, H. (2020). The Concept of Extended Producer Responsibility (EPR) in Industrial Waste Management. *Journal of Technology and Environmen*t, 6(3), 221–230.

Saepudin, A., Muryantini, S., & Maghfiroh, HD (2020). Indonesia's Policy in Realizing Green Industry During the Administration of President Joko Widodo. Eksos LPPM, 2(2), 166–177.

Sari, D., Nabila, R., & Yusuf, I. (2025). *Barriers to Circular* Economy Implementation in Indonesia: *Policy and Technology Perspectives*. Green *Industry Journal*, 11(1), 72–84.

Sufitrayati, N., Amalia, D., & Prasetyo, L. (2025). The Role of Circular Economy in Increasing National Industrial Competitiveness. *Journal of Applied and Development Economics, 8(2), 89–103.*

Sufitrayati, S., Fitriliana, F., Ulfia, U., Syamsuddin, N., & Nurhadi, A. (2025). Application of Alternative Raw Material Innovation for Cost Efficiency and Sustainability of Craft Products. *Jurnal Serambi Engineering*, 10(3).

Tanti Kirana Utami, Azzahara Salsabila Ramadani, et al. (2025). *Regulatory Support for Circular Economy Policy as a Realization of Sustainable* Development Goals (SDGS) in Indonesia. Indonesian Legal Media (MHI) Published by *Daarul Huda Krueng Mane Foundation,* 2 (5).

https://ojs.daarulhuda.or.id/index.php/MHI/index

Winda Fandira, Monik Solistiyowati, TS (2023). Circular Economy: The Main Strategy to Support Sustainable Development Goals (SDGs) to Achieve Sustainable Development Goals. *Proceedings of the National Seminar on Economics and Taxation*, 3(1).

Zul Ammar, M. Irwan, D. (2024). Green Economy as a Sustainable Development Strategy in Indonesia: Literature Review. *Al Khitmah Journal of Economics.*