

Research Article

Green financing for Environmental sustainability: Analysing the trends with Barriers and Challenges in the context Malaysia

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- Green Income Tax Exemption (GITE) Services

Abstract

Alternative funding sources such as green financing other than government and financial institutions are becoming increasingly relevant in promoting green development. Green private equity, for example, has emerged as a funding vehicle that assists green entrepreneurs in obtaining funding in developed economies. Renewable energy projects face two financial obstacles: a lower rate of return than fossil fuel projects and a higher chance of default. Despite the government's efforts to fund renewable energy, initial costs and a lack of support structures stymie the industry's development. In general, there is a lack of funding and confidence from local investors, as well as financial institutions' knowledge and perception of renewable energy. Government green procurement may also help to create financial instruments like credit lines and revolving funds that are explicitly designed for investments in cleaner production. In conclusion, to ensure the effective implementation of green growth in Malaysia, the formulation of sustainable development policies and regulatory initiatives must take into account a comprehensive finance, technology, and capacity-building support.

INTRODUCTION

Green finance refers to the funding of investments that have environmental benefits, such as lowering pollution and greenhouse gas (GHG) emissions, increasing energy efficiency, such as wind energy, and taking climate change mitigation steps. Green finance is a modern form of financial instrument designed to address environmental issues, and it represents the pinnacle of financial innovation in environmental security (Wang et al. 2019b). In order to meet the need for green finance, a wide selection of investment instruments has been launched in recent years. Green finance items can include green bonds and sukuk, green lending guidelines, green banks, carbon finance, green insurance, green IPOs, green stock indices, green credit, and green asset securitization, according to the ADB report [1]. These instruments present huge opportunities for the Islamic finance industry.

How does green finance works?

Green industries and innovations are at various stages of development, necessitating varying levels of funding from various sources of capital [2]. There are three main sources:

- a) Domestic public finance
- b) International public finance
- c) Private sector finance

Domestic public finance refers to government funding; international public finance refers to funding from international organisations and multilateral development banks; private sector finance refers to funding from both domestic and international sources. Green finance can be packaged in a variety of ways using a variety of investment structures (Table 1).

Green finance products

The four main categories of green financial products that need to be researched and developed are as follows: (Table 2).

- a) Retail Finance
- b) Asset Management
- c) Corporate Finance
- d) Insurance

Table 1: Benefits of Green Finance.

Financial Industry	Economic Growth	Environmental improvement
Development of new financial Project	Development of technologies	Better environment through green industries and technology
Financing more industries and technologies	Promotion of eco-friendly industries	Active trading carbon market
Advancement of risk management techniques	Design of efficient trading schemes	Legislation of better environment
Efficient operation of Emission trading market		

Source: [3].

Table 2: Green products.

Retail Finance	Corporate Finance
Green mortgage	Green project finance
Green home loan	Green securitization
Green Commercial building loan	Green technology leasing
Green car loan	Carbon finance
Green credit card	
Asset Management	Insurance
Eco fund	Auto insurance
Carbon fund	Carbon insurance
Eco RTF	Green insurance

Source: [4].

Generally, governments pursue the following objectives through green financing measures:

- Develop and protect renewable industry and green growth financing.
- Create new financial products to support low-carbon green growth.
- Attract private capital for the construction and maintenance of green infrastructure.
- Increase financial support for companies that use green management practises by improving corporate transparency.
- Create markets for environmentally friendly products and services.

GREEN FINANCE IN ASIAN COUNTRIES

In order to encourage green growth, the ASEAN Capital Market Forum has started working on implementing the ASEAN Green Bond Standard [5]. Malaysia, as the only ASEAN country to be a member of the Green Bank Network, can be considered a leader in promoting green finance and investment in East Asia (GBN). The leading objective of the GBN is sharing involvements and information among banks and financial institutions, counting the Green Fund of Japan, the Australian Clean Energy Finance Corporation, the New York Green Bank, the Connecticut Green Bank, and the UK Green Investment Bank, to promote green industry through financing and investment [6]. Green bonds are becoming more common as a source of financing for both private and public organizations. Green bond demand and supply have increased globally as a result of the Paris (Climate) Agreement in 2016. In this phase, the importance of environmental awareness among socially responsible investors should not be overlooked. Green bonds make it easier to allocate

resources to solving environmental issues while still allowing for green and sustainable development [7]. The governments of Indonesia, Singapore, and Malaysia, on the other hand, have clear institutional support for green bonds as a source of funding. Green bonds are issued by the government in Indonesia, while green bond issuance is subsidized by green bond grants in Singapore and Malaysia, which cover the expense of marking bonds as “green”[8,9]. Indonesia was the largest issuer of green bonds in ASEAN (Figure 1), accounting for nearly half (49%) of all green bonds issued (Figure 1), led by Singapore (19%) and Malaysia (12%). (15 percent). Green bond issuance in ASEAN is rapidly increasing. As compared to 2017, it increased by half in 2018 and nearly doubled in 2019. (Figure2). Despite this, ASEAN only accounts for around 2% of global green bond issuance per year (Figure 1).

Given that a large proportion of green bonds are currently being issued to finance green building projects in ASEAN, green bonds tend to be a promising funding vehicle for such projects.

Green Financial Incentives in Malaysia

Many attempts have been made to lower interest rates for



Figure 1 Amount of Green Bond Issuance in ASEAN Relative to Rest of World..

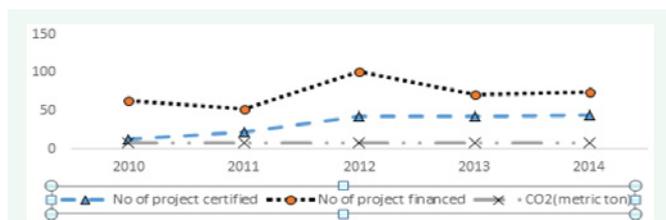


Figure 2 Issuance of Green Bonds in ASEAN by Country (2017–2019).

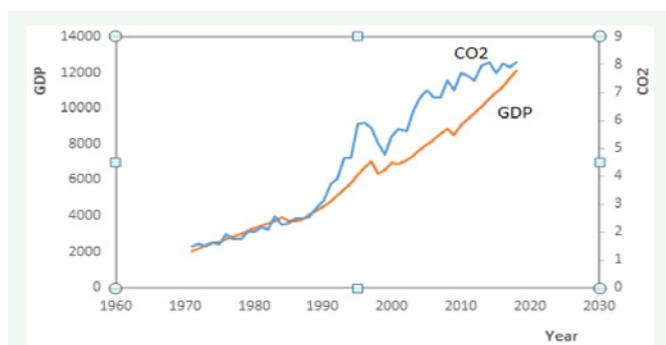


Figure 3 GDP and CO2 trend from 1971-2018.

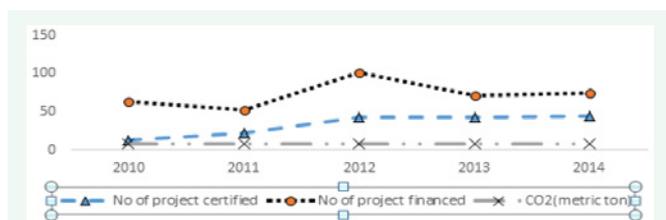


Figure 4 Annual loans Approved from Participating Financial Institutions for Green Technology Project and CO2 emission from 2010 to 2014.

renewable energy technologies in order to speed up the market's growth. Top solar panel-producing countries like Malaysia and the Republic of Korea, for example, have launched a programme known as "green technology financing," which allows renewable energy companies to borrow money at a low interest rate.

The Malaysian government implemented financial incentives to enable investors to invest in green technology industries in its 2014 budget, as shown by the Malaysian Green Technology Corporation's MyHIJAU green goods and services procurement and purchasing initiative. They also hope to promote private sector adoption of green technology, as well as businesses to purchase assets that have been verified as green technology assets, and to make the expiration of current tax incentives for renewable energy, energy efficiency, and green building projects easier [10]. In this section, we shed light on major available incentive schemes for green finance in Malaysia.

The Malaysian government will provide tax breaks for the procurement of green technology equipment as well as tax exemptions for the use of green technology facilities. Small and medium-sized businesses will be able to expand their Renewable Energy market as a result of these tax incentives. The Malaysian

government's key goal is to entice potential investors and industry participants to invest in renewable energy. Furthermore, the Malaysian government wishes to enable businesses to invest in green technology assets and, of course, to increase the number of green technology service providers. The following are the three classes eligible for the Green Technology Tax Credit: Green Investment Tax Allowance (GITA) Assets

- Green Investment Tax Allowance (GITA) Project
- Green Income Tax Exemption (GITE) Services

Green Investment Tax Allowance (GITA) Assets:

GITA Assets are classified in the MyHIJAU Directory for companies that acquire eligible green technology assets. ALL of the following conditions should be met by businesses:

- The companies should minimise the degradation of the environment or reduce greenhouse emissions.
- They should promote health and the improvement of the environment.
- They need to conserve the use of energy, water and other forms of natural resources, or promote the use of renewable energy, or are able to recycle waste material resources.

The Rate of Incentive:

From the date of purchase until December 31, 2020, a Green Investment Tax Allowance (GITA) of 100 percent of eligible capital expenditure incurred on approved green technology assets is available. • Unused allowances can be carried forward until they are completely absorbed, and they can be offset against 70% of statutory wages in the year of assessment.

Green Investment Tax Allowance (GITA) Project:GITA Projects are for companies that undertake a qualifying green technology. Companies should comply with ALL of the following criteria:

- minimise the degradation of the environment or reduce greenhouse emission
- promote health and improvement of the environment
- conserve the use of energy, water and/or other forms of natural resources, or promote the use of renewable energy, or are able to recycle waste material resources

Rate of Incentive:

- Green Investment Tax Allowance (GITA) of 100% of qualifying capital expenditure incurred on green technology project from the date of application received by MIDA until the year of assessment 2020.
- The allowance can be offset against 70% of statutory income in the year of assessment.
- Unutilised allowances can be carried forward until they are fully absorbed.

Green Income Tax Exemption (GITE) Services: GITE Services are companies that provide green technology services and are classified in the MyHIJAU Directory after being checked by GreenTech Malaysia. Companies must meet the following

requirements to qualify as green technology service providers:

- At least one competent/qualified personnel in the respective green technology;
- Must have a green policy related to the environmental or sustainability; and
- 100% income must be derived from the respective green technology services.

Rate of Incentive: 100% of statutory income from the date of application received by MIDA until the year of assessment 2020 (the maximum period is 5 years from the date of commencement).

QUALIFYING ACTIVITIES

For SEDA, there are two main qualifying activities to be approved for the tax incentives:

a) **Renewable Energy:** Commercial and industrial business entities which undertake generation of energy in the form of electricity, steam, heat and chilled water using renewable energy resources such as:

Solar Power (including NEM)

- Biomass
- Biogas
- Mini hydro
- Geothermal

b) **Energy Efficiency:** Companies invest in energy efficient equipment or technologies and invest in energy saving equipment.

Currently, Malaysia's solar power industry generates 67 percent of the country's total renewable energy capacity of 270MW. Solar farms sell electricity to the grid in Malaysia. Solar farms are designed to generate enough energy to power thousands of homes and businesses. If you've never seen one before, they're similar to the solar panels you put on your roof to produce electricity. It's critical to begin using renewable energy sources now because they provide clean energy for our lives and minimise global change and pollution; we can also reduce the risk of cancer and heart attacks by reducing our reliance on oil and gas.

Malaysia has participated in clean development mechanism (CDM) projects and raised funds from public and private sector sources through various concessional and nonconcessional loans, grants, and carbon finance in order to support green growth efforts. The Renewable Energy Act of 2011, the feed-in-tariff system, and the Green Technology Financing Scheme (GTFS) have all aided the growth of the renewable energy industry in the region. All green goods, facilities, and systems that meet certain requirements, such as minimising environmental pollution, promoting the use of renewable energy sources, and emitting zero or low greenhouse gases (GHGs), are eligible to apply for the GTF [6].

Producers of green technology may be eligible for up to RM 100 million in funding, while consumers of green technology may be eligible for up to RM 10 million. The scheme began in

2010 with a fund of RM 1,5 109 and was later extended until December 2017 with a fund of RM 1,2 109. The eligibility criteria for producers and customers are detailed in Table 2. In addition to the GTFS, the government provides a number of tax breaks. Renewable energy generators, for example, are eligible for a 100 percent statutory income tax exemption with pioneer status for ten years, as well as a 100 percent investment tax credit for the first five years of capital expenditure (MIDA, 2015). Other fiscal means of promoting green growth include import duty and sales tax exemptions for all imported and locally procured green technologies (Table 3).

Following the Renewable Energy Act of 2011, Malaysia has mandated the introduction of feed-in-tariffs (FiTs), which enable power producers (both individuals and non-individuals) to sell renewable energy electricity to power utility companies at a pre-determined tariff for a set period of time. For different renewable resources and installed space, the FiT rate varies. Solar photovoltaic, biogas, biomass, small hydropower plants, and geothermal power are currently eligible for the FiT incentive mechanism (SEDA, 2017). In December 2014, a total of 2,371 renewable projects had successfully connected to the power grid, totaling 249 MW of renewable energy. Solar resources contributed about 160 MW of capacity, followed by biomass 65 MW, biogas 12 MW, and mini hydro-plants 12 MW

Southeast Asia has experienced rapid economic growth in recent decades. However, the region's economic development paradigm is based on unsustainable natural resource extraction, which has resulted in a number of environmental disasters. Many of these countries have begun to mainstream various climate change and green growth priorities into their economic development strategies, recognising the inevitable environmental deterioration and its impact on their long-term economic growth sustainability.

The ASEAN Capital Market Forum, in cooperation with the International Capital Market Association, has also made a concerted effort to implement ASEAN Green Bond Standards (Securities Commission Malaysia, 2017). Malaysia, as the only ASEAN member of the Green Bank Network (GBN), is a key player in promoting and supporting green growth in the ASEAN region through green financing and investment. Green Technology Malaysia, tasked with accelerating green technology deployment in Malaysia, is a founding member of the world's first GBN, alongside other well-known green funds such as the Green Fund of Japan, Australian Clean Energy Finance Corporation, New York Green Bank, Connecticut Green Bank, and UK Green Investment Bank (GreenTech Malaysia, 2016). Green Banking Network (GBN) is a collaborative forum for green banks and institutions to exchange expertise, information, and experiences in order to encourage green financing and investment. Table 4 shows the distribution of the financing sum approved by the participating financial institutions in 2015. The energy sector accounts for 84.12 percent of total finance, with the waste and water treatment, construction, and transportation sectors accounting for 14.36 percent, 0.84 percent, and 0.67 percent of total financing accepted, respectively. By the end of 2016, green technology ventures had received approval for 84.7 percent (RM 2.962 109) of the total amount allocated for the GTFS (RM 3.5

Table 3: Eligibility Criteria for GTFS Producers and Users.

	Green technology users	Green technology producers
Eligibility Criteria	Legally registered Malaysian-owned companies ($\geq 70\%$) in all economic sectors	Legally registered Malaysian-owned companies ($\geq 51\%$) in all economic sectors
Financing size	\leq RM10 million/company	\leq RM100 million/company
Financing tenure	≤ 10 year	≤ 15 year
Participating Financial Institutions	All commercial and Islamic banks and GFIs (Bank Pembangunan, SME Bank, Agrobank Bank Rakyat, EXIM Bank, and Bank Simpanan Nasional)	

GFI green financial institution, *GTFS* Green technology financing scheme.

Source: GreenTech Malaysia 2017.

Source: [6].

Table 4: Distribution of Total Green Financing Approved by PFIs.

Sectors	Total Green financing (RM)	Percentage
Energy	2,15,00,81,672	84.12
Waste and Water Management	36,71,28,223	14.36
Building	2,14,00,052	0.84
Transportation	1,72,50,000	0.67

109), with the remaining 15.3 percent (RM 536.6 109) still open for applications.

GREEN BONDS

The Securities Commission of Malaysia has issued the first green sukuk. Green sukuk can be a complementary concept of Islamic finance for Malaysia, which has the world's largest Islamic bond market, selling around 75% of all sukuk. Green bond issuance may also support other Malaysian businesses. Cenergi Sea Sdn Bhd, a Khazanah Nasional Bhd subsidiary established in 2013, is involved in carbon-reduction biofuel ventures. It could use green bonds to raise the huge sums of money needed to expand its energy efficiency programmes or invest in other clean energy projects. Tenaga Nasional Bhd, a Malaysian power utility, is another company that can benefit from the use of green bonds to increase the quality and sustainability of its electricity supply. It could use green bonds to raise the huge sums of money needed to expand its energy efficiency programmes or invest in other clean energy projects. Tenaga Nasional Bhd, a Malaysian power utility, is another company that can benefit from the use of green bonds to increase the quality and sustainability of its electricity supply.

Malaysia has implemented a range of energy policies and strategies since 1979, including the National Energy Policy of 1979, the National Depletion Policy of 1980, the Four-Fuel Diversification Policy of 1981, the Fifth Fuel Policy of 2000, and the National Renewable Energy Policy of 2011. To assist energy suppliers in enforcing the policies, the government has provided fiscal incentives such as investment tax credits. On July 28, 2017, Rating Agencies Malaysia (RAM) rated this sukuk provided by Tadau Energy Sdn Bhd. RAM sees Malaysia as a leading and sustainable green finance hub, based on the country's strong foundation of well-coordinated government and regulatory initiatives spanning more than three decades. RAM Sustainability

Sdn Bhd (RAM Sustainability), a wholly owned subsidiary of RAM Holdings Berhad (RAM or RAM Group), is now an Approved Verifier for the certification of Climate Bonds under the *Climate Bonds Standard & Certification Scheme* (the Scheme) after having been awarded the status by the Climate Bonds Standards Board on 12 August 2020. This certification process under the Scheme will allow issuers to demonstrate to the market that their green bonds, sukuk or loans meet global best practice standards for climate integrity, management of proceeds and transparency.

In 2019, issuances of green bonds and green loans in ASEAN doubled to USD8.1 billion, up from USD4.1 billion in the preceding year, indicating strong interest from issuers, bankers and investors, backed by a conducive regulatory environment for a more sustainable financial market. The Scheme acts as a universal adapter across jurisdictions as it incorporates the Green Bond Principles (GBP) and Green Loan Principles and is aligned with the European Union Green Bond Standard and guidelines and regulatory requirements in China, ASEAN, Japan, India and other countries.

The Malaysian government has launched the world's first green sukuk to fund renewable energy projects, demonstrating its dedication to green finance. Sukuk is an interest-free bond that produces returns for investors while adhering to shari'ah (Islamic law) principles that forbid the payment of interest. It's a shari'ah-compliant defence that's backed by a specific pool of money. Investors see cash flows that are very close to those seen when investing in bonds in most shari'ah-compliant sukuk applications, making sukuk a viable alternative to bonds when funding shari'ah-compliant ventures. Global sukuk gross issuance increased by 41.6 percent to USD130.2 billion in 2019, compared to USD91.9 billion the previous year. Turkey (+320.4 percent), Qatar (+62.2 percent), Malaysia (+57.7 percent), Bahrain (+45.1 percent), and Indonesia (+26.2 percent) were the top five countries by incremental value.

GREEN FINANCE AND ENVIRONMENTAL SUSTAINABILITY

Green finance encourages the spread of new technologies and the construction of environmentally friendly infrastructure. Investment in environmentally friendly technologies, such as renewable energy, could lower their costs and speed up their adoption. Governments are then responsible for developing infrastructure that will result in stronger long-term resource management, increasing the country's productivity and channelling private-sector capital into domestic green markets. In response to mounting pressures from climate change and other environmental and economic crises, low carbon green growth may eventually transition from a voluntary to a mandatory strategy. Expanding green finance now will give you a strategic edge as environmental standards tighten. By improving and publicising their participation in green finance, companies, organisations, and corporations will add value to their portfolio. As a result, they will give their company a green edge, attracting more environmentally conscious customers and clients. Through developing and encouraging domestic markets for renewable resources and innovations, governments that promote green finance help to protect their economies at a time when resources become scarce. They increase their economic prospects further by dipping into the new markets that possess a great potential for the employment generation.

Various policies aimed at improving the climate have now been implemented by several nations. Malaysia, like the rest of Southeast Asia, is currently dealing with a number of environmental issues, including low urban air quality and river water quality, deforestation, and insufficient household and industrial waste management. Environmental pollution is now widely acknowledged as a significant challenge to social and economic stability, as well as human life.

Failure to address environmental issues or maintain a safe atmosphere would hasten environmental deterioration. Malaysia's weather is hot and humid all year, with an average temperature of 80 degrees Fahrenheit (27 degrees Celsius) and little difference in annual temperature. Malaysia has 580 cubic kilometres of water, 76 percent of which is used for agriculture and 13 percent for industrial use. In 2014, Malaysia was one of the fastest developing countries in South Asia, relying heavily on nonrenewable energy sources such as 40% petroleum, 36% gas, and 17% coal (Ali & Abdullah., 2015). Because of its reliance on these energy sources, the country emits a large amount of greenhouse gases (GHGs) into the atmosphere, causing climate change. The shift in the economy from agriculture to manufacturing, and then to services, has been a major factor in the rise in energy consumption.

This economic structural transition has had an effect on the transportation sector, which is now Malaysia's second most energy-intensive sector, behind the manufacturing sector. These two industries account for roughly 40% of Malaysia's overall energy consumption [11]. Human activities have had significant threats to the environment in Malaysia. Deforestation, water pollution, air pollution, and GHG emissions are all caused by it. Malaysia has lost an average of 140,200 hectares of forest per year

since 2000, or 0.65% of its total forest area [11]. Malaysian cities produce 1.5 million tonnes of solid waste per year on average. Malaysia is now ranked 26th among the top 30 GHG emitters due to rising GHG emissions. If the current rate of pollution persists, the country will move up the ladder [12]. Malaysia is far more vulnerable to pollution than the rest of the world. If no action or strategy is taken, the overall cost of climate damage to Malaysia for the period 2010-2110 will be about 40 billion.

Recognizing the importance of addressing climate change, Malaysia has set a voluntary commitment to reduce GHG emissions from GDP growth by 2020. In 2013, the energy intensity of Malaysia was reduced by 33% under the 10th Malaysia programme, though this was less than the reduction goal. To meet this growing demand for energy while avoiding environmental losses associated with fossil fuel production, Malaysia will need to invest a significant amount of money in renewable energy resources to reduce GHG emissions. Malaysia has vast clean energy resources, such as residues of palm oil biomass, residues of mills, solar, urban waste, landfill gas, hydro and rice [13]. The use of nonrenewable resources has risen CO₂ emission along the economic growth. Figure 3 depicts the time trend of GDP growth and CO₂ emission in Malaysia from 1971-2018.

The Environmental Quality Act of 1974 was established in Malaysia to preserve environmental quality. In 1981, Malaysia introduced the Four Fuel Diversification Program to avoid over dependency on fossil fuels. Renewable energy was deemed the fifth fuel in the energy mix in 2001, and the declaration was later transformed into the country's fifth fuel policy [13]. The government further implemented the 1987 Environmental Quality Order to mitigate the air pollution assigned to some particular industrial projects [14]. Malaysia is preparing to cut CO₂ pollution by 25 percent to add to the global attempts to combat the risks of global warming and climate change. The main challenge of Malaysia is to improve economy while keeping down the CO₂ emission [14]. To achieve sustainable growth, strong policies and strategies are required to minimize reliance on fossil fuel resources, energy intensity, and CO₂ emissions [15].

The Paris Agreement was signed in 2015 by 178 countries to discuss global climate change problems jointly. According to the International Energy Agency's 2014 statistics, 53 trillion dollars will be needed by 2035 to sustain the Paris Agreement's 2°C temperature threshold. Around the same time, the global stock market's trading volume increased to 68.212 trillion dollars in 2018. Clearly, using financial resources to fill this large funding gap is a viable choice [16]. According to Galaz et al. [17] and [18], the rapid growth of financial innovation has a significant effect on many facets of human society, but the impact on the ecological environment is limited, and therefore there is a large room to promote the ecological environment using financial funds. Scholars have also looked at some of the more important aspects of green finance in terms of environmental conservation such as how to boost the involvement of private green capital in environmental conservation programmes [19,20], and the transmission route of green finance to the environment [21], and the role of the government in the development of green finance [22].

For example, Malaysia aspires to become a developed country by 2020, and as a result, energy demand has increased rapidly, resulting in the depletion of primary non-renewable energy resources and a rise in greenhouse gas emissions (GHGs). Malaysia is one of the fastest-growing countries in terms of renewable energy sources, thanks to a focus on long-term energy security, sustainable economic development, and greenhouse gas emissions reduction. Renewable energy and other capital-intensive cleantech ventures are not only highly leveraged and require substantial initial investments, but they also face a variety of risks, including market risk, credit risk, liquidity risk, operational risk, and regulatory risk [23]. If this risk-return analysis is not adequately performed, risks associated with cleantech projects will directly impact the amount, timing, cost and availability of financing [24]. Moreover, to achieve bankability, clean technologies not only need to be proven and reliable, they have to be also be scalable. As a result, the type of financing available to cleantech projects is largely dependent on risk management approaches employed by the project developers and the risk management tools available to mitigate real and perceived risks. Hence, Malaysia has made considerable progress toward renewables, with incentives provided over the years reflecting the government's efforts to develop and support the sector. As part of its intent to invest in a green economy, Malaysia, like many countries, has enhanced its efforts, incentives, standards, awareness, and policies regarding green finance. Despite all the developments and progresses, the country requires more support from the government in motivating people to use renewables and developing new green projects. If we can implement the path rightly, we will get the benefits of green opportunities such as employment generation, energy security, and industrial efficiency, reduction of vulnerability of people under the poverty line and adverse effects of climate change. Therefore, greening the financial system will be a determinant of measuring the environmental challenges of the growth pathway.

There are four main sectors namely Energy, Building and Township, Transport, and Water and Waste Management that are eligible to be funded by the Green Technology Financing Scheme (GTFS). Figure 4 shows total amount of financing approved by the participating financial institutions (PFIs) for various projects in these four sectors and CO₂ emission from 2010 to 2014.

Although there are many projects certified and eligible to apply for the financing scheme, many of them are turned down for financing by the Participating Financial Institutions (PFIs) due to uncertain economic viability of these projects. Figure 4 presents that the level of CO₂ is almost same during the period of 2010 to 2014. This indicates that green financing does not make any improvement in CO₂ emission in the country.

The idea of green financing in Malaysia as part of a green economy was introduced in the 1970s by the government, which implemented a group of policies towards sustainable development. The importance of sustainable development has been evident since 1976 and was enacted in the country's five-year development plan. The advancement of the green economy process was more apparent in the 2000s, with the instigation of two national policies regarding green technology and climate change. Moreover, the Malaysian government has introduced

different green financing initiatives with the help of major financing channels, including banking, the equity market, and the fixed-income market. Furthermore, Malaysia is proactive in introducing the use of Islamic financing facilities to support the green technology sectors. Although the country has great potential in green financing, there are several barriers and challenges that have slowed the process, and which are explained in the next section.

BARRIERS AND CHALLENGES REGARDING GREEN FINANCE IN MALAYSIA

Renewable energy projects face two financial obstacles: a lower rate of return than fossil fuel projects and a higher chance of default. Despite the government's efforts to fund renewable energy, initial costs and a lack of support structures stymie the industry's development. In general, there is a lack of funding and confidence from local investors, as well as financial institutions' knowledge and perception of renewable energy. As a result, the cost of capital rises as renewable companies seek foreign investors who can provide them with the necessary expertise, technology, and funds; the riskiness of investments rises as a result [25]. The most important stumbling block appears to be a lack of political will. This can be seen in the vast amounts of support and subsidies given to the fossil fuel industry, while tax breaks and incentives given to the renewable energy industry are insufficient to cover costs. As a result, Malaysia has experienced slow development in the renewable energy industry. Administrative issues have plagued the renewable energy sector. There is a lack of cooperation between investors and the authorities involved, which has slowed growth. The two most important non-technical obstacles to opening up renewable energy sources in Malaysia, according to [26], are a lack of knowledge and financial support. A green industry is aided by the availability of low-cost financial facilities. Financial assistance from the government is particularly necessary at the start of green industrialization [27]. Renewable energy ventures, on the one hand, are typically capital-intensive and involve a large initial investment. On the other hand, such ventures come with a lot of demand, credit, liquidity, and operational risks [23]. Clean energy projects' high costs would hinder their complete penetration into the energy market. Many banks and lending institutions view these ventures as risky and are hesitant to lend to them; as a result, a comprehensive incentive mechanism for increasing the rate of return while lowering the risk of investment is needed [20]. There are, without doubt, other barriers besides financial barriers that should be considered, such as technical, institutional, regulatory, and information barriers.

Although government-led financing is important to encourage green development, government financing schemes cannot meet the investment costs needed for scaling up clean technology projects. The number of projects approved and accredited is increasing, as shown in Figure 4, but these projects are unable to obtain significant amounts of funding from financial institutions and capital markets, owing to real and perceived risks. Lenders and investors would enforce stricter lending and investment requirements, increasing the cost of borrowing above that of government-sponsored schemes. Biorefineries, for example, are highly leveraged and complex cleantech ventures that are

more likely to face high funding costs, as well as the possibility of delayed completion and discontinuation [28].

Furthermore, local banks are unfamiliar with green and cleantech programmes and lack the capacity to assess them. As a result, they sell few, if any, financial products explicitly designed to fund renewable energy initiatives and rely heavily on technology experts to create such products. Cleantech projects with high certainty of expected profits are favoured by financial institutions, which often need greater cooperation between borrowers and technology experts to ensure project viability. Furthermore, several green technology businesses struggle to secure credit due to a lack of “near cash” collateral and a weak credit history [29]. Banks consider much of the machinery and technologies used in renewable energy projects to be insufficient collateral because it is fresh and unproven, with a short life span. Energy Waste & Water Management Building Transportation have not extended their lending activities beyond conventional sectors such as consumer and infrastructure ventures, as approved by PFI’s Energy Waste & Water Management Building Transportation.

- These financing gaps and challenges can be addressed in several ways. To begin with, alternative funding sources other than government and financial institutions are becoming increasingly relevant in promoting green development. Green private equity, for example, has emerged as a funding vehicle that assists green entrepreneurs in obtaining funding in developed economies. Green private equity funds invest in businesses that are committed to environmental growth and green ventures. Private equity funds are received by both retail and institutional investors, with a preference for those with ethical and green investment goals [30]. The capital raised can be used to fund new technologies, expand working capital within an owned company, or to strengthen a balance sheet [31]. Second, syndicated project funding, which has historically been used to fund major infrastructure projects such as transportation tunnels and airports, can be used to fund large renewable energy projects as well. This method of financing is especially useful for project creation in developing countries, where project parties often rely on assurances, long-term off-take or purchase arrangements, and other contractual relationships to ensure the project’s long-term viability [32]. For building, service, and maintenance, the funding arrangement may include debt, equity, guarantees, and credit enhancement.

- Third, in recent years, green bonds have risen to prominence as a debt market tool for funding initiatives with positive environmental and/or climate benefits. However, in emerging markets such as Malaysia, the green bond market is non-existent, and it will take time for the market to expand because investors traditionally perceive green bonds as a new asset class that is riskier than conventional bonds [33].

- Finally, green government procurement will act as a catalyst for green growth in Malaysia. Malaysia’s public procurement accounts for around 12% to 15% of the country’s GDP, and government spending is expected to rise in the future [34]. Green public procurement not only benefits the environment, but it also provides a source of funding for the development and implementation of green products and services that the market

might not be able to provide, particularly in the early stages of new green technology. The government’s green procurement will be made mandatory for all government ministries and agencies in its 11th Malaysia Plan 2016-2020, creating demand for green products and services while also encouraging industries to improve the standard and quality of their products to meet both domestic and international green certifications.

CONCLUSION AND RECOMMENDATIONS FOR GREEN FINANCE

Green growth does not only help a country meet the challenge of sustaining its economic and social development, it also safeguards the country’s long-term economic performance by diversifying its economic activities. When implementing green growth efforts, it is essential that the policy makers consider not only the potentially high cost of not going green, but also design green growth financing strategies and mechanisms that support the efforts to promote growth of green industries in general and foster green technological innovations. Further, policy makers need to be clear about policy signals they send to capital providers about their green growth policy agenda so that financial institutions and capital markets can respond accordingly by offering a wide range of financial products and services specially targeted for green industries. Although policy directions and financing options are important for green growth, workforce with “green” skill is also equally important. An effective education and training system focusing on sustainable development goals helps build new skills required for a thriving green growth. The transition to green economy requires both policy shifts towards sustainable development goals and major investments in infrastructure, technology, and green workforce. Some of these enablers require close collaboration between government agencies and green industries through effective partnerships and network linkages with both domestic and international partners. Understanding enablers and constraints of green growth in an integrated manner is critical for the policy makers to undertake policy reviews and for the private sector to register their interest in green growth investments and innovations as well as for consumers and producers to internalize costs and benefits of green growth. Future works can continue to focus on other enabling conditions such as infrastructure and education and training systems required for green growth and address challenges associated with these enablers. A benchmark study can also be insightful and the findings can be used for identifying opportunities for improvement and/or setting performance targets for green growth best practices and standards. Finally, green growth performance indicators should be also developed to provide useful insights into strategy/policy implementation for green technology and improvement of enabling conditions as well as reduce barriers of green growth.

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