Financial and institutional Impediments to Effective Implementation of Sustainable Green Financing of Renewable Energy in Ghana

Author’s Details:
Francis Atta Sarpong 1*, Larsey Naphtali Akwetteh 1, Kalissa Fatoumata Kir 1, Jesse Jackson Makwetta 1 Benjamin Blandful Cobbinah 1
1 School of Economics and Management, Anhui University of Science and Technology, Huainan, PR China
Emails: francis.sarpong@stu.ucc.edu.gh (F.A.S); nlarsey.nl@gmail.com (L.N.A);
kfatoumatakir25@gmail.com (K.F.K); jmakwetta@yahoo.com (J.J.M); bencobbah421@gmail.com (B.B.C)

Abstract:
Access to clean and reliable electricity is significant in many emerging African nations, including Ghana. The study examined the institutional and financial impediments to providing an investment-focused framework for promoting and developing the country's rich renewable energy resources for sustainable economic growth and improved social life. To accomplish this objective, unprecedented financial and technical expenditures will be needed. Ghana has difficulty achieving universal access to modern energy services due to a lack of energy sector investment. The impression is that the area contributes little to global greenhouse gas emissions and therefore provides limited opportunities to decrease emissions, thereby excluding climate financing initiatives. A power purchase guarantee has been proven to encourage energy industry investments. Due to various technological, legal, and financial obstacles, warranties of power purchases such as Feed-in Tariffs are sluggish to develop in Ghana. Using Ghana as a case study, this paper examines the difficulties of renewable energy deployment and climate change management in Sub-Saharan Africa. These challenges include a lack of high-quality investment risk assessment data, limited potential risk assessment, clarity about what green financing entails, credit and capital market risks, and a lack of domestic and green investors. A green finance maturity mismatch affects green sector investments. This research identified substantial investment possibilities in Ghana's energy, agricultural, transport, waste management, industrial, and construction sectors. They are essential to establishing a green economy, and national development strategies have been created to assist them.

Keywords: Green finance, Renewable Energy, Financial impediments, Institutional Barriers, Ghana

1. Rationalization of the Study

The depletion of primary energy supplies and global warming are just a few reasons the world is undergoing a sea change and moving toward an energy transition away from fossil fuels and toward renewable and sustainable energy sources [1-3]. From the 1992 UNFCCC through the 2015 SDGs, many worldwide measures have been made to eliminate poverty and fight climate change by providing universal access to cheap, dependable, sustainable, and modern energy. Deploying ambitious plans to mitigate global warming has proven difficult in Africa's impoverished countries, resulting in little investment in renewable energy [4-5]. However, Africa's enormous population expansion, which results in a dramatic rise in energy consumption, and the 600 million people projected to live without power by 2030 are the primary reasons for enforcing a swift course correction. Indeed, investing in renewable energy options in Africa has become critical in energy fulfilment, reducing reliance on imported energy, solving the absence of or depletion of primary energy sources, and providing universal access to power [1, 6-9].

Numerous shortcomings have slowed the implementation of clean and renewable technologies, limiting their share of electricity production (excluding hydropower) to 3% in 2016 [12]. Investors have
interpreted this low investment appetite as a sign of market instability and high perceived business risks. Many studies point to political instability, economic uncertainty, an outdated legal and regulatory framework, a lack of transparency, and a lack of political will as major present hurdles in the African renewable energy sector.[10-11]. Financing renewable energy is one of the most significant impediments to successfully developing and implementing in Ghana[13-16]. This has resulted in increased access to energy efficiency initiatives to resolve energy sources such as electricity, solar, and coal mining, among others. Ghana is one of the economies of the Economic Community of West African States (ECOWAS) that is blessed with significant renewable energy sources. The administration has made it a priority to see that prioritised seeing All Agenda is implemented [12 , 17-19]. In 2011, the government enacted the Sustainable Energy for All Act to guarantee that all citizens, especially those living in rural regions, have access to sustainable energy.

To combat this problem, a concerted effort at many levels is needed. To begin, Africa needs a strong political will and commitment to the energy transition, supported by comprehensive capacity building initiatives [20-22]. Second, creating an open, transparent, and competitive market at the legislative level requires a clear and adequate policy and regulatory framework. Finally, to reduce perceived risks connected with investing in African countries, it is essential to transfer funds to the right market participants and use financial de-risking processes. Competitive auctions and PPPs are two important methods for expediting the ressentiment of renewable energy systems throughout the continent [23-25]. For primary energy in Ghana (GhaBiomass) comes first, followed by an oil reserve for primary energy in Ghana (40 percent). Then comes natural gas and hydropower, which contribute for 3% and 7% of the total primary energy supply, respectively[26-27]. The Africa-EU cooperation was established in 2000 to help Africa attain the SDGs by 2030 by providing grants, high-level talks, technical assistance, risk capital, interest rate subsidies, and guarantees [28-30]. The EU External Investment Plan (EIP) was launched in 2017 by the European Commission to help partner nations in Africa and the EU Neighborhood achieve the SDGs by 2030. Over 100 financial instruments have been created to support renewable energy development in Africa, with only 17 relevant to our study [31-33].

The lack of modern energy to support basic needs such as cooking, heating, lighting, and primary energy services for manufacturing, services, schools, health centres, and income generation, which approximately two-thirds of the continent's population suffers from, is one of the most severe challenges confronting African countries like Ghana [32, 34-37]. To make sure that everyone in the world has access to energy, it is imperative to take local action and cooperate with other countries. IRENA reports that Africa's primary energy supply increases at 3 percent per year primarily due to population growth. The Renewable Energy Master Plan (REMP) wouldn't have been possible without the support of many financial institutions and other stakeholders. The "China-Ghana South-South Cooperation on Renewable Energy Technology Transfer" project provided funding for the plan, which is a cooperation between Ghana's Energy Commission, China's Ministry of Science and Technology, and the UNDP's Accra and Beijing Country Offices [32]. This project, sponsored by DANIDA, is designed to help Ghana capitalize on China's extensive development expertise through knowledge and technology exchange. Sustainable finance is the financial support of investment in economic management that promotes green products and environmentally-friendly activities that help create a more sustainable economy. The phrase "green finance" refers to the funding of green growth. A robust eco-finance sector is essential for both financial and environmental sustainability. This group of financial instruments includes everything from public money to equity to project financing to debt.

2. Purpose of the Study
The study's primary objective was to determine Ghana's financial and institutional barriers to successful green financing deployment in renewable energy. The purpose of this study was to determine the financial impediments to green financing in Ghana's energy sector, to examine the effect of financial institutions' roles on renewable energy financing in Ghana, and to identify strategies for overcoming the financial impediments impeding the effective implementation of green finance in renewable energy in Ghana.

2.1. Green Lending in Ghana

The short-term borrowing of Ghanaian banks, which dominates the system, is the primary cause of the structural maturity mismatch of the Ghanaian financial system. Consequently, it is difficult to obtain long-term funding for green investments in Ghana [40-42]. On the other hand, a suitable alternative to bank financing is also hard to find. This is a common trait in financial systems in developing countries. Credit supply and demand imbalances contribute to maturity mismatches. As a fundamental function of the banking system, maturity transformation (e.g., borrowing short-term and lending for longer durations) could hinder many green efforts [41-43]. One way to reduce our carbon footprint is to make these two industries greener. It would be best if the government, in collaboration with financial institutions, looked into green bonds. Similar to traditional debt financing, a green bond is a loan issued to finance environmentally friendly projects. The issuer will utilize the money raised to fund green projects. To resolve the maturity mismatch in green financing, long-term green credits and investments may be financed with low-cost funds via the usage of green bonds in Ghana. This may help lessen some of the age discrepancies and the challenges involved in extending long-term green loans. Such financial institutions may be encouraged to issue green bonds if green bond criteria are created at the local level and regulations are passed to compel them to do so. It may also serve as a source of investment funds by becoming a financial firm's anchor investor [46-49]. A green bond should be attractive to pension funds and insurance companies since they manage significant asset pools. Ghana may use concessional loans and a combination of debt types to solve any maturity mismatches [26]. Two main reasons are why Ghana may profit from green bonds in its move to a green economy. According to the B&FT and EMEA Finance reports, Ghana has some of Africa's best bond market performances (2017; 2017) [27].

Furthermore, governments may use green bonds to raise money for green infrastructure and help lower the cost of financing for green projects by attracting new investors and getting private capital flows. Three sovereign green bond issuers in 2018 were Ghana, Nigeria, Seychelles, and Indonesia, which together raised $16 billion. In contrast to the global corporate green bond market, which issued more than $170 billion in 2018, global sovereign green bond issuance is still in its infancy.

3. Emerging Issues in Green Financing

3.1. Green Financing Framework

The shift to a low-carbon, climate-resilient economy will need substantial economic investment in "green" industries [33]. According to [14], the yearly investment required to achieve a green economy between 2010 and 2050 will be about 2% of world GDP. One of the most significant characteristics of environmentally friendly investments (especially in renewable energy and green technologies) is the integration of numerous technologies at various maturity levels; each of these technologies may need a different kind of financing [35]. Furthermore, the financial needs for a sustainable transition may be considerably more significant than the capacity of the public sector, necessitating substantial private sector participation and more targeted use of current funds [16]. From this vantage point, GF is essential in promoting environmentally friendly investments by businesses, assisting governments in reducing emissions, decarbonizing economies, and adapting to the effects of climate change [47].
According to [38], GF includes any "financial investment in projects and efforts for sustainable
development, environmental products and policies promoting the establishment of a more sustainable
economy." GF consists of all financial goods and services targeted towards the broader spectrum of
environmental goals, such as industrial pollution management, water, sanitation, and biodiversity
preservation. In addition, operational expenditures for green investments (excluded from the definition of
green investment, e.g., project planning and site acquisition fees) are included, making it more challenging
to fund these expenses [49].

GF features are public funds, venture capital, business angels, project financing, equity, debt,
pension funds, and green infrastructure bonds. In terms of different funding mechanisms, specific phases of
green project are best suited to various methods: venture capital for untested and experimental
technologies, project finance for established technologies, and green infrastructure bonds for later stages (e.g.
operational refinancing). The instruments of all GFEs are made with an eye toward environmental
sustainability by basing investment and lending decisions on environmental screening and risk assessment
[50]. Furthermore, GFs post-closing monitoring and risk management processes also consider
environmental issues [51-54]. Investors should be forced to invest green for several reasons, including
ethical considerations, attractive return profiles, legal or regulatory limitations, and improved investor image
[55].

A growing body of research [54] examines the efficacy of GF by looking at how lower amounts of
money may be utilized to allow a sustainable transformation. According to [56], the success of GFs is
contingent upon many variables, including the efficacy of the green project, the sustainability of the
financed investment, and the openness of decision-making procedures. On the other hand, green initiatives
show a variety of case-specific features compared to different kinds of investment projects. First, the
majority generate cash flows and profits over the long run, despite the substantial initial investment needed
[64]. Second, they often exhibit an unfavourable risk/reward profile due to green sectors' relative immaturity;
this raises investors' sense of risk connected with the future development of technology and markets [33].

Despite recent advances in some environmentally friendly technology, they remain in their infancy in
terms of market adoption, increasing the volatility of this type of investment. Meanwhile, investors must
also deal with the effects of further market distortions caused by traditional high-emission technologies
becoming more mature. A third factor is that green investments are highly dependent on public support,
which is frequently unpredictable and unclear. This volatility and the uncertainty in the regulatory and
policy climate, in turn, contribute to the overall risk for investors [55]. A significant number of investors
have been put off by the factors described above, creating a financial gulf that is restricting financing to
environmentally friendly projects, especially for smaller companies [36]. In summary, the capital market
friction arising from investments in green business initiatives increases the cost of external capital for
companies trying to fund their projects via internal sources [67]. For this reason, shortfalls in internal
resources lead to companies being "financially constrained," making it impossible for them to fund their
planned projects [48].

There is a shortage of empirical data, however, on the investment decisions of green companies. We
know of just one study performed [29] and concluded that the financial fragility of eco-innovative
companies significantly decreases their likelihood of becoming involved in investment projects.
Additionally, several studies have researched companies' economic challenges, but none have focused on
environmentally conscious decisions [67-70]. However, research on this connection has resulted in varied
findings attributed to the financial constraint proxy employed to assess financial constraints. The results are
much more diverse when cash flow has been used as a proxy for available internal funds, especially when a
proxy measure is used [16, 35, 43-46]. While others have shown the opposite, some research has
demonstrated that companies' investment decisions are substantially cash flow sensitive. But, when employing an explicit measure (e.g., ad hoc surveys that get businesses' views on financing projects) to examine financial limitations, it seems like findings point clearly to the presence of these restrictions in firms' investment behaviour. This research tries to fill a gap in the literature by utilizing a direct financial constraint measure gathered from a pool of biomass production experts through a survey.

3.2. Green Financing in Ghana

Ghana has set its eyes on the green economy as a means to meet its development objectives, and a lot of work has been done to transform the country's fiscal policy to encourage green finance. These initiatives are in line with national development targets and global environmental standards. As defined by the United Nations Environment Programme (UNEP) (2012), the Green Economic Initiative promotes human well-being and social justice while significantly reducing environmental risks and ecological scarcities. You will need a large quantity of green finance to change to a green economy. Public, corporate, and nonprofit investment in projects and activities that create a more sustainable economy is green finance [70].


PAGE also supports developing sustainable banking systems in Ghana within the framework of greening the economy as pursued by the Bank of Ghana in partnership with the International Finance Cooperation (IFC), the Ghana Association of Bankers, and the Environmental Protection Agency. Another goal of the program is to reconcile Ghana's green economic policies with the Sustainable Development Goals and the country's Paris Climate Agreement objectives. Together, the IFC and the Bank of Ghana designed an Environmental and Social Risk Management (ESRM) framework for Ghana's banking sector, intending to green the country's economy. Technical support to bolster the organizational structure will be provided by the IFC as per the agreement. Without a doubt, this attempt would affect the development of environmentally friendly financial goods in Ghana's financial industry. In the long run, this study aims to investigate the private sector's role in green finance in Ghana and the prospects for stimulating the market. The goal is to raise awareness in Ghana's business community of the significance of sustainability and enable businesses to access green finance to help contribute to Ghana's long-term growth.
Helping the Ghanaian government and critical stakeholders put into practice policies that promote the sustainability and growth of green finance in Ghana. This study may help in the scaling up of demand for green financing and investment in various areas of the economy, which would promote Ghana's green economy transition. The research results will help PAGE assist the Ghanaian government and other non-state actors in implementing critical sectoral changes and expanding green financing in Ghana [8]. A mixed technique approach, including desk review, survey, in-depth interviews, consultations, and stakeholder interaction, was utilized in the study. These represent the opportunities and challenges to expanding green financing in Ghana.

3.3. Innovative Finance

The concept of innovative development financing is still under debate. The World Bank, in a recent study, defines aid according to the source of funds (e.g., publicly or privately raised) and the use to which it is put (e.g., for public or private benefit): According to the World Bank, USD 57.1 billion in total official transfers was raised between 2000 and 2008, as well as USD 11.7 billion in concessional transfers. The more significant figure includes things that are often not considered creative finance, like the financial support offered by developing nations (USD 10.7 billion) and multilateral development bank local currency bonds (USD 40 billion in 2000-08). The numbers are much lower if one ignores the bank's solidarity levies, catalytic mechanisms like carbon finance, and public-private partnerships (USD 3.6 billion). Another concept of innovative finance includes the following: it should serve as a supplement to or as a complement to aid, rather than to aid's substitute; and the financial trend should be predictable and stable over time with long-term commitments and new taxes or other permanent sources of funding.

4. Barriers to Green Financing in Ghana

Despite the potential options described above, the private sector faces many obstacles in accessing green funding. These obstacles include mismatch of maturity, the lack of high-quality investment risk assessment data, limited potential risk assessment, a lack of clarity about what green financing constitutes, a shortage of domestic and green investors, credit and capital market risks and the poverty of domestic green investors and a lack of policy framework. Investments in green sectors are affected by a green finance maturity mismatch. Because banks are restricted in their capacity to offer good long-term loans, there is a problem with financing long-term green projects [56]. Short-term bank loans in Ghana make it challenging to fund sustainability projects. The private sector, to support the long-term green investment options presented in this study, need long-term loans; however, such loans are rare. The world has very little data and analytical capacity to understand and estimate investment risks and risk mitigation strategies in all sectors with green financing prospects. Private-sector investment needs are restricted because of the difficulties involved with taking on long-term projects in green sectors. However, because of a lack of knowledge, it is difficult to judge these risks. Also, the project assessment, customer demand projections, and financial flow studies, all of which are essential preconditions for business decision making, lack available data. Financial institutions, institutional investors, and independent risk rating firms in Ghana have a poor understanding of the risks of investments in green finance since they cannot properly assess, identify, and measure them [48, 54, 71].

Subtly, Ghana is deficient in professionals that specialize in environmental investment and long-term green financing. Private sector demand for green financing is being thwarted by the absence of an agreed-upon definition of what constitutes green finance activities. Private businesses are not sure how to invest in 'green' finance, and the term's exact meaning is unclear. The absence of local and environmentally conscious investors in Ghana hinders demand for green finance. Institutional investors are so-called "patient" investors that invest in long-term sectors and are slow to move their assets. Unfortunately, the findings indicate a
shortage of institutional investors in Ghana. Because these investors are split between different interests, numerous decision and approval points have been created, slowing the decision process to invest in green sectors. Due to their limited collateral and weak credit history, SMEs, the most common prospects for green finance, have limited collateral values [34, 48, 56-59]. This makes it impossible for them to engage in green industries since they have no access to green funding (even if they exist). A problem with long-term green investment, as you may see, is that counterparty creditworthiness is often present. According to the evaluation of the banking sector study, the banking industry's high levels of non-performing loans were noted as a hurdle to green finance. Despite attempts to overhaul corporate governance, the banking industry's total deposits grew by 20% (up to $13.87 billion) in 2018, and interest rates on short-term instruments were lowered from above 25% in 2017 to 17% in 2018, yet significant NPLs persist as a stumbling block to development. For example, in 2018, 95.5 percent of Ghana's non-performing loans were held by the private sector. There is some uncertainty around Ghana's green finance strategy. Investors have little fundamental understanding of government plans to promote green financing. Most of the existing policy instruments appear too complex; thus, their application into sound financial decision making may be delayed. The financial industry often neglects to follow the sector-specific regulations that may inadvertently affect its clients [6, 17, 30].

5. Opportunities to Green Financing Ghana

The research identifies substantial green financing possibilities for Ghana's business community across many sectors, including energy, agriculture, transportation, waste management, and industrial and commercial construction. There are possibilities for green investment in Ghana's energy industry, for example. Ghana is prosperous with renewable energy resources, most notably biomass, solar, wind energy, steel kilns for charcoal manufacturing, biomass power plants, biogas power plants, wind power, photovoltaic solar energy, improved cookstoves, and LPG stoves. Together with Ghana's increasing energy consumption, these changes offer investment possibilities for the private sector to pursue. Private companies may increase green investment in agriculture by expanding afforestation projects on deforested areas and in the cocoa industry.

Financing possibilities in the transportation industry have been found in rail, water, and bus rapid transit (BRT). Ghana's transportation strategy, which aims to reduce emissions from road transportation, encourages private sector involvement. Investing in a more efficient, well-maintained, and environmentally friendly transportation system is critical for Ghana's competitiveness. Thus, there is the possibility of integrating green finance methods into transportation sector projects. In the trash industry, there are opportunities for green financing. Composting technologies, biogas power plants, substantial municipal landfills, composting plants, and wastewater treatment plants are all examples of these.

Additionally, there are many opportunities to green the construction sector. The energy-for-all initiative and government policies aimed at attaining a 10% energy mix by 2020 offer further greening the construction industry. Due to Ghana's high power cost compared to other sub-regional nations, there is a strong need for energy-efficient equipment in households and businesses. There are many green investment possibilities in the water industry, including infrastructure management, technical solution design, water conservation and quality, and solar water pumps. The primary reason for investing in green projects is to get market access, improve company image, attract investors, and reduce operational expenses.

6. Recommendations and Implications of the Study

Despite the potential options described above, the energy sector faces many obstacles in accessing green funding. These obstacles include mismatch of maturity, the lack of high-quality investment risk assessment data, limited potential risk assessment, a lack of clarity about what green financing constitutes, a
shortage of domestic and green investors, credit and capital market risks and the poverty of domestic green investors and a lack of policy framework. Investments in green sectors are affected by a green finance maturity mismatch. Because banks are restricted in their capacity to offer good long-term loans, there is a problem with financing long-term green projects [56].

Short-term bank loans in Ghana make it challenging to fund sustainability projects. The private sector, to support the long-term green investment options presented in this study, need long-term loans; however, such loans are rare. The world has very little data and analytical capacity to understand and estimate investment risks and risk mitigation strategies in all sectors with green financing prospects. Private-sector investment needs are restricted because of the difficulties involved with taking on long-term projects in green sectors. However, because of a lack of knowledge, it is difficult to judge these risks. Also, the project assessment, customer demand projections, and financial flow studies, all of which are essential preconditions for business decision making, lack available data. Financial institutions, institutional investors, and independent risk rating firms in Ghana have a poor understanding of the risks of investments in green finance since they cannot properly assess, identify, and measure them [48, 54, 71].

Subtly, Ghana is deficient in professionals that specialize in environmental investment and long-term green financing. Private sector demand for green financing is being thwarted by the absence of an agreed-upon definition of what constitutes green finance activities. Private businesses are not sure how to invest in ‘green’ finance, and the term’s exact definition is unclear. The absence of local and environmentally conscious investors in Ghana hinders demand for green finance. Institutional investors are so-called "patient" investors that invest in long-term sectors and are slow to move their assets. Unfortunately, the findings indicate a shortage of institutional investors in Ghana. Because these investors are split between different interests, numerous decision and approval points have been created, slowing the decision process to invest in green sectors. Due to their limited collateral and weak credit history, SMEs, who are the most common prospects for green finance, have limited collateral values. This makes it impossible for them to engage in green industries since they have no access to green funding (even if they exist). A problem with long-term green investment, as you may see, is that counterparty creditworthiness is often present. According to the evaluation of the banking sector study, the banking industry's high levels of non-performing loans were noted as a hurdle to green finance. Despite attempts to overhaul corporate governance, the banking industry's total deposits grew by 20% (up to $13.87 billion) in 2018, and interest rates on short-term instruments were lowered from above 25% in 2017 to 17% in 2018, yet significant NPLs persist as a stumbling block to development. For example, in 2018, 95.5 percent of Ghana's non-performing loans were held by the private sector. There is some uncertainty around Ghana's green finance strategy. Investors have little fundamental understanding of government plans to promote green financing. Most of the existing policy instruments appear too complex; thus their application into sound financial decision making may be delayed. The financial industry often neglects to follow the sector-specific regulations that may inadvertently affect its clients.

7. Conclusions

This study has shown significant investment opportunities in many sectors of the Ghanaian economy, including energy, agriculture, transport, waste management, industry and construction. The growth of a green economy is impossible without them, and national development plans have been established to help support them. Despite the availability of resources, some hurdles exist in green financial development, with both the supply and demand sides of the market-facing reciprocal impediments that drive capital into green sectors. Macroeconomic and microeconomic variables affect green financing. The prospects for green funding are hampered by, among other things, excessively high-interest rates, currency fluctuations, a lack
of understanding of the green economy, market, and credit risk. National and international governments must embrace a green agenda incorporating Green Finance to solve societal issues like climate change and resource depletion (GF). A more wide-ranging conversation in each country has to take place about the global fund's options, limitations, and objectives concerning national action. This research has examined the constraints that biomass producers in Italy face when investing in GFP and how such restrictions may affect their investment decisions. We carried out this research using a two-step design. We began by using voice analysis to find critical articles around the Ghanaian GF debate. Once this was done, we evaluated how well various storylines are perceived as credible in the process of acquiring GF by conducting semi-structured interviews with a sample of biomass specialists. While it seems that a few of our findings point to business-related claims woven together to build narratives about GF as a sustainable development and innovation source, others highlight the institution and financial constraints that companies face. In the eyes of respondents, both accounts were considered trustworthy and comprehensive in their description of the current policies of Ghana regarding the issuance of GFA.

For a green economy and resilient development pathways to succeed, private sector involvement in green financing is essential. The rise in foreign direct investment into Ghana has provided the private sector with a unique chance to help drive capital toward environmentally friendly initiatives. The low carbon economy needs their investments and novel skills. Government efforts to boost green financing in Ghana have included creating an enabling environment for private sector demand for green goods and implementing specific regulatory measures. Yet, there are many obstacles, incentives, and awareness issues that need to be addressed.

Green finance has a chance to become the first choice for businesses that want to make an environmentally friendly investment instead of doing what they would do otherwise. The private sector will have to make up for financing shortfalls overtime when it comes to green initiatives. To expand and attract personal sector finance, governments may cooperate with a range of stakeholders to improve capital flows and develop new financial instruments across various asset classes. The research's main flaw is that it lacks a detailed description of the experiment. However, it is possible that our two-step methodological approach is not the most suitable technique for policy engineering since it does not allow for quantitative assessment of the policies that need to be implemented. Our analysis opens up opportunities for future study that looks at the intricacies of GF from multiple perspectives, for example, from the eyes of different industries and on various geographical scales.

**Reference**


Hjort Ingrid. (2016). Potential Climate Risks in Financial Markets: A Literature Overview, CREE Centre acknowledges financial support from The Research Council of Norway


