SCOPING REVIEW OF GREEN INNOVATION DEVELOPMENT IN INDONESIA

I Putu Hendy Bimantara Dinata[1)], Daniel Edgar Hirasma Saragi[2)], Amrie Firmansyah[3)*]

[1,2]D4 Public Sector Accounting Program, Politeknik Keuangan Negara STAN, Indonesia
[3]Faculty of Economics and Business, Universitas Pembangunan Nasional Veteran Jakarta, Indonesia

Abstract

The purpose of this research is to identify the expansion of GI in Indonesia. We use the scoping review method to answer the research objective. This research is divided into three clusters, i.e., the practice of GI in small and medium enterprises, the practice of GI on the listed company in the Indonesia Stock Exchange, and other issues about GI development in Indonesia. GI has been applied in the business sector with broad and varied stakeholders. It positively impacts the firm performance and the company's competitive advantage. This research can have implications for business owners who intend to implement GI immediately.

Keywords: *firm performance, green innovation, listed company, small and medium enterprises*

1. INTRODUCTION

Industrial development benefits humans through economic growth, technological advancement, improved living standards, and infrastructure development (Raza et al., 2020). But on the other hand, the existence of advanced industries also has a negative impact on the environment. These include water pollution, degradation of soil quality, and decreased biodiversity (Erwin, 2011). Businesses need to protect the preservation of nature from the negative impacts arising from their operational activities. Managing global warming pollution and implementing supporting regulations cannot be separated from good environmental management by businesses (Novitasari & Agustia, 2022). Thus, concern for the environment is a critical issue from a business point of view.

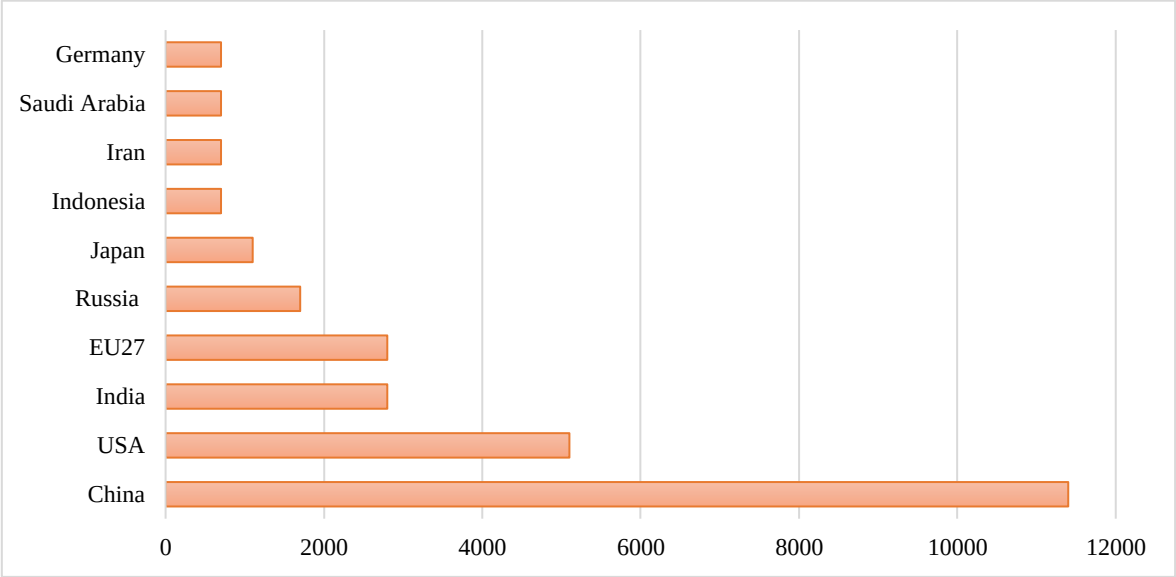
Green innovation is a step toward producing products or running business processes by considering environmental aspects to reduce the negative impacts generated by the industry (Amaranti et al., 2019). This issue is a focus for stakeholders in various business sectors. This is in line with stakeholder theory, which states that the purpose of running a company is limited to its owners and wider stakeholders because of the significant impact generated by a business activity (Yuniarti et al., 2022).

Institutional theory states that external pressures can cause adaptations made by an organization. The theory aligns with the fact that not all business people voluntarily apply the concept of green innovation. Not a few apply because they are under pressure from customers, owners, and the government. Nevertheless, green innovation tends to positively impact business actors regarding sales growth, competitive advantage, innovation, cost efficiency, and people's preference to choose environmentally friendly products. Thus, companies are encouraged to pay more attention to environmental management and disclosure (D. A. Putri & Soewarno, 2020).

*Corresponding author. *Email address:* amrie.firmansyah@gmail.com

Published by AFEBI Economic and Finance Review

For Indonesia, the implementation of green innovation is very important. Indonesia is one of the ten countries that contribute the most to carbon emissions by 2022. According to data from the Global Carbon Project, Indonesia has produced 700 billion tons of carbon emissions by 2022. This condition is reflected in the air pollution in big cities and industrial areas in Indonesia. If not handled properly, excessive carbon emissions will impact public health (Marpaung, 2023).



Source: Annur (2023)

Figure 1. Carbon Emission (in billion ton/year)

Water conditions are also a factor that increases the urgency of green innovation implementation in Indonesia. Water pollution in Indonesia is mainly caused by human activities that create residential, agricultural, and industrial waste, including mining (Farhan et al., 2023). Water pollution in Indonesia can be categorized as the poor condition. Hermawan & Wibawa (2022) explained that the quality of Indonesia's priority rivers in 2019 was unfavorable, with 76.5% of rivers having poor and fair quality (IKA: 50 - 70). The deterioration of water and river quality is due to pollution caused by human activities, both home waste and factory production waste. Water pollution causes damage to aquatic ecosystems such as rivers, lakes, and seas. Water pollution can also harm biodiversity, threaten the availability of water resources, and impact human health (Farhan et al., 2023).

Indonesian business actors' commitment to green innovation is essential in environmental sustainability. The implementation of green innovation shows the company's social responsibility towards the environmental impacts resulting from its business (Nejati et al., 2014). By implementing green innovation, the public can believe that the company can protect the environment. If public confidence is high, the company value will also be high (Fitriyah et al., 2020). Green innovation allows companies to gain a competitive advantage and public legitimacy (Li et al., 2017).

Despite the benefits, implementing green innovation brings many challenges in Indonesia. The cost aspect is crucial. The application of green innovation requires costs to measure waste prevention, handling, and release (N. A. H. A. Putri et al., 2022). Increased production costs are inevitable because green innovation requires additional steps in the production process to develop products and services (Mariyamah & Handayani, 2020). Another aspect that is challenging in green innovation implementation in Indonesia is limited knowledge. Indonesian people have a low understanding of environmental issues. In addition,

Published by AFEBI Economic and Finance Review

environmental education actors have limited commitment to transferring this knowledge (Kospa, 2021).

Atlantika et al. (2023) also explained that many business actors in Indonesia still do not understand the technical application of green innovation in conducting their business. The system built in the country also still has many limitations. The Indonesian government has not provided many incentives and facilities for businesses that implement green innovation (Raihan et al., 2022). In addition, environmental law enforcement in Indonesia is relatively weak. It can be seen from the lack of human resources, facilities, inter-agency coordination, and political intervention. It causes the law enforcement process slow and ineffective (Kamal et al., 2024).

This research purposed to describe the development of green innovation in Indonesia using a scoping review approach. We extract literature using "Green Innovation" and "Indonesia". Based on this limitation, 36 papers align with the theme raised by this research. However, We only managed to access 25 of them as material to be developed in this study. By knowing the range of green innovation developments in Indonesia, business actors and policymakers can formulate complete instruments to improve sustainable business management. This research provides academic and practical benefits for applying green innovation in Indonesia. Thus, this research can contribute to expanding knowledge horizons that emphasize the importance of environmental concerns as part of business objectives in addition to profit.

2. LITERATURE STUDY

2.1. Green Innovation

Green Innovation is also known as eco-innovation or environmental innovation. Several definitions of green innovation have been expressed in several studies. Castellacci & Lie (2017) defined green innovation as a process that contributes to creating new products and technologies intending to reduce environmental risks. Meanwhile, Asni & Agustia (2022) explained that green innovation results from adapting a sustainability model that changes the manufacturing process to pay more attention to environmental impacts. Amaranti et al. (2019) explained that green innovation is related to company product and process development activities to reduce negative environmental impacts. Green innovation can also be defined as product and process innovation related to energy saving, pollution prevention, waste recycling, and environmentally friendly products (Nuryakin & Maryati, 2022). Some of these definitions show that green innovation is closely related to environmental aspects (Amaranti et al., 2019).

Research on green innovation is still insufficient in the agriculture and plantation sectors. While in terms of region, the eastern part of Indonesia is still limited in research. According to Stucki (2019), the challenges in implementing green innovation generally are reluctance to spend more, high development costs, high commercial uncertainty, and low interest from business actors.

The development of green innovation will also positively impact the environment. GI encourages companies to innovate processes and products to encourage environmental sustainability (Soewarno et al., 2019). It is realized by developing energy-efficient products, managing production waste, and implementing a recycling system. Green innovation can also reduce environmental risks caused by pollution and exploitation of natural resources (Castellacci & Lie, 2017). From various explanations, green innovation is crucial for social communities and companies to achieve sustainability and competitive advantage (Chu et al., 2019).

Published by AFEBI Economic and Finance Review

2.2. Green Product Innovation

GI is generally categorized into innovation in goods/services and innovation in process (Takalo et al., 2021). Green product innovation refers to introducing a new product or service concerned with resource conservation and environmental protection (Yi et al., 2023). Innovation in products is made by making environmentally friendly products (Amaranti et al., 2019). Tubitak (2023) explained that an essential aspect of green product innovation is the improvement in using materials and components that favor product performance.

Green product innovation can be done in several ways. The first is using cleaner raw materials in the production and packaging (Zeng et al., 2011). Another way to apply this is to use raw materials as efficiently as possible (Dugoua & Dumas, 2021). Product development with less negative environmental impact is also a step toward implementing green product innovation (Durif & Boivin, 2010). In addition, Green Product Innovation can be achieved by reducing the use of toxic materials, reducing energy use during product use, and increasing the useful life of the product (Küçükoğlu & Pınar, 2015).

By implementing green product innovation, companies can achieve several benefits. The first is improving financial performance, driven by increased consumer interest in environmentally friendly products and reduced production costs (Yi et al., 2023). Green Product Innovation also increases a company's competitive advantage (Al-Abdallah & Al-Salim, 2021). Another benefit of implementing green product innovation is an increase in firm value if the entity can maintain intellectual property while increasing product sales (Yao et al., 2019).

2.3. Green Process Innovation

Innovation in the process is done by modifying production methods to use resources more efficiently (Amaranti et al., 2019). Green process innovation is also known as streamlining resource usage in production, energy saving, pollution prevention, waste recycling, and toxicity avoidance (Yi et al., 2023). Green process innovation aims to reduce environmental impact by developing the company's production facilities or adding new stages in the production process (Küçükoğlu & Pınar, 2015). Green process innovation tends to be more difficult for customers to recognize because it relates to the company's internal productivity.

Green process innovation can be implemented in several ways. The first is using technology to control emissions at the end of the production stage (Cai & Li, 2018). Another way is to manage waste disposal and the efficiency of water usage in the production process (Küçükoğlu & Pınar, 2015). Simplification of the production process is also a form of Green Process Innovation. Because then there will be efficient use of raw materials and fuel (Rexhäuser & Rammer, 2014). Another way to implement green process innovation is to choose natural, low-emission, and biodegradable raw materials (Rexhäuser & Rammer, 2014). The implementation of green process innovation provides benefits to the company in the form of direct economic performance improvement (Wang et al., 2021).

2.4. Benefits of Green Innovation

Green innovation is important for companies to win the competition in an era that places environmental aspects as a strategic issue (Soewarno et al., 2019). It is inseparable from the fact that green innovation is essential for companies because it can impact their business performance (Tjahjadi et al., 2020). From an economic perspective, green innovation can increase the company's market share, attract customers, and gain a competitive advantage. Dangelico & Pujari (2010) explained that green innovation is an essential strategy for companies in creating environmentally friendly products. These environmentally friendly

Published by AFEBI Economic and Finance Review

products can provide better bargaining power to customers than products from competitors (Nuryakin & Maryati, 2020).

The benefits generated from implementing Green Innovation can be categorized into three, i.e., improved financial performance, increased competitive advantage, and increased company value. Financial performance can generally be measured using sales growth and net profit. Zhang et al. (2019) explained that implementing GI can increase financial ratios. In addition, the benefits of increasing competitive advantage also positively impact implementing GI. Barney (1991) defined competitive advantage as an advantage in profit or benefits obtained by a company in more significant quantities than its competitors. These benefits can take the form of cost savings, technology, brand, management, and others that can save the use of raw materials, reduce toxic materials, and increase the product's useful life. Increased competitive advantage is achieved by applying GI throughout the organizational learning process (Tu & Wu, 2021). The last benefit is the increase in company value, which is generally measured using Tobin's Q (Tang et al., 2021). Tobin's Q is measured by dividing the aggregate value of listed stock and the book value of total debt by the book value of total assets. Green innovation is an essential intangible asset affecting the firm's value, helping enterprises transform the environmental sustainability goal into a profitable investment opportunity (Xie et al., 2022).

2.5. Implementation of Green Innovation Across Sectors

Green innovation has been applied in several business sectors through different approaches. In the banking sector, GI is applied by promoting environmentally preferable financing products and services, hoping to increase customer adoption rate (Desalegn & Tangl, 2022). In addition, GI is also applied to support businesses in areas such as energy-efficient buildings and digitization to reduce paper usage (Fakhira et al., 2023). Banks also develop their human resources by providing training to improve resource use efficiency in running businesses (Razaq, 2020).

In the manufacturing sector, GI is implemented in several ways. Innovative waste management is first (N. A. H. A. Putri et al., 2022). Furthermore, GI is carried out by increasing efficiency in using raw materials for production and reducing pollution (Bibi & Narsa, 2022). Manufacturing entities implement GI using integrated recycling and warehousing processes that reduce environmental adverse impacts (N. A. H. A. Putri et al., 2022).

Another sector that implements GI is mining. As an industry with the most detrimental environmental impact, the mining sector implements GI by applying green degrees using measurement indicators such as mine environment, resource development, energy conservation, and enterprise management (Luo et al., 2023). Investment in environmentally friendly technology is also a form of GI prevalent in the mining sector (Jiang, 2020).

Meanwhile, GI is generally implemented by integrating workforce competency development in the small and medium enterprise sectors. Followed by an introduction to environmentally friendly technology and communication and leadership skills (Astuti & Wahyun, 2018).

3. RESEARCH METHODOLOGY

This research employs the scoping review method to answer the research questions contained in this study. The scoping review method determines how green innovation develops in Indonesia. This research aims to map research on green innovation in Indonesia and review the themes discussed. To do this, We collected several previous studies that discussed green innovation in Indonesia. The scoping review method is effectively used to assess the development of a research topic, which can be the basis for future research development (Peterson et al., 2017).

Published by AFEBI Economic and Finance Review

In this research, we have made several guidelines for conducting a scoping review, as shown in Table 1. The guidelines contain provisions regarding the scope of the research, data sources, and information taken from previous research. The provisions regarding the scope of the research include the duration of the review, language, and research location. We utilized the Publish or Perish application to collect previous studies relevant to this research. The database used in the Publish or Perish application is Scopus. The selection of the Scopus database aims to ensure that the articles to be analyzed are of high quality. The information collected from previous research includes title, author name, year of publication, research objectives, research cluster, research methodology, research results, research implications, limitations, and suggestions for future research. After determining the scope of the research, data sources, and information collected, the author conducted a thematic analysis of the articles that had been collected. The scoping review process in this study was conducted with the following steps: 1) inclusion and exclusion, 2) systematic search strategy, 3) research selection, 4) data retrieval, and 5) data synthesis.

The article search process used the keywords "green innovation" and "Indonesia". In the initial search process, thirty-five articles were obtained that met the keyword criteria. Of these thirty-five articles, nine could not be accessed, and one had a topic that did not match the discussion. In the end, twenty-five articles met the criteria to be used in the scoping review process in this article. The articles that have been collected are then grouped based on the topics discussed in each article. Next, a discussion of the important points of the research results from the articles collected following the grouping of the topic of discussion will be presented.

Table 1. Research Guidelines

Scope	Data Source	Information used
Duration of review: two weeks Articles in Indonesian and English Research location in Indonesia Research article and Conference Preceding	Electronic Database: Scopus	Title, author name, year of publication, objectives, clusters, methodologies, countries, results, implications, limitations, and suggestions for future research

Source: processed

4. RESULT AND DISCUSSION

4.1. Literature Search Results

Based on the previously established guidelines, We collected research articles that followed the research questions. Article collection begins with determining search keywords,

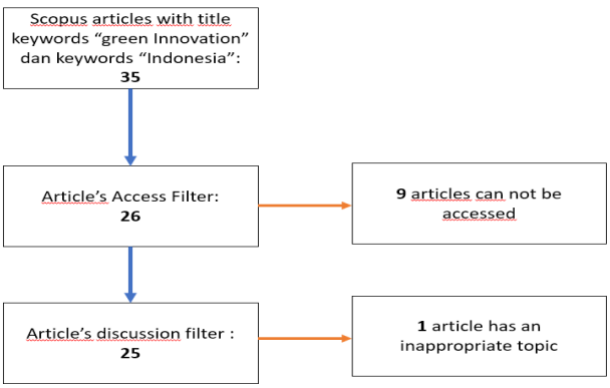


Figure 2. Article Search Process

selecting the article source database, selecting article search results, retrieving data from articles, and pouring the results of the analysis of the data that has been collected. The flow of the article collection process can be seen in Figure 1.

The article collection process in this study was conducted using the Publish or Perish application. The research database that researchers refer to is Scopus. Article searches are conducted based on article titles and keywords in the article. The last article search was conducted on July 17, 2023. Details of the article search results are in Table 2.

Through the process of searching for articles based on predetermined guidelines, a total of twenty-five articles met the criteria. After the article search process, We attempted to visualize the relationship between keywords in each article. The results of the visualization can be seen in Figure 3, figure 4, and Figure 5.

Table 2. Article Search Result

No.	Keywords.	Database	Search Results	Discussion is not appropriate	Inaccessible	Article Used
1	title words: "green innovation" and keywords: Indonesia	Scopus	35	1	9	25

Source: processed

In Figure 3 regarding network visualization, the words that appear a lot together with the word "green innovation" are the words "company", “impact," and "performance". The visualization shows that the articles collected discuss the effects of green innovation. Research on the effects of green innovation is mainly done on company performance.

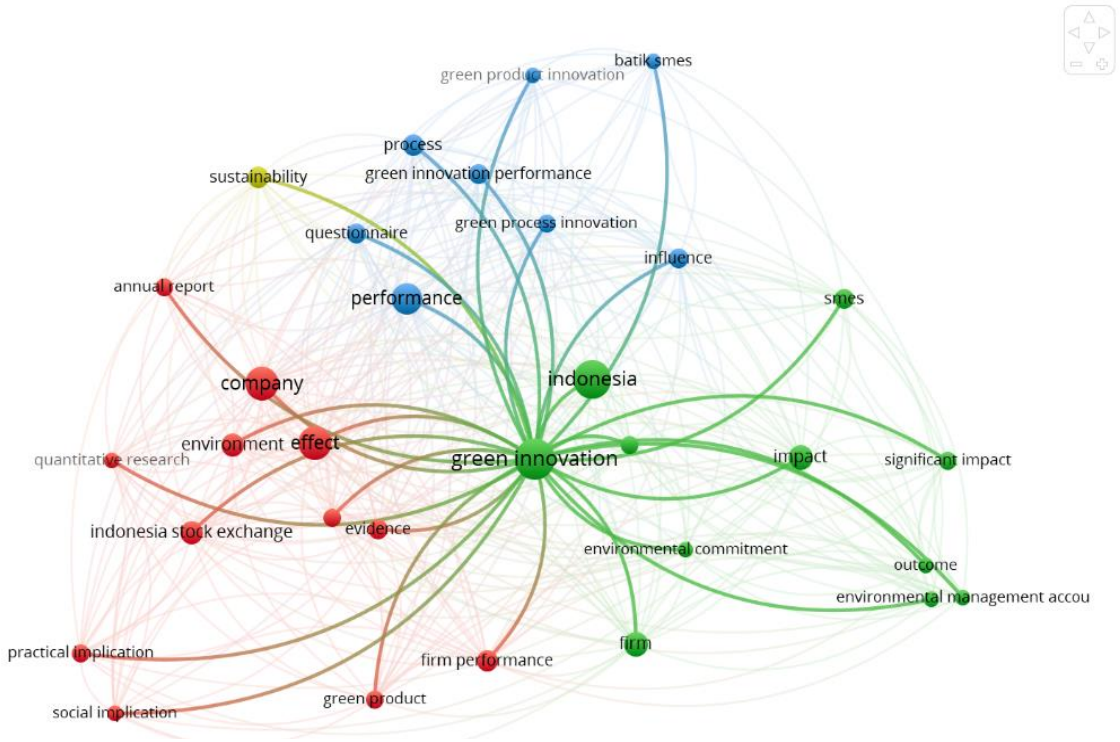


Figure 3. Network Visualization

Published by AFEBI Economic and Finance Review

Figure 4 on overlay visualization shows the development of green innovation research over time. In the figure, the articles on green innovation that We collected began to be published around 2016. The most research on green innovation was conducted around 2021.

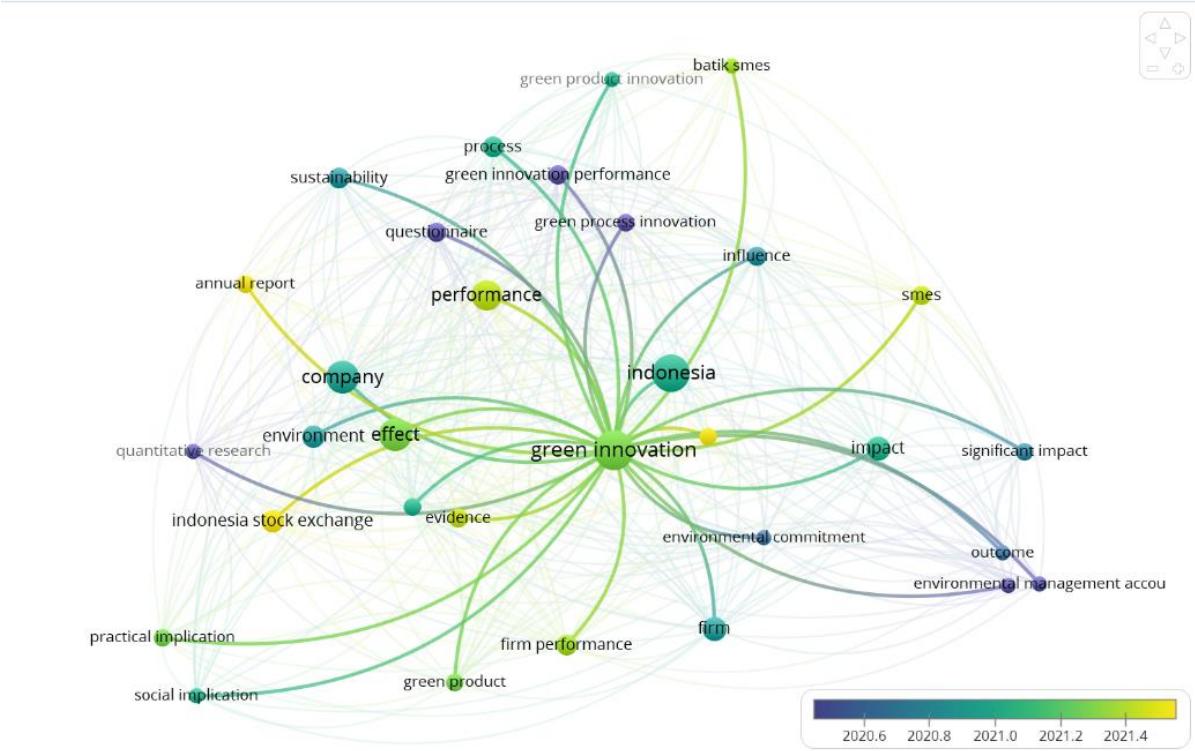


Figure 4. Overlay Visualization

Figure 5 on density visualization shows the most discussed topics related to green innovation. The most discussed topics are about companies, environmental impact, and performance. This can be seen from the dense color of these words in the visualization in Figure 5.

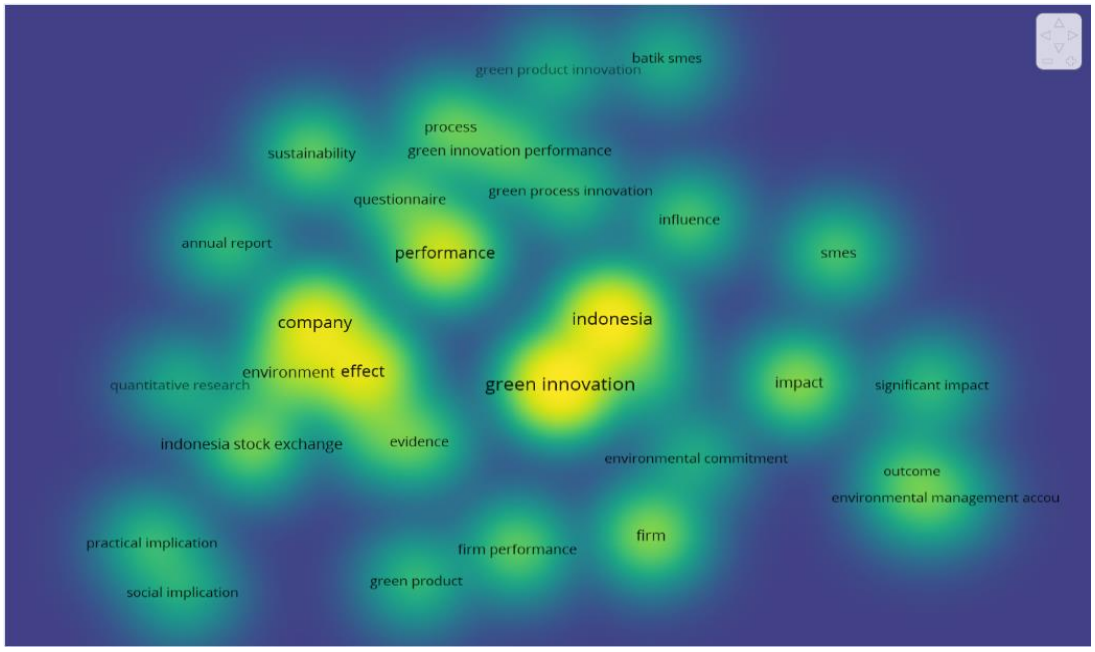


Figure 5. Density Visualization

4.2. Overview of Previous Research

Figure 6 shows that research on green innovation in Indonesia published in Scopus journals began to be published in 2016. This indicates that research on green innovation in Indonesia is still relatively new. Most of the research was published in 2022, with as many as nine articles. From 2016 to 2023, there has been an increasing trend of publications on green innovation in Indonesia. This indicates that the theme of green innovation is becoming a concern for researchers in Indonesia.

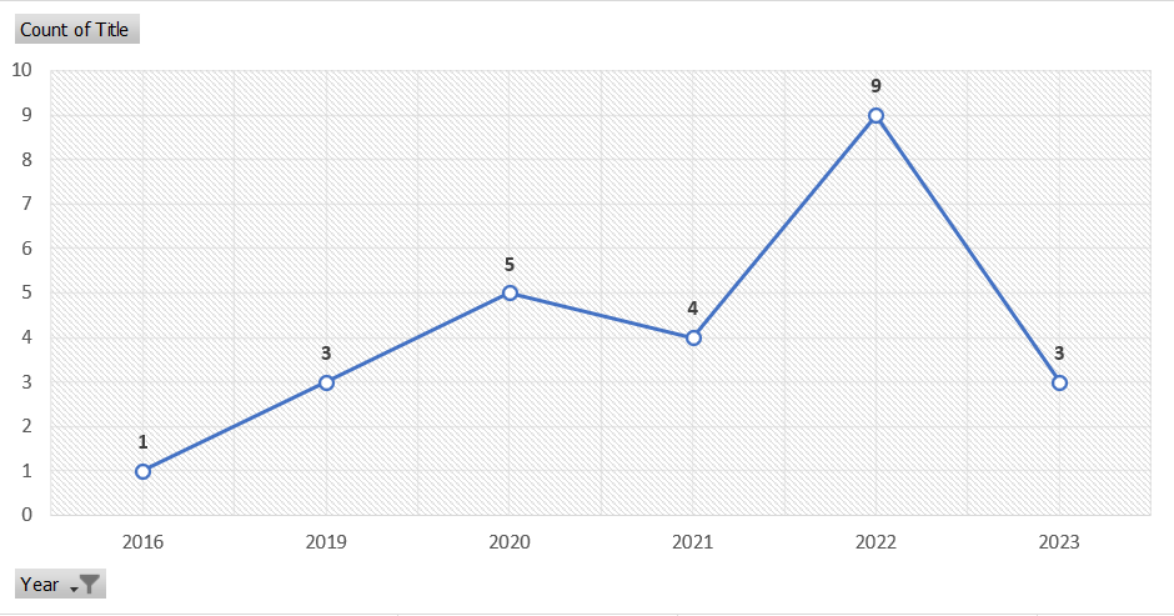


Figure 6. Year of Published Article

We found from the twenty-five articles selected, most have been indexed on Scopus Q1 - Q4. This shows that the selected articles are of excellent quality and credible. Scopus has previously indexed four journals, but as of 2023, they have an inactive status. In addition, three articles were sourced from conference proceedings. Details of the journal classification for the articles selected can be seen in Table 3.

Table 3. Journal Classification

No.	Title	Year	Journal	Journal Ranking
1	Green innovation strategy and green innovation: The roles of green organizational identity and environmental organizational legitimacy	2019	Management Decision	Q1
2	Green supply chain management and firm performance: the mediating effect of green innovation	2021	Journal of Industrial Engineering and Management	Q2
3	The role of green innovation between green market orientation and business performance: its implication for open innovation	2020	Journal of Open Innovation: Technology,	Q1

Published by AFEBI Economic and Finance Review

No.	Title	Year	Journal	Journal Ranking
4	Green product competitiveness and green product success. Why and how does mediating affect green innovation performance?	2020	Markets, and Complexity Entrepreneurship and Sustainability Issues	Inactive
5	Achieving carbon neutrality pledge through clean energy transition: linking the role of green innovation and environmental policy in E7 Countries	2022	Energies	Q1
6	Impact of environmental commitment, environmental management accounting, and green innovation on firm performance: An empirical investigation	2020	International Journal of Energy Economics and Policy	Q2
7	Green innovation for resource efficiency and sustainability: Empirical analysis and policy	2023	Resources Policy	Q1
8	The role of green innovation in the effect of corporate social responsibility on firm performance	2022	Economies	Q2
9	Do green innovation and green competitive advantage mediate the effect of green marketing orientation on SMEs' green marketing performance?	2022	Cogent Business and Management	Q2
10	Quality management, green innovation, and firm value: Evidence from Indonesia	2021	International Journal of Energy Economics and Policy	Q2
11	Does corporate governance induce green innovation? An emerging market evidence	2022	Corporate Governance (Bingley)	Q1
12	The nexus of knowledge transfer, green innovation, and environmental performance: the impact of environmental management accounting	2019	International Journal of Energy Economics and Policy	Q2
13	The impact of customer pressure and the environmental regulation on green innovation performance	2021	IOP Conference Series: Earth and Environmental Science	-
14	Green dynamic capability for enhancing green innovations performance in a manufacturing company: A conceptual framework	2019	IOP Conference Series: Materials Science and Engineering	-

Published by AFEBI Economic and Finance Review

No.	Title	Year	Journal	Journal Ranking
15	The mediating role of green innovation on the effect of environment-based culture on company performance	2020	International Journal of Innovation, Creativity and Change	Inactive
16	Does green innovation improve SME performance?	2022	Economies	Q2
17	Green innovation on firm value with financial performance as mediating variable: evidence of the mining industry	2022	Asian Academy of Management Journal	Q3
18	The effect of environmental management disclosure and green innovation on the Indonesian food and beverages industry's sales growth	2021	IOP Conference Series: Earth and Environmental Science	-
19	Firm performance in environmentally friendly firms in Indonesia: the effects of green innovation	2020	International Journal of Innovation, Creativity and Change	Inactive
20	Evaluation of green innovation criteria for environment sustainability	2016	International Business Management	Inactive
21	The new model: green innovation modified to moderate the influence of integrated reporting, green intellectual capital toward green competitive advantage	2023	International Journal of Energy Economics and Policy	Q2
22	Does green innovation play an important role in the effect board gender diversity has on firm performance?	2022	Intangible Capital	Q3
23	Hope- hype of green innovation, corporate governance index, and impact on firm financial performance: a comparative study of Southeast Asian countries	2023	Environmental Science and Pollution Research	Q1
24	The role of green supply chain management and green innovation in the effect of corporate social responsibility on firm performance	2022	Gestão & Produção	Q3
25	motives and green innovation performance in Indonesian small and medium enterprises (SME's) Batik - a qualitative case study	2022	Quality - Access to Success	Q4

Source: processed by

Published by AFEBI Economic and Finance Review

Based on Table 4, secondary data was the most dominant data type used in the articles We collected. Fifteen articles use secondary data collected by the documentation method. Secondary data sources usually come from company financial reports and the PROPER Index released by the Ministry of Environment and Forestry. In addition, nine articles use primary data from surveys, and only one uses the interview method to collect data.

Table 4 Data Collection Methods

Data Collection Methods	Total
Secondary Data - Documentation	15
Primary Data - Survey	9
Primary Data - Interview	1

Source: processed

Table 5 shows that regression is the most widely used data analysis method in the collected articles. The regression method was used in thirteen articles that We collected. Meanwhile, the SEM PLS method was used in ten articles that We collected, and there is also one article each that uses the literature review method and qualitative descriptive analysis to conduct data analysis.

Table 5 Data Analysis Methods

Data Analysis Method	Quantitative	Qualitative
Regression	13	
PLS SEM	10	
Literature Review		1
Qualitative Descriptive		1
Total	**23**	**2**

Source: processed

4.3. Green Innovation in Micro, Small and Medium Enterprises (MSMEs)

There is a significant amount of study on green innovation in Indonesia, mainly focusing on Micro, Small, and Medium Enterprises (MSMEs). Indisputably, MSMEs have made an indissoluble contribution of 61.07% to Indonesia's Gross Domestic Product (GDP) (A. K. Hermawan & Ramadhan, 2020). Furthermore, the MSME sector in Indonesia exhibits a labor absorption rate of 97% of the entire workforce (A. K. Hermawan & Ramadhan, 2020). Given the significant impact of MSMEs on the Indonesian economy, it is undoubtedly intriguing to analyze the progress of Green Innovation within the MSME sector.

This study examines ten publications exploring the progress of environmentally-friendly innovation in Indonesia's Micro, Small, and Medium Enterprises (MSME) sector. Tjahjadi et al. (2020) conducted a study to investigate the impact of green innovation on the connection between green market orientation and business performance in micro, small, and medium enterprises (MSMEs) in East Java Province. The findings of this study demonstrate that green innovation might mediate the relationship between green market orientation and corporate performance. Research conducted by Tjahjadi et al. (2020) indicates that organizations that develop environmentally-friendly innovations should expect to see a positive impact on their financial performance.

Nuryakin & Maryati (2022) also researched green innovation in MSMEs. The study was conducted on batik micro, small, and medium enterprises (MSMEs) in the Yogyakarta region. The study findings indicate that green innovation has a substantial and favorable influence on the performance of green marketing. Thus, MSMEs should make concerted efforts to cultivate environmentally friendly innovation within their business operations to enhance

their green marketing performance (Nuryakin & Maryati, 2022). Furthermore, green innovation can serve as a crucial approach to engage customers, foster product innovation, and enhance production operations.

In their study, Nuryakin & Maryati (2020) investigated the correlation between the competitiveness of green products and the achievement of success in green product innovation performance. They also explored the role of green product competitiveness and success as mediating factors. The study was also conducted on the Yogyakarta region's batik micro, small, and medium enterprises (MSMEs). The study findings demonstrate a notable and favorable correlation between the invention of environmentally friendly products, their competitiveness in the market, and their overall performance. Implementing green innovation can be a strategic approach for organizations to keep their competitive edge and promote environmental sustainability in the long run.

Lestari et al. (2021) conducted a study that differed slightly from previous research. The study was carried out on micro, small, and medium enterprises (MSMEs) in the food sector located in Batu, East Java. The objective of this study is to ascertain the impact of customer pressure on the performance of green innovation. The findings suggest a direct and favorable correlation between customer pressure and green innovation performance. Customer demand pressures MSMEs, compelling them to prioritize environmental considerations in their business operations. Companies should also promote ecologically sustainable practices due to the numerous advantages they offer (Lestari et al., 2021).

Sudaryati et al. (2020) investigated the correlation between a corporate culture centered around the environment and a company's financial success, with green innovation serving as a mediator. This study employs two green innovation dimensions: product and process. The findings of this study demonstrate that a culture influenced by the environment has a beneficial effect on financial success. However, only the dimension of green process innovation effectively mediates the relationship between the two factors. Sudaryati et al. (2020) further elucidated that environmentally sustainable business practices can enhance a company's operational and financial performance.

Rustiarini et al. (2022) examined the progress of green innovation in micro, small, and medium enterprises (MSMEs) in Bali Province. The study aimed to ascertain the function of green innovation in mediating the connection between intellectual capital and financial performance. The study findings demonstrate that green innovation effectively acts as a mediator between intellectual capital and financial performance. Green innovation enables organizations to establish a favorable brand image and gain a competitive edge (Rustiarini et al., 2022).

The study conducted by Sunarjo et al. (2022) employed a qualitative methodology to assess the effectiveness of green innovation in the micro, small, and medium enterprises (MSME) sector. This study's findings suggest that many micro, small, and medium enterprises (MSMEs) have successfully integrated environmentally-friendly innovation into their day-to-day operations. The primary catalyst for promoting the adoption of green innovation in MSMEs is moral incentives. Furthermore, instrumental and relational motives serve as additional incentives for MSMEs to adopt green innovation, albeit their impact is not as significant as moral motives.

In their study, Soewarno et al. (2019) investigated the impact of a green innovation strategy on implementing green innovation. This study focuses on a corporation situated in Surabaya Industrial Estate, Rungkut. The findings of this study demonstrate that implementing a green innovation strategy has a beneficial effect on the development of green innovation. According to Soewarno et al. (2019), organizations should have a robust green identity to bolster their green innovation strategy.

Published by AFEBI Economic and Finance Review

Zandi et al. (2019) sought to ascertain the impact of environmental accounting on promoting information transfer, green innovation, and environmental performance in micro, small, and medium enterprises (MSMEs) in Indonesia. This study's findings suggest a favorable correlation between environmental accounting and information transfer, green innovation, and environmental performance. Thus, enterprises should adopt environmental accounting to promote eco-friendly innovation and enhance environmental performance.

In their study, Somjai et al. (2020) investigated the impact of environmental commitment, environmental management accounting, and green innovation on the performance of small and medium firms in Indonesia. The findings of this study suggest that the implementation of green innovation and environmental management accounting has a beneficial impact on the overall performance of companies. Green innovation has the potential to enhance organizations' performance in Indonesia significantly. This research also advocates for politicians to promote implementing environmentally friendly purchase and payment practices.

4.4. Green Innovation in Publicly Listed Companies in Indonesia

Publicly traded corporations should be held responsible for their financial results and how they manage their operations. Hence, green innovation is important for companies listed on the Indonesia Stock Exchange (IDX). The IDX comprises 875 firms that engage in the trading of their shares on the stock exchange. Since 2020, there has been a significant increase in the number of companies engaging in initial public offerings (IPOs). Furthermore, the current count of investors in the country stands at eleven million. This phenomenon demonstrates the general public's and business entities' significant enthusiasm to engage in the capital market, both as investors and entities seeking financial resources. Eleven study literature sources specifically focus on green innovation in publicly listed companies in the IDX. The reviewed literature demonstrates that green innovation has a crucial role in business performance (Widiatami et al., 2021; Yuniarti et al., 2022), firm value (Husnaini & Tjahjadi, 2021), and the competitive advantage of companies (Rachmawati, 2023).

Novitasari & Agustia (2021) investigated the relationship between green supply chain management (GSCM), green innovation, and corporate performance. They found that green innovation is a mediating variable between GSCM and company success. The objective of this study is to ascertain the extent to which green innovation influences the relationship between the two variables. The study's findings indicate that GSCM has a beneficial impact on green innovation. The implementation of green innovation positively impacts the organization's overall performance (Novitasari & Agustia, 2021). This research also offers a valuable understanding of the government's role in promoting enterprises to adopt green supply chain management (GSCM) practices promptly. This step addresses the environmental issues that arise within society (Novitasari & Agustia, 2021).

The study by Novitasari & Tarigan (2022) examined the impact of green innovation on companies' corporate social responsibility (CSR) initiatives. Corporate Social Responsibility (CSR) refers to the exchange between a company and society, which can be divided into five key areas: environmental, social, economic, stakeholder, and volunteer components. Through implementing Corporate Social Responsibility (CSR), commercial entities can effectively contribute to improving social well-being, foster economic development, and enhance their commitment to environmental sustainability. Novitasari and Tarigan (2022). The findings indicate that organizations that prioritize implementing environmentally friendly innovation have the potential to enhance their corporate social responsibility efforts and ultimately enhance overall company success.

Published by AFEBI Economic and Finance Review

Husnaini & Tjahjadi (2021) examined quality management, green innovation, and firm value. They analyzed 352 financial reports published on the IDX between 2014 and 2017. This study investigates the impact of green innovation as a mediator between quality management and corporate value (Husnaini, 2021). The findings indicated that the implementation of quality management practices has the potential to decrease the overall worth of a corporation. Nevertheless, if it is executed with environmentally-friendly innovation, it can enhance the organization's value. Nonetheless, a significant obstacle entrepreneurs face in adopting environmentally friendly innovation is the substantial financial investment needed (Husnaini & Tjahjadi, 2021).

Asni & Agustia (2022) investigated the impact of corporate governance on the presence of environmentally friendly innovation in publicly traded companies on the IDX. During the period from 2016 to 2020, a total of 640 companies were included in the research. The findings indicate that effective governance can incentivize a corporation to adopt environmentally-friendly innovation in its business practices. More precisely, the factors that have a significant impact include the number of administrative authorities, the existence of autonomous commissioners, and the allocation of corporate equity ownership. The implication of this research is to promote the development of government policy recommendations and control mechanisms rooted in corporate governance to effectively address the interests of all stakeholders (Asni & Agustia, 2022).

In their study, Yuniarti et al. (2022) investigated the impact of green innovation on firm value while considering financial performance as a mediating variable. The study centered on the mining sector, regarded as one of the industries with the most significant adverse ecological consequences. The mining businesses that participated in the Corporate Performance Rating Assessment (PROPER) between 2012 and 2018 were selected as the sample for this study. The findings indicate that implementing green innovation has a favorable impact on the financial performance of companies operating in the mining industry. Additionally, the financial performance of these enterprises positively influences their overall value (Yuniarti et al., 2022).

Widiatami et al. (2021) researched the food and beverages (F&B) sector. The study investigated the impact of disclosing environmental management practices and implementing green innovation on the sales growth of enterprises in the food and beverage industry. The primary discovery indicates that implementing environmentally friendly innovation has a notable and beneficial impact on the sales growth rate for enterprises in the food and beverage industry. Conversely, the disclosure of environmental management substantially impacts the increase in sales. According to Widiatami et al. (2021), individuals prefer tangible actions from businesses rather than relying solely on reporting and information dissemination.

In their study, Putri and Soewarno (2020) investigated the correlation between environmental management accounting (EMA), green product innovation, green process innovation, and firm performance. The study by D. A. Putri and Soewarno (2020) found that all three factors had a strong and favorable correlation with corporate performance. This research can serve as a valuable resource for publicly traded companies in Indonesia seeking to enhance their performance through EMA and green innovation.

In their study, Rachmawati (2023) investigated the correlation between integrated reporting and green intellectual capital concerning a company's sustainable competitive advantage. Green innovation serves as a mediating variable in this study. The findings indicated that implementing green innovation can enhance the impact of integrated reporting while diminishing the impact of green intellectual capital on the company's competitive advantage (Rachmawati, 2023). This study also indicates that organizations need to adjust and surmount the challenges posed by climate change by implementing sustainable innovation to attain a lasting competitive edge.

Published by AFEBI Economic and Finance Review

Mahsina & Agustia (2023) examined the influence of gender diversity on a company's performance in Indonesia by analyzing its impact on the Board of Directors. Green innovation serves as an intermediary in this investigation. A total of 518 businesses listed on the IDX were selected as the research sample. The findings indicate that having gender diversity on the board of directors benefits corporate performance in developing countries. Nevertheless, green innovation lacks a substantial impact.

Khan et al. (2023) did a comparative study in Malaysia and Indonesia to investigate the influence of green innovation and governance indices on business financial performance. This study aims to conduct a comparative analysis of green innovation practices in both nations and create a corporate governance index. Khan et al. (2023) gathered data from 188 companies listed on the stock exchange over three years and analyzed using the General Least Square Method. The findings indicated that green innovation yields superior outcomes in Malaysia. However, the significance of company performance is more remarkable in Indonesia (Khan et al., 2023). This research may have ramifications for the divergence of policy suggestions implemented by the governments of both countries.

Novitasari & Agustia (2022) investigated the function of green supply chain management (GSCM) and green innovation as intermediaries between corporate social responsibility (CSR) and firm performance. The research subjects comprised companies that were active from 2015 to 2019. The findings indicate that GSCM serves as a mediator for the influence of CSR on company performance, whereas green innovation does not work as a mediator for the impact of corporate CSR on company performance. Furthermore, GSCM serves as a mediator between corporate CSR and green innovation, but green innovation does not serve as a mediator between GSCM and corporate performance. This study additionally discovered that these findings apply exclusively to companies listed in the Corporate Performance Rating Assessment (PROPER) program on the Indonesia Stock Exchange.

4.5. Other Issues on Green Innovation

The study by Saleh et al. (2016) examined the appropriate assessment procedure for criteria in green innovation. Tseng et al. (2013) outlined three critical requirements for green innovation: management, process, and product innovation. The findings of this study offer a hierarchy of factors that organizations should consider while adopting green innovation. This research also highlights the need to prioritize product innovation while adopting green innovation within the company.

Amaranti et al. (2019) aimed to create a conceptual framework that explains how a company's dynamic green capabilities influence its green innovation performance. Organizations require dynamic skills to effectively adjust and respond to changes in their external environment (Amaranti et al., 2019). The findings of the conceptual framework in this study indicate that three factors need to be considered to optimize green innovation performance. The three facets encompass the capacity to assimilate information, the organization's dynamic competencies, and environmentally conscious innovation.

According to a study by Yu et al. (2022), additional challenges are associated with implementing green innovation in poor nations. The study sought to establish the correlation between the implementation of clean energy, green technology, environmental legislation in the form of environmental levies, and technical innovation with the carbon emissions produced by businesses. The E7 countries, often known as the seven emerging countries, are the seven major developing countries expected to influence global GDP growth by the year 2050 significantly. The E7 countries comprise Brazil, China, India, Indonesia, Mexico, Russia, and Turkey. The E7 countries have pledged to achieve carbon neutrality by adopting a renewable

Published by AFEBI Economic and Finance Review

energy-based energy transition, fostering green innovation, and implementing laws that promote environmental conservation.

The significance of the E7 countries has increased due to their potential to emerge as leaders in the global economy. This also highlights these nations' need to allocate resources towards green innovation. Renewable energy (REN), green innovation (GINNO), environmental tax (ETAX), and technical innovation (TECH) are key factors that can assist E7 countries in attaining their carbon-neutral objectives. Studies indicate an indirect causal connection between REN and GINNO and the decrease in enterprises' carbon emissions. Nevertheless, introducing ETAX was discovered to have little immediate impact on firms' efforts to decrease carbon emissions.

The study conducted by Sun et al. (2023) investigates the correlation between green innovation, resource efficiency, and sustainable economic growth in E7 nations. Sustainable innovation and optimal utilization of resources are crucial elements for the economic advancement of a growing nation. The findings indicate that both variables favorably impact sustainable economic growth in developing nations. This research suggests that the government should prioritize green foreign direct investment (Green FDI), encourage green finance tools, and support the creation of environmentally friendly jobs in small and medium firms.

4.6. Implications of Green Innovation Implementation

Various previous research results show that implementing green innovation has a positive impact on various business lines. The implementation of green innovation is carried out at various business scales, ranging from micro, small, and medium enterprises (Sunarjo et al., 2022) to public companies (Yuniarti et al., 2022). This fact shows that the implementation of green innovation can have a very positive impact on a business.

Tjahjadi et al. (2020) explained that green innovation positively impacts MSMEs in the manufacturing sector. Tjahjadi et al. (2020) further explained that green innovation will impact better business performance, cost efficiency, increased profits, and a better reputation for MSMEs. In an era where environmental concerns are increasing, green innovation is a very important strategy to be implemented in an MSME business (Nuryakin & Maryati, 2022). Sunarjo et al. (2022) conducted more specific research on implementing green innovation in batik MSMEs in Pekalongan. The research shows that batik MSMEs in Pekalongan have implemented green innovation in their production process and output. Sunarjo et al. (2022) also explained that various stakeholders should collaborate to encourage green innovation in the batik production process to create an environmentally friendly business process that positively impacts batik MSMEs.

The implementation of green innovation also has a positive impact on businesses run at the company level. Companies in various sectors can benefit from implementing green innovation in their business. Yuniarti et al. (2022) explained that mining companies in Indonesia that implement green innovation in their business have a greater chance of getting an increase in sales. Integrating green innovation in the short term will increase the company's operating expenses and social contribution, positively impacting the company's financial performance in the future (Yuniarti et al., 2022). Besides the mining sector, implementation can also positively impact companies in other sectors. Widiatami et al. (2021) revealed that implementing green innovation can encourage increased sales in food and beverage companies. The study revealed that companies that innovate by making more environmentally friendly products will attract interest and loyalty from customers increasingly concerned about environmental issues. This will ultimately increase company sales.

5. CONCLUSION

Published by AFEBI Economic and Finance Review

Research on developing green innovation in the MSME sector has been conducted extensively in Indonesia. This is inseparable from the fact that MSMEs contribute to Indonesia's GDP. Numerous studies reveal various positive impacts of green innovation on MSMEs. Green innovation can improve the financial performance of MSMEs (Rustiarini et al., 2022; Sudaryati et al., 2020; Tjahjadi et al., 2020). In addition, green innovation also positively impacts green marketing performance (Nuryakin & Maryati, 2022). Factors that are considered to influence green innovation are green product competitiveness, green product success, and green marketing performance (Nuryakin & Maryati, 2020), customer pressure (Lestari et al., 2021), green innovation strategy (Soewarno et al., 2019), and environmental accounting (Zandi et al., 2019).

We have several conclusions regarding applying green innovation in publicly listed companies on the IDX. First, applying green innovation is important for companies on the IDX because it can help improve financial performance and build a sustainable competitive advantage (Rustiarini et al., 2022; Sudaryati et al., 2020). Thus, green innovation positively influences the company's performance on the IDX. Then, certain sectors, such as foods, beverages, and mining, have more urgency in implementing green innovation in their business lines (Widiatami et al., 2021; Yuniarti et al., 2022). Even the application can provide positive benefits for the company's business development. Green innovation also provides a mediating role for several variables, such as green supply chain management (GSCM) and corporate social responsibility (CSR), on company performance (Novitasari & Agustia, 2022; Novitasari & Tarigan, 2022). Also, concerning green innovation, the implementation of this aspect in the company is influenced by factors such as corporate governance, gender composition of company leaders, quality management, and CSR (Asni & Agustia, 2022; Mahsina & Agustia, 2023; Novitasari & Agustia, 2022).

Green innovation research in Indonesia is not limited to discussions in the MSME sector and publicly listed companies. Other issues are discussed, such as the selection of criteria for evaluating green innovation (Saleh et al., 2016) and the conceptual framework of green innovation (Amaranti et al., 2019). Another issue of green innovation is related to the Emerging Seven (E7) countries. As countries that will play a significant role in the world economy by 2050, the E7 urgently needs to invest in green innovation immediately (Yu et al., 2022). It is more urgent as research shows that green innovation has a positive relationship with sustainable economic growth (Yu et al., 2022).

This study has several shortcomings related to the research method and data collection process. The data collection process in this study was limited to journals from the Scopus database, so the number of articles analyzed was still not too large. In addition, the method used in this research is a scoping review, so the information analyzed from the articles collected is limited to the study's primary results in general, and a more in-depth discussion is not conducted.

Based on the results of this study, We can provide several suggestions. First, we propose that business actors, both MSMEs and companies, immediately apply the principle of green innovation when running their businesses. This is because applying green innovation in running a business has been proven to improve the business's performance. This can also improve the company's image in the eyes of the public, who have increasingly paid attention to aspects of environmental sustainability. Suggestions for future research include using more databases to collect articles about green innovation in Indonesia so that the research results can provide more insight into the development of green innovation in Indonesia. Future studies on green innovation, especially those that aim to conduct empirical testing, can also be conducted with data collection methods other than questionnaires so that they can get a more precise picture of the effect of green innovation on business actors.

Published by AFEBI Economic and Finance Review

Reference

Al-Abdallah, G. M., & Al-Salim, M. I. (2021). Green product innovation and competitive advantage: an empirical study of chemical industrial plants in Jordanian qualified industrial zones. *Benchmarking: An International Journal*, *28*(8), 2542–2560. https://doi.org/10.1108/BIJ-03-2020-0095

Amaranti, R., Govindaraju, R., & Irianto, D. (2019). Green dynamic capability for enhancing green innovations performance in a manufacturing company: A conceptual framework. *IOP Conference Series: Materials Science and Engineering*, *703*(1), 1–7. https://doi.org/10.1088/1757-899X/703/1/012023

Annur, C. M. (2023, December). *Indonesia masuk daftar 10 negara penghasil emisi karbon terbesar dunia*. https://databoks.katadata.co.id/datapublish/2023/12/06/indonesia-masuk-daftar-10-negara-penghasil-emisi-karbon-terbesar-dunia

Asni, N., & Agustia, D. (2022). Does corporate governance induce green innovation? An emerging market evidence. *Corporate Governance (Bingley)*, *22*(7), 1375–1389. https://doi.org/10.1108/CG-10-2021-0389

Astuti, M., & Wahyun, H. C. (2018). Human capital integration model with technology innovation in small and medium enterprises (SME). *Proceedings of the 1st International Conference on Intellectuals' Global Responsibility (ICIGR 2017)*. https://doi.org/10.2991/icigr-17.2018.6

Atlantika, Y. N., Manggu, B., & Magdalena, Y. (2023). Analisis tingkat pengetahuan lingkungan, persepsi, dan perilaku umkm di daerah perbatasan dalam upaya mengimplementasikan green economy. *Sebatik*, *27*(1), 87–96. https://doi.org/10.46984/sebatik.v27i1.1973

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Bibi, Y. S., & Narsa, N. P. D. R. H. (2022). Pengaruh enviromental management terhadap kinerja keuangan dengan green innovation sebagai variabel mediasi. *Jurnal Akuntansi Universitas Jember*, *20*(2), 90-105. https://doi.org/10.19184/jauj.v20i2.34896

Cai, W., & Li, G. (2018). The drivers of eco-innovation and its impact on performance: Evidence from China. *Journal of Cleaner Production*, *176*, 110–118. https://doi.org/10.1016/j.jclepro.2017.12.109

Castellacci, F., & Lie, C. M. (2017). A taxonomy of green innovators: Empirical evidence from South Korea. *Journal of Cleaner Production*, *143*, 1036–1047. https://doi.org/10.1016/j.jclepro.2016.12.016

Chu, Z., Wang, L., & Lai, F. (2019). Customer pressure and green innovations at third party logistics providers in China: The moderation effect of organizational culture. *International Journal of Logistics Management*, *30*(1), 57–75. https://doi.org/10.1108/IJLM-11-2017-0294

Dangelico, R. M., & Pujari, D. (2010). Mainstreaming green product innovation: Why and how companies integrate environmental sustainability. *Journal of Business Ethics*, *95*(3), 471–486. https://doi.org/10.1007/s10551-010-0434-0

Desalegn, G., & Tangl, A. (2022). Forecasting green financial innovation and its implications for financial performance in Ethiopian Financial Institutions: Evidence from ARIMA and ARDL model. *National Accounting Review*, *4*(2), 95–111. https://doi.org/10.3934/NAR.2022006

Dugoua, E., & Dumas, M. (2021). Green product innovation in industrial networks: A theoretical model. *Journal of Environmental Economics and Management*, *107*, 102420. https://doi.org/10.1016/j.jeem.2021.102420

Published by AFEBI Economic and Finance Review

Durif, F., & Boivin, C. (2010). In search of a green product definition. *Innovative Marketing*, *6*(1), 25-33. https://www.businessperspectives.org/index.php/journals/innovative-marketing/issue-126/in-search-of-a-green-product-definition

Erwin, M. (2011). *Dampak kegiatan industri genteng terhadap kerusakan lingkungan fisik di Desa Karangasem Kecamatan Wirosari Kabupaten Grobogan*. http://lib.unnes.ac.id/13046/

Fakhira, N., Zulbainarni, N., & Simanjuntak, M. (2023). Green banking adoption strategy (Case study of banks in Jabodetabek). *Indonesian Journal of Business and Entrepreneurship*. https://doi.org/10.17358/ijbe.9.1.49

Farhan, A., Lauren, C. C., & Fuzain, N. A. (2023). Analisis faktor pencemaran air dan dampak pola konsumsi masyarakat diIndonesia. *Jurnal Hukum Dan HAM Wara Sains*, *2*(12), 1095–1103. https://doi.org/10.58812/jhhws.v2i12.803

Hadiah Fitriyah, Bambang Tjahjadi, & Noorlailie Soewarno. (2020). Peran green product innovation dalam memediasi pengaruh corporate social responsibility terhadap kinerja bisnis industri kreatif. *Journal of Accounting Science*, *4*(1), 12–28. https://doi.org/10.21070/jas.v4i1.397

Hermawan, A. K., & Ramadhan, M. R. (2020). Pengaruh Perubahan Tarif Pajak PPh UMKM terhadap Kepatuhan Pembayaran Pajak di KPP Pratama Boyolali. *Simposium Keuangan Negara*, *2*(1), 43–58. https://jurnal.bppk.kemenkeu.go.id/snkn/article/view/521

Hermawan, S., & Wibawa, A. (2022). Kajian tentang audit lingkungan oleh Badan Pengawas Keuangan (BPK) di Indonesia. *Jurnal Hukum Lingkungan Indonesia*, *8*(2), 402–430. https://doi.org/10.38011/jhli.v8i2.392

Husnaini, W., & Tjahjadi, B. (2021). Quality management, green innovation and firm value: Evidence from Indonesia. *International Journal of Energy Economics and Policy*, *11*(1), 255–262. https://doi.org/10.32479/ijeep.10282

Jiang, S. (2020). *Sustainable development model and innovation of mineral resources* (pp. 104–128). https://doi.org/10.4018/978-1-7998-1966-0.ch005

Kamal, U., Baety, A. N., & Hanafi, A. R. (2024). Penerapan hukum lingkungan dalam penegakan hak warga atas lingkungan hidup yang sehat dan layak. *Jurnal Ilmiah Kajian Multidisipliner*, *8*(5), 632-639. https://sejurnal.com/1/index.php/jikm/article/view/1653

Khan, P. A., Johl, S. K., Kumar, A., & Luthra, S. (2023). Hope-hype of green innovation, corporate governance index, and impact on firm financial performance: a comparative study of Southeast Asian countries. *Environmental Science and Pollution Research*, *30*(19), 55237–55254. https://doi.org/10.1007/s11356-023-26262-4

Kospa, H. S. D. (2021). Kajian pendidikan lingkungan hidup di Indonesia. *Jurnal Tekno Global UIGM Fakultas Teknik*, *10*(1). https://doi.org/10.36982/jtg.v10i1.1722

Küçükoğlu, M. T., & Pınar, R. İ. (2015). Positive influences of green innovation on company performance. *Procedia - Social and Behavioral Sciences*, *195*, 1232–1237. https://doi.org/10.1016/j.sbspro.2015.06.261

Lestari, E. R., Dania, W. A. P., Indriani, C., & Firdausyi, I. A. (2021). The impact of customer pressure and the environmental regulation on green innovation performance. *IOP Conference Series: Earth and Environmental Science*, *733*(1), 1–8. https://doi.org/10.1088/1755-1315/733/1/012048

Li, D., Zheng, M., Cao, C., Chen, X., Ren, S., & Huang, M. (2017). The impact of legitimacy pressure and corporate profitability on green innovation: Evidence from China top 100. *Journal of Cleaner Production*, *141*, 41–49. https://doi.org/10.1016/j.jclepro.2016.08.123

Published by AFEBI Economic and Finance Review

Luo, D., He, S., Wu, H., Cheng, L., & Li, J. (2023). An integrated approach to green mines based on hesitant fuzzy topsis: Green degree analysis and policy implications. *Sustainability*, *15*(13), 10468. https://doi.org/10.3390/su151310468

Mahsina, & Agustia, D. (2023). Does green innovation play an important role in the effect board gender diversity has on firm performance? *Intangible Capital*, *19*(2), 146–164. https://doi.org/10.3926/IC.2020

Mariyamah, M., & Handayani, S. (2020). Pengaruh green innovation terdahap economic performance dengan environmental management accounting sebagai variabel moderasi. *Jurnal Akuntansi Dan Auditing*, *16*(2), 105–123. https://doi.org/10.14710/jaa.16.2.105-123

Marpaung, A. P. (2023). Pengaruh polusi udara terhadap kesehatan paru-paru pada anak-anak di kawasan industri Kota Medan. *Jurnal Ilmiah Simantek*, *7*(2). https://simantek.sciencemakarioz.org/index.php/JIK/article/view/427

Nejati, M., Amran, A., & Hazlina Ahmad, N. (2014). Examining stakeholders' influence on environmental responsibility of micro, small and medium-sized enterprises and its outcomes. *Management Decision*, *52*(10), 2021–2043. https://doi.org/10.1108/MD-02-2014-0109

Novitasari, M., & Agustia, D. (2021). Green supply chain management and firm performance: the mediating effect of green innovation. *Journal of Industrial Engineering and Management*, *14*(2), 391–403. https://doi.org/10.3926/jiem.3384

Novitasari, M., & Agustia, D. (2022). The role of green supply chain management and green innovation in the effect of corporate social responsibility on firm performance. *Gestão & Produção,29*, e117. http://doi.org/10.1590/1806-9649-2022v29e117

Novitasari, M., & Tarigan, Z. J. H. (2022). The role of green innovation in the effect of corporate social responsibility on firm performance. *Economies*, *10*(5), 1–19. https://doi.org/10.3390/economies10050117

Nuryakin, & Maryati, T. (2020). Green product competitiveness and green product success. Why and how does mediating affect green innovation performance? *Entrepreneurship and Sustainability Issues*, *7*(4), 3061–3077. https://doi.org/10.9770/jesi.2020.7.4(33)

Nuryakin, N., & Maryati, T. (2022). Do green innovation and green competitive advantage mediate the effect of green marketing orientation on SMEs' green marketing performance? *Cogent Business and Management*, *9*(1), 1–19. https://doi.org/10.1080/23311975.2022.2065948

Peterson, J., Pearce, P. F., Ferguson, L. A., & Langford, C. A. (2017). Understanding scoping reviews: Definition, purpose, and process. *Journal of the American Association of Nurse Practitioners*, *29*(1), 12–16. https://doi.org/10.1002/2327-6924.12380

Putri, D. A., & Soewarno, N. (2020). Firm performance in environmentally-friendly firms in Indonesia: the effects of green innovation. *International Journal of Innovation, Creativity and Change*, *13*(4), 464–481. https://www.ijicc.net/images/vol_13/Iss_4/13444_Putri_2020_E_R.pdf

Putri, N. A. H. A., Indraswari, A., Yahya Wulandari, & Ronnawan Juniatmoko. (2022). Green accounting: analisis penerapan green innovation pada pengelolaan limbah pabrik tahu di Kartasura. *Jurnal Akuntansi Dan Audit Syariah (JAAiS)*, *3*(2), 196–214. https://doi.org/10.28918/jaais.v3i2.5964

Rachmawati, S. (2023). The new model: green innovation modified to moderate the influence of integrated reporting, green intellectual capital toward green competitive advantage. *International Journal of Energy Economics and Policy*, *13*(2), 61–67. https://doi.org/10.32479/ijeep.13921

Published by AFEBI Economic and Finance Review

Raihan, F. A., Supriyadi, I., & Syahtaria, I. (2022). Pembiayaan hijau (green financing) dan aturan kebijakan pada energi terbarukan dalam rangka mendukung ketahanan energi nasional. *Jurnal Ketahanan Energi*, *8*(2). https://jurnalprodi.idu.ac.id/index.php/KE/article/view/4468/

Raza, E., Sabaruddin, L., & Komala, A. L. (2020). Manfaat dan dampak digitalisasi logistik di era industri 4.0. *Jurnal Logistik Indonesia*, *(4)*1, 49-63. https://doi.org/10.31334/logistik.v4i1.873

Razaq, A. (2020). Impact of green life style on green innovation in the banking sector: mediated by manager's training and moderation of green innovation strategies. *Journal of Organization & Business*, *1*(1), 45–63. https://doi.org/10.52131/job.2020.0101.0004

Rexhäuser, S., & Rammer, C. (2014). Environmental innovations and firm profitability: Unmasking the Porter hypothesis. *Environmental and Resource Economics*, *57*(1), 145–167. https://doi.org/10.1007/s10640-013-9671-x

Rustiarini, N. W., Bhegawati, D. A. S., & Mendra, N. P. Y. (2022). Does green innovation improve SME performance? *Economies*, *10*(12), 1–13. https://doi.org/10.3390/economies10120316

Saleh, C., Zasyana, V., Muharafandy, N., & Immawan, T. (2016). Evaluation of green innovation criteria for environment sustainability. *International Bussiness Management*, *10*(19), 4703–4707. http://dx.doi.org/10.3923/ibm.2016.4703.4707

Soewarno, N., Tjahjadi, B., & Fithrianti, F. (2019). Green innovation strategy and green innovation: The roles of green organizational identity and environmental organizational legitimacy. *Management Decision*, *57*(11), 3061–3078. https://doi.org/10.1108/MD-05-2018-0563

Somjai, S., Fongtanakit, R., & Laosillapacharoen, K. (2020). Impact of environmental commitment, environmental management accounting and green innovation on firm performance: An empirical investigation. *International Journal of Energy Economics and Policy*, *10*(3), 204–210. https://doi.org/10.32479/ijeep.9174

Stucki, T. (2019). What hampers green product innovation: the effect of experience. *Industry and Innovation*, *26*(10), 1242–1270. https://doi.org/10.1080/13662716.2019.1611417

Sudaryati, E., Agustia, D., Tjaraka, H., & Rizki, A. (2020). The mediating role of green innovation on the effect of environment-based culture on company performance. *International Journal of Innovation, Creativity and Change*, *11*(11), 320–334. www.ijicc.net

Sun, Y., Gao, P., Tian, W., & Guan, W. (2023). Green innovation for resource efficiency and sustainability: Empirical analysis and policy. *Resources Policy*, *81*(103369). https://doi.org/10.1016/j.resourpol.2023.103369

Sunarjo, W. A., Setyanto, R. P., & Suroso, A. (2022). Motives and green innovation performance in Indonesian small and medium enterprises (SME's) batik-a qualitative case study. *Quality - Access to Success*, *23*(186), 74–82. https://doi.org/10.47750/QAS/23.186.10

Takalo, S. K., Sayyadi Tooranloo, H., & Shahabaldini parizi, Z. (2021). Green innovation: A systematic literature review. *Journal of Cleaner Production*, *279*, 1-22. https://doi.org/10.1016/j.jclepro.2020.122474

Tang, T. (Ya), Zhang, S. (Katee), & Peng, J. (2021). The value of marketing innovation: Market-driven versus market-driving. *Journal of Business Research*, *126*, 88–98. https://doi.org/10.1016/j.jbusres.2020.12.067

Tjahjadi, B., Soewarno, N., Hariyati, H., Nafidah, L. N., Kustiningsih, N., & Nadyaningrum, V. (2020). The role of green innovation between green market orientation and business

Published by AFEBI Economic and Finance Review

performance: its implication for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4), 1–18. https://doi.org/10.3390/joitmc6040173

Tseng, M. L., Wang, R., Chiu, A. S. F., Geng, Y., & Lin, Y. H. (2013). Improving performance of green innovation practices under uncertainty. *Journal of Cleaner Production*, *40*, 71–82. https://doi.org/10.1016/j.jclepro.2011.10.009

Tu, Y., & Wu, W. (2021). How does green innovation improve enterprises' competitive advantage? The role of organizational learning. *Sustainable Production and Consumption*, *26*, 504–516. https://doi.org/10.1016/j.spc.2020.12.031

Tubitak. (2023). *Türkiye green industry project.* https://tubitak.gov.tr/sites/default/files/6-tubitak-wbgi-sep.pdf

Wang, M., Li, Y., Li, J., & Wang, Z. (2021). Green process innovation, green product innovation and its economic performance improvement paths: A survey and structural model. *Journal of Environmental Management*, *297*, 113282. https://doi.org/10.1016/j.jenvman.2021.113282

Widiatami, A. K., Solikhah, B., Setiyani, R., & Yanitama, A. (2021). The effect of environmental management disclosure and green innovation on the Indonesian food and beverages industry's sales growth. *IOP Conference Series: Earth and Environmental Science*, *896*, 1-6. https://doi.org/10.1088/1755-1315/896/1/012018

Xie, Z., Wang, J., & Zhao, G. (2022). Impact of green innovation on firm value: Evidence from listed companies in China's heavy pollution industries. *Frontiers in Energy Research*, *9*, 1-17. https://doi.org/10.3389/fenrg.2021.806926

Yao, Q., Liu, J., Sheng, S., & Fang, H. (2019). Does eco-innovation lift firm value? The contingent role of institutions in emerging markets. *Journal of Business & Industrial Marketing*, *34*(8), 1763–1778. https://doi.org/10.1108/JBIM-06-2018-0201

Yi, Y., Zeng, S., Chen, H., & Shi, J. J. (2023). When does it pay to be good? A meta-analysis of the relationship between green innovation and financial performance. *IEEE Transactions on Engineering Management*, *70*(9), 3260–3270. https://doi.org/10.1109/TEM.2021.3079098

Yu, Y., Radulescu, M., Ifelunini, A. I., Ogwu, S. O., Onwe, J. C., & Jahanger, A. (2022). Achieving carbon neutrality pledge through clean energy transition: linking the role of green innovation and environmental policy in E7 countries. *Energies*, *15*(17), 1–23. https://doi.org/10.3390/en15176456

Yuniarti, R., Soewarno, N., & Isnalita. (2022). Green Innovation on Firm Value with Financial Performance as Mediating Variable: Evidence of The Mining Industry. *Asian Academy of Management Journal*, *27*(2), 41–58. https://doi.org/10.21315/aamj2022.27.2.3

Zandi, G. R., Khalid, N., & Islam, D. M. Z. (2019). Nexus of knowledge transfer, green innovation and environmental performance: impact of environmental management accounting. *International Journal of Energy Economics and Policy*, *9*(5), 387–393. https://doi.org/10.32479/ijeep.8285

Zeng, S. X., Meng, X. H., Zeng, R. C., Tam, C. M., Tam, V. W. Y., & Jin, T. (2011). How environmental management driving forces affect environmental and economic performance of SMEs: a study in the Northern China district. *Journal of Cleaner Production*, *19*(13), 1426–1437. https://doi.org/10.1016/j.jclepro.2011.05.002

Zhang, D., Rong, Z., & Ji, Q. (2019). Green innovation and firm performance: Evidence from listed companies in China. *Resources, Conservation and Recycling*, *144*, 48–55. https://doi.org/10.1016/j.resconrec.2019.01.023

Published by AFEBI Economic and Finance Review