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ORIGINAL PAPER

Green financing and climate change: challenges and regulatory mechanisms in Malaysia and Indonesia

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Abstract
Over the past few decades, there has been an increase in concerns about climate change in Malaysia and Indonesia. This has put pressure on both public-listed companies and small and medium-sized enterprises to modify the way they conduct their business. Therefore, in order to encourage the adoption of environmentally friendly financing in the country, it is crucial to modify regulatory frameworks, synchronize public financial incentives, promote green financing across various sectors, align public sector financing decisions with the environmental aspect of the Sustainable Development Goals (SDGs), and increase investments in clean and sustainable technologies. This paper examines the challenges of implementing effective green financing in Malaysia to comply with the climate change mitigation requirements of the Paris Agreement. It compares Malaysia's policies and regulatory mechanisms with Indonesia's and presents the challenges faced in implementing green financing. The government is identified as a key player in ensuring the success of the initiatives, but barriers remain that may limit the extent of their effectiveness. As a recommendation, to help nations become high-income nations by 2025 and achieve SDGs, green financing needs to be improved. All industry players, including small and medium-sized businesses, must adopt greener practices.

Graphical abstract

Keywords Green financing · Climate change · Challenges · Regulatory mechanisms

Introduction

It is undeniable that the environment has been undergoing drastic changes since the mid-1990s and the situation has further escalated worldwide. To effectively combat the impact of climate change, various robust and strategic measures are being proposed and implemented at different levels (Tiep et al. 2021). The financial sector can play a significant role in the fight against global warming by supporting risk reductions related to climate change and mitigating the effects of unfavorable climate events. The Paris Agreement is a global agreement to tackle climate change, including targets, mitigation, adaptation, loss, damage,

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finance, technology, capacity building, and transparency (Salman et al. 2022). Its long-term goal is to limit the global mean temperature increase to below 2 °C over the pre-industrial period, with efforts to limit the increase to 1.5 °C (Iacobuţă et al. 2022). Additionally, the agreement seeks to achieve net zero greenhouse gas emissions in the second half of the twenty-first century by reducing man-made carbon emissions to a level that can be absorbed by forests and oceans after 2050 (Musah et al. 2023). To achieve these goals, the role of green finance has become increasingly important.

Green finance refers to economic activities that support environmental enhancement, response to climate change, and the efficient use of resources (Qin et al. 2022). Green financing can take many forms, including green bonds, loans, mortgages, and other financial products designed to support sustainable projects. Green bonds, for example, are a type of fixed-income security that raises funds for projects with positive environmental benefits. On the other hand, green loans are loans explicitly provided for green projects or activities (Hadaś-Dyduch et al. 2022). Green financing aims to promote the growth of sustainable industries and stimulate the development of new technologies and practices that can help reduce carbon emissions and mitigate the impact of climate change (Park and Kim 2020). Besides offering financial benefits for investors, green financing can positively impact the environment and foster the creation of a more sustainable global economy (Sachs et al. 2019). These activities are closely related to the Paris Agreement goals, and countries worldwide are developing green finance to achieve them.

Therefore, green finance is essential in achieving the Paris Climate Agreement goals and is a meaningful study that has not been comprehensively explored in the existing literature. Central banks and other regulators are modifying their frameworks and procedures from a governance standpoint in response to the complex risks posed by climate change. This includes methods to enhance climate risk disclosure and classification standards, which will aid financial institutions, investors, and regulators in better assessing their exposures to climate risks, which include green financing (Demekas and Grippa 2021).

By supporting sustainable projects, green financing can create a more sustainable and resilient future for everyone. Both the private and public sectors need to implement strong policies to mitigate these risks while exploiting the economic opportunities that arise from solutions to these problems (Kaminker and Majowski 2018). Nevertheless, as with any financing, questions can arise with green financing (Chiu et al. 2022), which include a lack of clarity and consistency in the definitions of what constitutes a "green" project or investment, which leads to legal issues and enforcement compliance.

This paper examines the role of green finance in achieving Paris Agreement goals. It analyses the challenges of implementing green financing in Malaysia and the legal consequences of non-compliance. A comparative study with Indonesia is conducted to assess Malaysia's compliance with the Paris Agreement in the context of green financing.

To tackle the concerns raised and fulfill the requirements of the Paris Agreement, various mechanisms have been suggested to establish a stronger and more efficient regulatory framework for green financing and sustainability. This will aid the shift toward a more ecologically sustainable economy.

Literature review

Climate change poses a significant threat to our world, and it is crucial to take action now to prevent disastrous consequences. The Paris Agreement of 2015 has highlighted the urgency of addressing environmental damage and climate change, making green financing an increasingly popular solution. Green finance is a type of financial transaction that involves environmental activities aimed at protecting the environment from degradation (Wang and Zhi 2016). Green finance is a vital tool to counteract these threats and reduce the risks associated with climate change (Nawaz et al. 2021). In recent times, central banks have been considering the issue of climate change risks to financial system stability (Gagnon and Sack 2018).

Studies have shown that the global initiative has increased the risk of return for stocks in polluting industries while also providing a strong foundation for sustainable development and long-term growth (Pham et al. 2019). More than 200 countries have publicly committed to reducing their impact on climate change through Intended Nationally Determined Contributions (INDCs), demonstrating the widespread recognition of the need for action (Arezki 2021). Scientific publications have discussed the response of companies and markets worldwide to the Paris Agreement, with green investments gaining international attention as a solution for reducing CO_2 emissions (Birindelli and Chiappini 2020). Furthermore, a meta-analytic study has revealed that green financing positively correlates with an enterprise's green performance (Xu et al. 2020).

Green financing involves raising capital to invest in projects and activities that promote environmental sustainability, reduce carbon emissions, and mitigate the effects of climate change (Khan et al. 2021). It specifically aimed at supporting projects that positively impact the environment and contribute to the transition toward a low-carbon economy. Hence, green financing plays a critical role in the fight against climate change. It involves increasing financial resources from various sectors, such as banking, insurance,

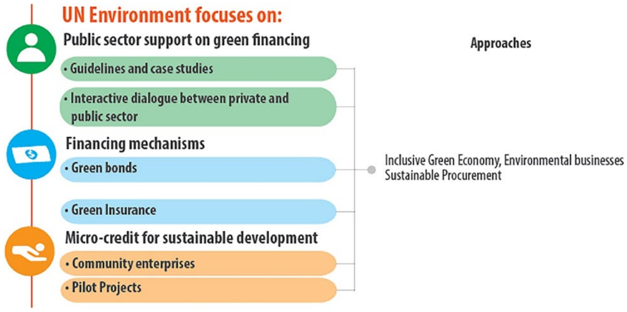

Fig. 1 Sustainable Development Goals (SDGs) and green financing (UNEP 2021)

and investment, toward sustainable development priorities (UN Environment Program 2021). This approach enables the funding of eco-friendly projects like energy-efficient buildings, renewable energy, and clean transportation, decreasing greenhouse gas emissions contributing to global warming (Sachs et al. 2019). With the evidence showing the benefits of green financing and the pressing need for action to counter environmental threats, it is clear that this approach is a key enabler for achieving a sustainable future.

Green financing and the SDGs are interconnected since both aim to foster sustainable development and tackle environmental challenges. Green financing plays a crucial role in achieving these objectives by financing projects that promote sustainable economic growth, social development, and environmental protection. The SDGs establish a structure for advancing sustainable finance and green investment. On the other hand, green financing provides a channel for funding and carrying out the initiatives and actions necessary to achieve these objectives. The combination of SDGs and green financing can be a powerful tool to promote sustainable development and tackle global environmental challenges, as shown in the figure below (Fonseca et al. 2020) (Fig. 1).

On top of that, green financing also offers significant economic benefits (Sachs et al. 2019). A green economy is a way of achieving sustainable development by linking economic activities to development levels. There is no single approach to restructuring economic activities toward a green model that suits every situation. The conventional economic growth model implies that income generation promotes the growth of industry, business, and trade. Furthermore, a market economy promotes competition and eliminates poor performance, while company profit is the primary incentive (Batrancea et al. 2021). A green economy is the way forward to promote innovative and efficient solutions in renewable energy. With advancements in science and technology, reducing the burden on conventional energy and natural resources is crucial. It is imperative to implement green economy initiatives across the globe to mitigate greenhouse gas emissions and global warming and to promote the judicious use of global resources. Developed, emerging, and developing economies in North and South America, Europe, Africa, and Asia must prioritize adopting these initiatives to ensure a sustainable future (Batrancea et al. 2021).

Investments in sustainable projects can create jobs, stimulate economic growth, and generate long-term cost savings. For instance, investing in renewable energy can reduce reliance on fossil fuels, which can help stabilize energy prices over time. Environmental, Social, and Governance (ESG) strategies are used to identify companies that prioritize sustainable practices, and green financing is often used to support these companies. ESG analysis can help investors evaluate a company's environmental, social, and governance practices, informing investment decisions and promoting sustainable economic growth (OECD 2022).

It is submitted that based on the factors discussed above, justifying why green financing is essential because it supports the transition to a sustainable economy, helps address climate change, and reduces environmental risks while providing economic benefits. Green financing is a powerful tool to mitigate the risks associated with environmental damage (Chin et al. 2022). This can be achieved by funding projects that promote environmental sustainability, such as preventing oil spills, pollution, and deforestation.

Malaysia has pledged to achieve the SDGs by 2030 and comply with the Paris Agreement commitments. It has set specific targets to promote environmental sustainability, social development, and economic growth. However, to fulfill this commitment, Malaysia needs to anticipate and minimize obstacles and challenges through effective mechanisms.

Research methodology

This research employed a doctrinal comparative analysis of the green financing laws and policies and their challenges in Malaysia and Indonesia. A comprehensive review of the existing literature on green financing laws, policies, and practices in Malaysia and Indonesia has been conducted to provide a foundation for understanding the legal and regulatory frameworks for green financing in both countries. Afterward, a comparative analysis focused on the similarities and differences in the legal and regulatory frameworks for green financing in both countries. The analysis examines the effectiveness of the laws and policies in promoting green financing. It includes identifying relevant legal sources, developing a framework for comparison, and gathering and analyzing data.

Results and discussion

Green financing policies

The main goal of green financing is to encourage investments in projects that promote climate mitigation, adaptation, and environmental sustainability. Accordingly, several international policies have been developed to guide and encourage green financing to support these goals. Through doctrinal study, some of these policies include

(a) Paris Agreement: The Paris Agreement, signed in 2015, is an international agreement that aims to combat climate change. One of its primary objectives is to mobilize financial resources to support the transition toward a low-carbon and climate-resilient economy. To achieve this, the agreement promotes using financial instruments that support sustainable development and the transition toward a low-carbon economy (United Nations Framework Convention on Climate Change 2015).

(b) United Nations Sustainable Development Goals (SDGs): The SDGs are 17 worldwide objectives that aim to promote sustainable development, eliminate poverty, and safeguard the planet. They offer a framework for creating policies and initiatives in green financing that promote sustainability in both development and the environment (United Nations 2015).

(c) European Union Sustainable Finance Action Plan: The EU Sustainable Finance Action Plan is a collection of policies and initiatives that aim to boost sustainable finance and investment within the EU. The plan encompasses various measures to stimulate green financing, including creating a sustainable activity classification system, implementing a green bond standard, and introducing a sustainable finance label.[1]

(d) G20 Green Finance Study Group: The G20 Green Finance Study Group is a forum consisting of G20 countries that focuses on promoting the development of green finance policies and initiatives. The group has developed voluntary guidelines for issuers and investors of green bonds, and it has also created a network of national green finance initiatives.[2]

(e) International Organization of Securities Commissions (IOSCO): IOSCO is a global association of securities regulators that creates standards and guidance for securities markets. One of the areas IOSCO focuses on is the development of recommendations for green bond issuers to promote the honesty and openness of green bond issuance and investment.[3]

These policies and initiatives provide a framework for developing green financing policies and initiatives that support sustainable development and environmental sustainability.

Green financing has been recognized as essential to supporting sustainable development in the ASEAN region, and several policies and initiatives have been implemented to promote it. In 2017, the ASEAN Capital Markets Forum (ACMF) introduced the ASEAN Green Bond Standards, a set of guidelines to encourage the issuance of green bonds in the region. The standards are intended to improve transparency, credibility, and consistency in the green bond market (ASEAN Capital Market Forum 2018). The ASEAN Infrastructure Fund (AIF) also launched the ASEAN Catalytic Green Finance Facility in 2018, providing loans and technical assistance to support green infrastructure projects in the region (Perdiguero and Roberts 2023).

In 2020, the ASEAN Capital Markets Forum (ACMF) released the ASEAN Sustainable Finance Roadmap, which outlines the region's strategy for promoting sustainable finance. The roadmap includes initiatives to develop sustainable finance policies, improve disclosure and reporting, and encourage the creation of green financial products (ASEAN Capital Market Forum 2018).

On top of that, some ASEAN countries have introduced tax incentives and other financial incentives to promote green investments. For example, in 2020, the Philippines submitted a green bond tax incentive program, which provides tax breaks for issuers and investors in green bonds. In addition, several ASEAN countries have issued green bonds to finance sustainable projects. In 2020, Indonesia issued its first sovereign green bond, while Singapore's first green bond was published in 2017. These policies and initiatives demonstrate ASEAN's commitment to promoting

[1] Valdis Dombrovskis (born August 5, 1971) is a Latvian politician serving as Executive Vice President of the European Commission for An Economy that Works for People since 2019 and European Commissioner for Trade since 2020.

[2] The Sustainable Finance Working Group (SFWG) aims to mobilize sustainable finance as a way of ensuring global growth and stability and promoting the transitions toward greener, more resilient, and inclusive societies and economies. The Group is tasked to identify institutional and market barriers to sustainable finance and to develop options to overcome such barriers and contribute to a better

Footnote 2 (continued)

alignment of the international financial system to the objectives of the 2030 Agenda and the Paris Agreement.

[3] The International Organization of Securities Commissions (IOSCO) is the international body that brings together the world's securities regulators and is recognized as the global standard setter for the securities sector. IOSCO develops, implements, and promotes adherence to internationally recognized standards for securities regulation. It works intensively with the G20 and the Financial Stability Board (FSB) on the global regulatory reform agenda.

sustainable finance and supporting the transition to a low-carbon, sustainable economy (Azhgaliyeva et al. 2020).

(a) Malaysia

Although it is a relatively recent concept, the Malaysian government has acknowledged the significance of promoting sustainable development and has taken measures to encourage green financing. One such initiative is the Green Technology Financing Scheme (GTFS) introduced in 2010. This scheme provides financing to firms interested in investing in green technology projects (Ibrahim 2012). The Malaysian Green Technology Corporation administers the GTFS and offers loans to qualified companies at a lower interest rate. Moreover, in 2014, the Securities Commission Malaysia presented the Sustainable and Responsible Investment (SRI) Sukuk framework, which enables the issuance of green bonds or sukuk. Malaysia became the first country to issue a green sukuk, an Islamic bond complying with Islamic finance principles, in 2018 to finance environmentally sustainable projects. In 2017, the Securities Commission Malaysia (SC) also introduced a green bond framework, which encourages companies to release green bonds to finance projects with environmental benefits, providing guidelines for green bond issuance in Malaysia (ZICO Law 2022).

Furthermore, Malaysia has additional green financing initiatives that support sustainable development. The Sustainable Energy Development Authority (SEDA) is a government agency that promotes renewable energy and energy efficiency projects by providing incentives and financial support. Meanwhile, the Green Investment Tax Allowance (GITA) is a tax incentive scheme that encourages companies to invest in green technology by offering tax deductions (Voon and Chong 2022).[4]

Moreover, Malaysia's Central Bank, Bank Negara Malaysia, has issued guidelines on environmental risk management for financial institutions (Bank Negara Malaysia 2023). These guidelines require financial institutions to assess the environmental risks associated with their lending activities and take steps to mitigate them. Additionally, the Malaysian government mandates companies listed on the stock exchange to disclose their ESG (Environmental, Social, and Governance) practices in their annual reports, fostering sustainable practices and improving reporting transparency.

The Malaysian government also offers tax incentives to companies that invest in green technology projects. These incentives include income tax exemptions and allowances for capital expenditure on green technology. Such initiatives provide opportunities for companies to invest in qualifying green projects such as renewable energy, energy efficiency, and waste management while contributing to the country's sustainable development goals (Securities Commission Malaysia 2019).

Overall, these mechanisms have helped to create a favorable environment for green financing in Malaysia. The government's efforts have encouraged companies to invest in sustainable projects and technologies, which is crucial for achieving Malaysia's sustainable development goals. However, one notable law related to green financing in Malaysia is the *Securities Commission Malaysia (SC) v. AmInvestment Bank Berhad* (AmBank) case in 2020. The case involved an alleged failure by AmBank to exercise due diligence and provide accurate information to investors concerning the issuance of RM 990 million (approximately USD 235 million) worth of green sukuk (Islamic bonds) (Securities Commission Malaysia 2021).

The SC claimed that AmBank had made false and misleading statements in the prospectus and bond documentation, which led to investors being misled about the environmental benefits of the green sukuk. In addition, the SC argued that AmBank had failed to disclose material information about the use of proceeds, the criteria for selecting the projects, and the green standards used to assess the environmental impact of the projects. As a result, the court found AmBank guilty of breaching several securities laws and regulations, including the Securities Commission Malaysia Act 1993 and the Guidelines on Sustainable and Responsible Investment (SRI) Funds issued by the SC. As a result, the court ordered AmBank to pay a penalty of RM 53.7 million (approximately USD 12.8 million) and to compensate the affected investors.

The case highlighted the importance of transparency, due diligence, and disclosure in green financing and the need for financial institutions to comply with the relevant laws and regulations. The case also underscored the increasing importance of green financing in Malaysia and the need for more rigorous standards and regulations to ensure the integrity of the market and the protection of investors.

Nonetheless, while Malaysia's green financing regulatory mechanisms have been lauded as one of the most progressive in the region, some potential loopholes in the mechanism could be exploited. For example, while the regulatory mechanism provides a broad definition of "green projects," it does not provide specific definitions for key terms such as "environmentally sustainable" or "low-carbon." This lack of clarity can make it difficult for financial institutions and

[4] The Sustainable Energy Development Authority (SEDA) Malaysia is a statutory body formed under the Sustainable Energy Development Authority Act 2011 [Act 726]. The key role of SEDA is to administer and manage the implementation of the feed-in tariff mechanism which is mandated under the Renewable Energy Act 2011 [Act 725].

project developers to determine what qualifies as a green project and may lead to greenwashing.

Apart from that, the green financing mechanism only applies to certain types of financial institutions and does not cover all actors involved in the financial market. This could lead to regulatory arbitrage, where some institutions may choose to avoid the regulatory requirements by engaging in transactions outside the scope of the law.

In addition, the regulatory authorities responsible for enforcing the green financing law may be unable to monitor and enforce compliance effectively, which could result in some financial institutions and project developers not complying with the regulations.

Regarding the penalty, the regulatory mechanism does not provide specific penalties for non-compliance, leaving the regulatory authorities with limited enforcement powers. On the other hand, the green financing mechanism may not be fully harmonized with other relevant environmental regulations, such as those related to pollution control and waste management. This could lead to potential conflicts and gaps in the regulatory framework. Therefore, addressing these loopholes would require the Malaysian government and regulatory authorities to continue refining and improving the green financing regulatory mechanism and associated regulations to ensure that they effectively promote sustainable finance and mitigate environmental risks.

(b) Indonesia

On the other hand, green financing in Indonesia is more established, and the country has a well-developed green financing ecosystem. Moreover, the government has implemented several initiatives to promote green projects, including issuing government and private sector bonds and introducing tax incentives for green investments. In addition, in 2018, Indonesia's Financial Services Authority (OJK) introduced green financing regulations, requiring financial institutions to integrate Environmental, Social, and Governance (ESG) factors into their lending decisions.

The promotion of green financing in Indonesia is closely linked to its commitment to comply with the provisions of the Paris Agreement, which was made into law as Law No. 16 of 2016. Since then, green financing has been increasingly promoted as an option to support sustainable development and "green" infrastructures, projects, sectors, and institutions. The recent enactment of Act No. 4 of 2023 concerning the Development and Strengthening of the Financial Sector has further facilitated the development of sustainable finance. This law requires the Indonesian Central Bank and the Financial Services Authority to establish a committee on sustainable finance, which the Ministry of Finance will coordinate (Indonesia 2003). The committee will support the preparation of strategies, policies, and programs for sustainable finance (Indonesia 2003). In addition, financial sector businesses, issuers, and public companies are mandated to incorporate sustainable finance into their business activities by adopting investment strategies and business practices that take into account environmental, social, and governance aspects (Indonesia 2003).

The Indonesian Central Bank has actively promoted green financing and, in 2021, announced the development of green and sustainable money market instruments due to the recognition of climate change's impact on economic growth and the financial system (Haryono 2021). These instruments were developed in accordance with Indonesia's commitment to the Paris Agreement, which requires efforts to limit global warming to below 2 °C and preferably below 1.5 °C compared to pre-industrial levels (Haryono 2021). Despite various measures to promote green financing, there is still a lack of regulations to accommodate and provide certainty for investors.

Green financing was first implicitly addressed in Bank Indonesia Regulation No. 14/15/PBI 2012 concerning Commercial Bank Asset Quality Assessment. Therein, banks were mandated to consider environmental aspects when assessing the feasibility and prospects of businesses (Dewi 2021). Recently, green financing has also been further encouraged by the Indonesian Central Bank through the development of policies such as Bank Indonesia Regulation No. 21/13/PBI/2019 concerning Green Loan-to-Value (LTV)/Financing-to-Value Ratio concerning activities, namely credit property or property financing and advancement for motor vehicle loans or motor vehicle financing that are deemed eco-friendly (Haryono 2022).

The development of green financing in Indonesia also heavily involves the Financial Services Authority (hereinafter, "FSA"), which operates as a regulatory system and supervises the activities in the financial system (Indonesia 2011). Considering its function, most regulations concerning green financing are thus in the form of FSA Regulations and regulated by such an Authority. To date, the FSA has issued two (2) Regulations addressing green financing. First, as part of its Sustainable Finance Roadmap Phase I (2015–2019), the FSA in 2017 enforced the "FSA Regulation No. 51/POJK.03/2017 on the Implementation of Sustainable Finance for Financial Institutions, Issuers, and Public Companies." Although green financing was not explicitly discussed, the Regulation constitutes a starting point for green financing as the Financial Services Sector was tasked to apply sustainable financial principles (such as social and environmental risk management and governance), submit the Sustainable Finance Action Plan (RAKB) to the FSA, and publish its Sustainability Report to the public (Otoritas Jasa Keuangan 2022). The Regulation intended to enhance awareness of sustainable finance principles and further commenced market exploration for sustainable project financing (Otoritas Jasa Keuangan 2022). With the Sustainable Finance Action Plan, the Financial Services Sector was expected to convey its plan for developing sustainable financial products and/or services that integrate economic, social, environmental, and governance aspects in their features (Otoritas Jasa Keuangan 2017).

Subsequently, in December 2017, in response to the prospects of the green bond market in Indonesia, the FSA developed and issued "FSA Regulation No. 60/POJK.04.2017 on The Issuance and the Term of Green Bond." This Regulation was formulated by considering inputs and comments from the World Bank (The World Bank 2019) and pertains to the standards published by The International Capital Market Association. It regulates disclosure requirements and green bond issuance included in the Category of Environmental-Based Business Activity (KUBL) (Otoritas Jasa Keuangan 2022). The Regulation further aims to provide and guarantee legal certainty for issuers of green bonds. According to Article 4 of such a Regulation, related business activities (KUBL) that can be funded through the issuance of green bonds include, *among other things,* renewable energy, energy efficiency, prevention and management of pollution, and environmentally friendly transportation.

Moreover, concerning the issuance fee incentive, a reduction of 25% of standard fees was determined through the FSA Board of Commissioner Decision No. 24/KDK.01/2018, reflecting its efforts to support the development of green bonds (Prisandy and Widyaningrum 2022). Along with regulatory instruments, the Financial Services Authority has published the Indonesia Green Taxonomy to provide further guidance for investors and other relevant stakeholders. Despite not being a regulation, it constitutes a significant document as it can be used as a basis when formulating incentive and disincentive policies by ministries and institutions and a reference for risk management and development of sustainable finance products and/or services (Otoritas Jasa Keuangan 2022).

Discussion

Challenges to implementing green financing

Green financing policies are initiatives designed to encourage and support environmentally sustainable projects and businesses. While these policies are becoming increasingly popular, there are still several challenges that can make it difficult to implement them effectively. Here are some of the significant challenges to implementing green financing policies:

There is a lack of clear and standardized guidelines for "green" projects, making it difficult for financial institutions to determine which projects should receive financing. This lack of clarity can also create confusion among businesses and consumers, who may not know which projects qualify for green financing (Nicholls 2021).

On top of that, although more and more financial institutions are beginning to offer green financing products, they are still not as widely available as traditional financial products. This can make it difficult for businesses and individuals to access the financing they need to fund sustainable projects. Additionally, many environmentally sustainable projects require high upfront costs, making it difficult for companies to secure the financing they need. Additionally, these projects may have a more extended payback period, which can be a disincentive for some investors. Furthermore, despite growing interest in sustainable finance, there is still a lack of public awareness around the benefits of green financing. This can make it difficult for businesses and individuals to understand the importance of investing in environmentally sustainable projects and make it harder for financial institutions to market their green financing products. Also, green financing policies may require establishing new regulatory frameworks, which can be challenging and time-consuming to develop. This can create uncertainty for financial institutions, making developing and implementing green financing products harder. While there are many benefits to implementing green financing policies, several challenges must be addressed to ensure their effective implementation (Park and Kim 2020).

a. Challenges to Implement Green Financing in Malaysia.

Malaysia has made progress in promoting green financing policies, but several implementation challenges remain. One of the key challenges facing the implementation of green financing in Malaysia is the lack of clarity and consistency in the definitions of what constitutes a "green" project or investment. While there are guidelines and principles for sustainable financing, there is no clear definition of a "green" project or investment, leading to potential confusion and uncertainty among investors and financial institutions (Martin et al. 2021).

Another challenge is the lack of standardization and certification of green financing products. There are currently no widely recognized or accepted certification schemes for green financing products in Malaysia, which makes it difficult for investors to compare and evaluate different products. Additionally, there is a need for greater transparency and reporting requirements for green financing in Malaysia. Although some financial institutions have voluntarily started reporting on their green financing activities, there is no legal requirement for them, making it difficult to track progress and evaluate the impact of green financing initiatives (Susskind et al. 2020).

Despite the growing interest in green financing, there is still a lack of awareness and understanding among the public and businesses in Malaysia. This limits the demand for green financing products and services, which hinders the development of a sustainable finance market (Khanna 2020).

Apart from that, there is a need for more comprehensive and consistent regulatory and policy frameworks to support the development of green financing. Malaysia has made efforts to introduce policies and regulations that promote sustainable finance, but more needs to be done to create a conducive environment for green financing. Currently, consistent and reliable data and metrics are lacking to measure the environmental impact of projects and investments. This makes it difficult for financial institutions and investors to assess the risks and opportunities of green financing (Goel et al. 2022).

There is also a shortage of qualified professionals with expertise in green financing and sustainable finance. This limits the capacity of financial institutions and other stakeholders to develop and implement green financing policies and products. Furthermore, some investors and businesses may be reluctant to invest in green projects due to higher costs and lower profitability concerns. This highlights the need for innovative financial mechanisms to provide incentives and reduce the risks of green investments (Volz 2018).

Addressing these challenges requires a multi-stakeholder approach involving government, financial institutions, businesses, and civil society. It is crucial to raise awareness and promote education on green financing, develop comprehensive policies and regulations, improve data and metrics, build capacity and expertise, and create innovative financial mechanisms to incentivize green investments.

b. Challenges to Implement Green Financing in Indonesia.

Policies and regulations concerning green financing remain a developing and ongoing process for financial sectors in Indonesia. Since green financing is still relatively new in Indonesia, a comprehensive regulatory framework has yet to be made. As there is a lack of Regulation concerning green financing, an established, cohesive definition and standards illustrate the extent of green financing in Indonesia. As a result, financial institutions use the term green financing without providing a regulatory basis that can be used by relevant stakeholders, particularly investors and issuers, to interpret what the term means. This lack of definition may lead to "greenwashing," allowing issuers of "green assets" to provide misleading descriptions, elucidating that their assets are environmentally friendly (Prasidya 2020).

Furthermore, a lack of benchmark that Indonesia can refer to challenges developing sufficient Regulations on green financing (Gunawan et al. 2022). For instance, in 2018, a report by the World Bank indicated that when the Indonesian FSA was developing its Regulation on green bonds, there was a lack of knowledge and information concerning the procedure and requirements behind its issuance. Moreover, at that time, the FSA regulations on green bonds had not been tried out, while the ASEAN Green Bond Standards were never tested outside Malaysia. Insufficient benchmarks to look upon can impede the development of regulations supporting the transition to green financing (Yakovlev and Nikulina 2019).

Considering the continuous growth of green financing, regulations concerning such a matter shall be formulated in a much more rigid form to enhance further and provide legal certainty. Although the FSA has issued a Green Taxonomy guidance to classify green activities, a regulation providing a common language on what falls under green financing and regulating its concepts to prevent greenwashing is still immensely needed. Currently, the general concept of green financing is not regulated in a unified regulation. Still, its subsystems, such as green bonds, are prescribed alone in their Regulation issued by the FSA. However, especially with regards to green bonds, it has been suggested that due to its growing market, it is preferred that it is governed in Regulation at a much higher hierarchy than the FSA Regulation to provide legal certainty for investors (Park and Kim 2020).

One court case related to green financing in the ASEAN region is the dispute between PT Borneo Lumbung Energi & Metal Tbk and PT Bank Mandiri (Persero) Tbk in Indonesia. The case involved a dispute over a green loan of IDR 4.5 trillion (approximately USD 317 million) provided by Bank Mandiri to Borneo Lumbung, a coal mining company, to finance its renewable energy projects. In 2020, Borneo Lumbung filed a lawsuit against Bank Mandiri, claiming that the bank had breached the terms of the green loan agreement by not disbursing the funds promptly. Borneo Lumbung argued that the delay in the disbursement of the funds had caused the company to miss its target for the development of renewable energy projects and had resulted in financial losses. On the other hand, Bank Mandiri argued that it had acted following the terms of the green loan agreement and that the delay in the disbursement of the funds was due to Borneo Lumbung's failure to meet the necessary conditions for the disbursement. The case highlights the importance of clear and transparent terms and conditions in green loan agreements and the need for effective monitoring and enforcement mechanisms to ensure compliance. It also underscores the challenges and complexities of green financing, particularly in the context of financing for companies in extractive industries, and the importance of balancing environmental concerns with economic development goals. The case is ongoing, and the outcome is yet to be determined.

While both countries have implemented green financing initiatives, Indonesia's green financing ecosystem is more

Table 1 Potential legal issues with green financing

Misrepresentation	Greenwashing is a common problem in the green finance industry. This occurs when companies make false or misleading claims about their environmental credentials or the impact of their projects. Misrepresentation can result in legal action from investors or regulatory authorities (Armour 2021)
Disclosure	Investors who invest in green projects may require additional information about the project's environmental impact and its financial risks. Failure to disclose this information can result in legal action (Eccles and Klimenko 2019)
Certification	There is no universally accepted definition of what constitutes a "green" project, and numerous certification schemes exist. Investors may use these certifications to evaluate a project's environmental impact. Nonetheless, if the certification is incorrect or deceptive, it may lead to legal action (Nicholls 2021)
Regulatory compliance	Green financing is subject to various regulations, including environmental, securities, and tax laws. Failure to comply with these regulations can result in legal action and fines (Falcone 2020)
Contractual issues	Green financing agreements can be complex, with multiple parties involved. Disputes over the terms of the agreement or breaches of the agreement can result in legal action (Atienza and González-Gallarza 2018)

established and prominent than Malaysia's. However, Malaysia has been making progress in recent years and is expected to continue to develop its green financing market.

Based on the above discussion, there are potential legal issues associated with green financing. Some of these issues include (Table 1)

Therefore, while green financing can provide opportunities for sustainable investment, it also requires careful consideration of the legal issues involved. Therefore, seeking legal advice and conducting due diligence is essential before entering green financing arrangements.

Conclusion and policy implications

Green financing is a relatively new concept in Malaysia; as such, regulatory mechanisms for its enforcement are still in development. Although the government has shown support for sustainable financing, the lack of robust regulatory frameworks and enforcement mechanisms presents a challenge for implementing and developing green financing in the country.

The Malaysian government and regulatory bodies are tackling these difficulties by creating and implementing regulatory frameworks to enforce green financing. One way they do this is by introducing sustainable and responsible investment guidelines through the Securities Commission Malaysia (SC). Additionally, Bank Negara Malaysia has issued guidelines on environmental risk management for financial institutions.

Enforcing green financing laws in Malaysia can be challenging, but several ways exist to improve effectiveness. Firstly, the Malaysian government should continue to enhance its regulatory frameworks for green financing and sustainability by updating regulations and guidelines and providing clear guidance and standards for market participants. On top of that, the government, financial institutions, and other stakeholders should increase public awareness and education on green financing and sustainability, including the benefits, risks, and best practices for green funding.

The government should encourage greater transparency and reporting by financial institutions and companies on their green financing activities and environmental impact through standard metrics and reporting requirements. Additionally, the government should strengthen its monitoring and enforcement mechanisms through increased inspections, audits, and penalties for non-compliance. It should also consider creating a dedicated regulatory body for green financing and sustainability.

Additionally, the government should foster collaboration and partnerships between financial institutions, companies, civil society organizations, and other stakeholders to promote the growth of the green financing market, share best practices, and address common challenges.

By implementing these measures, Malaysia can create a more effective and robust regulatory environment for green financing and sustainability, which will help to support the transition to a more environmentally sustainable economy. Therefore, it is submitted that while challenges remain to be addressed, Malaysia has positive developments regarding implementing green financing and developing regulatory mechanisms to ensure its enforcement.

As compared to Indonesia, green financing has made commendable progress in Malaysia, due to the collaborative efforts of private sector players and the government's initiatives. The growth of green financing has contributed significantly to reducing carbon emissions, developing green technology industries, and creating new jobs and economic opportunities. Malaysia can be proud of the significant progress it has made in promoting green financing and sustainable development. The government's initiatives have helped raise awareness of the importance of environmental sustainability and encouraged companies to invest in green technology.

However, there are still some challenges to be addressed, including a lack of awareness and understanding of green financing and the limited availability of green projects.

Addressing these challenges will ensure the continued growth and success of green financing in Malaysia, while complying their commitment to the Paris Agreement. In order to achieve a more sustainable and environmentally friendly future, it is important to work collaboratively and diligently toward these goals. There is still room for further development and improvement, particularly in areas such as transparency and disclosure of environmental risks.

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