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THE INTRINSIC ROLE OF THE BANKS IN DECARBONIZING THE ECONOMY

Abstract

Global warming and climate change continue to disrupt the environment and all aspects of people's endeavors and as such, there is need to look at causes of climate change and deploy appropriate tools to address the problem of the scourge of climate change. Banks hold a pivotal position in the economy of any country. Apart from being the custodian of money, they also collaborate with the government and international financial institutions to perform various roles that shape the direction of the world's economy in terms of growth and development. Against the backdrop of this, this article looks at banks as part of the appropriate tools that should constantly be used to address and reduce the influence of fossil fuels that are fuelling global warming and climate change and switch to more sustainable green economy. In order to achieve this, there should be radical acceleration in advancing credit and loan facilities by banks to fund green projects and investments in order to decarbonize the economy, and at the same time maintain sustainable economic growth and development.

Keywords

climate change, banks, renewable energy, green investments, sustainability

JEL Classification

Q53, Q54, Q58

INTRODUCTION

Today, virtually all aspects of human endeavors are being impacted and affected by the unprecedented distortion in the climate worldwide (Tanner et al., 2014). All scientific evidences so far with respect to the cause of global climate change phenomenon point to human induced activities as the major causative factor of climate change (Whitmarsh, 2009). These activities cause the emission of carbon dioxide and other noxious gases (greenhouse gases), which consequently result in global warming and climate change. It is imperative that human race takes responsibility by doing everything humanly and scientifically possible to decarbonize the environment (Mathenge, 2013). An important element that is needed to foster and support any intervention and strategy to proactively fight against climate change is funds (Santarius et al., 2012). The banking sector is one of the sources of funding for different developmental and economic projects in the local and global economies (Weiss, 2000). Their customers are numerous and include sectors that use fossil fuels which emit carbon dioxide for business activities (Jeucken, 2010). These fossil fuel sectors also need financial assistance and usually approach the banks for credit and loan facilities. In most cases, when they meet the terms and conditions of the credit and loan facilities, the banks will approve the loans and disburse accordingly to projects that will use fossil fuel and afterwards emit carbon dioxide to the atmosphere and the environment (Cogan, 2008). In view of the devastating impact of carbon emission, particularly as a driver of global climate change, the banks

should reposition their lending strategies and activities to refrain from lending to companies that have severe ecological footprint causing pollution and other environmental harms (Lohmann, 2009). It is imperative that the banking sector plays an active role in decarbonizing the environment by giving credit and loan facilities to their numerous customers for green investments (Neuhoff et al., 2010). Green investments are “essentially investment activities that focus on companies or projects that are committed to the conservation of natural resources, the production and discovery of alternative energy sources, the implementation of clean air and water projects, and/or other environmentally conscious business practices” (Rao, 2004).

1. RATIONALE AND METHODOLOGY

Banks and other financial institutions are expected to play active roles in ensuring that investment in green economy is radically promoted as part of the measures to fight global warming and climate change. In view of this, credit and loan facilities extended to fossil fuels projects and ventures are now considered as anti-greening financial lending (these are investment activities that focus on companies or projects that are not committed to the conservation of natural resources, the production and discovery of alternative energy sources, the implementation of clean air and water projects, and/or other environmentally conscious business practices) (Koester, 2016) and hence an affront to all the international, national and local initiatives and instruments that prohibit emission of greenhouse gases (Kauffmann et al., 2012). This article examines the intricate role of banks in driving reasonable green investments for sustainable development and growth. The devastating impact of climate change is no more a breaking news. The bizarre climate change is having huge negative impact and distorting the weather forecast to the extent that most times it becomes impossible for weather forecasters to predict with certainty (Ward, 2008). This is very troubling and a cause for great concern. The human race and international community must stand up to the challenge and combat the climate change surge. The banking sector is essentially pivotal as part of the solution and it is in this regard that this article examines the critical role being played and continue to be played to combat global climate change and global warming (Wright & Nyberg, 2012). The article utilized qualitative research approach by relying on existing data such as contemporary literature, books, reports, international initiatives and instruments (Marshall & Rossman, 2014). Critical engagement and review of these contemporary sources that relate to how to salvage the environment and the

planet from the surge of global warming and climate change promptly revealed why there is an urgent need for the banks to radically accelerate the pace of advancing credit and loan facilities toward green financing as opposed to anti-green financing. Green financing and investments will decarbonize the economy and the environment and make the planet safe, while the anti-green financing and investments will produce contrary outcomes and results.

2. PROBLEM STATEMENT

There is an increasing call for switching from conventional fossil fuels energy causing global climate change to more renewable sustainable energy. It is against the backdrop of this that this article examines how banks and other financial institutions can be formidable as part of the institutions to decarbonize the economy to have clean environment. Undoubtedly, banks are in the business of managing, investing and lending money, hence, any business that will bring profit to the bank would seem to be a good focus for investment and engagement. To this end, banks lend money to various types of profitable businesses which also involve businesses using fossil fuels which cause climate change. Climate change is impacting the environment and businesses negatively and devastatingly, hence, there is need to discourage the banks and other financial institutions from lending credit and loan facilities to companies and institutions that utilize and generate revenues and incomes from fossil fuels businesses.

3. THEORETICAL PERSPECTIVE

Scientific investigations commissioned by the international communities, agencies, institutions and mostly governments of the world have con-

firmed that human activities due to the use of fossil fuels that emit greenhouse gases cause global warming and climate change resulting in catastrophic impacts such as drought, flooding and extreme heat on the environment, living and non-living things (Paterson, 1996). It has been emphatically confirmed that “more than twice as much heat trapping carbon dioxide is emitted each year as a result of human activity than can be absorbed by the world’s oceans and forests” (Tanner & Horn-Pathanotai, 2014). Even though there have been scepticisms expressed in climate science by some pundits, nevertheless the evidence from human induced climate change is overwhelming and as such climate change is real (Poortinga et al., 2011).

Various solutions have been proffered to address climate change, one of which is for humans to stop the use of fossil fuels and switch to sustainable alternative renewable energies such as solar, wind, geothermal, bioenergy and hydropower (Meadowcroft, 2009). This is realizable if all the stakeholders and the role players take the appropriate steps in the right direction by encouraging businesses to switch to the use of these renewable energies as sources of energies to power their business activities. It is against the backdrop of ensuring the sustainability of the earth and environment that businesses that are inclined to make the change are encouraged and assisted through different mechanisms and financial institutions.

It is pertinent to mention that it will not be an easy task to switch to green economy because most economies in the developed, developing, under-developed and least developed countries of the world remain tied and glued to fossil fuels causing global climate change (Lowitt et al., 2009). The problem is exacerbated by the position currently taken by the President of the USA in dismantling laws and policies that have been put in place to decarbonize the country’s economy. Currently, instead of divesting funds and investments away from fossil fuels energy and businesses, Donald Trump-USA intends to accelerate the use of fossil fuels energy by spending huge amount on coal mining and other carbon extractive ventures which will be used in the manufacturing sector and other sectors in the USA. The reason advanced for this unsustainable economic path is that coal mining will create jobs needed by the people. This argument has, however,

been debunked by many scientists, industrialists and pundits on the ground that this strategy would produce contrary results. Another mind boggling example is in Nigeria where the government is currently posing as one of the countries that promote sustainable development by encouraging the use of renewable energies (Shaaban & Petinrin, 2014). The irony, however, is that the Nigerian government not only relies heavily on fossil fuel sales for income, but also heavily subsidizes petrol which is a fossil fuel being utilized by the citizens for industrial and domestic activities (Boehmer-Christiansen, 2016 Library Search Fewer).

The world bank has continuously warned that the prospects of a 4 degree Celsius rise in global temperatures is real and would have devastating effects and consequences (Hillman et al., 2007). This is why the World Bank has been providing various forms of green investments assistance to banks, particularly in the developing countries where the impact of climate change is huge.

As part of the sustainable effort to combat climate change, international community and all nations came together to forge “a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort” (UNFCCC, 2016). In 2015, the international community jointly signed the Paris Agreement with the main aim “to strengthen the global response to the threat of climate change by keeping global temperature rise in this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.” In order to realize these ambitious goals, there is also a consensus by the international community to “strengthen the ability of countries to deal with the impacts of climate change through appropriate financial flows, a new technology framework and an enhanced capacity building framework.” The appropriate financial flows envisaged in this agreement are green investments that will be administered through financial institutions, more importantly by the banking industry. Undoubtedly, vulnerable and developing countries are targeted to benefit from this agreement in line with their own national objectives (UNFCCC, 2016).

4. LITERATURE REVIEW

Undoubtedly, the price of fossil fuel-oil is volatile and impacting energy security (Omer, 2008). Worst still oil and other fossil fuels emit carbon dioxide causing climate change (Olah, 2005). Against this backdrop, the attractiveness of alternatives to conventional fossil fuels based energy sources is increasing and adding reasons to rethink the world's energy future (Sonntag-O'Brien & Usher, 2006). Green investments "are the core of transition to a sustainable energy future, as massive amounts of new capital will be required to cover the world's growing energy demand in order to meet commitments to large carbon emissions reductions" (Sonntag-O'Brien & Usher, 2006). To do this, there is a need for strong leadership that will trigger concerted efforts to transit to renewable energy.

There are dearth of alternatives to solve the problem of global climate change (Hallegatte, 2009). Also, there are ample materials for transformation such as enormous sources of available natural renewable energies even in the midst of precarious situations or problems confronting humanity (Clark & Geppert, 2002). There are also many policies, measures and interventions from the international and local spheres that are capable of underpinning the types of change required to fight and combat climate change (Soltau, 2009). Pursuant to this, the international community is continuously agitating for environmental and financial institutions to promote international initiatives on greening investments (Van de Graaf & Lesage, 2009). On the national scenes, some governments of the world have also introduced policies and laws geared toward greening investments as part of the solution to reduce emissions of greenhouse gasses in order to combat climate change (Haas et al., 1993). However, it is pertinent to point out that more would have been achieved if there are strong concerted efforts by the leaders of the world. What seems to impede effective climate action is what Lohmann (2008) described as "the way political and social power is organized, and the way large numbers of people, especially the middle class on whose passive consent many political elites are dependent, have been made forgetful about what they already know, ignorant about what already exists, and divided from the movements and pro-

cesses that are already working toward transformation." The lackadaisical attitude to the impact of climate change and lack of effective climate action have just been recently demonstrated by the American President, Donald Trump, when he recently pulled out of the most formidable Climate Accord/Agreement entered into in Paris in 2015 (Mehling, 2017). However, the good news is that majority of the countries in the United Nations still stand firm and align to the agreement and its implementation. The international community is resolved to fight and combat climate change using financial institutions and agencies to develop financial products that will decarbonize the world (Mattoo & Subramanian, 2013). Pursuant to this, Germany, France, Russia and China have filled the leadership gap created by Donald Trump by assuming the mantle of leadership in the fight against global warming and climate change (Boehmer-Christiansen, 2017).

One of the measures that have been scientifically proved to be potent in combating climate change is the bank's investment in low-carbon emission ventures (Campiglio, 2016). The Kyoto Protocol, an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets (Bodansky, 2010) encourages countries of the world through their financial institutions to increase investment in green projects and ventures (Geels, 2013). Banks are therefore positioned to promote green investments and projects by advancing credit and loan facilities to companies that intend or if already existing embarks on green businesses (Draft, 2012). These are companies that have begun to pursue green business by taking actions that enhance both the firm's environmental performance and its competitiveness" (Hirsch, 2011). It is pertinent to point out that there is a link between investment and climate change (Mayo, 2007). Both have intersect and a very strong linkage in a number of ways because the manifestation of the devastating effects of climate change have now presented unique opportunities for investments in carbon markets, renewable energy sources, and low carbon technologies (Miles, 2008). Therefore, there is need for international and national investments to be geared toward combating global environmental challenges of the 21st cen-

tury by ensuring that investments become driver that will assist with the transition to a low carbon economy (Miles, 2008). Similarly, corporate entities are expected to respond to climate change by being part of the solution by abandoning the use of fossil fuels in their operations and switching to the use of renewable alternative energy (Benn et al., 2014). To this end, the banks are expected to support corporations and companies that seek to move to the sustainability path (Dale, 2008).

Undoubtedly, a vanguard of investments these days are adapting business model to the realities of climate change (Lubina & Esty, 2010). There is need for the banks to increase and accelerate lending toward green projects and become very proactive by coming up with various innovative products to address the threats of climate change (Mills, 2009). Consequently, the banks should intensify their efforts by rebranding their products to ensure that they reflect the realities of climate change (Savitz, 2013). This will assist banks and the customers to keep the environment clean as well as promote investment by having different climate compliant bank's products options to select from (Esty & Winston, 2009). These days, customers as well as regulators and shareholders are eager to see banks "provide more products and services that respond to the 'greening' of the global economy, expand their efforts to improve disaster" (Mills, 2009). These bank products and services should, however, not be a one off process, but a continuous one, where the veracity of green improvements are constantly done in order to provide good green banking services to the customers (Bei & Shang, 2006).

At the international level, there have been sustainable banking initiatives which include the United Nations Environmental Program's (UNEP) important declaration on banking and the environment (Jeucken, 2010). Financial institutions who signed up to this declaration knew very well that they have to stimulate sustainable development by integrating environmental considerations into their internal management and commercial decisions (Richardson, 2005). There have been various initiatives and interventions to combat climate change through investments in facilities and projects that promote sustainability and development in the financial institutions (Sarkar & Singh, 2010) such as the Global Environment Facility (GEF). The

Global Environment Facility (GEF) acts as a central funding body for sustainable development projects "crosscutting financial instrument for major international environmental conventions, including the UNFCCC and its mandate is to provide funding to developing countries to help the world achieve the goals of those conventions" (Michonski & Levi, 2010). One of the partners to GEF is the World Bank, which acts as project developer and implementer. The GEF has "an average annual operational budget of \$24 million and an average annual grant budget of about \$500 million, funded by donations from member countries, GEF funds about fifty climate projects per year" (Michonski & Levi, 2010).

According to Michonski and Levi (2010), most of the GEF-funded projects have reduced greenhouse gases to an average of about \$3 million per project. These projects are being implemented primarily by the World Bank, UNDP, and UNEP. In terms of disbursing the green finance, on a yearly basis, "the GEF grants \$250 million to projects relating to energy efficiency, renewable energy, sustainable land use, forestry, and transportation (most of which also contribute to climate change mitigation). Since the inception of GEF in 1992, it has devoted \$2.7 billion to climate-related projects. These projects have generated \$17.2 billion in co-financing; it estimates that these projects have reduced GHG by one billion tons" (Michonski & Levi, 2010).

The GEF continues to finance investment in green ventures and "has recently started to increase funding for adaptation projects, through the management of two UNFCCC-created funds, the Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF), with about \$200 million in funding for adaptation work provides administrative support for the UNFCCC-mandated Adaptation Fund" (Michonski & Levi, 2010). The significance of this is that the international community and their agencies are taking the issue of climate change seriously and doing everything humanly and financial possible to combat it as demonstrated by GEF investing substantial amount in green projects and infrastructure (Mosello, 2015). Most of these fundings are disbursed through state parties' financial institutions such as banks that are known to be drivers of decarbonizing the economy.

5. DISCUSSION

5.1. Jettisoning business as usual: switching to green banking and green investments

The commitment of the international community to combat global climate change yielded an unprecedented result in 2015 when the world agreed on the first universal climate agreement which meant pledging to limit global warming to below 2°C, striving even for 1.5°C (Berensmann & Lindenberg, 2016). The implication of this is that there will be radical changes in the way businesses are conducted in the financial world which will lead to radical acceleration of decarbonizing the economies (Barker, 2017). To this end, decarbonizing the economy means there will be a radical shift towards green economy and green finance which “represents a positive shift in the global economy’s transition to sustainability through the financing of public and private green investments and public policies that support green initiatives” (Berensmann & Lindenberg, 2016). In order to accomplish full implementation of this agreement, international and national investors and financial institutions are needed to drive one of its focus which is to radically promote green finance. Banks, including the central banks, have critical roles to play because of their expertise in the investment space and ability to invest and finance sustainable products through green finance (Gomez-Echeverri, 2013). Governments around the world, financial institutions and investors have also indicated that huge flow of capital for green investments and conducive environment for growth and sustainability is needed in order to implement green economy (Zenghelis, 2012; Barbier, 2011). All players, especially companies are expected to play their role of disclosing the extent to which they are investing in green ventures and in the same vein, the banks and other financial institutions would have to come to the party by ensuring that they accelerate the pace of lending towards green ventures (Newell & Paterson, 2010). More importantly, governments and their regulatory institutions would have to be vigilant in the areas of effective and efficient monitoring and constant evaluations to ensure that the banks and financial institutions are constantly in compliance with the regulations and guidelines

that have been put in place to achieve green economy for sustainable development (Jepkorir, 2011). A huge catalyst in implementing and achieving green economy is giving incentives such as international funding opportunity-green credit lines being offered to the banks and the companies that embark on green projects (Koester, 2016). For instance, in South Africa, the Agence Francaise de Development (AFD), a financial institution and the main implementing agency for France’s official development assistance to developing countries and overseas territories provided green credit assistance to Eskom through three banks in South Africa (McDonald, 2014). The AFD advanced credit facilities to three banks, namely ABSA, IDC and Nedbank in the sum of EUR 120 million to finance renewable energy and energy efficiency projects. The banks were given leeway to identify feasible green projects using their own expertise in financial eligibility and risk criteria. The overall objective of the intervention was to increase energy efficiency and the share of renewable energy in the South African economy in order to reduce CO₂ emissions and the pressure placed on fossil fuels.

The assistance is provided against the backdrop that “South Africa is a country with high energy intensity and a major emitter of greenhouse gases (GHG). Three main causes can be identified: the importance of the industry sector to its GDP, the dominance of coal in its energy balance: 71% of primary energy consumed, 93% of electricity produced, and finally, the generally low degree of energy efficiency (industry, housing, transport, electricity) resulting from low energy prices (electricity distributed in South Africa is amongst the cheapest in the world) and the abundance of coal resources, which does not encourage energy conservation” (AFD, 2011).

Due to increase in demand of electricity in South Africa, there will be undoubtedly more emission of green gases except the use of alternative renewable energies is embraced (Szabo et al., 2009). Intervention by AFD is to enable South Africa change to the path of renewable energy and energy efficiency in order to secure electricity supply. The green credit project had salvaged the situation by intervening and advancing credit line to Eskom to utilize renewable energy to fill the gap in demand. The AFD intervention in financially assisting de-

Source: Volz (2016) cited in Lindenberg and Volz (2016). Green Banking Regulation – Setting out a Framework: Fostering green finance for sustainable development in Asia, Report prepared for the 2016 Annual Meeting of the Asian Development Bank, Bonn: German Development Institute/Deutsches Institut für Entwicklungspolitik (DIE).

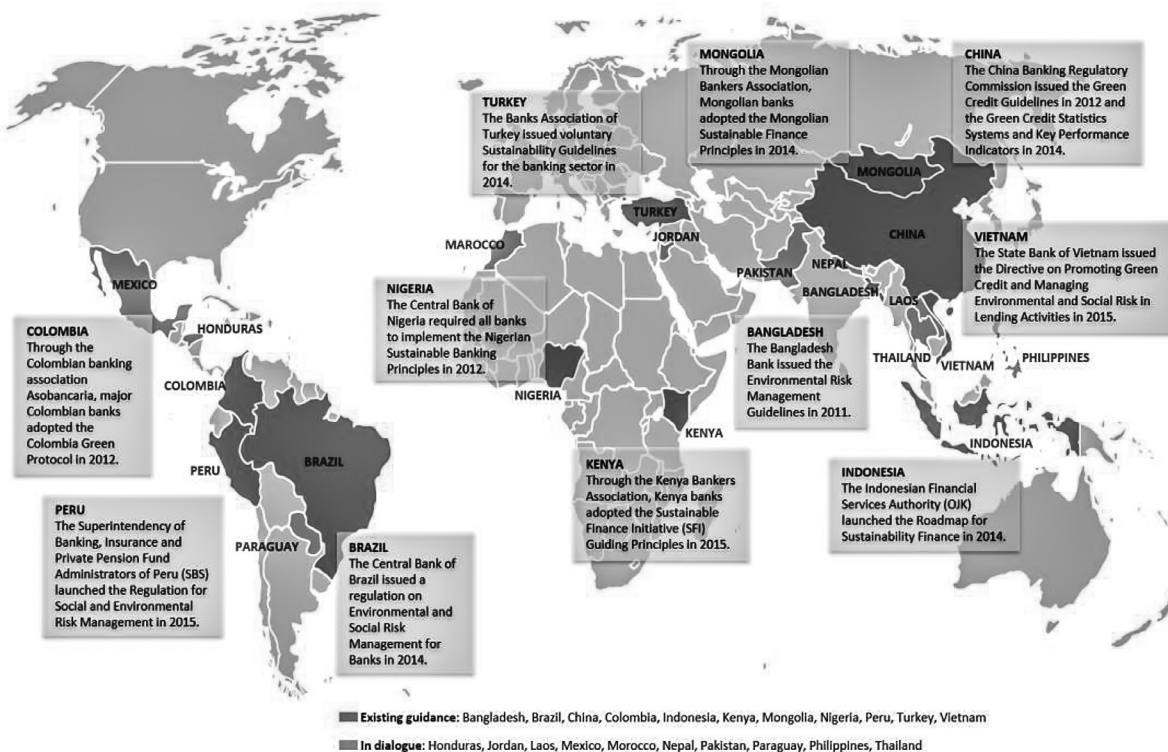


Figure 1. Sustainable Banking Network members and countries having introduced green finance guidelines and regulations

veloping countries is in line with the international community stand on fighting global warming and climate change. The impacts and implications of these interventions for Eskom, the environment and the industry are that they will be able to generate clean energy through renewables and saved energy therein reducing greenhouse emissions and make the environment clean (AFD, 2011).

5.2. Paradigm shift from brown to green sustainable green banking

According to Figure 1, twenty-one countries of the world, mostly from developing and emerging economies have come together to promote and pursue sustainable green banking through collaboration and partnership interventions and as such they have become what is now known as the “Sustainable Banking Network”. This is a knowledge-sharing network of banking regulators and banking associations established in 2012 that supports the development of environmental and social risk management by financial institutions and

promotes green and inclusive lending (Lindenberg & Volz, 2016). Countries that form the sustainable banking network are poor countries that are the hardest hit with climate change effects. These countries often do not have the scientific innovations and technological wherewithal of their own that can be used to adapt to the impact of climate change. It is against the backdrop of these lacks that they have decided to take responsibility that will mitigate the impact of climate change while relying on the advanced countries to assist in the areas of adaptation which requires the use of modern day technologies (Pelling, 2010).

Middle income countries have also introduced green interventions in their financial institutions and banks. In South Africa, for example, Nedbank group is known for promoting green banking in all aspects of its corporate and investment banking businesses and as such is “fully committed to green funding, responsible lending and supporting sustainability initiatives even within its working environment” (Zadek & Flynn, 2013). Nedbank is proactively participating in the reduction of

carbon emissions through carbon finance – this is the general term applied to resources provided to a project to purchase greenhouse gas (GHG) emission (Starkey & Anderson, 2005) and offering assistance to their numerous customers through dedicated and expertise advises being offered by the banks staff on how to reduce offset green gas emissions (Lingl & Carlson, 2010).

It is pertinent to point out that the Nedbank Group as a financial institution is financially exposed to many types of risks mainly because of the intermediary function which it performs such as lending, volatility in cash flow and so on often otherwise treated as externalities. It is against the backdrop of this that banks have begun to introduce “policies to encourage what they construe as sustainable banking by starting to extend principles of responsible action more broadly, across many of their business lines, as conditions of lending to their corporate clients” (Conley & Williams, 2011). Some banks have taken “a leadership role in regulating lending and development by enacting policies that attempt to mitigate the potentially negative social and environmental consequences of infrastructure development in politically unstable or environmentally fragile landscapes” (Conley & Williams, 2011). The vehicle for doing this is a voluntary agreement called the Equator Principles (EPs). These principles are about the framework by which banks can manage environmental and social issues in project financing (Richardson, 2005). In 2005, Nedbank became “the first African bank to adopt the Equator Principles – a set of performance standards and guidelines governed by the International Finance Corporation. The Equator Principles is a voluntary code for environmentally responsible project financing by commercial and investment banks (Richardson, 2005). These guidelines apply to all project finance transactions exceeding US\$10 million (Worsdorfer, 2015). The significance of the principles is to project financing is that it impact the way and manner project finance takes place in emerging market. Since adopting the principles, the bank has been undertaking sustainable financing by conducting robust assessments of the environmental impacts of businesses to be financed in order to ensure that the project does not harm and degrade the environment (Conley & Williams, 2011). By so doing, the bank is promoting and practising voluntary

sustainable green lending, financing and development in South Africa.

In addition, as part of its social corporate responsibility and promotion of sustainability, “in June 2010 Nedbank was part of an innovative power-saving initiative that saw solar-powered traffic lights installed at a number of intersections around Sandton in Johannesburg, South Africa. The lights are powered exclusively by solar energy, thereby lessening the load and reducing dependency on the region’s power grid.” Even if a particular business proposal or transaction is rejected due to non-compliance to sustainability standards, the bank’s banking practice is to offer viable and useful advice and guidance that will assist the potential client make amends that would ensure compliance with sustainability standards and requirements.

As a corporate business entity, Nedbank is also practising what it preaches. One of the ways it demonstrated this was when the bank decided to switch and use an innovative hybrid renewable power system. This renewable energy system harnesses solar and wind energy and converts them to standard electricity directly to effectively fully power (100%), one of its Nedbank group branch (Nedbank, 2014). The branch has completely switched to the use of sustainable renewable energy as part of the bank’s commitment to being a leading enabler of environmental sustainability in South Africa. This is a practical demonstration of green banking at its best and it is also an indication that the bank is taking the issues surrounding carbon emissions reduction and sustainability seriously.

6. FOSTERING A CLIMATE FOR INVESTMENT IN SUSTAINABLE RENEWABLE ENERGY

Renewable energy sector is undoubtedly growing as support for sustainable energy is improving and increasing (Twidell & Weir, 2015). The costs of technology to drive this sector are huge. The technology are also of different dimensions and as such the investments in this energy sector depend

on the technology size, capacity and the markets (Lewis & Wiser, 2007). It has been found that renewable energy can improve the economy in many cases and assist in ensuring energy security and clean environment (Kaygusuz, 2012). These days, the renewable energy investments are growing but not fast enough. In the past, the cost of renewable technology and devices used to be very high but currently the cost of manufacturing and production is gradually decreasing (Kurtz, 2009). To this

end, “the wind and solar photovoltaics (PV) are one-tenth of the cost they were in the early 1980’s and additional cost reductions of about 5 percent per year are expected in the near term” (Sonntag-O’Brien & Usher, 2006). More importantly, the Kyoto Protocol has had a remarkable influence on the use of renewable energy and the volatility of fossil-fuel markets is making renewable energy sources more and more competitive and attracting new forms of investments (Winston, 2009).

CONCLUSION

The path towards sustainable and clean environment involves citizens, non-governmental organizations, governments, companies and obviously financial sector working together. Combating climate change cannot be achieved without adequate funds. Banks have already started providing green finances; however, the progress is slow and should be accelerated. Investments in green technology and products are undoubtedly sustainable and are catalyst for new jobs creation, therefore, there should be radical acceleration of this. The bank should take responsibility by concentrating more on availing credit and loan facilities to green businesses. In this way, the banks will be contributing to the greening of the environment for sustainability.

REFERENCES

1. AFD (2011). Agence Francaise de Developpement. Green Credit Line: Providing the commercial banks with an incentive to explore the renewable energy and energy efficiency markets. Retrieved from <http://www.afd.fr/lang/en/home/pays/afrique/geo-afr/afrique-du-sud/projets-afrique-du-sud/energie-et-climat/pid/15793> (accessed on 22.01.17).
2. Barbier, Edward (2011). The policy challenges for green economy and sustainable economic development. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1477-8947.2011.01397.x/full> (accessed on 12.01.17).
3. Barker, Terry (2017). The economics of avoiding dangerous climate change. Retrieved from <https://link.springer.com/chapter/10.1007/978-3-319-38919-6> (accessed on 29.01.17).
4. Bei, L. T., Shang, C. F. (2006). Building marketing strategies for state-owned enterprises against private ones based on the perspectives of customer satisfaction and service quality. *Journal of Retailing and Consumer services*, 13(1), 1-13. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0969698904000517>
5. Benn, Suzanne, Dunphy, Dexter, Griffiths, Andrew. (2014). Organizational change for corporate sustainability. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=ww-jhq7sbq0xx&sig=fki88anxak8hdiw6muvnotepek0#v=onepage&q&f=false> (accessed on 08.07.17).
6. Berensmann, Kathrin, Lindenberg, Nannette (2016). Green Finance: Actors, Challenges and Policy Recommendations. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2881922 (accessed on 20.01.17).
7. Berensmann, Kathrin, Lindenberg, Nannette (2016). Green Banking Regulation – Setting out a Framework. Retrieved from <http://scholar.google.co.za/scholar?hl=en&q=Green+Banking+Regulation+%E2%80%93+Settin>
8. Bodansky, D. (2012). The Copenhagen climate change conference: a postmortem. *American Journal of International Law*, 14(2), 230-240. Retrieved from <https://www.cambridge.org/core/journals/american-journal-of-international-law/article/div-classtitlethe-copenhagen-climate-change-conference-a-postmortemdiv/04A9AD2A440C507DBB834DB5D7091AD8>
9. Boehmer-Christiansen, S. A. (2016). Fuel for Thought. *Energy & Environment*, 27(3-7), 434-515. Retrieved from <http://journals.sagepub.com/doi/abs/10.1177/0958305X16659026?journalCode=eaea> (accessed on 28.07.17).
10. Boehmer-Christiansen, S. A. (2017). Fuel for thought: Mid-December to early March. Retrieved from <http://journals.sagepub.com/doi/abs/10.1177/0958305X17705934?journalCode=eaea> (accessed on 08.08.17).

11. Campiglio, E. (2016). Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy, *Ecological Economics*, 121, 220-230.
12. Clark, Ed, Geppert, Mike (2002). Management learning and knowledge transfer in transforming societies: approaches, issues and future directions. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/13678860210142137> (accessed on 14.06.17).
13. Cogan, Douglas (2008). Corporate governance and climate change: The banking sector. Retrieved from https://era.library.ualberta.ca/files/gf06g3741/ceres_climate_change_banking_report2008.pdf (accessed on 19.17).
14. Conley, J. M. Williams, C. A. (2011). Global banks as global sustainability regulators? The equator principles. *Law & Policy*, 33(4), 542-575. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9930.2011.00348.x/full> (accessed on 11.02.17).
15. Dale, Gareth (2008). Green shift': an analysis of corporate responses to climate change. Retrieved from <http://www.inderscienceonline.com/doi/abs/10.1504/IJMCP.2008.021271> (accessed on 27.05.17).
16. Draft, C. (2012). Green Growth and Developing Countries. Retrieved from <http://www.oecd.org/development/environment-development/50559116.pdf> (accessed on 08.04.17).
17. Esty, Daniel, Winston, Andrew (2009). Green to gold: How smart companies use environmental strategy to innovate, create value, and build competitive advantage. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=2nj9fwqxldwc&sig=0nqbqgrlseyfnhobtcbyrgq0tk#v=onepage&q&f=false> (accessed on 01.08.17).
18. Geels, F. W. (2013). The impact of the financial-economic crisis on sustainability transitions: Financial investment, governance and public discourse. *Environmental Innovation and Societal Transitions*, 6, 67-95. Retrieved from <http://www.sciencedirect.com/science/article/pii/S221042241200069X>
19. Gomez-Echeverri, Luis (2013). The changing geopolitics of climate change finance. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/14693062.2013.822690> (accessed on 20.01.17).
20. Haas, Peter, Keohane, Robert, Levy, Marc (1993). Institutions for the earth: sources of effective international environmental protection. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=c-m4-sclmpbuc&oi=fnd&pg=PR4&dq> (accessed on 11.05.17).
21. Hallegatte S. (2009). Strategies to adapt to an uncertain climate change, *Global Environmental Change*, 19(2), 240-247. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0959378008001192>
22. Herz S. (2017). Making Paris Work. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/00139157.2017.1274584?journalCode=venv20> (accessed on 29.06.17).
23. Hillman, Meyer, Fawcett, Tina, Rajan, Sudhir (2007). The suicidal planet: How to prevent global climate catastrophe. Retrieved from https://books.google.co.za/books?hl=en&lr=&id=zxQ_TqpXAK0C&oi=fnd&pg=PR7&dq (accessed on 24.07.17).
24. Hirsch, Dennis (2011). Green Business and the Importance of Reflexive Law: What Michael Porter Didn't Say. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1758102 (accessed on 18.04.17).
25. Hulme, Mike (2009). Why we disagree about climate change: Understanding controversy, inaction and opportunity. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=DWMkb4ondbQC&oi=fnd&pg=PT1&dq=> (accessed on 16.04.17).
26. Jepkorir, Susan (2011). Challenges of implementing financial innovations by commercial bank in Kenya. Retrieved from <http://erepository.uonbi.ac.ke/handle/11295/12216> (accessed on 26.06.17).
27. Jeucken, Marcel (2010). Sustainable finance and banking: the financial sector and the future of the planet. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=kPEyZv9cUUMC&oi=fnd&pg=PR1&dq> (accessed on 09.03.17).
28. Kauffmann, Celine, Corfee-Morlot, Jan, Marchal, Virginie, Kennedy, Christopher, Stewart, Fiona (2012). Towards a green investment policy framework: The case of low-carbon, climate-resilient infrastructure. Retrieved from <http://search.proquest.com/openview/abf6d6b1799902314a006fd84fa857ee/1?pq-origsite=gscholar&cbl=54480> (accessed on 16.03.17).
29. Kaygusuz, K. (2012). Energy for sustainable development: A case of developing countries, *Renewable and Sustainable Energy Reviews*, 16(2), 1116-1126. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1364032111005491>
30. Koester, Eric (2016). Green entrepreneur handbook: the guide to building and growing a green and clean business. Retrieved from https://books.google.co.za/books?hl=en&lr=&id=njuhfrps hk8c&oi=fnd&pg=pp1&dq=anti=mr5mwlyir1&sig=jjg872daac_aLds6JMgguhNBmwM#v=onepage&q&f=false (accessed on 02.05.17).
31. Kurtz, S. R. (2009). Opportunities and challenges for development of a mature concentrating photovoltaic power industry. Retrieved from <http://large.stanford.edu/courses/2010/ph240/kalantarian1/docs/43208.pdf> (accessed on 21.02.17).
32. Lewis, J. I., Wiser, R. H. (2007). Fostering a renewable energy technology industry: An international comparison of wind industry policy support mechanisms, *Energy policy*, 35(4), 1844-1857. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0301421506002606>

33. Lingl, Paul, Carlson, Deborah (2010). Doing business in a new climate: a guide to measuring, reducing and offsetting greenhouse gas emissions. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=> (accessed on 22.02.17).
34. Lohmann, L. (2009). Toward a different debate in environmental accounting: The cases of carbon and cost-benefit. *Accounting, organizations and society*, 34(1-3), 499-534. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0361368208000287>
35. Lowitt, Eric, Hoffman, Andrew, Walls, Judith, Caffrey, Anna (2009). Sustainability and its Impact on the Corporate Agenda. Retrieved from http://webuser.bus.umich.edu/ajhoff/panels/2009%20Accenture_WBCSD.pdf (accessed on 18.06.17).
36. Lubin, D., Esty, D. (2010). The sustainability imperative. Retrieved from <https://pdfs.semanticscholar.org/dbbf/2f941d25dfbf691c0943d96343b1e719bd03.pdf> (accessed on 18.07.17).
37. Marshall, C., Rossman, G. (2014). Designing qualitative research. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=qTByBgAAQBAJ&oi=fnd&pg=PT8&dq> (accessed on 18.04.17).
38. Mathenge, G. (2013). Living More Humanely and Sustainably: A Framework to Embracing Environmental Ethics as a Driver to Stable, Just and Self-Sustaining Societies. Retrieved from http://s3.amazonaws.com/academia.edu/documents/32447416/Living_More_Humanely_and_Sustainably.pdf?AWSAccessKeyId (accessed on 29.06.17).
39. Mattoo, A., Arvind, S. (2013). A Greenprint For International Cooperation on Climate Change. Retrieved from <https://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-6440> (accessed on 12.05.17).
40. Mayo, E. (2007). A review of the Stern Review on the economics of climate change. Retrieved from <http://www.ingentaconnect.com/contentone/aea/jel/2007/00000045/00000003/art00004> (accessed on 18.03.17).
41. McDonald, D. (2014). Rethinking corporatization and public services in the global south. https://books.google.co.za/books?hl=en&lr=&id=luZiDgAAQBAJ&oi=O4hHoqLrcb099_fw-jBYfAcVI#v=onepage&q&f=false (accessed on 26.07.17).
42. Meadowcroft, J. (2009). What about the politics? Sustainable development, transition management, and long-term energy transitions. Retrieved from <https://link.springer.com/article/10.1007/s11077-009-9097-z> (accessed on 18.06.17).
43. Mehling, M. (2017). A New Direction for US Climate Policy: Assessing the First 100 Days of Donald Trump's Presidency. Retrieved from https://papers.ssrn.com/Sol3/papers.cfm?abstract_id=296071 (accessed on 08.06.17).
44. Michonski, K., Levi, M. (2010). Harnessing international institutions to address climate change. Retrieved from http://agriculturedefensecoalition.org/sites/default/files/file/geo_scheme (accessed on 29.05.17).
45. Miles, K. (2008). International investment law and climate change: issues in the transition to a low carbon world. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1154588 (accessed on 17.05.17).
46. Mills, E. (2009). A global review of insurance industry responses to climate change. *The Geneva Papers on Risk and Insurance – Issues and Practice*, 34(3), 323-359. Retrieved from <https://link.springer.com/article/10.1057/gpp.2009.14>
47. Mosello, B. (2015). How to Deal with Climate Change? Retrieved from <https://link.springer.com/book/10.1007/978-3-319-15389-6> (accessed on 29.06.17).
48. Nedbank (2014). Nedbank: Africa's First 100% Renewable Energy Powered Bank Branch 23 January 2014, Green Africa Directory.
49. Neuhoﬀ, Karsten, Fankhauser, Sam, Guerin, Emmanuel, Hourcade, Jean-Charles (2010). Structuring international financial support for climate change mitigation in developing countries. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1596079 (accessed on 06.03.17).
50. Newell, Peters, Paterson, Matthew (2010). Climate capitalism: global warming and the transformation of the global economy. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=xKP7lJvOm7QC&oi> (accessed on 02.01.17).
51. Olah, George. (2005). Beyond oil and gas: the methanol economy. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1002/anie.200462121/full> (accessed on 02.05.17).
52. Omer, Abdeen, Mustafa (2008). Energy, environment and sustainable development, *Renewable and sustainable energy reviews*, 12(9), 2265-2300. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1364032107000834>
53. Paterson, Matthew. (1996). Global warming and global politics. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=9j8RTPJ1lS6NQPe&sig=2uukM343ceGKiEhIvUx9jXmpxgw#v=onepage&q&f=false> (accessed on 17.04.17).
54. Pelling, Mark (2010). Adaptation to climate change: from resilience to transformation. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=g6Z9AgAAQBAJ&> (accessed on 22.02.17).
55. Poortinga, W., Spence, A., Whitmarsh, L., Capstick, S., Pidgeon, N. F. (2011). Uncertain climate: An investigation into public scepticism about anthropogenic climate change. *Global Environmental Change*, 21(3), 1015–1024. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0959378011000288>
56. Rao, Purba (2004). Greening production: a South-East Asian experience. Retrieved from <http://www.emeraldinsight.com/doi/abs/10.1108/01443570410519042> (accessed on 21.05.17).

57. Richardson Benjamin (2005). Equator Principles: The Voluntary Approach to Environmentally Sustainable Finance. Retrieved from <http://heinonline.org/HOL/LandingPage?handle=hein.kluwer/eelr0014&div=54&id=&page> (accessed on 11.04.17).
58. Santarius, Tilman, Scheffran, Jurgen, Tricarico, Antonio. (2012). North South Transitions to Green Economies: Making Export Support, Technology Transfer, and Foreign Direct Investments Work for Climate Protection. Retrieved from http://pubman.mpg.de/pubman/item/escidoc:2035103/component/escidoc:2035102/2012-06_north_south_transition.pdf (accessed on 12.01.17).
59. Sarkar, A., Singh, J. (2010). Financing energy efficiency in developing countries – lessons learned and remaining challenges. *Energy Policy*, 38(10), 5560-5571. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0301421510003502>
60. Savitz, Andrew (2013). The triple bottom line: how today's best-run companies are achieving economic, social and environmental success and how you can too. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=9tikaqaqbaj&oi=1d2rrrwubtvalagqgu#v=onepage&q&f=false> (accessed on 08.02.17).
61. Shaaban, M., Petinrin, J. O. (2014). Renewable energy potentials in Nigeria: meeting rural energy needs. *Renewable and Sustainable Energy Reviews*, 29, 72–84. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1364032113006187>
62. Soltau, Friedrich (2009). Fairness in international climate change law and policy. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=w5RBCj5kn54C&oi=fnd&pg=PR9&dq> (accessed on 11.06.17).
63. Sonntag-O'Brien, Virginia, Usher, Eric (2006). Mobilizing finance for renewable energies. Retrieved from https://books.google.co.za/books?hl=en&lr=&id=JM_R_mDe5SACHON&sig=39j5mSI8qFIEMU1HgYD-VtENfL8#v=onepage&q&f (accessed on 01.02.17).
64. Starkey Richard, Anderson Kevin. (2005). Domestic Tradable Quotas: A policy instrument for reducing greenhouse gas emissions from energy use. Retrieved from http://www.fcrcn.org.uk/sites/default/files/Tyndall_Domestic_tradable_quotas_0.pdf (accessed on 16.06.17).
65. Szabó, L., Soria, A., Forström, J., Keränen, J. T., Hytonen. E. (2009). A world model of the pulp and paper industry: Demand, energy consumption and emission scenarios to 2030. *Environmental Science & Policy*, 12(3), 257-269. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1462901109000227>
66. Tanner, Thomas, Horn-Phathanothai, Leo (2014). Climate change and development. Retrieved from https://books.google.co.za/books?hl=en&lr=&id=kapgcgaaqbaj&oi=fnd&pg=pp1&dq=vqcvluzk&sig=k4snv_5tx_qrn9gtc2vh6pqw8#v=onepage&q&f=false (accessed on 16.06.17).
67. Twidell, John, Weir, Tony (2015). Renewable energy resources. Retrieved from <https://books.google.co.za/books?hl=en&lr=&id=LYMcBgAAQBAJ&oi=fnd&pg=PP1&dq> (accessed on 21.02.17).
68. UNFCCC (2016). United Nations Framework Convention on Climate Change Retrieved from <http://bigpicture.unfccc.int/#content-the-paris-agreement> (accessed on 04.07.17).
69. Van de Graaf, T., Lesage, D. (2009). The International Energy Agency after 35 years: Reform needs and institutional adaptability. *The Review of International Organizations*, 4(3), 293-317. Retrieved from <https://link.springer.com/article/10.1007/s11558-009-9063-8>
70. Ward, Robert (2008). Good and bad practice in the communication of uncertainties associated with the relationship between climate change and weather-related natural disasters. Retrieved from <http://sp.lyellcollection.org/content/305/1/19.short> (accessed on 12.04.17).
71. Weiss, Linda (2000). Developmental states in transition: adapting, dismantling, innovating, not normalizing. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/095127400363631> (accessed on 29.07.17).
72. Whitmarsh, Lorraine. (2009). What's in a name? Commonalities and differences in public understanding of climate change and global warming. Retrieved from <http://journals.sagepub.com/doi/abs/10.1177/0963662506073088> (accessed on 19.06.17).
73. Lohmann, Larry (2008). Carbon trading: solution or obstacle? Retrieved from <http://www.thecornerhouse.org.uk/sites/thecornerhouse.org.uk/files/Indiachapter.pdf> (accessed on 14.07.17).
74. Worsdörfer, M. (2015). 10 Years' Equator Principles: A Critical Appraisal. *Responsible investment banking*, 473-501. Retrieved from https://link.springer.com/chapter/10.1007/978-3-319-10311-2_32
75. Wright, Christopher, Nyberg, Daniel (2012). Working with passion: Emotionology, corporate environmentalism and climate change. Retrieved from <http://journals.sagepub.com/doi/abs/10.1177/0018726712457698> (accessed on 08.04.17).
76. Zadek, Simon, Flynn, Cassie (2013). South-originating green finance. Retrieved from <https://doc.rero.ch/record/208970/files/06-south-originating.pdf> (accessed on 02.02.17).
77. Zenghelis, Dimitri (2012). A strategy for restoring confidence and economic growth through green investment and innovation. Retrieved from http://pascalobservatory.org/sites/default/files/pb-zenghelis-economic-growth-green-investment-innovation_0.pdf (accessed on 26.01.17).