Green Financing Options in Barbados

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Developing countries tend to have large areas of the economy unserved by the dominant banking and formal financial sectors. Governments also encounter difficulties when trying to obtain financing for development priorities. With the onset of the threat of climate change, however, it has become even more urgent for countries to secure financing to address its impacts and related challenges, which requires significant amounts of financing. Green financing therefore becomes the key to unlocking investment opportunities in renewable energy and energy efficiency, but more importantly a much-needed tool to channel capital markets and investors towards environmental projects and sustainable infrastructure. Green financing can take many forms, but this study chooses to focus on the financing options available from bank and non-bank financial institutions in Barbados, as well as initiatives implemented by the Government of Barbados to support achieving the 2030 target of 100% renewable energy usage. This research will also discuss international best practices in relation to the supply of green financing which manage risk and increase the rate of return for the lending agency. This paper uses a survey approach to assess the state of the green financing market in Barbados. After reviewing existing literature on green financing, the first phase outlines the existing policy measures implemented by the Government of Barbados to promote usage of green products. In the second phase, the authors employ a survey of financial institutions operating within Barbados. By investigating the applicability of green financing to small developing countries in the Caribbean, this research fills the gap in the literature on studies reviewing green financing in Barbados and brings attention to strategies countries may employ to help achieve their sustainable development goals.

Keywords: green finance; renewable energy; environmental conservation; sustainable development.

1 Introduction

Global warming and climate change, resulting from increases in greenhouse gas emissions, remains one of the greatest environmental threats, with temperatures projected to rise further if global energy production remains heavily dependent on fossil fuels. The negative impacts of climate change place pressure on the future of biodiversity, food production, human health and survival in general. Given these potentially devastating effects, it is crucial to protect the planet against the risks associated with climate change. The 2030 Agenda for Sustainable Development, agreed to by the member states of the United Nations in 2015, outline a list of sustainable development goals (SDGs) that aim to guide Governments towards climate-resilient initiatives, including access to affordable clean energy. In order for the world to achieve these SDGs, the issue of the supply of financing for sustainable projects needs to be addressed. Green finance, financial instruments and policies which prioritise environmental benefits (Sachs et al., 2019), has been put forward as one solution to the financing challenges faced by small states.

For small islands where tourism is a major contributor to economic activity, the long-term negative impacts of climate change are particularly severe and could result in the loss of marine biodiversity, fisheries and shorelines (Munday, et al., 2009). Beyond environmental protection, small island developing states such as Barbados could benefit further from transitioning to sustainable energy production. Due to limitations stemming from size and dependence on fossil fuels, utilising renewable energy would reduce risks related to vulnerability from external shocks such as supply and price volatility (Moore et al. 2012). Additionally, reducing the fuel import bill has positive spillover effects via foreign exchange savings ultimately preserving international reserve levels.

While the public sector has historically driven investment in renewable energy projects

through grants, tax write-offs and reductions, fiscal constraints limit the level of financing that can be provided by Governments in developing countries. Therefore, the private sector must also engage in the battle against climate change. Some of the main types of green financing products offered by private financial institutions include green mortgages, green building loans as well as green auto loans. The main purpose of green financing tools provided by public and private entities is to encourage investment in environmentally friendly projects with the ultimate goal of achieving sustainable development.

This paper reviews the literature to take stock of green finance products that exist internationally and uses the results to develop a survey and conduct a qualitative analysis to determine the green finance products that are available in Barbados. The remainder of this paper is structured as follows. Section 2 reviews the literature on green financing. Section 3 discusses the methodology used. Section 4 provides the results, while section 5 concludes.

2 Literature Review

2.1 History of Green financing

The relevance of green financing has grown steadily over recent years upon the realisation that only a fraction of the funds needed to ensure sustainable development can realistically come from public sources. (Forstater, Halle & Zadek, 2016). The United Nations estimates that US $5-7 trillion a year is needed to implement the SDGs globally. Therefore, in an age where environmental risks and opportunities abound, there is an

urgency to have options for reconciling environmental concerns with lending and financing arrangements (Huhtala & Bird, 2013).

The history of green financing is rooted in the literature on financing sustainable projects. Financial resources are a key input into protected area management. [1] These resources typically help to support the goals of biodiversity conservation, both natural and socio-economic aspects. The finance provided to support biodiversity conservation is usually justified using moral concepts such as duty of care or the inherent rights of non-human species and ecosystems. The discussion on the need for financing for protected areas, particularly within the context of the Millennium Development Goals, is also motivated based on the contribution that preserving biodiversity has to poverty reduction and sustainable development.

Traditionally, the public's balance sheet has been the primary tool used to finance investment in sustainable development. Essential tools include tax write-offs of spending in areas classified as desirable, lower taxes on income from investments in green industries and grants to support business and household investments in environmentally desirable areas. From a financial perspective, governments also increase the supply of finance to green industries by providing guarantees and, in some instances, targeted loans for businesses in these areas. However, while green financing has gained prominence, it remains in its nascent stages, with bond issuance and green infrastructure investment accounting for less than one per cent of total bond issuance and total infrastructure investment worldwide (Del Río et al. 2014).

[1] Emerton, Lucy, Joshua Bishop, and Lee Thomas. "Sustainable Financing of Protected Areas: A global review of challenges and options." (2006).

Existing market and institutional failures may stifle efforts to fully incorporate environmental dimensions into bank decision-making. For example, short-termism, misaligned incentives, inadequate expertise, and underdeveloped risk assessment methodologies are all features of a banking system not equipped to assimilate environmental and social concerns into existing portfolios (Forstater, Halle & Zadek, 2016). Fundamentally, a financial system consists of institutions and markets that interact to channel funds towards investment and provide facilities for commercial activity financing. The role of financial institutions within the system is primarily to intermediate between those that provide funds and those that need funds and typically involves transforming and managing risk. Banks play an integral role in assessing risk, originating loans and underwriting the issuance of equities and debt. However, as short-term deposit-takers, they are not well suited to hold long-term assets on their balance sheets. Therefore, capital markets provide a critical channel to allow the sale of long-term debts or equity-backed securities to institutional investors.

Financial systems are also critical in enabling large scale projects and corporate ventures. Taghizadeh-Hesary & Yoshino (2020) suggest that credit guarantee schemes (CGS) could provide a possible solution to reduce the risk concerns of banks. A CGS absorbs the risk, and its guarantee acts as collateral. Therefore, by reducing the level of risk, banks should be more willing to lend to borrowers. However, Paulson (2016) argues that the core challenge is industrialising green finance to achieve scale.

The literature agrees that linking sustainable development and finance could harness the power of finance to achieve societal and environmental goals. Ideally, the financial system would redirect capital flows towards more sustainable objectives, away from

polluting industries. Because many green industries are just now emerging, however, there tends to be uncertainty and doubt about placing funds in these industries. Dörry & Schulz (2018) posit that incorporating economic sustainability through social and environmental gains opposes alternative economic practices. They assert that the current discourse surrounding green finance is primarily about "assets" and investing activities that emphasise finance as an investment vehicle with expectations of an economic return greater than the initial investment's value and the administration costs involved. However, while capital flows might help generate social returns, the economic returns for investors are not entirely clear. One solution to this problem is to link social and economic returns by requiring institutional investors to disclose their investments' social, economic, and environmental returns. In this way, investors' growing interest in the environment would allow them to direct funds to those firms investing in environmentally sustainable areas.

Folqué et. al (2021) note five measures to assist the smoother transition of the financial system to a more sustainable path. To begin with, enhancing market practices in the form of improved market efficiency and accountability of financial institutions, particularly concerning the consolidation of sustainability disclosures and standards. Furthermore, harnessing the public balance sheet to improve the risk-adjusted returns to investors in key areas. For example, tax benefits are provided to investors who buy municipal bonds targeted at renewable energy investments in the US, which guarantees them a return on investment. Also, protecting finance through policy, requirements, and prohibitions to direct investments to areas of interest. Lastly, through cultural transformation and the upgrade of government architecture through the internalisation of sustainable development to become consistent with financial regulators and central banks.

Currently, the potential for green finance reform is promising. Several countries worldwide are attempting to bring the different networks and financial actors together, which contributes to identifying gaps and developing synergies. The global increase in the green financing tools available is a testament to these efforts. These tools will be discussed in detail in the following section.

2.2 An Analysis of Existing Green Financing Tools

Hoshen et al. (2017) describe green financing as products and policies aimed at encouraging investment in sustainable development projects and initiatives. Internationally a wide sweep of products and services are available on the market in areas ranging from personal home mortgages to commercial business loans. Overtime, competition has driven financial institutions to creatively develop green financing packages which simultaneously improve their rate of return as the lender, while providing affordable financing to their customers. Additionally, there is an incentive for financial institutions to play an active role in preserving the planet given heightened awareness among clients and stakeholders regarding environmental challenges such as climate change and water scarcity (UNEP Finance Initiative, 2007). Finding ways to increase consumer loyalty in recent years has become a challenge for banks within the region as new players enter the market. By recognising greening as a branding strategy, bankers can increase consumer loyalty. A study by Sun and others (2020) investigated the role green banking initiatives play in enhancing customer loyalty among environmentally conscious consumers. They find that by actively engaging in corporate social responsibility (CSR) practices, involving customers in the co-creation process, and implementing green banking initiatives, companies can strengthen their relationships

with green-minded customers and foster long-term loyalty(Sun et al, 2020).The discussion below explores some of these best practices.

According to the 2007 Green Financial Products and Services report prepared by the United Nations Environmental Programme Finance Initiative (2007), one way that lending agencies can stimulate demand for green financing is via attractive packages for home mortgages. Such products, also known as green mortgages or energy efficient mortgages (EMMS), offer lower interest rates to clients who purchase energy efficient homes or invest in retrofits, energy efficient appliances and green power. Some other types of green mortgages offered by financial institutions include providing loans to switch a house from conventional to green power and then making climate change donations based on the customer's home energy rating. Home equity loans also aid customers with financing the cost of transitioning to green energy. By partnering with solar power installation companies, customers can complete a one-step application process which allows them to make affordable monthly loan payments while generating electricity from solar powered systems.

In addition to offering financing to individuals, the UNEP Finance Initiative report (2007) also outlines products for businesses. Commercial building loans allow the developer to repay the loan through savings from utilising energy efficient appliances, equipment and materials. To qualify for such loans, the building must pass an energy efficiency test quantified by integrated computer models, designed and monitored by third party consultants.

Below market interest rates on hybrid and electric vehicles could potentially encourage both individual consumers and businesses to purchase vehicles with such characteristics. To attract a wider customer base for these products, financial institutions also evaluate greenhouse gas (GHG) ratings for each vehicle type and apply low interest rates accordingly. As with mortgages, banks make donations to offset CO2 emissions produced by cars they financed (UNEP Finance Initiative, 2007).

Similarly, banks provide donations to various environmental Non-Governmental Organizations (NGOs) via other products such as green credit and debit cards, where the bank donates amounts equivalent to approximately half a percentage point on every purchase, balance transfer or cash advance made by the card owner. By signing up for Landcare term deposit accounts, customers can support local farmers and sustainable agriculture while receiving the same features and rates of regular term deposit accounts. In this case banks make an annual donation to agricultural causes based on the customer's average balance of deposits. According to this report, the method of tying credit cards and personal accounts to an offset or donations program has become increasingly popular among European financial institutions since there is little to no additional costs for the them to provide these types of schemes, while simultaneously giving the customer the opportunity to manage their funds at an institution which helps the environment.

Based on the literature presented above, the authors constructed a database of green financing tools that was employed in the survey to loan officers of domestic financial institutions. The options range from green mortgages aimed at households to green bonds issued by the sovereign. These financing options in some instances are just traditional financial products but aimed at green products (e.g. green auto loan) while others are

more complex financial products (e.g. green bonds). Table 1 also provides the advantages and disadvantages associated with each financial product.

Table 1: Advantages and Disadvantages of Various Types of Retail Banking Green Financing Products

Product	**Description**	**Advantages**	**Disadvantages**
Green Mortgages	Offering lower interest rates to clients who purchase energy efficient homes or invest in retrofits, energy efficient appliances and green power.	Cheaper mortgages for customers. Encourages green energy residential construction.	Requires personalised solutions. Interest may cancel out your savings May require extra documentation.
Green Home Equity Loans	Financial institutions partner with solar power companies, allowing customers to install solar powered systems on their homes.	Affordable monthly loan payments make solar systems more accessible. Potential to offset loan payments with revenue earned from excess solar energy.	Interest rates may be higher. Home is used as collateral. Significant equity has to already exist within your home.
Commercial Building Loan	Developer repays the loan through savings from utilising energy efficient appliances, equipment and materials. To qualify for such loans, the building must pass an energy efficiency test quantified by integrated computer models, designed	Reduces costs to the developer. Energy and water efficient Reduction in waste Protect and conserves natural resources	High initial costs Unclear long-term effects Technological barriers Maintenance may be difficult

	and monitored by third party consultants.		
Green Auto Loan	Offering lower interest rates on hybrid and electric vehicles compared to gas and diesel.	Cheaper financing for the customer. Encourages the public to purchase hybrid and electric vehicles reducing CO2 emissions.	Discourages public transport Given the price of hybrids and electric vehicles only a few households might qualify for the loan
Green Credit/Debit Cards	Financial institutions make donations to environmental NGOs based on a ratio of number of transactions made by the card owner.	Environmentally friendly agencies receive financing to protect the planet.	No direct benefit to card holder.
Deposit	Financial institutions make annual donation to environment NGOs based on amount of customers' deposits	Environmentally friendly agencies receive financing to protect the planet.	No direct benefit to account holder.
Green Bonds	Fixed-income securities that fund exclusively green projects with environmental or climate-related benefits.	Provides a source of funds to green various sectors of the economy.	Increases the debt stock of the country.

Source: Sachs, J., Woo, W.T., et al., 2019. *Handbook of green finance: energy security and sustainable development*. Singapore: Springer. p. 48., UNEP Finance Initiative,. 2007. Green Financial Products and Services. p. 14,.

2.3 Regulations and Green Financing

The main goals of financial regulatory authorities in developing countries is the maintenance of financial stability as well as supporting economic policy aimed at economic growth. Environmental sustainability, traditionally, is not taken into account as one of the key goals of these regulators. Given that environmental damages are likely to impact the stability of institutions in the financial sector (e.g. stability of banks and insurance companies) then it can be argued that issues related to sustainability should be incorporated into the toolkit of regulators.

Regulators have to address three types of risk: transitional, physical and liability.[2] Transitional risk refers to the changes in the price and value of various technologies as countries attempt to meet emission goals as well as respond to the introduction of new green taxes and environmental regulation. Within the Caribbean, the potentially most well-known are physical risks that occur as a result of natural disasters such as hurricanes, storms, floods and droughts. Liability risk, on the other hand, may arise from uncertainty from the potential financial losses owing to natural disasters. There is therefore a strong case for financial regulators taking into account notions of sustainability given the potential for disruption to the financial system.

Given that central banks in developing countries also have a growth or development mandate, the active development of green financial products would be consistent with the objectives of these institutions. The Central Bank of Barbados' Act, for example, identifies that one purpose of the Bank is to "foster the development of money and capital markets in Barbados". This legal mandate could be interpreted to mean the development

[2] Carney M (2015) Breaking the tragedy of the horizon – climate change and financial stability. Speech given at Lloyd's of London, 29 September. www.bankofengland.co.uk/publica tions/Pages/speeches/2015/844.aspx.

of innovative new financial products such as green finance. The Act also lists another purpose as to "foster credit and exchange conditions conducive to orderly and sustained economic development of Barbados". Greening, to the extent that it supports economic development, can therefore be incorporated into the mandate of the Central Bank of Barbados. To date, however, the Bank has not explicitly stated that it has incorporated any sustainability objectives into any of its policy communications.

Beyond just financial regulation, regulations, say issued by the Ministry of the Environment, can impact green financing as a driver for green products and hence green finance. Legislation that impacts on price/market certainty can stimulate the demand for green goods and services. In Barbados, for example, tax incentives for the purchase of solar water heater systems in Barbados significantly enhanced the demand for these systems[3]. More recently, the establishment of a system of feed-in-tariffs for renewable energy helped to stimulate the demand for renewable energy systems by both businesses as well as households[4].

[3] Perlack, Bob, and William Hinds. *Evaluation Of Renewable Energy Incentives: The Barbados Solar Water Heating Experience*. Technical Report Series 2004-1, Renewable Energy Centre, Barbados, 2004.

[4] Moore, Winston, et al. "Green economy scoping study: synthesis report Barbados." (2012).

3 Methodology

The main goal of this study is to investigate the types of green products available in Barbados. A mixed-methods approach is employed to capture the data needed for the study. The first approach features a review of budget estimate speeches between 2006 and 2022 in order to determine existing measures implemented by the Government of Barbados to encourage investment in green products. The second approach is a survey of representatives of financial institutions: commercial banks, trusts, finance companies and merchant banks, operating in Barbados. The survey was built using the survey monkey platform. Following completion of the building phase of the survey, the authors proceeded to test the survey. Feedback from the testing phase was then incorporated into the survey before being administered to participants. Upon release via email in mid-November 2022, participants were given 2 weeks to complete the survey. During the stipulated deadline, 45 percent of targeted financial institutions had completed the survey. Given the initially low response rate, the authors decided to grant a deadline extension in an effort to expand the sample size. The survey was administered to 11 entities, representing all financial institutions operating under the purview of the Central Bank of Barbados. However, given a final response rate of 91 percent, the sample size totalled 10 financial institutions.

The survey captures information in relation to investment policy, perceptions of risk, current green products offered by the businesses, plans to offer green products and perceptions of the incentives offered by the Government to support greening. The survey contained 42 questions and took most participants approximately 25 minutes to complete. In the area of investment policy participants were asked to indicate the type of green financial products that were requested by their customers and whether or not the institution actively supported green financial products. Questions in relation to perceptions attempted to capture the views of senior loan managers in relation to whether

or not they viewed green financial products as more or less risky than traditional financial products offered by the institution and the extent to which current government incentives are sufficient to support green financial products. Given the government's plan to invest more in renewable energy over the medium to long term, participants were also asked about their anticipated demand for green financing, how prepared the financial institution was, as well as any concerns about providing greater green financing in the future, the industry, type of projects, as well as the drivers and obstacles of the decision to provide green financing. This assessment also captured information on the evaluation and qualification process for green financing and whether or not these are more stringent than the requirements for traditional financial products.

The demand for green financial products by financial institutions can be conceptualised as driven by four key factors: macroeconomic developments, fiscal incentives, market trends and the sustainability goals of the financial institution. Rapid changes in macroeconomic conditions such as high fuel and oil prices and uncertainty surrounding the future of these prices can drive both households and businesses to consider investments in renewable energy. Investing in renewable energy in these circumstances can not only reduce monthly energy costs, but can also help the business or household to better plan for the future.

In addition to macroeconomic developments the financial institution might shift its portfolio towards more green products in an attempt to take advantage of emerging market trends and fiscal incentives. In Barbados the Government provides incentives to encourage the take-up of RE systems by both businesses as well as households. As a result, there has been a significant market shift towards these systems. In order to keep-up with these market trends, financial institutions have developed new financial products aimed at both businesses and households.

Figure 1: Conceptual Framework

Many financial institutions also have sustainability goals for their organisation. These goals relate to the emissions related to lending, and other aspects of their business. The idea is that by reducing the CO2 emissions related to their loan portfolio, the business can claim to be greener and hence market themselves as a green business and potentially attract more business in the same area.

4 Results

4.1 Renewable Energy Development

Barbados has made significant strides towards sustainable development, particularly in the areas of renewable energy and electric vehicle (EV) deployment. According to the 2023 Sustainable Development Report, Barbados ranks 88th out of 166 countries (Trebucq,2023), scoring above the regional average due to its national policies and indigenous solutions promoting sustainability across society, economy, and environment. Among key areas of focus are renewable energy, green and blue economy growth, public health and safety, climate resilience, culture, social protection, and economic transformation, all aimed at promoting a more inclusive society that leaves no one behind.

The island boasts a rich history with renewable energy. During the country's sugar production era, planters used large windmills to grind the sugar cane for more than 300 years. More recently, the biomass from the sugar production is used to power the factory after the windmills were decommissioned. In the 1990's high energy prices and generous tax incentives supported the widespread adoption of solar water heaters on more than one third of all households (Headley,1997). Presently solar water heaters are a common fixture in all new residential builds.

The need to reduce the national reliance on imported fossil fuels drives the focus on renewable energy. Fossil fuel imports constitute about 7% of GDP (Moore, W., Chueca, J. E., Prado, V. R., Hallack, M. C. M., & Álvarez, L. G., 2022). The high cost of electricity, averaging 0.32 USD/kWh(Thompson et al, 2024), further emphasises the need

for local renewable energy sources to enhance economic resilience and environmental sustainability.

Barbados has seen significant changes in its energy policy over recent years. In 2009, the Barbados Light & Power Company (BL&P) proposed a Renewable Energy Rider (RER) program to allow distributed solar PV capacity to be supplied to the grid. This program began as a pilot in 2010, but its high upfront costs limited participation. In 2013, the introduction of the Electric Light and Power Act (ELPA) allowed Independent Power Producers (IPPs) to enter the market, challenging BL&P's natural monopoly. There are over 2,000 independent power producers now generating almost 20% of the island's solar capacity (Nightingale, 2022).

The RER program in Barbados continues to support the integration of renewable energy into the national grid, particularly focusing on solar photovoltaic (PV) systems. Following the 2015 COP 21 Paris Agreement, Barbados reinforced its commitment to increasing renewable energy through its Nationally Determined Contributions (NDC). The RER program has been a key driver in encouraging private sector participation in renewable energy generation despite cost challenges, being instrumental in increasing the capacity of distributed renewable energy across the island. The country has around 30 MW of distributed, customer-owned solar rooftop generation contributing to the national grid. Additionally, a 10 MW solar plant has been added, bringing the total solar energy capacity to approximately 40 MW (Energy Division).

Today, the country is advancing its renewable energy sector, aiming for 100% renewable energy supply by 2030. The island's National Energy Policy 2019-2030 outlines a

comprehensive plan to phase out fossil fuel-based generation and expand solar, wind, and biofuel energy sources. Currently, renewable energy accounts for approximately 10% of Barbados' electricity generation, reducing emissions by an estimated 680 gCO2e/kWh (Ashtine et al, 2018). Over 15 Government buildings have also been retrofitted with solar PV systems and energy efficient fixtures with another 100 buildings planned.

Electric Vehicle Deployment

Barbados leads the Caribbean in electric vehicle adoption. With over 430 EVs on the road and numerous publicly accessible charging points, the transition to EV's is supported by government incentives, including tax holidays on EVs and interest-free loans for government employees purchasing EV's (IDB,2020). The integration of EVs is part of a broader strategy to achieve a 49% reduction in fossil fuel use by electrifying 100% of public transportation by 2030, potentially saving $200-400 million annually in imported fuel costs (Perez, 2021).

In the 2022 budget presentation, Prime Minister Mottley announced further fiscal policies to incentivise the transition. Government workers are now eligible to borrow up to $100,000 interest-free for purchasing electric or hybrid vehicles, an increase from the previous $50,000 limit, which remains for diesel and gasoline-powered vehicles. This provision, however, for conventional vehicles may be phased out to align with the island's 2030 decarbonisation goals. Additionally, a 24-month excise tax and VAT holiday on electric vehicles will commence on April 1, during which only a 10% import duty will apply, encouraging more Barbadians to transition to cleaner transportation options.

The country's compact road network and low commuter distances make EV adoption particularly viable (Shah, Awojobi and Soomauroo, 2022). Additionally, declining battery costs and strong policy support have facilitated this shift, making Barbados a model for other Caribbean nations. The deployment of EVs not only reduces greenhouse gas emissions but also supports local economic development by creating jobs in the clean energy sector.

Barbados' commitment to renewable energy development and electric vehicle deployment highlights its leadership in sustainable practices in the Caribbean. By addressing the high costs and environmental impacts of fossil fuels, these initiatives contribute to a greener, more resilient economy, in line with the country's ambitious goal of achieving carbon neutrality by 2030. Continued investment and policy support are crucial to sustain and expand these efforts, ensuring long-term benefits for the environment and society.

4.2 The Public Sector

The literature on green finance highlighted the importance of the Government to the development of green finance given that the public sector's balance sheet has customarily been used as the main tool to finance investment in renewable energy initiatives. As discussed in the literature, key green financing tools offered by the public sector include tax write-offs, lower taxes on income from investments in green industries, grants to support business and household as well as the issuance of green bonds. Table 2 displays green financing tools implemented by the Government of Barbados and was derived by

examining budget estimate speeches from as early as 2006. Further, table 2 provides advantages and disadvantages of each policy measure.

Consistent with the literature, the Government of Barbados offers tax write-offs and reductions to encourage investment in green products. From as early as 2008, renewable energy equipment has been exempt from import duties. As of April 1st 2022, electric vehicles were exempt from excise tax and VAT for a period of 2 years. Tax rates for import duties and excises on fuel cell electric vehicles were reduced to 10 percent and 20 percent, respectively. Civil servants also have the option of borrowing up to BDS$100,000 in interest free loans for the purpose of purchasing electric or hybrid vehicles. Other tax incentives implemented by the Government of Barbados include income tax allowances for energy audits, renewable energy, and energy efficiency retrofits, up to $10,000 for individuals and $25,000 for small businesses. Additionally, $14 million in grant funding was made available via the Green Climate Fund earmarked for the provision of residential rainwater harvesting tanks.

Table 2: Green financing products offered by the Government of Barbados

Public sector products	Description	Advantages	Disadvantages
Import duties on renewable energy equipment	Renewable energy equipment were exempt from import duties since 2008	Cost savings on import duties for individuals and businesses after investing in environmentally friendly products.	Reduction in import duty revenue for the Government.
Tax Holiday on electric vehicles	Excise tax and VAT Holiday on the purchase of electric vehicles for a period of 24 months commencing April 1, 2022. Therefore, individuals will only pay 10% import duties during the period.	Creates incentives for individuals to purchase electric vehicles. Reduces fuel import bill and foreign exchange expenditure.	Reduction in tax revenue Increases the demand for electric vehicles without the end of life issues associated with batteries in electric vehicles
Import duties on fuel cell electric vehicles	Import duties on fuel cell electric vehicles reduced from 45% to 10% effective April 1st 2022. Significantly below the 45% import duties charged on diesel and gasoline fueled cars.	Creates incentives for individuals to purchase electric vehicles. Reduces fuel import bill and foreign exchange expenditure.	Reduction in tax revenue Increases the demand for electric vehicles without the end of life issues associated with batteries in electric vehicles
Excise tax on fuel cell electric vehicles	Excise tax on fuel cell electric vehicles reduced to 20% effective April 1st 2022, well below excises charged on diesel and gasoline fuels vehicles which ranges from 20% - 120%.	Creates incentives for individuals to purchase electric vehicles. Reduces fuel import bill and foreign exchange expenditure.	Reduction in tax revenue Increases the demand for electric vehicles without the end of life issues associated with batteries in electric vehicles

Public Officer Car Loans	Starting April 1st 2022, public officers can borrow up to $100,000 interest free for the purchase of electric or hybrid vehicles.	Creates incentives for public servants to purchase electric vehicles. Reduces fuel import bill and foreign exchange expenditure.	Discourages the use of public transport options Might not be feasible for public officers to borrow given their salary
Energy conservation income tax filing deductions	Income tax allowance for energy audits, renewable energy, and energy efficiency retrofits up to $10,000 for individuals and $25,000 for small businesses since 2011.	Cost savings on income taxes for individuals and businesses after investing in environmentally friendly products.	Reduction in income tax revenue for the Government.
Grant funding for Green Projects	The BWA will utilise grant funding, provided by the Green Climate Fund totalling BDS $14m to provide 1,500 tanks as well as BDS $5.6m for rainwater harvesting systems at homes.	Reduces the negative effects of droughts in Barbados	Does not address the demand side issues surrounding water use

Source: Government of Barbados budget estimate speeches 2006 - 2022

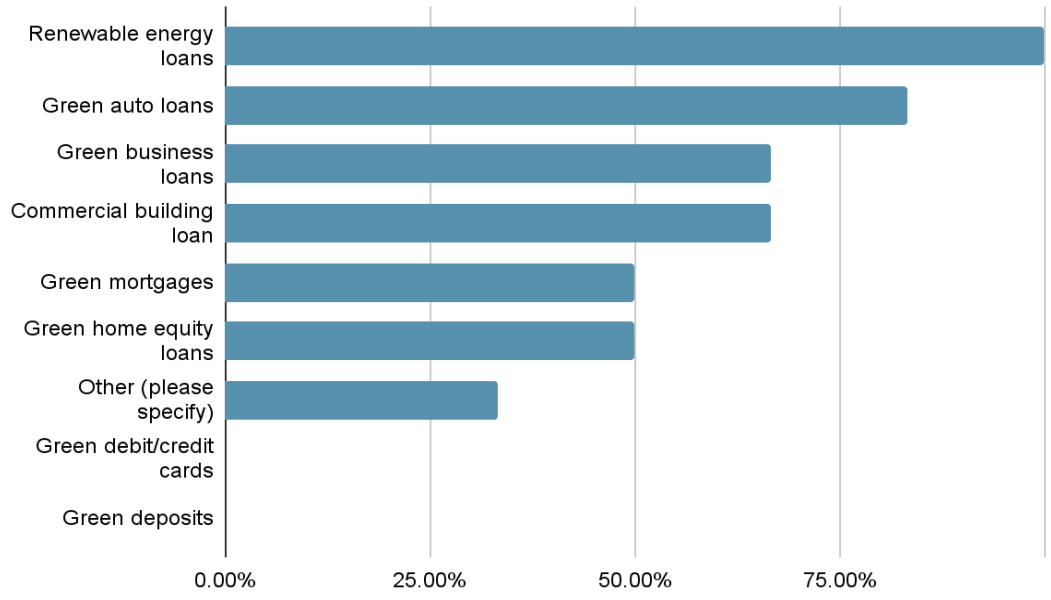
4.3 The Private Sector

The private sector has a significant role to play in the transition to renewable energy usage owing to fiscal and debt constraints typically faced by the Governments in small island developing states such as Barbados. This section discusses the results of surveys administered to representatives of financial institutions: commercial banks, trusts, finance companies and merchant banks, operating in Barbados.The majority of financial institutions surveyed had a policy in relation to green investment. One entity had signed onto the Net-Zero Initiative to be a net zero Banking Group by 2050. This initiative, supported by the French Agency for Ecological Transition (ADEME), the French Ministry of Ecological Transition, and twenty-one major companies aims to define the foundations of a rigorous and ambitious corporate climate strategy, aligned with science and with the objectives of the Paris Agreement.

The existence of these green policies have resulted in the development of a number of green financial products for the Barbados market, with some products being offered from as early as 2013. The majority of financial institutions surveyed offer some type of green loan product. These ranged from green auto loans and green business loans to commercial building loans. Banks also currently provide green home equity loans to allow customers to use the equity in their homes to green their property. Other more specialised green products identified by respondents were underwriting green bonds and the refinancing of debt with the savings directed towards green initiatives. There is still room for growth in the market as the banks currently do not offer green debit/credit cards or green deposits (Figure 2). Green credit cards would allow customers to direct a portion of every purchase to supporting their preferred green NGO, charity or activity. Green deposits are an investment product that earmark an individual's savings to be invested in

green projects.

Figure 2: Types of Green Financial Products



Source: Survey of Financial Institutions

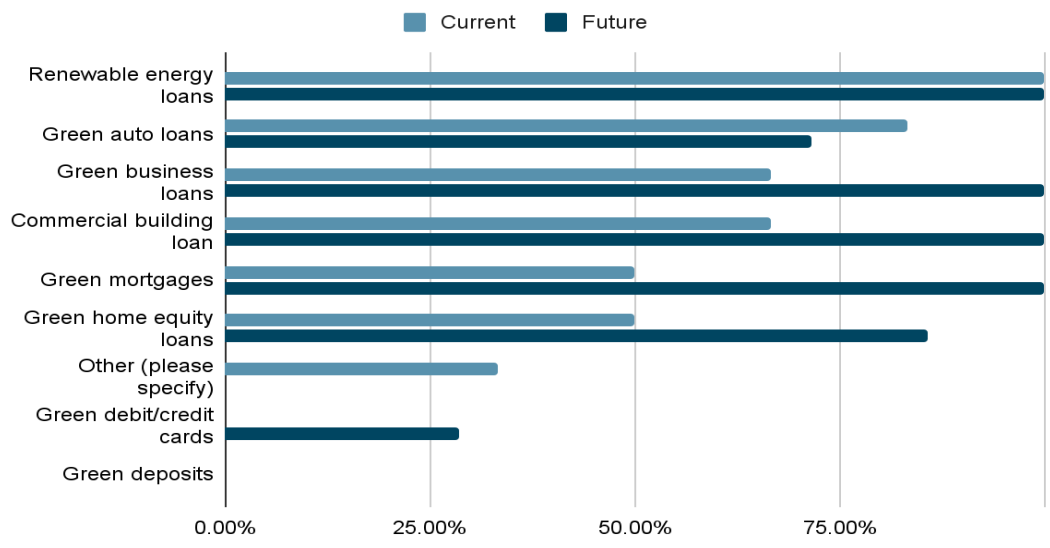
While the majority of green products outlined in the literature were found to be present in Barbados' financial landscape, the results showed that the proportion of institutions offering incentives for green financing, were in the minority. Only 20 percent of participants offered incentives for financing electric or hybrid vehicles, while 30 percent offered incentives for other renewable energy purchases. By offering lower interest rates to clients for energy efficient products, lending agencies can stimulate demand for green financing (UNEP Finance Initiative, 2007).

Despite 70 percent of participants reporting an increase in demand for green financing products over the last 5 years, the proportion of commercial banks' loan portfolio devoted to green loans, however, is still quite small. The average bank reported that just 7 percent of their loan portfolio was directed towards green products, with one bank reporting that this ratio was just 1 percent. There was one bank, however, which indicated that its portfolio of green loans had risen to now represent 20 percent of its overall loan portfolio. Perhaps one of the reasons for the growth in green loans at some banks is the relative ease by which consumers can access these products. When asked their views in relation to the following statement "The evaluation and qualification process for green financing at my institution is more detailed than the evaluation process for traditional financing" most banks either indicated that they disagreed or were ambivalent in relation to the statement.

Respondents were invited to select the products they would be willing to offer to their customers with no restrictions on how many they could select. The results suggest that financial institutions are overwhelmingly interested in offering green loans over other product types. An expected result as green mortgages, auto loans, renewable energy loans and commercial building loans would be easier to establish in the country given existing knowledge capacities (Figure 3). Interestingly, none of the financial institutions reported any interest in providing green debit or credit cards and only roughly 30 percent were willing to offer green deposits. The hesitancy from the financial institutions could be indicative of a lack of awareness surrounding the product or an unwillingness to pay the cost differential associated with creating the cards from more sustainable or recycled materials. Similarly, the low interest in green deposits could also speak to a lack of awareness or a belief that is unnecessary. However, green deposits could present an easy

way for financial institutions to link their client's liquidity requirements with their sustainability goals. These results suggest that almost every financial institution on the island should begin offering some type of green financing tool during the medium term. Additionally, surveyed financial institutions noted that they would be willing to designate an average of 30 percent of their financing portfolio's to green projects, an anticipated increase from the current average of 7 percent, with some commercial banks indicating that they are targeting ratios of 50 percent green loans and one bank noting that this could rise to as much as 60 percent.

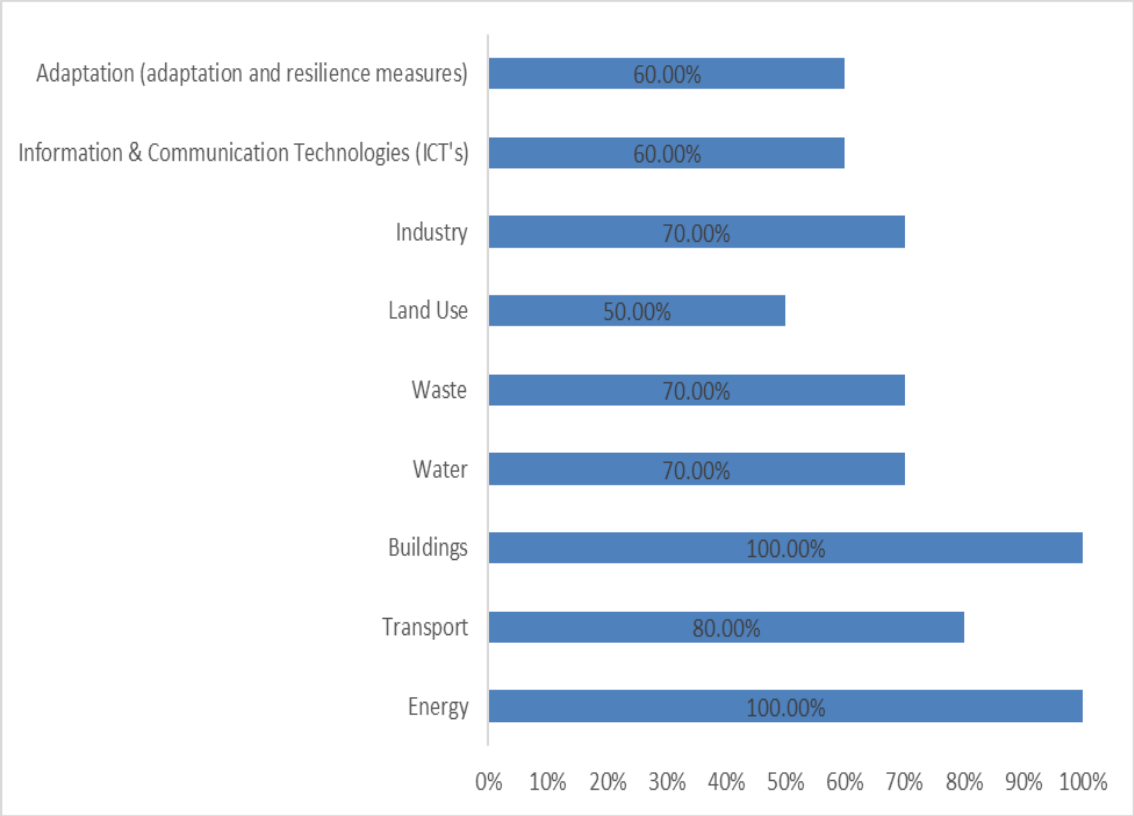
Figure 3: Current versus Future Available Green Financing Tools



Source: Survey of Financial Institutions

Respondents were asked to identify the types of projects they would be interested in financing, choosing as many that apply (Figure 4). Buildings and Energy related use of proceeds projects are preferred by financial institutions. The incomparable interest in energy projects could be indicative of inertia by institutions who prefer industries that have proven track records but could also reflect their broader strategic goals. Other possible explanations are simply increased market demand or risk mitigation. The demand for green buildings and renewable energy is increasing globally. Consumers, businesses, and governments are increasingly seeking sustainable solutions to reduce their environmental impact.

Figure 4: Use of proceeds which financial institutions are willing to fund



Source: Survey of Financial Institutions

When asked if entities would finance a loan or project with unclear use of proceeds, all respondents required clarity and transparency on how the funds would be used after disbursement. It is important for projects to have clear use of proceeds documentation especially at the embryonic stages of the development in green financing for several reasons. The most important being linked to risk mitigation. Two main tasks of green finance are to internalise environmental externalities and to reduce risk perceptions in order to encourage investments that provide environmental benefits (Berensmann and Lindenberg, 2016). Clearly specifying the use of proceeds enhances the project's credibility and transparency. It provides assurance to bankers and other stakeholders that the funds will be utilised for environmentally beneficial purposes. Transparent reporting and monitoring of the use of funds build trust among investors and lenders, thereby facilitating the flow of capital into green projects.

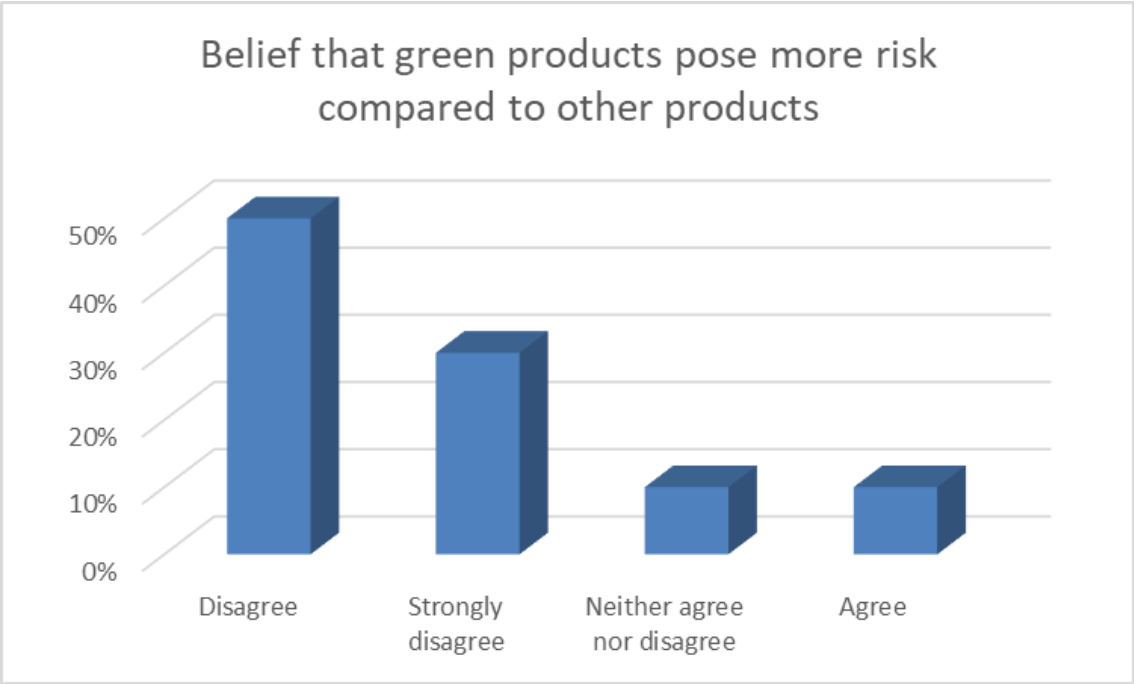
Respondents were invited to rank factors that influence their decision making in providing financing for green uses in order of importance. Currency preferences, size of the project and interest rates were ranked as being the most important for financial institutions when making decisions surrounding providing finance for green uses. As a small open economy with a fixed exchange rate, these findings were not surprising, however our findings suggest that financial regulations were of the least importance, consistent with the literature. While industry-led initiatives play a significant role in driving innovation and risk management, the involvement of central banks and financial regulators is crucial in mainstreaming green finance (Park and Kim, 2020). They have the responsibility to ensure climate-related risks are properly measured, verified, and reported. Hesitancy from central banks to ease capital requirements for green lending without clear evidence that

green finance carries lower risks has created some ambiguity providing an explanation for its lack of consideration in decision making for local financial institutions.

Respondents were further asked what would inspire them to provide green financing options to customers and to also rank the main market tools and mechanisms that they believe would support the development of green financing in the region. Approximately 90 percent of all respondents agree that the growth of green financing in their local markets would encourage them to provide further green options to customers followed closely by higher returns. The challenge the industry is therefore facing, is which bank will be the vanguard and be the first to expand their green portfolios. However, respondents do agree that greater support from governments through grants, credit guarantees and regulations could accelerate the development of the industry. Unfortunately, the feasibility of such an approach is constrained by limited fiscal space typical in developing countries. The United Nations Environmental Programme suggests that governments in developing countries should first seek to draft policies that would best align green financing to the country's sustainable development priorities, which once implemented growth should naturally follow (UNEP,2016).

The literature noted that market failures, such as underdeveloped risk assessment methodologies, have the potential to hinder the incorporation of environmental considerations into decision making. Consequently, financial institutions lend more in areas where risk is perceived or determined to be low. When participants were asked whether they believe green products pose more risk compared to other products, the vast majority of respondents indicated they disagreed (see figure 5).

Figure 5: Do green products pose more risk than other types?



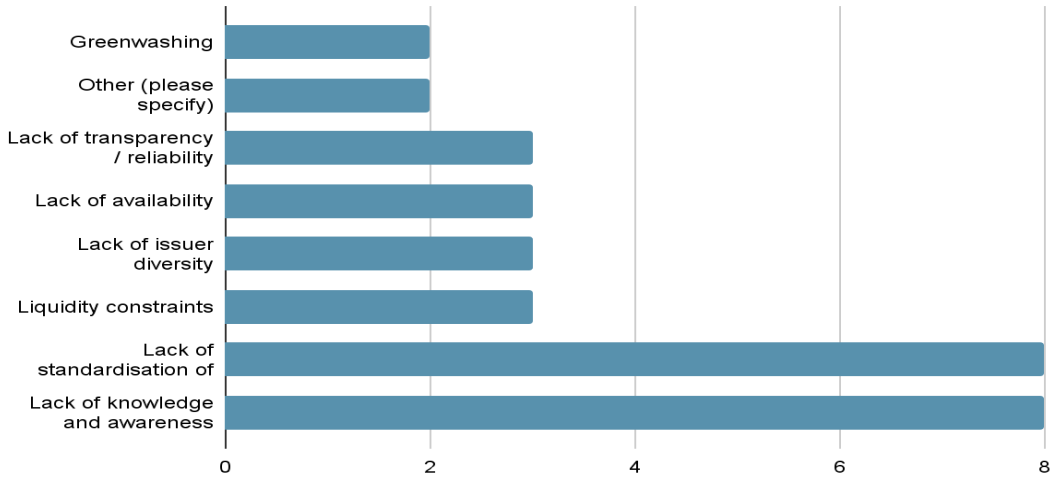
Source: Survey of Financial Institutions

As it relates to the perception of financial regulation and Government support, 80 percent of respondents believe current financial regulations promote the development of green financing, while 60 percent believe adequate support is provided by the Government towards green financing development.

When asked what were the main obstacles to establishing green financing in the region, a resounding 80% of respondents felt that the lack of standardisation of policies and definitions coupled with a lack of knowledge and awareness surrounding green banking were identified (See figure 6). The call by regional corporations for regional standardisation of policies and regulations is not new. Daley (2006) argues that CARICOM regulators need to be proactive and harmonise financial regulations in the

industry in order to safeguard the financial environment in a liberalised global economy punctuated by increased capital mobility. Beyond the security concerns of standardised regional financial regulations, it is also a financial concern to operating entities. Regional financial institutions usually operate in more than one neighbouring island, which all have differing financial regulations. This makes it difficult for banks to develop consistent strategies and products across the region contributing to confusion and uncertainty for both banks and potential investors. This uncertainty forces banks to increase their due diligence which comes with added costs without a guaranteed return. To overcome these challenges, green financing represents an opportunity for regional governments to engage in meaningful collaboration and coordination towards achieving shared goals. Establishing common definitions, criteria, and reporting frameworks for green banking can enhance consistency and facilitate knowledge sharing. Additionally, targeted capacity-building programs, awareness campaigns, and industry forums can help improve understanding and adoption of green financing practices.

Figure 6: Main Obstacles to Green Financing



Source: Survey of Financial Institutions

The surveyed institutions were asked to identify actions that would boost the attractiveness of green finance. In response, one institution indicated that adequate incentives existed , while the remaining responses offered suggestions such as, streamlining government approval processes for larger green infrastructure projects, reduction in the time to grant MOE License to connection to the Grid, increased returns on investment through attractive committed rates for supplying energy to utility company, further incentives and funding options from government including noticeable cost reductions through more cost effective sourcing of inputs including reduced taxes, enhancing the regulatory framework and some credit guarantees to mitigate potential risks. *how these responses compare to literature.

4.4 Case Study

Green Financing Products

Initiatives such as The Paris Agreement represent an international treaty regarding the climate change agenda and signify global commitment towards combating climate change and adapting to its negative impacts. In order to mitigate global warming and adapt to the adverse effects and implement climate-resilient measures, significant financial resources and large-scale investments are required (UN Climate Change, the Paris Agreement). Therefore, the provision of climate finance by the banking sector is crucial to unlocking affordable access to funds and encouraging investment in sustainable ventures such as renewable energy typically through lower interest rates (Dashi 2023).

Komea-Frimpong et al. (2020) conducted a systematic review of relevant studies on green finance within the context of the banking sector. Analysing research on green finance produced by country in terms of the volume of publications by institution, author and journal may serve as a useful indicator of the scale of industry practice. Amongst the 46 papers selected for review, the study revealed that China, followed by the United Kingdom and Italy produced the most research on green finance, in terms of the volume of publications by institution, author and journal. Further emphasizing Asia's dominance in the green finance arena, other countries in Asia, including Malaysia and Bangladesh, have also produced research on green finance. In addition to the United Kingdom and Italy, who placed second and third in the country-level analysis, other countries in Europe (the Netherlands, Spain, France, Germany, Poland and Luxembourg) have also contributed to green finance research, highlighting Europe's commitment to preserving the environment. The United States and Canada ranked fourth and tenth in the country-level analysis respectively, a result which is consistent with the view that progress

towards achieving the SDGs is slower in North America, compared to Asia and Europe (Komea-Frimpong et al. 2020).

The review of green finance publications conducted by Komea-Frimpong et al. (2020) also identified commonly found green finance products offered by banks. The table below compares popular green finance tools found in the literature to products offered by banks and non-bank financial institutions in Barbados. Table 3 shows that the vast majority of green financing tools referenced frequently in the literature are available in Barbados, with the exception of green bonds, deposits and cards.

Table 3.

Green Financing Tools	**Most Reported Globally***	**Barbados**
Green Mortgages	●	●
Green Home Equity Loans	●	●
Renewable Energy Loans/Carbon Finance (Long Term)	●	●
Green Auto Loans	●	●
Green Business Loans/ Green Credit (Short Term)	●	●
Green Commercial Building Loans	●	●
Green Bonds	●	
Green Deposits	●	
Green Credit/Debit Cards	●	

Source: *Isaac Akomea-Frimpong , David Adeabah , Deborah Ofosu & Emmanuel Junior Tenakwah (2021): A review of studies on green finance of banks, research gaps and future directions.

Determinants of Green Finance

A review of studies on green finance conducted by Akomea-Frimpong et al. (2020) ranked the main factors influencing bank's decisions to provide green finance across the 46 papers selected for review. The top five determinants of the provision of green finance found amongst research conducted in Asia, Europe and North America were, increased pressure from global organizations such as the United Nations to implement environmental protection measures, followed by requirements from national regulatory bodies for banks to obtain green certifications, green credit scores and other measures of environmental innovation, demands from customers to implement green policies, risk associated with issuing green finance, as well as improving the corporate image, customer loyalty and attracting new customers through taking action in social concerns. Remarkably, interest ranked as the 6th determining factor of a bank's decision to provide green finance, possibly due to comparatively low interest rates generally offered to encourage customers to select green financing options (Akomea-Frimpong et al. 2020).

In comparison to the review of green financing studies conducted by Akomea-Frimpong et al. (2020), bank and non-bank financial institutions in Barbados ranked the main factors influencing a banks decision to provide green finance as financial regulations, potential returns of the project, credit ratings of the borrower, green credentials of the borrower and interest rates, in that order. Similarly, the responses from the green finance survey conducted in Barbados indicated that regulations are of significant importance in a financial institution's decision to provide green financing products, while interest rates are of lesser importance compared to other determining factors in a financial institution's decision to provide green financing products. Comparatively, while financial institutions in Europe, Asia and North America are required by national regulatory bodies to report

on green initiatives, this is currently not the case in Barbados and as a result, only 20 percent of respondents noted that they disclose data regarding environmental, social and corporate governance (ESG). Further, 10 percent of respondents noted ESG information was available at the parent, level while 10 percent indicated they would be disclosing ESG information in the near future and 90 percent indicated they would be willing to incorporate environmental and social concerns into financing decisions. In agreement with the results discovered by Akomea-Frimpong et al. (2020), 80 percent of bank and non-bank respondents to Barbados' green financing survey noted that incorporating environmental concerns into financing decisions forms part of an institution's corporate social responsibility.

5 Conclusions

While there is room for growth, this research showed that the Government of Barbados as well as commercial banks, trusts, finance companies and merchant banks operating on island, have implemented some measures to encourage and provide financing for environmentally friendly products. Analysis of budget estimate speeches from as early as 2006, indicated that the government of Barbados has employed the use of various measures such as reductions on taxes on electric/hybrid vehicles, income tax filing reductions as well as grants to encourage investment in green products. As it relates to the private sector institutions surveyed, most of the major green financing tools discussed in the literature are currently available in Barbados. Based on the author's findings, other green financing tools which can be considered for future implementation by the public and private include, green bonds and green credit/debit cards.

These conclusions were drawn by analysing the results of a survey which was administered to representatives of the aforementioned financial institutions. Possible avenues to expand the research include, conducting focus groups with representatives from these institutions to obtain deeper information on the perspectives of these companies in relation to greening. Additionally, the analysis can be extended to include credit unions and insurance companies regulated by the Financial Services Commission, who also play a critical role in Barbados' financial sector. Lastly, the survey could also be administered to personnel at the Ministry of Finance, Ministry of Energy and various stakeholders in Barbados' green energy initiative in order to gain a holistic view of the current status of green financing in Barbados.

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