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## Energy and carbon reduction practices in South African banks

### Abstract

Although the banking sector is not directly involved with substantial manufacturing operations that warrant significant carbon emission; however, as the provider of capital to other sectors of business, it is desirable for the banking sector to demonstrate practical commitment to environmental responsibility. Therefore this paper reviews the energy and carbon reduction practices of South African banks. Using a desktop approach, energy and carbon management practices were collected from the sustainability reports of South African banks. These practices were also compared to various international regulations that govern energy together with carbon policies and practices in financial institutions. The paper finds that the operations of South African banks are imbued with energy efficiency and carbon reduction practices. However the findings indicate that some banks still need to establish green or sustainability departments. In the end, the paper makes recommendations to enhance further energy efficiency practices in banks.

**Keywords:** energy efficiency, carbon reduction, sustainable development, South African banks, environmental responsibility, environmental economics.

**JEL Classification:** M14, Q01, Q53, Q54, Q56.

### Introduction

Campaign for sustainable development has propelled advancement of practices that are aimed at restoring and preserving the environment. Financial institutions are an important part of the business community; therefore by integrating sustainable energy practices, banks assume greening responsibilities in protecting environments which enhance development of positive relationships with their stakeholders. Hofman (1996) suggested that corporate environmental sustainability activities are a desirable approach which spurs the preservation of the natural environment. Although banks may not have direct influence in carbon emission, they may be indirectly involved since they finance heavy industries which emit carbon. In this manner, financial institutions have great potential to select viable prospects through financial intermediation in practices that will propel carbon-offsets (Nath et al., 2014). Carbon finance by banks, play an important role by reducing greenhouse gas emissions (Yeoh, 2008). Thus in these modern times, financial institutions traditional methods of handling business which has no regard for natural environmental demands has received increased criticism (Hourcade et al., 2012). Hransky (2011) lamented that as a result of heightened worldwide concerns over energy use and carbon reduction matters, organizations have been called to answer. Thus the expanding heed to major roles banks play in sustainable economic growth has come to effect since they undertake pronounced duties in economic advancement, preservation of the environment together with social guardianship; both directly and indirectly from financial back-ups associated with their operations.

There has been an increased pressure from interest groups and the government deploying regulations and legislations that aim to implement mechanisms which are able to conserve natural environments so as to reduce surges in greenhouse gas emissions (Peterson and Rose, 2006). Copan (2008) explained that South Africa gives off three times more greenhouse gas emissions than any other country on the African continent. Therefore banks are highly accountable because of their financing decisions towards energy intensive projects.

In light of these views the main questions of this study are: Do South African Banks participate in sustainable development practices? What are the energy and carbon practices of South African banks? Hence, the objectives of this paper are to appraise whether South African banks are involved in sustainable development, and to analyze energy and carbon reduction practices of South African banks.

This paper is organized as follows: Section 1 discusses the role of international banks in energy and carbon reduction. It is followed by an examination of sustainable energy and carbon reduction practices of banks. The theoretical framework of the study is presented in Section 2 along with the methodology, which is discussed in Section 3. A detailed presentation on South African banks sustainable carbon and energy practices is outlined and they are also compared to financial institutions international regulations on energy and carbon management in Section 4. An evaluation of the analysis is accomplished and a conclusion is presented in the final Section.

### 1. Role of international banks in energy and carbon reduction

The World Bank embraced the concept on sustainable development when in 1991 signed the Global Environmental Policy with the United Nations De-

velopment Program which heralded a new era in which banks must seriously consider sustainability issues in their everyday operative activities (Mann and Hawkins, 2007). In this regard, significant progress has been made by the banking sector in supporting projects which are not energy intensive as such activities do not increase carbon emissions (Korea Capital Market Institute, 2010). Thus the World Bank has greater potential to excel through this approach by heightening investments in energy efficient projects rather than mere specializing in financing businesses that need to improve their energy efficiency through its Power sector policy and lending scheme (Sturm and Strickland, 1998).

The World Bank identified the dwindling stock of natural resources in national income accounts by introducing a “genuine savings” tool which assimilates a specified number of environmental benchmarks (Pillarsetti, 2005). This instrument promotes zero carbon schemes focusing on energy efficiency together with protecting environments by reducing deforestation and doing away with unsustainable mineral exploitive practices. As a result, the World Bank through the Global Environmental Facility (GEF) and International Finance Corporation (IFC) has designed projects for training, investment as well as finance schemes which expand use of solar power in third world nations (Murthy, 2001). Thus for many developing countries in Latin America, the World Bank has been funding sustainable energy supplies and strategies but as of 1993, such schemes have produced unsatisfactory results (Oliveira, 1997). The bank devised upgrading and modernizing steps that included monitoring and ensuring transparency in electricity supply and distribution, commercialization of power sectors in these countries as well as offering incentives to the private sector which would make them more involved in its projects (Oliveira, 1997).

Large financial institutions in the world are also expected to develop sustainability courses of action that will help countries and businesses in need. Therefore, propositions to form a funding system identified as Country Undertakings and Rights for Environmental Sustainability (CURES) in which rich nations make contributions to an international bank have been made (Grafton et al., 2004). The established international bank will use the funds to promote national schemes that address environmental sustainability issues as well as financially support nations which have shown approved environmentally sustainable performances (Grafton et al., 2004). Thus previewing and testing Foreign Direct Investment (FDI) in terms of sustainability in pursuit to recognize lasting growth behaviors is fundamental (Narula, 2012).

**1.1. Sustainable energy and carbon reduction practices in banks.** Global energy consumption and carbon emissions persist to increase and sustaining energy efficiency represents a viable approach for financial entities (Borgstein & Lamberts, 2014; Spyropoulos & Balaras, 2011). Hence, there is need to introduce initiatives with specific attention to energy consumption, degree of energy usage, security of energy provision as well as determining environmental energy effects (Grundey, 2007; World Bank, 2010). Therefore, achieving significant savings in energy consumption require banks to measure actual energy rates consumed, monitor energy use after office hours along with regulating and monitoring electric machines. Moreover, financial institutions and governments have begun to put more focus and priority to energy efficient as well as zero carbon buildings in their energy policies (Ebbs et al., 2012). In addition, banks can mitigate climate change by reducing energy use in IT systems along with replacing non-exhaustible energy sources with renewable ones (Furrer et al., 2009). Therefore, lasting impressions towards an energy saving approach in issues involving environmental sustainability account towards reducing energy consumption as well as accepts the benefits linked to renewable energy usage (Hammond, 2000).

Therefore, the core business practice of a bank can be improved through establishing distinct commodities that improve on energy efficiency, carbon reduction, disclosure of environmental indicators and overall engagement in these initiatives (Swoboda et al., 2007). Siemens (2012) suggests that its energy metering services assist UK financial institutions in gathering energy consumption data as well as enables them to monitor their meter according to billing standards. Furthermore, peak energy use programs must also be designed for banks. These strategies serve to monitor the bank’s energy consumption given the fact that energy use vary from time to time along with differences in season (highest peak in winter but low usage during summer) (Breisblatt et al., 2012). Highlighting the importance of banks energy use trends on a study conducted on over 100 banks (Furrer et al., 2009) explained that energy consumption patterns in banks can go a long way into establishing their impact on climate change. Thus Siemens (2012) posits that their energy metering systems empower banks to have more control on energy consumption and are also able to communicate their energy usage very quickly.

Educating staff on energy efficiency issues, establishing departments accountable for energy consumption issues together with clear and complete reporting on energy use issues are valuable steps

banks can adopt since they encourage all staff members to develop a green linked philosophy vital for sustainability (Heron and Oglethorpe, 2010). As a result, major issues considered in efforts to attain environmental sustainability of banks and other organizations include amongst others training of staff members, improving efficiency of tools in current use, full transparency in disclosing sustainability management decisions as well as appropriate punishment instituted on offenders (Warjnborg et al., 2007). Another alternative route from where banks can make contributions towards energy efficiency is through environmental financing. Hence, energy efficient mortgages to clients who have minimized energy costs together with energy efficient loans offered to clients towards upgrading their systems are fundamental green financial tools banks could use to aid sustainability on part of their customers (Bansal, 2005). Hewett (2009) suggests the establishment of a Green Investment Bank with state ownership is ideal to concentrate and assist organizations along with other green strategic initiative schemes that aim to create a low carbon economy (Hewett, 2009). Therefore, banks have the potential to show exemplary green leadership in their finance and investment decisions (Dass and Devidayal, 2010).

A critical analysis on banks' sustainability recognized carbon finance as important towards achieving required objectives on energy consumption together with forcing carbon emissions down (Xuan and Zhenfa, 2010; Souza & Thom, 2009). Therefore cooperative partnerships with the government, public and private entities to provide additional financial strength in carbon financing practices is fundamental (World Bank, 2010b; Xuan and Zhenfa, 2010). Thus to a greater extent, banks exercise a crucial part in reducing greenhouse gas emission intensity by being accountable for the projects they finance in the predictable future (Rossi de Souza, 2009). Therefore, financial institutions should develop business green projects which foster carbon investment activities and establishing carbon financial instruments in form of swaps, stocks, derivatives, financing and carbon insurance (Yang, 2010). It follows that financial entities in China have also recognized importance of a green economy therefore they are expected to institutionalize "Carbon Finance" in their organizations through adopting principles such as developing better carbon products, supporting projects that reduce carbon levels, training staff on carbon issues and observing the Equator principles (Fan et al., 2011). So once a carbon management accounting instrument has been integrated in the organization, better decision making, improved monitoring of energy and carbon flows leading to their control as well as product development are ultimate outcomes (Schaltegger and Csutora, 2012).

## 2. Theoretical framework: stakeholder theory

Freeman (1984) illustrates that a stakeholder defines a particular group or persons who can influence or are influenced by the performance of the company's activities. As such, Clement (2005) explains that companies are experiencing huge pressure to address their stakeholder concerns on environmental, social and governance (ESG) issues. For instance, some companies have integrated employees and activists as notable members in devising major decision making systems for the organization (Artus, 2002). This approach is important since a common hindrance to the incorporation of energy efficiency mechanisms relates to conflicting perspectives amongst involved stakeholder groups (de Bloise et al., 2011). Nonetheless, governments have adequate power to influence integration of energy saving methods through introducing tough standards and by developing environments which encourage integration (Comodi et al., 2012). Moreover, civil society institutions and media inducement about the concept on environmental preservation is significant to explain why some entities implement expanded energy efficiency practices (Croucher, 2011). Energy consultants play an important role in advising their clients in relation to potential sustainable activities though their power to influence their clients' final choice is limited (Cooke et al., 2007). Stanislaw (2008) demonstrates that collaborations involving the government, civil society institutions, corporations and the media stimulate extended adoption of energy and climate change policies. Thus, Penni (2009) posits that energy efficiency contributes benefits to stakeholders and the firm through reduced energy expenses, cost-effective investment approaches, promote reduced energy use and support environmental advantages. In this respect, Miron & Preda (2009) suggest that stakeholders such as energy consumers, potential investors, the government, trade unions and energy investment project developers' demands can determine the entity's energy policy. Giuliattia et al., (2001) further substantiate that green consumer requirements are highly regarded issues in firm energy policy. Therefore, stakeholder interest is important motivator of the company's environmental strategy (Hoffman & Ventresca, 2002).

## 3. Methodology

The energy efficiency and carbon reduction practices of eleven South African banks were collected from the banks sustainability reports. This selection includes both banks that are listed on the Johannesburg Stock Exchange JSE (those that met the sustainability benchmarks) (JSE, 2013) along with other emerging banks in the financial sector that are embracing sustainability practices in their business activities. Since this study included eleven South

African banks, it is therefore a multiple case design. Sagepub (2014) and SEERC (2010) demonstrate that multiple case studies involve collecting data from a particular individual while a number of such individuals or “cases” have also been considered in the study. As such, past research which promoted multiple case methods in relation with firm energy and carbon emission reduction contexts includes 19 companies in the energy sector (Rogge et al., 2011); 9034 manufacturing firms (Anderson & Newell, 2004); and 295 Small and Medium Enterprises (Bradford & Fraser, 2008). The method employed to gather from the banks sustainability reports was the content analysis. Berelson (1952, p. 1) defines content analysis as “a research technique for the objective, systematic and quantitative description of the manifest content of communication”. Weber (1990, p. 5) illustrates content analysis as a method which “classifies textual material, reducing it to more relevant, manageable bits of data.” The content analysis approach has been increasingly supported as a better technique for gathering data from companies with respect to sustainability issues (Jose and Lee, 2007), as it is dependable (Guthrie & Abeysekera, 2006) and it has the ability to eliminate redundancy in the

research (Roca & Searcy, 2012). Hence, previous studies which deployed content analysis technique with reference to corporate sustainability perspectives include Holcomb et al. (2007), Thompson & Zakaria (2004) and Albino et al. (2009).

#### 4. South African banks energy and carbon management practices

In this section, we present energy and carbon management practices of South African banks. Therefore, the following (Table 1, see Appendix) presents a summary of common energy and carbon management practices of the above banks.

**4.1. Towards improving energy and carbon management practices in South African banks.** Considering all carbon and energy management practices in South African banks highlighted in the preceding section, it is evident that there are still some international regulations not yet observed by South African banks, therefore this section highlights some of these international practices which can further strengthen South African banks’ energy and carbon management practices. These suggested international regulations are presented in Table 2 below:

Table 2. International financial institution regulations South African banks need to adopt

Body	Regulation
The Intent (2009), European Commission (1997)	Employing qualified personnel who possess expertise in handling environmentally compatible technologies and energy sustainable matters.
UNEP-FI (2009)	Harmonize climate change hazards and utilizing advantageous openings by establishing them as main organizational commercial operations.
IFC (2011), Bank Track (2009)	Inaugurate structures that act as indexes upon which zero carbon strategy expectations conform to present scientific evidence on climatic change control.
European Investment Bank (2009), UNEP-FI (2009)	Designing energy consumption policies that are in agreement and coordinate well with the horizontal and vertical hierarchies of the bank system.
UNEP-FI (2009), UNEP-FI (2007)	Establish common understanding and correlative alliances with other financial entities by cleaving to familiar energy efficient ideologies and benchmarks.
Ceres (2008)	Affirming climatic change as a pinnacle issue to the organizations success.
IFC (2011), European Investment Bank (2009)	Building sustainability systems which are continually being reviewed and updated to existing innovative capacities on issues relating to carbon markets, energy saving as well as renewable energy renovates appliances.
European Commission (1997)	Stepping forward in the business, industrial and international scales as exemplary “green” captains in supporting non-exhaustible energy projects.
GHG Protocol Financial Sector Guidance (2012)	Assessing and comprehensive disclose of carbon loss trends and quantities owing to their financing and investment decisions.

#### Discussion

The above analysis shows that considerable energy efficiency and carbon reducing practices have been instituted by most South African banks though there are outstanding important practices which when embraced and adopted could result in favorable sustainable growth. Recruiting qualified people who possess expertise in handling environmentally compatible technologies and energy efficiency matters is very crucial for South African banks. For this reason, improved deep research on environmental issues by establishing adequate departments focusing

on environmental management should be the focus in financial institutions (UNEP-F1, 1997; UNEP-F1, 2012; Equator Principles, 2006; NEMA, 1998).

There is also greater need for South African banks to integrate energy use and climate change goals and objectives as core organizational business ventures. Hence, establishing frameworks that meet carbon off-set goals in accordance with current science on climate normalization should be done. Thus continual review and updates on these environmental issues along with handling energy sustainability difficulties facing the bank should be embedded in

its portfolios (Equator Principles, 2006; Collevocchio Declaration, 2003 cited in Bank Track, 2010). Moreover Basel Convention (1989) commented that there is need for banks to make optimal use of available natural resources in their operations.

Designing energy and carbon policies that are compatible and reliable at all levels of the organization by removing potentially stumbling blocks and awkward regulatory systems is also critical for South African banks. Such an action will not leave other departments unaccountable for their energy and carbon consumption. Supporting this view UNEP-FI (2009), UNEP-FI (1997), Basel Convention (1989) explained that chemicals and any waste from banks system need to be managed, compatible systems for recycling installed, treating as well as disposal of waste properly in line and being implemented efficiently at all levels. This is done to reduce carbon emission increases and it must not imply refuse material from electronic equipment alone.

Establishing common dialogue and mutual partnerships with other banks to adhere to similar yardsticks on energy efficiency matters is fundamental for the South African banking sector. Such activities will affirm climatic change, a top priority agenda in the sectors success. Therefore, banks should undertake the initiative to communicate with other investment offering institutions to put into practical effect research plus cross examination on environmental issues as a gradually developing subject along with full training of their employees on these matters (UNEP-FI, 2012; UNEP-FI, 2009). In addition, banks should work with the government on issues relating to energy efficiency and carbon emissions reduction. In supporting this argument (Collevocchio Declaration, 2003, cited in Bank Track, 2010) emphasized that financial entities have an obligation to collaborate with their respective governments in erecting alliances that propel formation of sustainable markets that are capable of regulating market operations with special attention to environmental matters.

Building energy sustainability structures which are subject to continued retrospective analysis and modernized on matters such as energy consumption, clean and renewable energy practices as well as carbon markets are also desirable for South African banks. On that account, scheme appraisals and complete feedback on investment decisions by banks in matters involving financing projects of borrowers should encompass enough information on suitability to funding, compliance with environmental sustainability standards in

projects activity as well as the impacts of those projects on the environment (Equator Principles, 2006; UNEP-FI, 2012; Collevocchio Declaration, 2003 cited in Bank Track, 2010). This indicates that banks should step forward in the economic system as exemplary “green” leaders who support renewable energy projects adoption and investing.

South African banks should also evaluate and make complete disclose of carbon emission patterns and quantities as a result of their lending’s. This is also made possible and easy by creating a regular and compatible structure which measures carbon emissions and energy usage. Thus banks can take leading roles in transforming economies to low-carbon scenarios. In this manner, comprehensive analysis of environmental, social and governance (ESG) issues by banks should be executed annually and the reports should be disclosed to all concerned stakeholders (UNEP-FI, 2012; Collevocchio Declaration, 2003 cited in Bank Track, 2010; UNEP-FI, 1997). All in all, employees must also feel comfortable, secure and knowledge empowered to make sustainable energy and zero carbon objectives a realizable goal.

## Conclusion

This paper was devised to examine if South African banks are engaged in sustainable development practices. Therefore, the paper analyzed energy and carbon reduction practices of South African banks. Using a multiple case study of eleven (11) South African banks, the content analysis technique was deployed to collect relevant data from each banks sustainability reports. The gathered data were then represented in tabular formats to indicate diversified energy and carbon reduction practices of the sampled South African banks. The presented South African banks energy and carbon reduction practices show growth and potential in making progressions that attain objective results of sustainable development. This is as a result of their commitment and underway practical sustainability projects on ground to address environmental challenges. Nonetheless, deeper scientific research on energy and carbon management, establishing green departments and developing energy efficiency frameworks that are compatible with the bank are still required. Moreover, establishing strong relations with other banks on energy consumption matters, continual review of sustainability practices in line with climate change matters along with building businesses which emerge from climate change issues should form the banks’ top priority.

## References

1. ABSA (2007). *Sustainability Review Report*, ABSA Group, South Africa.
2. ABSA (2008). *Sustainability Review Report*, ABSA Group, South Africa.

3. ABSA (2010). *Group Annual Report 2010*, ABSA Group, South Africa.
4. African Bank (2011). *Sustainability Review Report*, African Bank, South Africa.
5. Albino, V., Balice, A. & Dangelico, R.M. (2009). Environmental strategies and green product development: an overview on sustainability-driven companies, *Business Strategy and the Environment*, 18 (2), pp. 83-96.
6. Anderson, S.T. & Newell, R.G. (2004). Information programs for technology adoption: the case of energy-efficiency audits, *Resource and Energy Economics*, 26 (1), pp. 27-50.
7. Artus, P. (2002). Saving stakeholder capitalism: Europe must change its economic model from within if it is to defend itself against the US alternative, *Financial Times*, February 28, US edition, p. 13.
8. BankTrack (2009). *A Challenging Climate 2.0: What banks must do to combat climate change*. Updated position paper, Copenhagen edition: December 2009.
9. Bank Track (2010). *Collevocchio Declaration: The role and responsibility of financial institutions*. Bank Track: Netherlands.
10. Bansal, S. (2005). The Role of Financial Sector in Sustainable Development, *Bulletin of the National Institute of Ecology*, 15, pp. 259-269.
11. Basel Convention (1989). Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal Adopted by the Conference of the Plenipotentiaries, Secretariat of the Basel Convention, pp. 13-15, Chemin des Anemones, CH-1219 Chatelaine, Geneva, Switzerland.
12. Berelson, B. (1952). Content analysis in communication research, New York, NY, US: Free Press.
13. Bidvest (2010). *Annual Report: Governance and Sustainability Report*, Bidvest, South Africa.
14. Bidvest (2011). *Carbon footprint report 2011*, Bidvest, South Africa.
15. Borgstein, E. & Lamberts, R. (2014). Developing energy consumption benchmarks for buildings: bank branches in Brazil, *Energy and Buildings*, 82, pp. 82-91.
16. Bradford, J. & Fraser, E.D. (2008). Local authorities, climate change and small and medium enterprises: identifying effective policy instruments to reduce energy use and carbon emissions, *Corporate Social Responsibility and Environmental Management*, 15 (3), pp. 156-172.
17. Breisblatt, D., Du, C. & Fletcher, D. (2012). *Driving energy Efficiency at Self Help Credit Union's Retail Banks*. Duke University.
18. Capitec (2011). *Annual Report 2011*. Capitec, South Africa.
19. Ceres (2008). *Corporate Governance and Climate Change: The Banking Sector*. Ceres: January 2008.
20. Clement, R.W. (2005). The lessons from stakeholder theory for U.S. business leaders. *Business Horizons*, 48, pp. 255-264.
21. Comodi, G. & Cioccolanti, L., Polonara F. & Brandoni, C. (2012). Local authorities in the context of energy and climate policy, *Energy Policy*, 51, pp. 737-748.
22. Cooke, R., Cripps, A., Irwin, A., Kolokotroni, M. (2007). Alternative energy technologies in buildings: stakeholder perceptions, *Renewable Energy*, 32 (14), pp. 2320-2333.
23. Copan, G. (2008). SA's carbon emissions a cause for concern, Newspaper article, January 25, 2008, *Engineering news*.
24. Croucher, M. (2011). Potential problems and limitations of energy conservation and energy efficiency, *Energy Policy*, 39, pp. 5795-5799.
25. Dass, A. & Devidayal, U. (2010). *Climate Change and Finance in India: Banking on the low carbon Indian economy*, The Climate Group.
26. De Blois, M., Herazo-Cueto, B., Latunova, I. & Lizarralde, G. (2011). Relationships between construction clients and participants of the building industry: Structures and mechanisms of coordination and communication, *Architectural Engineering and Design Management*, 7 (1), pp. 3-22.
27. Ebbs, N., Rodrigues, L. & Garratt, T. (2012). Is added sustainability equal to added value? *Energy Conversion and Management*, 63, pp. 203-207.
28. Equator Principles (2006). *The Equator Principles*, Available at: [http://www.equator-principles.com/resources/equator\\_principles\\_II.pdf](http://www.equator-principles.com/resources/equator_principles_II.pdf) (Accessed October 15, 2012).
29. European Commission (1997). *The Role of Financial Institutions in Achieving Sustainable Development*, European Commission.
30. European Investment Bank (2009). *The EIB Statement of Environmental and Social Principles and Standards*, European Investment Bank.
31. Fan, Z., Hui, Y. & Qin, L.Y. (2011). Thinking on the development of "Carbon Finance" in Commercial Banks of China, *Energy Procedia*, 5, pp. 1885-1892.
32. First Rand-FNB (2011). *Environment Programme*, Available at: <http://www.firstrand.co.za/Sustainability/Pages/environment-programme.aspx> (Accessed October 15, 2012).
33. FNB (2010). *Report to society 2010*, First Rand, South Africa.
34. Freeman, R.E. (1984). *Strategic management: A stakeholder approach*, Marshfield, MA7 Pittman Publishing.
35. Furrer, B., Swoboda, M. & Hoffman, V.H. (2009). *Banking & Climate Change – Opportunities and Risks: An Analysis of Climate Strategies in more than 100 Banks Worldwide*, European Commission.
36. GHG Protocol Financial Sector Guidance (2012). *Concept Note: GHG Protocol Financial Sector Guidance for Corporate Value Chain Accounting*, GHG Protocol.
37. Giuliettia, M., Price, C. & Waterson, M. (2001). *Consumer Choice and Industrial Policy: A Study of UK Energy Markets*, CSEM, WP 112, University of California Energy Institute, California University, Berkeley, CA.

38. Grafton, Q.R., Jotzo, F. & Wasson, M. (2004). Financing sustainable development: Country Undertakings and Rights for Environmental Sustainability CURES, *Ecological Economics*, 51 (1), pp. 65-78.
39. Grindrod. (2011). *Integrated Annual Report 2011*, Grindrod, South Africa.
40. Grundey, D., Streimikiene, D. & Ciegis, R. (2007). Energy indicators for sustainable development in Baltic States, *Renewable and Sustainable Energy Reviews*, 11 (5), pp. 877-893.
41. Guthrie, J. & Abeysekera, I. (2006). Content analysis of social, environmental reporting: what is new? *Journal of Human Resource Costing & Accounting*, 10 (2), pp. 114-126.
42. Hammond, G.H. (2000). Energy, Environment and Sustainable Development: A UK Perspective, *Process Safety and Environmental Protection*, 78 (4), pp. 304-323.
43. Heron, G. & Oglethorpe, D. (2010). Sensible operational choices for the climate change agenda. *International Journal of Logistics Management*, 21 (3), pp. 538-557.
44. Hewett, C. (2009). *Establishing a Green Investment Bank for the UK*. Green Alliance.
45. Hoffman, A. & Ventresca, M. (Eds). (2002). *Organizations, Policy and the Natural Environment: Institutional and Strategic Perspectives*, Stanford University Press, Stanford, CA.
46. Hofman, H. (1996). Corporate environmental reporting: the next tool for environmental gains? In *Tracking systems: linking environment and economy through indicators and accounting systems*. Edited by the Institute of Environmental Studies, Conference papers, Australian Academy of Sciences Fenner Conference on the Environment. University of New South Wales: Institute of Environmental Studies.
47. Holcomb, J.L., Upchurch, R.S. & Okumus, F. (2007). Corporate social responsibility: what are top hotel companies reporting? *International journal of contemporary hospitality management*, 19 (6), pp. 461-475.
48. Hourcade, J.C., Fabert, B.P. & Rozenberg, J. (2012). Venturing into uncharted financial waters: an essay on climate-friendly finance, *International Environmental Agreements: Politics, Law and Economics*, 12 (2), pp. 165-186.
49. Hrasky, S. (2011). Carbon footprints and legitimation strategies: symbolism or action? *Accounting, Auditing & Accountability Journal*, 25 (1), pp. 174-198.
50. International Finance Corporation (2011). *Update of IFC's Policy and Performance Standards on Environmental and Social Sustainability, and Access to Information Policy*, IFC.
51. Investec (2012). *Sustainability Report 2012*. Investec, South Africa.
52. Jose, A. & Lee, S.M. (2007). Environmental reporting of global corporations: a content analysis based on website disclosures, *Journal of Business Ethics*, 72 (4), pp. 307-321.
53. JSE (2013). Introduction to SRI Index. Johannesburg Stock Exchange (JSE). Available at: [http://www.jse.co.za/About-Us/SRI/Introduction\\_to\\_SRI\\_Index.aspx](http://www.jse.co.za/About-Us/SRI/Introduction_to_SRI_Index.aspx) (Accessed 18 March 2013).
54. Korea Capital Market Institute (2010). Financial Strategy to Accelerate Innovation for Green Growth. Available at: <http://www.oecd.org/sti/ind/45008807.pdf> (Accessed 11 August 2014).
55. Mann, S. & Hawkins, D.E. (2007). The world bank's role in tourism development, *Annals of Tourism Research*, 34 (2), pp. 348-363.
56. Miron, D. & Preda, M. (2009). Stakeholder Analysis of the Romanian Energy Sector, *Review of International Comparative Management*, 10 (5), pp. 887-892.
57. Murthy, M.R.L.N. (2001). PV promotion in developing countries by World Bank and other international organizations, *Journal of Solar Energy Materials & Solar Cells*, 67, pp. 629-637.
58. Narula, K. (2012). Sustainable Investing' via the FDI route for sustainable development, *Procedia-Social and Behavioral Sciences*, 37, pp. 15-30.
59. Nath, V., Nayak, N. & Goel, A. (2014). Green Banking Practices – A Review, *IMPACT: International Journal of Research in Business Management (IMPACT: IJRBM)*, 2, pp. 45-62.
60. Nedbank (2011). Environmental Sustainability. Available at: <http://www.nedbankgroup.co.za/sustainEnvironmentIntro.asp> (Accessed 26 October 2012).
61. NEMA (1998). National Environmental Management Act (1998). South Africa.
62. Oliveira de, A. (1997). Electricity system reform: World Bank approach and Latin American reality, *Energy for Sustainable Development*, III (6).
63. Penni M.C. (2009). Energy Efficiency: Principle and Practices. *Penni Well Corporation*, pp. 7-15.
64. Peterson, T.D. & Rose, A.Z. (2006). Reducing conflicts between climate policy and energy policy in the US: The important role of the states. *Energy Policy*, 34 (5), pp. 619-631.
65. Pillarisetti, R.J. (2005). The World Bank's "genuine savings" measure and sustainability, *Ecological Economics*, 55, pp. 599-609.
66. Roca, L.C. & Searcy, C. (2012). An analysis of indicators disclosed in corporate sustainability reports, *Journal of Cleaner Production*, 20 (1), pp. 103-118.
67. Rogge, K.S., Schneider, M. & Hoffmann, V.H. (2011). The innovation impact of the EU Emission Trading System — Findings of company case studies in the German power sector, *Ecological Economics*, 70 (3), pp. 513-523.
68. Rossi de Souza, G. (2009). *An economic incentives framework for carbon accountability in the financial sector*, Carbon Confidence.
69. Sagepub (2014). Designing case studies. Available at: [http://www.sagepub.com/upm-data/24736\\_Chapter2.pdf](http://www.sagepub.com/upm-data/24736_Chapter2.pdf) (Accessed 11 August 2014).
70. Sasfin Bank (2011). Integrated Annual Report. Available at: <http://www.sasfin.com/LinkClick.aspx?fileticket=fcCio0DTVsq%3D&tabid=250> (Accessed 17 October 2012).

71. Schaltegger, S. & Csutora, M. (2012). Carbon accounting for sustainability and management. Status quo and challenges, *Journal of Cleaner Production*, 36, pp. 1-16.
72. SEERC (2010). Single and Multiple-Case Study Designs IS493 1 – SEERC. Available at: [http://www.seerc.org/dsc2010/misc/Single\\_and\\_Multiple\\_Case\\_Study\\_Designs.pdf](http://www.seerc.org/dsc2010/misc/Single_and_Multiple_Case_Study_Designs.pdf) (Accessed 11 August 2014).
73. Siemens (2012). Smart Meter Reading for Customers: Customer case study: UK Banks and Financial Institutions, Available at: <http://w3.siemens.co.uk/smartgrid/uk/en/services/mcs/smb/pages/finance.aspx> (Accessed 30 November 2012).
74. Souza de, G. & Thom, I. (2009). *Banking on Carbon Accountability: The carbon impact of investment*. Carbon Confidence.
75. Standard Bank (2011). Environment-Sustainability. Available at: [https://sustainability.standardbank.com/downloads/segmented/segment\\_12.pdf](https://sustainability.standardbank.com/downloads/segmented/segment_12.pdf) (Accessed 28 October 2012).
76. Standard Bank (2011). *Sustainability Report 2011*. Standard Bank.
77. Stanislaw, J.A. (2008). Climate Changes Everything: The Dawn of the Green Economy, Deloitte Development LCC.
78. Sturm, R. & Strickland, C. (1998). Energy efficiency in World Bank power sector policy and lending New opportunities, *Energy Policy*, 26 (11), pp. 873-883.
79. Swoboda, M., Furrer, B. & Hoffmann, V. (2007). *Banking & Climate Change: Opportunities and Risks: An Analysis of Climate Strategies in more than 100 banks worldwide*, European Commission.
80. Spyropoulos, G.N. & Balaras, C.A. (2011). Energy consumption and the potential of energy savings in Hellenic office buildings used as bank branches – a case study, *Energy and Buildings*, 43 (4), pp. 770-778.
81. The Intent (2009). The Carbon Principles. Available at: <http://www.carbonprinciples.com/intent.php> (Accessed 15 October 2012).
82. Thompson, P. & Zakaria, Z. (2004). Corporate social responsibility reporting in Malaysia, *Journal of Corporate Citizenship*, 2004 (13), pp. 125-136.
83. UNEP FI (1997). UNEP Statement by Financial Institutions on the Environment & Sustainable Development. UNEP FI, Available at: [http://www.unepfi.org/fileadmin/statements/fi/fi\\_statement\\_en.pdf](http://www.unepfi.org/fileadmin/statements/fi/fi_statement_en.pdf) (Accessed 15 October 2012).
84. UNEP Finance Initiative’s UNEP-FI (2007). CEO briefing, Carbon Crunch Meeting the cost. UNEP-FI.
85. UNEP Finance Initiative’s UNEP-FI (2009). Energy efficiency and the finance sector, a survey on lending activities. UNEP-FI.
86. UNEP-FI (2012). Financing Renewable Energy in Developing Countries: Drivers and Barriers for Private Finance in sub-Saharan Africa. UNEP publication
87. Warjnberg, D., Steger, U., Aileen, I.O. & Lins, C. (2007). *Corporate Sustainability in the Brazilian Sector*. IMD.
88. Weber, R.P. (Ed.) (1990). *Basic content analysis* (No. 49). Sage.
89. World Bank (2010). *The Potential Demand Response: Increasing Energy Efficiency Chapter 4*. World Bank.
90. World Bank (2010b). Carbon Finance at World Bank. Available at: [http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/For\\_Web\\_CF\\_at\\_WB-web.pdf](http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/For_Web_CF_at_WB-web.pdf) (Accessed 11 August 2014).
91. Xuan, T. & Zhenfa, Q.I. (2010). *The Researches on Strategies for Developing Carbon Finance in China*, Seiof-Bluemountain.
92. Yang, G. (2010). The Challenges and Solutions of Chinese Commercial Banks Facing Carbon finance. Available at: [www.seiofbluemountain.com/search/detail.php?id=6429](http://www.seiofbluemountain.com/search/detail.php?id=6429) (Accessed October 11, 2012).
93. Yeoh, P. (2008). Is carbon finance the answer to climate control? *International Journal of Law and Management*, 50 (4), pp. 189-206.

**Appendix**

Table 1. Energy and carbon management practices of South African banks

South African banks carbon/energy management practices
<p>Undertaken to bring down energy consumption by marked percentage targets yearly.</p> <p>Modernizing available luminaries with computerized gears that reduce lighting usage substantially; usually by 22%.</p> <p>Switching off electricity use after hours, from 1900 to 0600 hours monitored by one switch that lights for an hour then automatically switches off.</p> <p>Adopting use of chlorine free refrigerants in air conditioning equipment which reduce greenhouse gas emissions (GHG) substantially.</p> <p>Using energy saving air conditioning equipment that is able to retain heat as well as enable energy consumption.</p> <p>Improved complete usage of available office space per employee that enhances energy savings.</p> <p>Accounting the carbon footprint as well as forming partnerships with suppliers which raise awareness on carbon emissions.</p> <p>All travelling purposes to be minimized by at most 6 million kilometres which increase energy efficiency.</p> <p>Acquiring carbon credits since gas powered stations produce half greenhouse gas emissions than coal.</p> <p>Training credit processing leadership on the importance and objectivity associated with environmental finance.</p> <p>Monitoring the banks carbon footprint and taking part in the Carbon Disclosure Project.</p> <p>Spread education and cognisance to staff, customers and other stakeholders on carbon reduction and energy efficiency.</p> <p>The banks’ branches are expected to buy energy which suits their needs, furnished with an instituted reward system in line with performance on energy use.</p> <p>Use of computerized vehicle tracking systems that provide details of the drivers’ whereabouts hence fostering routing efficiency.</p> <p>Quantifying carbon levels and disclosure.</p> <p>Replenished air conditioning scores along with refrigeration gas amounts are to be accounted so as to further ascertain carbon reduction strategies.</p> <p>Individual gases such as butane and propane are to be recorded separately as other gases since they also contribute to greenhouse gas emissions.</p> <p>Establishing alliances with the Renewable Energy Independent Power Producer (REIPP) program which prioritizes the use of renewable energy advancements.</p> <p>Sponsor initiatives that create a green society and are also involved with establishing future schemes that handle energy security demands.</p> <p>Uninterrupted provision of occupancy sensors that monitor and control lighting consumption in offices.</p> <p>Refurbishment of light fittings in conformance with energy saving requirements.</p>



Table 1 (cont.). Energy and carbon management practices of South African banks

South African banks carbon/energy management practices
<p>Strict management and control of air-conditioning equipment that is peripheral within buildings so as to avoid over comfort which use a lot of energy.</p> <p>Increased usage of computerized communication systems such as video conferencing plus telephone conferencing mechanisms which cuts travelling that consume a lot of fuel.</p> <p>Offering Green Building Retrofit Loans, also "Eco Energy Loan" that aid in reducing carbon emissions as buildings possess 33% of carbon dioxide emissions.</p> <p>Exhibiting bucks benefits that include ecologically friendly commodities such as solar-powered mobile phone charging systems.</p> <p>Belongs to the Green Building Council of South Africa which works to improve and upgrade existing buildings using the greening effect principle.</p> <p>Working progressively to report both financial and environmental performances in annualized formats.</p> <p>Responsible lending together with investing.</p> <p>Observing Equator principles guidelines and King III report objectives.</p> <p>Holds campaigns such as Solar Initiatives, Earth Hour and COP17 climate change conferences that promote and address energy use and GHG emission issues.</p> <p>Energy financing in collaboration with the European Investment Bank (EIB) that offer loans to support energy consumption and clean energy schemes in South Africa.</p> <p>Remodel current office buildings so as to achieve energy efficiency requirements.</p> <p>Offering funding schemes to employees so that they engage solar geyser program which put solar water geysers in their households.</p> <p>Establishing solar water heater projects and are members of the Sustainable Energy Society of Southern Africa's Solar Water Heating Division.</p> <p>Construct new buildings paying attention to the Green Star SA building rating mechanism that evaluates buildings in light of environmental indicators such as energy savings.</p> <p>Take part in various initiatives spearheaded by the International Emissions Trading Association (IETA) which aims to reduce carbon emission in Africa.</p> <p>Funding organizations such as CarbonSoft Corporation a firm that sets up and clear avenues for organized clean development systems for solar enhanced lamps in Africa and worldwide.</p> <p>Embark on country wide operations that offer light-emitting diodes (LEDs) lamps, which are responsible for 80% energy consumption reduction per lamp.</p> <p>Collaborate with the South African Government's Power Conservation Program in monitoring energy usage of all energy intensive projects.</p> <p>Use of CFL (compact fluorescent light) luminaries within their buildings which accomplish energy consumption.</p> <p>Apply modern energy systems in all organizations servers which minimize energy use in their cooling effect.</p> <p>Change available geysers with quick water heating systems as well as furnishing them with timers.</p> <p>Possess Circuit breakers characterized by ethernet ports which are connected to the banks system that condense data on energy consumption hence the bank can shed load in accordance with the need.</p> <p>Install PLC (programmable logic controller) load shedding of air conditioning networks that make energy consumption achievable at night.</p> <p>Works with South African government's Climate Change Response Green Paper, an organization which considers environmental and social impacts of business operations.</p> <p>The buildings have large windows that provide natural light within banks offices.</p>