

Green Banking: Prospects and Challenges

Emily C. D'amora and Samuel K. Andoh*
Southern Connecticut State University

Abstract

The paper examines the concept of green banking and sustainable financing, the forces driving green banking, and the reasons for this. The paper suggests that the move toward green banking and financing is the result of environmental degradation and the public's demand for remediation. As enablers of the industries that create pollution, financial institutions bear a significant responsibility in leading the efforts to curb greenhouse gas emissions. Also, greenhouse gas emissions are the result of market failures; therefore, there is a need for governments to act. The paper also examines the challenges facing green banking and its prospects. The conclusion is that while green banking displays good growth prospects, there exists three major challenges: (1) limited awareness of green products and services that banks can offer, (2) greenwashing, and (3) the high cost of offering green financial services. Despite these challenges, the paper affirms the potential of green banking to promote sustainability and mitigation of the environmental crisis.

Keywords: banking, climate change, environmental crisis, environmental degradation, financial institutions, green banking, greenwashing, sustainability, sustainable financing

Green Banking: Prospects and Challenges

Since the advent of the steam engine in 1712, a pivotal invention by Thomas Newcomen that marked the onset of the Industrial Revolution, the trajectory of environmental pollution has risen relentlessly to the level of posing as an existential threat to the planet. Ahmed (2024) asserts, "Climate change has emerged as one of the most critical macroeconomic and financial policy challenges that the IMF membership will face in the coming years and decades." This is further substantiated by United States government data, which indicates a steady increase in the main drivers of climate change, namely carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and sulfur hexafluoride (SF₆).¹ Environmental scientists view the current trajectory of greenhouse gas emissions as a direct threat to life on Earth, rendering it unsustainable as a result of economic activities, primarily financed by financial institutions. Therefore, rendering financial institutions as enablers and critical to this crisis's solution.

¹ <https://gml.noaa.gov/ccgg/data/> June 21, 2024

*Correspondence concerning this article should be addressed to Samuel K. Andoh, Economics Department, School of Business, 10 Wintergreen Avenue, Southern Connecticut State University, New Haven, CT 06515, United States. Email: andohs1@southernct.edu

Environmental pollution is a fundamental example of market failure, a case of detrimental externality. In theory, competitive markets achieve allocative and productive efficiency. Allocation efficiency is achieved when society apportions scarce resources to produce the goods and services that maximize social welfare. Productive efficiency is achieved when the goods and services are produced at the lowest possible cost. Implicit in attaining these efficiencies is that all costs incurred in producing the goods and services are internalized.

In practice, sometimes, a portion of the costs associated with production are not borne by producers or consumers; instead, they are passed on to third parties. The resulting cost of global warming to society stems from the emission of greenhouse gases into the atmosphere, the discarding of plastics into the waterways and the oceans, and deforestation for lumber or fuel.

When the market fails to deliver the socially optimal mix of goods and services, the usual recourse is government intervention through enacted laws and promulgated rules and regulations directly on the polluters and/or indirectly on enablers of the pollution, such as the institutions financing the activities. Consequently, financial institutions are cautious toward lending to businesses adversely affected by disasters caused by climate change, not just for altruistic reasons but also for their bottom line. A study by Chiaramonte et al. (2024) concluded that banks can improve financial stability by embracing environmental policies. The authors also suggested that “environmentally engaged banking systems can mitigate the economic costs associated with climate change and environmental disasters.”

Several studies suggest financial institutions increasingly consider environmental factors when making lending decisions. A paper by Coulson and Monks (1999) concluded that banks are taking the environmental impact of corporate borrowers into account as part of their investment decisions. Fard et al. (2020) found that firms facing stricter environmental regulations tend to pay higher interest rates on their bank loans. Lenders also adjust other contractual aspects of loans, such as requiring more collateral, higher upfront fees, and shorter maturities, to mitigate the risks associated with environmental regulations. The negative impact of these regulations on loan costs is particularly pronounced for financially constrained firms, companies in industries with high environmental litigation risk, and firms in bank-based economies. Javadi and Al Masum (2020) reached a similar outcome, indicating that businesses located in areas more vulnerable to climate risk, as measured by drought conditions, tend to pay significantly higher spreads on their loans. Mueller and Sfrappini (2022) found that banks adjust their credit allocations based on businesses' exposure to climate change and regulatory risks. In the United States, banks lend relatively more to firms with lower exposure to regulatory risks, while European banks are shifting credit supply toward firms that could benefit from future regulations. Finally, a study by Bruno and Lombini (2023) discovered that after the Paris Climate Agreement, banks began charging higher margins to polluting borrowers. Banks also respond to increased climate risk by raising both the cost and the volume of credit available to highly polluting firms in countries with stringent climate policies. The share of credit allocated to these borrowers decreased, indicating a reallocation effect within the loan portfolio. The study also revealed that since the Paris Climate Agreement, banks categorized borrowers based on their CO₂ emission intensity at the industry level, increasing the cost and share of loans granted to high-polluting industries. While this is welcome, the consensus is that more needs to be done to prevent the Earth from plunging into a climate crisis from which recovery may not be easy.

The Paris Climate Agreement brought the issue of climate change to the global forefront. Adopted in 2015, the accord was built on an earlier agreement known as the United Nations Framework Convention on Climate Change (UNFCCC, 1992) which had established an

international cooperation on climate, and the Kyoto Protocol (1997), which had set binding emissions targets for developed countries but had excluded developing countries. The success of the Paris Climate Agreement hinged on the near-universal participation of all countries and on the flexible Nationally Determined Contributions (NDCs) that encouraged countries to set their own emission reduction targets. The focus on limiting global warming to 1.5°C and on developed countries pledging to contribute \$100 billion annually are all seen as successes of the Paris Climate Agreement. Unfortunately, no enforcement mechanism exists to ensure that countries abide by the reduction targets they voluntarily set. Buchholz (2024) notes that not one of the larger industrialized countries nor the European Union as a whole is on target to meet the 2°C goal. Nigeria, Ethiopia, and Kenya are among the few countries on track to meet their fair share approach goals.

The flip flopping position of the United States distracts from the success of the Paris Climate Agreement. During President Trump's first term, in June 2017, the United States pulled out, only to reenter in January 2021 under President Biden and leave again in January 2025 after Trump's re-election. This withdrawal reduces financial support to the global effort and emboldens other nations to weaken or waver on their commitment.

Mobilizing financial institutions to reduce greenhouse gas emissions represents a strategic approach to environmental sustainability. The role of financial institutions in fighting climate change could include an environmental risk assessment in their lending decisions and making loans to renewable energy companies. Because financial institutions, like all businesses, operate to maximize profits, the mere goal of reducing greenhouse gas emissions lacks motivation to propel them to actively and strategically reduce emissions. This necessitates government and public action, both of which are crucial in mitigating climate change.

As the public becomes more conscious of the harm done to the environment by business practices, the call for action becomes louder. This paper examines what actions are being called for, by whom, and the prospects for halting or reducing greenhouse emissions. More specifically, our objectives are to:

- i. Identify the factors moving banking into green banking
- ii. Explain the challenges associated with green banking and sustainable finance
- iii. Explore the future developments and possibilities in green banking and sustainable finance

Green Banks and Green Banking

According to the Environmental Protection Agency (EPA), *green banks* are “public, quasi-public, or non-profit financial entities that leverage public and private capital to pursue goals for clean energy projects that reduce emissions.”² The Coalition for Green Capital (CGC) states that these institutions are “mission-driven and use innovative financing to accelerate the fight against climate change.” For green banks to succeed, the projects they broker must meet sound financing principles. Thus, a green bank may issue a bond to finance the installation of solar panels, but it does so by evaluating the stream of net cash flow resulting from the investment and determining whether or not that investment makes financial sense.

Green banking or *green financing* refers to banking and financing practices that consider environmental factors throughout the lending decision-making to promote responsible

² <https://www.epa.gov/statelocalenergy/green-banks#:~:text=Green%20banks%20are%20public,energy%20projects%20that%20reduce%20emissions.>

investments and stimulate growth in low-carbon technologies, projects, and businesses.³ Green banks are solely dedicated to green banking; other financial institutions, including banks (depository institutions), engage in green banking whenever environmental factors are considered in the lending decisions.⁴

Worldwide, the issuance of green bonds has been rising. It increased steadily from about US\$46.50 billion in 2014 to US\$619.90 billion in 2023. About US\$6.35 billion in green bonds were issued in the United States in 2022. The largest banks in the United States are the biggest issuers of green bonds, yet those banks are a small percentage of their total assets. The top nine issuers held only .12% of their assets in green bonds. JP Morgan Chase, the biggest bank in the country, held .06 % of its assets in green bonds, while the second biggest bank, Bank of America, had .21%.

Table 1

Biggest Issuers of Green Bonds in the United States

| Bank | Green Bonds Issued (US\$ M) | Total Bank Assets (US\$ B) | Percent of Assets |
|------------------|------------------------------------|-----------------------------------|--------------------------|
| PNC | \$1,900 | \$557 | .34 |
| TD Bank | \$1,874 | \$592 | .32 |
| Fifth Third | \$500 | \$207 | .24 |
| Bank of America | \$6,350 | \$3,051 | .21 |
| Wells Fargo Bank | \$2,000 | \$1,881 | .11 |
| Citigroup | \$1,867 | \$2,417 | .08 |
| JP Morgan Chase | \$2,250 | \$3,666 | .06 |
| Goldman Sachs | \$800 | \$1,442 | .06 |
| Morgan Stanley | \$500 | \$1,180 | .04 |
| TOTAL | \$18,041 | \$14,994 | .12 |

Source: Statista Research Department, Accessed on Jul 11, 2023, 6/25/2024

<https://www.spglobal.com/marketintelligence/en/news-insights/research/largest-50-us-banks-by-total-assets-q422>

In 2020, United States green banks used \$442 million of their funds to generate a total investment of \$1.69 billion. The 2020 investment brought the cumulative total investment between 2011 and 2020 to \$7 billion, of which \$1.9 billion were green bank funds and \$5.1 billion were private co-investments. The mobilization ratio of 3.7 (See Table 2). With the exceptions of 2017 and 2018, the trend has been positive.

³ Price Waterhouse Coopers Consultants (PWC) (2013): Exploring Green Finance Incentives in China, PWC

⁴ For a brief primer on the definition of Green Finance, see Nannette Lindenberg's *Definition of Green Finance*, German Development Institute, April 2014

Table 2*Investment by and Caused by Green Banks*

| | |
|---|---------------|
| Total Investment Caused by Green Banks | \$7.0 billion |
| Total Green Bank Investment | \$1.9 billion |
| Total Private Co-Investment | \$5.1 billion |
| Mobilization Ratio (Total Investment/Total Green Bank Investment 1/2) | 3.7 |

Source: GREEN BANKS IN THE UNITED STATES: 2021 U.S. Green Bank Annual Industry Report, p 2. With Data from Calendar Year 2020. American Green Bank Consortium.

The Ascent of Green Banking

The ascent of green banking and financing is primarily due to public awareness of the damage caused by climate change. According to The National Oceanic and Atmospheric Administration (NOAA), the earth's temperature has risen by an average of 0.11°F (0.06°C) per decade since 1850. Both NOAA (2023) and Berkeley Earths (Rohde, 2023) suggest the warming trends are becoming more severe, with the earth's temperature registering a 2°C (3.6°F) increase above pre-industrial levels. While this gradual increase in temperature might seem insignificant, scientists caution this warming rate could lead to severe consequences, including more frequent and intense weather events, rising sea levels, and ecosystem disruptions. Continued temperature increases at this pace may push the earth to a tipping point, posing significant threats to global stability and human health.

Many types of disasters have worsened due to the increase in global temperature. The National Oceanic and Atmospheric Administration estimates that in 2021 the price tag for climate and weather disasters was at least \$145 billion. This cost fails to consider the higher-than-normal death rates resulting from extreme heat, higher wildlife extinctions, more acidic oceans, and rising sea levels, which threaten coastal areas of many parts of the world.

As the public realizes the damage caused by global warming, the clamor for actions to reduce greenhouse gas emissions grows. Environmental consciousness results in calls for legislation to reduce the use of fossil fuels, conserve natural resources, and promote the use of renewable energy. According to Mambu (2023), Millennials are spearheading the move toward green banking. The study also reported that 70% of global consumers would choose a bank that puts (sustainability) purpose over profits, and 58% are willing to pay a premium for financial services that help curb environmental degradation. In that respect, it is similar to the willingness of educated consumers to pay more for a healthy diet (Rao, 2013). One can conclude that public awareness is leading the charge.

Public awareness and the call for action are pushing legislators to act. Greenhouse emissions and environmental degradation are market failures caused by detrimental externalities. In the presence of such externalities, producers and consumers of the product or service have no incentive to rectify the situation, hence the need for government intervention. The history of congressional action on climate legislation in the United States dates back many years.⁵ A notable example is the carbon tax on greenhouse gas emissions. Several proposals have been made to enact a carbon tax law in the United States. The world has realized that global

⁵ <https://www.c2es.org/content/congress-climate-history/> 8/7/2024

temperatures will keep rising from greenhouse gas emissions without a concerted global effort. The Paris Climate Agreement, signed by 196 countries and implemented in 2016, has the overarching goal of holding “the increase in the global temperature to well below 2°C above pre-industrial levels” and pursuing efforts to “limit the temperature increases to 1.5°C above pre-industrial levels.”⁶

Financial institutions are in business to maximize profit; thus, in the final analysis, they will change policies if the rewards from the change exceed the costs. Banks will embrace green banking despite public demand and legislative actions if they can “do well by doing good.” Several studies suggest that green banks do better or do no worse than their non-green banks. A study by Malandrakis, I., & Drakos, K. (2024) employed global panel data comprising 165 banks from 38 countries to determine whether there are discernible performance differences between green and non-green banks. One conclusion was that green banks performed better in their Total Capital, Tier 1 Capital, and Nonperforming Loans to Reserve for Loans ratios. Similar conclusions have been found by Toth et al. (2021) and Liu et al. (2021). Both papers concluded that environmentally oriented banks have lower ratios of non-performing loans.

Challenges

One challenge regarding green banking and sustainable finance is the public lack of awareness. Several studies, including Chandra et al. (2024), Mathapati (2024), and Boutera et al. (2022), have found that the public lacks awareness of green banking and its products. A study by Mambu (2023) finds that globally, only 41% of consumers have heard of ethical finance, green finance, or both. Of those who have heard of the terms, 35% said they did not fully understand what they meant. The same study found only 26% of consumers have knowingly used a green banking service or product, but of those who have, 84% were more satisfied with green banking than traditional banking services or products. This shows consumer preference for green banking, but many consumers are still unaware it exists. A possible way to mitigate this problem is to raise awareness of green banking.

Another challenge of green banking and sustainable finance is the problem of greenwashing done by both banks and non-banking businesses. *Greenwashing* is when an organization or a business lies or exaggerates how sustainable their products or services are, thereby misleading consumers about how environmentally friendly they are. According to a survey by The Harris Poll for Google Cloud (2023), 59% of executives in 16 countries admitted to overstating or inaccurately representing their company's sustainability activities, i.e., greenwashing. Dempere et al. (2024) suggest that businesses engage in greenwashing by “using ambiguous language, making irrelevant claims, and maintaining opacity.” Businesses producing green products and banks who finance the businesses engage in the practice to enhance their market appeal and capitalize on the growing consumer demand for sustainable goods. A study by Somany (2023) revealed that corporations and brands like H&M, Unilever, and Nestle have engaged in the practice. Nisa et al. (2023) also found that many corporations exploit the “green trend” by promoting misleading information about their sustainability impacts, which can result in consumer confusion and distrust. According to Hummel and Festl-Pell (2015), banks greenwash by presenting their sustainability efforts in a manner that may not accurately reflect their actual environmental impact, particularly in their sustainability disclosures. This finding is supported by Khalill and Sullivan (2017), who exposed Lebanese banks that used greenwashing

⁶ <https://unfccc.int/process-and-meetings/the-paris-agreement> 10/25/2024

in their internet social and environmental reporting. Parker and Sheedy-Reinhard (2022) suggested that while banks publicly committed to green practices, their pronouncements were not accompanied by substantive actions.

Alaudhli (2024) concluded that when shareholders become aware of greenwashing, a substantial portion of those shareholders revised their investment strategies. When banks or companies are greenwashing, credit is taken away from the ones making sustainability changes. As with wary investors, consumers struggle with corporate greenwashing hypocrisy, not knowing who to believe; this distrust trickles to financial institutions and their sustainability efforts. Greenwashing can discourage actual sustainability efforts. If banks see that other banks can be perceived as green without putting any effort into making changes, they may do that instead of trying to offer green products or services. A possible way to mitigate this challenge is to enforce regulations and consequences for greenwashing.

Of all the challenges facing financial institutions seeking to go green, none is as severe as the high initial costs and the uncertainties of profitability. Sachs et al. (2019) argued that financial institutions show more interest in fossil fuels than green energy products because the risks associated with fossil fuels are known. While the technology for green products is still evolving, and with no sign of stopping, the current amount, quality, accessibility, and longevity of green products creates too many variables around future costs and revenue streams. These uncertainties have to be priced into the cost of financing green products.

Among the many reasons for elevated cost of green financing, Taghizadeh-Hesary et al. (2020) concluded that banks generally depend on short- and medium-term deposits; whereas, most green energy products have long gestation periods. Banks may see great risk and little advantages in placing significant assets into a nascent technology with long gestation periods. The cost of solar photovoltaic modules illustrates a clear case of the risks. IEA (2020) data revealed a solar photovoltaic module per watt cost US\$105.70 in 1975. A decade later, the price decreased to US\$12.70 (almost 88%). By 1995, it had fallen to US\$5.50. These steep drops in costs are the result of innovation and improvements in technology, characteristics of new technology, and increasing returns to scale, which can drive some borrowers out of business. Banks will naturally be leery of lending in such a sector. In the United States and worldwide, despite the cries for greener financing, private banks hold exceedingly small portions of their assets in green notes (See Table 1). Consequently, many political leaders have taken the initiative to jump-start the transition.

To alleviate the high initial costs and uncertainties surrounding green financing, in the United States, several state governments have established green banks dedicated to financing clean energy projects and other environmental initiatives. The banks issue loans and sometimes invest directly in green projects. The model preferred by green banks is public-private financing, in which public funds are used as leverage to attract private capital. These banks not only help finance green projects but also drive innovation by encouraging the development and adoption of green technologies. The first green bank was formed in 2011 in Connecticut, and there are now 23 across the United States. As of 2022, cumulative public-private investment has exceeded \$14.85 billion, of which public capital comprises \$4.20 billion.⁷

⁷ <https://coalitionforgreencapital.com/new-report-american-green-bank-consortium-partners-caused-record-4-6b-in-investment-in-2022/> Accessed 11/05/2024

Prospects

Given the incentives governments are providing and investors' interest in green banking and financing, indicators suggest that green banking and financing will continue to grow and evolve. In addition to government incentives to encourage the production and adoption of green technology, governments are also penalizing non-adopters—taxes on businesses that pollute (carbon tax) and on consumers (congestion pricing). The prospects for growth stem from the reality that as green technology matures, uncertainties and risks decrease, which will increase expected profitability and thus entice more private capital to flow into the sector.

As the public demand for greener products and services increases, financial institutions will realize that they can increase profits by going green. The Mambu (2023) survey found that 85% of consumers have shifted their purchasing behavior to become greener. The study also revealed that consumers want banks to be more environmentally conscious in lending decisions. The Google Cloud Sustainability Survey 2023 also found that almost nine out of ten executives have noticed that consumers are “becoming more vocal about their preference for engaging with sustainable brands.” Stockholm's Enskilda Banken (SEB) forecasts that green bond issuance will grow by 20% in the North American region during 2024, mainly by corporate issuers. The rise in concern for environmental and social issues will continue to cause an increase in green banking and sustainable finance, impacting the double challenge of climate change and the energy crisis.

Government policies are the first step to accelerating the adoption of green products. The imposition of carbon taxes, the requirements for higher fuel-efficient vehicles, taxes on single-use plastics, increased utility rates for excessive consumption, waste disposal fees, and outright bans and restrictions on high-emission appliances are all intended to motivate businesses and consumers to switch to environmentally friendly products for the benefit of all.

Summary and Conclusions

The paper sought to identify the factors moving banking into green banking, to explain the challenges associated with green banking and sustainable finance, and to explore the future developments and possibilities in green banking and sustainable finance.

Green banking and financing represent a way to save the earth from what experts predict is an unsustainable increase in the earth's temperature which will increase global warming, raise sea levels, and cause disasters. The move toward green banking financing has been propelled by public awareness of the collateral damages to the climate by the emission of greenhouse gases. The public demands both industry and government to change course.

The transition to environmentally friendly products faces challenges. While public awareness of the damage calls for change, the lack of public awareness of green banking products hinders change. The prevalent practice of greenwashing, the misrepresentation of products or services as green or exaggeration of a bank's or corporation's greenness, leads to public distrust. This hinders banks that are genuinely offering green products. Uniform standards and transparency are necessary for the public to differentiate between truth and spin. Because green technology is new and still growing, the uncertainties and risks associated with financing leads to high initial costs which can deter investment on the side of businesses and adoption on the part of consumers.

In spite of the challenges to green banking, pressure from the public has motivated and will continue to motivate financial institutions and governments to act. Financial institutions recognize the benefit of offering green products and services. Governments have responded by setting up green banks, which leverage public capital to attract private capital. Governments are also providing incentives to adopters of green technology and penalties to hasten the transition to green products for the benefit of financial institutions, corporations, and the consumer.

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