

**WHY DO COMPANIES GO GREEN? A QUALITATIVE STUDY OF THE  
MOTIVATIONS AND CONTEXTUAL FACTORS INDUCING SUSTAINABLE  
RESPONSES**

Simon von Witt



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**Supervisor:** Louise Scholtz

**Co-supervisor:** Professor Alan Brent

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## DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained herein is my own, original work, that I am the authorship thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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## **ABSTRACT**

'Going green' draws its origins from the 'green' in politics, which was first used as a party name by the German Greens (Die Grünen) in the late 1970s, which, although not the first green party, through media hype triggered the conception of a green movement in the early 1980s. This was voiced through green parties across the globe. Green is now seen as a buzzword and is often used as shorthand for discussing sustainability. It has since gained support leading to the gathering of more than 100 heads of state at the Earth Summit, which took place in Rio de Janeiro, Brazil in 1992 and provided the necessary platform to launch a global campaign. It initially began in developed nations, in particular European countries, but has since spread to developing countries, despite receiving abundant opposition both from developed and developing nations, due to its impact on the oil and coal sectors. The purpose of this research is to determine the core motivation behind companies going green. The researcher does this through a qualitative study of the motivations and contextual factors that induce ecological responsiveness ranging from day to day business practices to the ecological design of their offices.

The researcher tests the hypothesis, namely climate change mitigation, which is developed through the literature study and adopted to evaluate the four case studies selected. The researcher builds up his argument in chapters 3 to 5, which draw on the literature studied and first discuss Government's response to climate change, then the interventions in place to address climate change and finally look at the four case studies. Climate change and its relevance to companies is the key motivation behind deciding on this topic and it is discussed throughout the thesis. Companies interviewed in this thesis expressed concern about it, although it was not always the primary motivation. Some had already introduced measures to address it and were continually looking at new ways of mitigating it. Similarly, the companies interviewed and others analysed were all concerned about introducing cost saving measures, which had the added advantage of being of benefit to the environment. Genuine reasons for mitigating climate change and

concern over the future of the planet put forward by certain companies, while protecting profit margins were given by others. All served to achieve one goal to protect the environment through the sustainable use of natural resources and ultimately to enhance companies' public images as being green companies.

This study is divided into a literature review and case studies, where literature pertaining to climate change, renewable energy, sustainable building, corporate governance, green jobs and others was sourced from government gazettes, newspapers, academic studies, books, documentaries, journals, magazines and internet sources. These serve to develop and support the case studies, which take the form of interviews done with owners and workers from the selected companies.

## OPSOMMING

Om groen te wees is 'n uitdrukking wat van die politiek afkomstig is. Die naam is eers deur die Duitse Groenparty (Die Grünen) in die laat sewentiger jaar gebruik en alhoewel dit nie eintlik die eerste groenparty was, het dit deur middel van die media gelei tot die totstandkoming van die groenbeweging in die vroeë tagtige jare. Die naam "groen" is deur groenpartye wêreldwyd gebruik en 'groen' word deesdae as 'n bynaam gebruik as 'n mens van verdedigbaarheid praat. In 1992 te Rio de Janeiro, Brazil het die groenbeweging sterk steun gevind toe meer as 100 staatshoofde by die 'Earth Summit' bymekaar vergader het. Oorspronklik het die groenbeweging in die ontwikkelde nasies, veral Europese nasies, begin maar het daarna tot die ontwikkelende nasies uitgebrei. Maar daar was heelwat teenstand van beide ontwikkelde en ontwikkelende nasies, weens die ekonomiese uitwerking op die olie en steenkool industriële. Die doel van hierdie navorsing is om te bepaal watter motiverende faktore maatskappye inagneem as hulle "groen" gaan. Die skrywer versoek om vas te stel deur middel van 'n kwalitatiewe studie van die motiverende en samehangende faktore wat ekologiese antwoordendheid teweegbring. Hierdie faktore beweeg van daaglikse besigheidspraktyke tot die ekologiese beplanning van die kantore.

Die skrywer gebruik die versagting van klimaatverandering as 'n toets, wat deur die literatuurstudie ontwikkel is en wat verwys word as die sleutelmotivering wat tot groening lei, en wat gebruik word om die vier uitgesoekte studies te beoordeel. Elkeen van die studies word volgens hierdie kriteria bepaal. Die skrywer pas hierdie kriteria ook op voorbeelde wat gebruik word om die vier uitgesoekte studies te steun.

Die skrywer bou in hoofstukke 3 tot 4 sy argument op. Daar word die regering se reaksie tot klimaatverandering en groot besigheid se antwoord op regeringsbeleid uiteengesit. Ons sien ook die bemiddeling wat in staat gestel is om klimaatverandering teen te

staan; daarna word die agtergrond oor die logiese gronde vir die verkiesing van die vier gevallestudies bespreek, en laastens word die eintlike gevallestudies behandel. Klimaatverandering en die relevantheid daarvan is die sleutelmotivering vir die keuse van hierdie onderwerp en dit word deurgaans in die proefskrif bespreek. Dit is die een gemeenskaplike faktor waaroor die vier ondervraagde maatskappye getoets is; hulle het reeds stappe geneem om dit teen te staan en soek aanhoudend om die uitwerking van klimaatverandering te versag.

'n Oorsig van die algemene literatuur en sake studies, die literatuur wat spesifiek op klimaatverandering van toepassing is, hernieubare energie, verduurbare geboue, maatskaplike beheer, 'groen' werk en klimaatverandering te versag. Inligting afkomstig van staatskoerante, koerante, akademiese studies, boeke, dokumentere studies, joernale, tydskrifte en internet bronne. Altesame het hierdie bronne bygedra tot die ontwikkeling en steun van die gevallestudies, wat hoofsaaklik die vorm van onderhoude met werkgewers en werknemers van uitgesoekte maatskappye gevat het.

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## ACRONYMS AND ABBREVIATIONS

|         |   |
|---------|---|
| ABB     | ABB Group (power and automation technologies)             |
| ADB     | African Development Bank                                  |
| AIDS    | Acquired Immune Deficiency Syndrome                       |
| ANZ     | Australia and New Zealand Financial Services              |
| AWEA    | American Wind Energy Association                          |
| BBC     | British Broadcasting Corporation                          |
| BP      | British Petroleum   |
| BRICS+G | Brazil, Russia, India, China, South Africa and Germany    |
| CDM     | Carbon Disclosure Mechanism                               |
| CEO     | Chief Executive Officer                                   |
| CSR     | Corporate Social Responsibility                           |
| DANIDA  | Danish International Development Agency                   |
| DEA     | Department of Environmental Affairs (DEA previously DEAT) |
| DEAT    | Department of Environmental Affairs and Tourism           |
| EC      | European Commission                                       |
| ECA     | Environmental Conservation Act                            |
| ECCP    | European Climate Change Programme                         |
| EDANZ   | Economic Development Agencies of New Zealand              |
| EMEA    | Europe Middle East and Africa                             |
| EPA     | Environmental Protection Agency                           |

|          |  |
|----------|--|
| ESKOM    | Electricity Supply Commission                                |
| ETS      | Emission Trading System                                      |
| EU       | European Union   |
| GBSA     | Green Building South Africa                                  |
| GDP      | Gross Domestic Product                                       |
| GM       | Genetically Modified   |
| ICT      | Information and Communication Technologies                   |
| IFC      | International Finance Corporation                            |
| ILO      | International Labour Organisation                            |
| ISEIS    | International Society for Environmental Information Sciences |
| ISO14001 | International Organisation for Standardisation               |
| IT       | Information Technology                                       |
| JSE      | Johannesburg Stock Exchange                                  |
| kg       | Kilogram   |
| kWh      | Kilowatt hour  |
| LSA      | Library Staff Association                                    |
| MDG      | Millennium Development Goals                                 |
| mJ       | millijoule   |
| MW       | Mega Watt  |
| OECD     | Organisation for Economic Cooperation and Development        |
| SAB      | South African Breweries                                      |

|        |  |
|--------|--|
| SENSE  | Research School for Socio-Economic and Natural Sciences of the Environment |
| UK     | United Kingdom   |
| UNDP   | United Nations Development Programme                                       |
| UNEP   | United Nations Environment Programme                                       |
| UNESCO | United Nations Educational Scientific and Cultural Organisation            |
| USA    | United States of America   |
| WBCSD  | World Business Council for Sustainable Development                         |
| WCED   | World Commission on Environment and Development                            |
| WHO    | World Health Organisation  |

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

In the last 100 years the world's population has nearly quadrupled, growing from 1.6 billion to 6.1 billion (Yale Global: 2004). These figures are predicted to grow further to 9 billion before 2050 of which almost 3 billion will survive on less than US\$2 a day (UNDP: 2006). Little has been said about the heart of the crisis, which is associated with a societal over-emphasis on money, material wealth and consumption to the detriment of socio-economic and environmental sustainability (Manzo: 2009).

Gore writes in his book "*Earth in the Balance*" that a population explosion has resulted in a new relationship between man and the earth's natural balance and has contributed to climate change, ozone depletion, the loss of living species and deforestation. This, coupled with the industrial and technological changes witnessed in the twentieth and twenty-first centuries respectively have contributed to two key factors. These determine humankind's current relationship to the earth, namely the addition of approximately one billion people to the planet every 10 years and a sudden acceleration of the scientific and technological revolution. This has resulted in humans being equipped with new powers to affect their environment by burning, cutting, digging, moving and transporting the physical matter that makes up the earth (Gore 2006). The impact of this was first recognised in the late 20<sup>th</sup> Century and gave rise to organisations such as the World Commission on Environment and Development (WCED).

The WCED, chaired by former Norwegian environment minister, Gro Harlem Brundtland, did two highly significant things of lasting impact. It coined the term "sustainable development", defined as "the ability of present generations to meet their own needs without compromising the ability of future generations to meet their own."(Brundtland:



2002). This called for an international conference on sustainable development, which was held as the Earth Summit in Rio de Janeiro in 1992 (Holliday *et al.*,2002). The WCED wrote before the Earth Summit conference as a motivation for it: “When the century began, neither human numbers nor technology had the power to radically alter planetary systems. As the century closes, not only do vastly increased human numbers and their activities have that power, but major, unintended changes are occurring in the atmosphere, in soils, in waters, among plants and animals, and in the relationships among all of these.” (WCED: 1987). This led to the world summit on sustainable development (WSSD) in Johannesburg in 2002. Here, challenges such as sustainable development in the face of mitigating the accelerating impacts of climate change were addressed.

Some of the impacts associated with climate change are attributed to a warmer earth leading to changes in rainfall patterns, a rise in sea levels, and a wide range of impacts on plants, wildlife, and humans. When scientists refer to climate change, their main concern is largely about global warming caused by human activities (EPA,2006). The United States (USA), which has only four (4) per cent of the world’s population, is responsible for 22 per cent of its greenhouse gas emissions. A rapid transition to energy efficiency and renewable energy sources may combat climate change, protect human health, create new jobs, protect habitat and wildlife, and ensure a secure, affordable energy future. Some of the possible health risks associated with a warmer climate could be Malaria, Dengue Fever and Encephalitis. These are hardly heard of in places like USA, but as temperatures rise, disease-carrying mosquitoes and rodents are likely to spread and infect more people. Doctors at the Harvard medical school have linked recent USA outbreaks of dengue fever, malaria, hanta virus and other diseases directly to climate change. Disease outbreaks can be directly linked to work output and economic growth having a major impact on businesses (Day *et al.*, 2004).

The importance of environmental management is evident in the aforementioned links and it is widely recognised that the concept of “sustainable development” embraces both human and environmental concerns equally (UNESCO World Conference: 2009).

However, sustainable development cannot be achieved by one nation on its own, nor in one sphere, but requires world partnerships never achieved before (WCED: 1987). As with sustainable development, which is divided into three pillars, business is viewed as one of three pillars of society, the other two being civil society and government (Demidov & Paniflova, 1998)<sup>1</sup>. However, the WBCSD is of the opinion that there will not be any real progress until business, government and civil society team up in new and dynamic partnerships to create sustainable solutions. One of the key factors these three pillars need to assess in their outlook is how climate change affects them and what can be done to mitigate it, be it through financial instruments, indices or policies (OECD: 2008). The average earth surface temperature has increased by more than 1 degree Fahrenheit since 1900 and the speed of warming has been almost three fold the century long average since 1970. Rising temperatures have already been linked to impacts on agriculture, coastal areas and public health. Melting ice caps could raise sea levels and inundate coastal areas, scientists say. Changes in ocean temperature could disrupt the Gulf Stream and make Europe much colder (Petsonk: 2005). This increase in earth's average temperature is called global warming (Gore: 2006). This, in turn, causes changes in climate, otherwise known as climate change. For the purposes of this study climate change will form the primary focus.

Climate change has many associated impacts. Government can be seen to be at the forefront of providing solutions to these. For example, they can provide financial structures and incentives, as well as punitive measures to dissuade polluting activities. Similarly, this has triggered companies to come up with their own solutions, such as in the IT industry, where climate change, energy efficiency and environmental sustainability have moved into the mainstream of business strategy. Pierre Liautaud, vice- president of Western Europe region, Microsoft Europe Middle East and Africa (EMEA) is cited as saying at the OECD Forum 2008: "In the IT industry this shift is well underway and there is a strong emphasis on partnership within the industry, with the scientific community, with customers and with governments to reduce energy consumption and drive

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<sup>1</sup> The potential power of civil society is underestimated, by government, business and even civil society organisations themselves and is arguably the most important of the three pillars.

innovation.” Mr Liautaud said that the IT industry was tackling climate change by helping society to better manage its resources. Reliable and timely information was the key to positively changing behaviour. The ICT sector uses 2 per cent of global energy consumption and this would be even less in the future thanks to new innovations; desktop computers which before consumed 200 watts now used only 70 watts. This positive change in energy consumption patterns leads us to the term sustainability.

Sustainability is a notion which is central to the challenges faced by companies in the 21<sup>st</sup> Century. Mahbub ul Haq defines sustainability as: “ensuring that human opportunities endure over generations.” This implies not just sustaining natural capital, but also physical, human and financial (Reflections on Human Development: 1995). Ghandi is reported to have said: “the world has enough for everyone’s need, but not enough for everyone’s greed.” (Guha: 2002). Sustainability can further be split into weak and strong sustainability, where weak refers to maintaining both natural and human capital intact, while strong sustainability refers to viewing natural and human capital as separate entities. This provides a good opportunity to expand on “going green’ and its relationship to sustainability, as both are intrinsically linked, yet distinct. Being green is not always sustainable, as it considers only one initiative while a sustainable enterprise, for example, manages its business in such a way that it has an overall positive effect on society by demonstrating economic, social and environmental responsibility (Clarkston Consulting: 2006). Besides providing jobs, “green companies” and sustainable enterprises both recognise the importance of mitigating climate change as being one of the primary motivations behind their formation. “In fact, the climate and the jobs crisis have common roots. We have over-emphasized the economy, especially the financial sector, and undervalued the social and environmental dimensions of sustainability. The response to the crisis needs to redress this imbalance.” (Somavia: 2009).

“A green economy can provide more jobs”, as quoted from the ILO Report, Green Jobs (2007). The only means of slowing the build-up of CO<sub>2</sub> concentrations so as to prevent a potential disaster from occurring due to unchecked climate change, which could take centuries to reverse, is for the energy economies of both industrial and developing

economies to transform simultaneously (Flavin: 2008). In order for this to occur, the energy policies of these countries would have to change rapidly, which, to a certain degree, is already happening. Renewable and energy efficient technologies will allow developing countries to increase their reliance on local resources and decrease their dependence on unstable, expensive imported fuels (Flavin: 2008). New energy systems have the potential to become a massive source of industrial development and job creation, opening new economic opportunities (Flavin: 2008). “Developing countries have the potential to leapfrog the carbon intensive development path of the 20th century and go straight to the advanced energy systems that are possible today.” (Flavin: 2008). However, this is hindered by many skeptics in the modern world, which is supported by Ervin, cited in Greenbiz (2007) as saying: “too many still perceive climate change as smacking of advocacy or political ideology, or at the least, distant from their own sphere of influence.” However, emerging sectors such as waste management have made substantial ground and this has been aided by the imposing of new legislation by the national Department of Environmental Affairs (DEA) in South Africa. Such legislation should facilitate the entrance of new “green businesses” into the job market.

Projections were made by the ILO that “the global market for environmental products and services should double from \$1,370 billion at present to \$2,470 billion by 2020.” In Germany, for example, environmental technology is projected to increase four-fold by 2030 and overtake car and machine-tool manufacture, the core of the German economy. Concern about climate change has also sparked new concern and fear into the construction industry, who traditionally have not been actively involved with research and development, when compared to other sectors<sup>2</sup>. The ILO revealed that “investments in improved energy efficiency in buildings could generate an additional 2-3.5 million green jobs in Europe and the United States alone”, with an even greater potential in developing countries. Investments made into renewable energy sources of energy could “translate into at least 20 million additional jobs.” This is more than those who are already

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<sup>2</sup> In the United Kingdom, as a means of addressing this, the Cambridge-MIT Institute joined with Salford University to convene the **21<sup>st</sup> Century Construction Group**, a community of large clients of the construction industry, to improve existing business practices and identify potential areas for research and development.

employed in the fossil fuels industry. This is evidence in itself that going green is not only best for the environment and assisting in mitigating climate change, but also it can provide many, much sought after jobs.

## **1.2 Motivation**

The focus here is on environmental issues, in particular climate change and whether it informs organisations decision to go green. This should become evident through an analysis of the case studies, where the primary objective is to determine whether going green and adopting a more, long term approach to their business practice in the face of climate change can be economically viable.

The mitigation of climate change is the hypothesis being tested in this study behind companies going green and four companies from diverse sectors of the economy were selected in an attempt to identify these. Some of the factors that may play a role behind their drive or lack thereof to mitigate climate change range from cost, profit margins through to genuine concerns and these are looked at later on in the study. All four business, however, need to make a profit in order for them to survive and, by being profitable, a business can provide sustainable jobs for its employees, good returns for investors and prosperity for the communities in which it operates (Andriorf & McIntosh: 2000).

## **1.3 Structure**

This study comprises six chapters. Chapter 1 is the Introduction and also serves to develop the primary argument behind this document, which is the mitigation of climate change. It also elaborates on terms such as sustainability and sustainable development, which are referred to throughout the document. Chapter 2 focuses on the structure of the study, the methodology and then moves on to look at the literature study.

Chapter 3 looks at the global perspective of how different countries in developed and developing nations are responding to climate change, the green versus the brown agenda and the Kyoto Treaty. All the arguments on climate change and the testing of whether the mitigation of climate was the primary driver to induce companies to go green are developed in this chapter. Examples of tools like 'greenwashing', are also found in this chapter, which are regularly used by other companies in their respective sectors and pose challenges to their integrity

In chapter 4 the study then shifts to focus on the interventions in place and proposed by the South African government, and companies to address climate change. It draws attention to the countless challenges faced in South Africa ranging from Eskom's low price of coal based electricity, insufficient government and private sector support to public scepticism (Africa Economic Outlook Overview: 2008). It then compares fossil fuels with alternative energy. South Africa is still, in many respects, some years behind the Western World and has been slow to address issues like climate change and reducing its carbon footprint (South Africa, Gartner: 2008). Pressure is also being felt by local companies and retail outlets of international companies to adapt their policies to conform to international environmental standards, such as the ISO14001 (Bethlehem: 2009). Chapter 5 focuses on the case studies with the aid of articles and general information on their specific sectors and discusses in depth each respective case study. It gives particular attention to sustainable building, as is pertinent to two of the case studies and one of the major contributors to CO<sub>2</sub> emissions. The study then progresses to its conclusion.

Chapter 6 is the conclusion of the study, which concludes with an overall summary of the findings of both the interviews and literature study, which supplemented the companies studied. It establishes a common thread between each of the studies and then paves the way for further studies highlighting existing challenges and outlining the way forward.

## **CHAPTER 2**

### **RESEARCH DESIGN**

#### **2.1 Background**

Two schools of thought are being tested in this thesis; namely, an ethical and technical modernity. This is done through a series of interviews with both employer and employee of the four selected companies. Both of these are reflected in the case studies, and in the modern world these can often be seen to work against each other. Hans Jonas proposed to build an ethical modernity that is able to limit the human capacity as a destructive agent of the perpetuity or the sustainability of life (Jonas: 1979). From that perspective, one can conceive sustainable development as a horizon within the framework of an ethical modernity, not only of a technical modernity (Jonas: 1979). Technical modernity on the other hand can be seen as a means of improving profit margins with little or no regard for the environment. Since the eighteenth century, technological power is becoming more and more connected with the power structure of the state and with the so-called free market forces, to such a point that, nowadays, the market chooses from available alternatives, the most profitable technology. In this process, nature is but a “storehouse of matters” (Francis Bacon: 1620, excerpt from Bartholo *et al.*,1993) and what really matters are values related to efficiency and productivity.

This study investigates the case studies through testing their drive to mitigate climate change, which is one of the motivations listed below behind companies going green and this is expanded on in the main body of the study. Other motivations looked at are: genuine concern about the impacts of climate change and the future of the planet earth (Environmental Management: 2007), to reduce costs (Grobler: 2002) and increase profit margins (Ethical Corporation: 2007) and finally greenwashing. These were conceived

through the literature study and supported later in the interviews done for the case studies. These are not the only motivations behind companies going green and other reasons were excluded from this thesis due to their incompatibility with the selected case studies and/or lack of supporting literature. However, the above are all well supported through background literature on the particular case studies selected and also through literature on climate change and sustainable buildings.

## **2.2 Research methodology**

This study is methodologically qualitative and comprises of case studies within four different companies from different sectors of the economy. Johann Mouton, author of the book, *“How to succeed in a Masters or Doctoral Studies”* ( 2001), describes it as one involving the use of predominately qualitative research methods to describe and evaluate the performance of programmes in their natural settings, focusing on the process of implementation rather than (quantifiable) outcomes. This was applied to the case studies through setting. According to Mouton (2001), case studies are usually qualitative in nature and aim to provide an in-depth solution of a small number of cases. Yin, author of the book *“Case Study Research”*, provides an apt explanation of a case study; he refers to it as an event, an entity, an individual or even a unit of analysis (Yin: 1989). The use of case studies to probe an area of interest in depth is particularly appropriate as described by Patton (2001). Case studies become particularly useful where one needs to understand some particular problem or situation in great depth, and where one can identify cases rich in information. The reasons for multiple case studies being selected here are to demonstrate that they follow replication, not sampling logic (Yin: 1993). The case studies selected aim to explore the different motives for companies deciding to “go green” and establish a common thread between them. Three overarching motivations were assessed in looking at the case studies; namely genuine concern about the mitigation of climate change and the future of the planet earth, being the hypothesis being tested in this thesis, cost reduction and improving profit margins and greenwashing. Through their successes in their respective sectors this thesis aims to be a reference point for other local companies across various sectors wishing to pursue a similar path. The case studies were conducted through a series of one-on-one



interviews at the offices of the directors, managers and employees of each of the respective organisations.

### **2.3 Literature study**

The nature of this topic required an in depth study of a myriad of literature sources, both local and international, ranging from newspaper articles, internet sources, green building reports, legal briefs on the environment to books written by economists and green architects. The purpose behind this study is far more complex than would outwardly appear and looks to explore the motives behind companies going green. This study analyses these and pre-empts their applicability to support the four case studies in the next phase of the study. It is anticipated that the contrasting view points from various authors could provide solutions for companies looking to shift towards a more sustainable path. Timelines set out in several readings on issues such as climate change and the need for a change in government and private companies' policies, which generally support each other. They also add a sense of urgency to the debate the world is currently grappling with as to whether to select economic growth over sustainable development or vice versa. The focus of this study is on South African companies; however, the literature study looks at both local and foreign readings. The pertinence of reviewing foreign literature, particularly on developing countries in a similar situation to South Africa, should become evident in this study. Literature on climate change forms an integral part of this study, where it argues with support from the interviews conducted for the case studies, that it is the most significant common factor behind companies going green.

## CHAPTER 3

### GOVERNMENT'S RESPONSE TO CLIMATE CHANGE

#### 3.1 Introduction

As society continues to make extreme demands on nature, it is essential that the finite nature of resources is acknowledged and human's behavioral patterns reviewed (Hussein: 1982). It is confirmed in scientific findings that "human activity is the primary cause of rising temperatures, but that climate change impacts are accelerating" (Earthtrends: 2009). Climate change has now been widely acknowledged to be a real phenomenon, but its worst effects will only truly be felt in the long term, unless there is leadership which can steer humankind on a more sustainable path, then people will probably continue to live in a manner which is clearly unsustainable (Boehmer-Christiansen: 2002). The urgency to address climate change is largely associated with its impacts, which include the "likelihood of extreme events and non-linear excursions. As extreme events, coupled with medium term excursions take place, the chance that any given event will exceed the built-in resiliency of natural or human made systems rises dramatically. And when such a threshold is passed the amount of damage also rises steeply" (GBN: 2007). Events such as floods, droughts, hurricanes and tsunamis have caused extensive environmental and economic damage across the world over the last decade.

#### 3.2 Developed world

In the developed world, as time progressed towards a new international agreement in 2009 to succeed the Kyoto Protocol, the EU were of the opinion that in order for Europe to be seen as genuinely committed to mitigating climate change, they must adopt the Energy and climate change package in December 2008 (European Commission: 2008).<sup>3</sup>

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<sup>3</sup> The EU felt it was essential that they moved ahead with the energy and climate change package, not despite the financial crisis, but partly in response to it.

This chapter initially looks at the Kyoto Protocol and how it was received by world powers. It then looks at developed nations like the USA and Canada and compares them to the EU and finally New Zealand.

The EU has been addressing climate change since the early 1990s and was actively involved in the 1992 Framework Convention on climate change, as well as the Kyoto Protocol, which came into force in 2005. As a means of putting things into perspective, the EU 15<sup>4</sup> are now on track to meet their Kyoto commitments: an 8 per cent reduction in overall emissions below 1990 levels by 2012 (and reductions of 6-8 per cent by the newer Member States). Europe's economy has grown by 25 per cent since 1990, and they've cut emissions by 8 per cent, showing that there is no inherent contradiction between economic growth and reducing emissions (European Commission: 2008). It is pertinent here to discuss the Kyoto Treaty in more detail, as its formation could be considered paramount to the developed world's attempt to address climate change. The pact was ratified by 141 nations and aimed to limit emissions from 35 industrialised countries. Developing countries were exempted from limits to give them a chance to catch up with the economic development of the industrialised world (Vedantam: 2005).

Some of the key elements of the Treaty are listed below:

- “Greenhouse gases: Controls emissions of carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.
- Targets: Assigns targets for reducing or limiting emissions to 35 industrialized countries.
- Trading: Allows emissions trading among countries: Industrial plants that do not use up allocations can sell "credits" to those who overshoot allowances.
- Joint implementation: Countries can develop an emissions-reduction project in another country to gain emissions credits” (Vedantam, 2005).

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<sup>4</sup> referring to Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom

Even supporters of the Treaty acknowledged those realities but argued that the real impact of the Treaty was not tangible. The Treaty's inauguration in 2005, resulted in deep debates in corporate boardrooms over the cost of doing nothing vs the cost of doing something (Fri: 2005). Under the treaty, the EU committed to reducing its emissions 8 per cent below 1990 levels; Japan and Canada committed to a 6 per cent cut; and Russia, whose entry three months ago provided the quorum needed to put the treaty into effect, committed to limit emissions to 1990 levels (Petsonk: 2005). Petsonk was reported to have said that the United States would have had to limit emissions at 7 per cent below 1990 levels.

The EU, who are staunch supporters of the Treaty, believe climate change is best viewed as a threat multiplier, which exacerbates existing trends, tensions and instability and It forms a major element of the EU's international security agenda. The ambassador of Valenzuela, head of the European Commission (EC) delegation to the UN, suggested that both the EU and the international community must be capable of dealing with the current financial challenges and the difficulties posed by climate change and energy insecurity. He said: "In fact, the two are linked; we'll have to walk and chew gum at the same time" (European Commission: 2008). Despite the pro-EU stance on climate change and their support of the Kyoto Protocol, some EU member states were of the opinion that the energy and climate package on the table was too expensive in light of the current economic crisis, or that it could put European competitiveness at too much of a disadvantage (European Commission: 2008). Nevertheless, the economic case for the energy and climate package is compelling for the following reasons:

- The costs of climate change will be much higher if the EU does not start making adjustments now; up to 20 per cent of GDP eventually according to the Stern Review, versus 0.5% of GDP cost projected via the package
- Without the package, the EU will be much more vulnerable to energy shocks, with potentially drastic consequences for their economies, which currently import 55 per cent

of their energy needs, and this could rise to 70 per cent by 2030, assuming present trends;

- More positively, moving to a lower carbon economy brings big opportunities - if the EU exploits its first mover advantage. Achieving a 20 per cent share for renewables, for example, could generate more than a million jobs in this industry by 2020.

In stark contrast to the EU, Australia and the United States, two major global economic powers, refused to join in the Kyoto Protocol. The Bush administration officials are quoted as saying that the treaty would hurt the economy and is ineffective and discriminatory because large, rapidly industrializing countries such as China and India escape the limits (Vedantam 2005). Moreover, they believe that many countries, including Japan and several in the European Union, are unlikely to meet their emission-control targets and will have to buy "carbon credits" probably from Russia, who will have an abundance, as many of its industrial plants shut down during the economic meltdown in the 1990s (Vedantam: 2005).

George Bush was quoted as saying in a BBC article (June, 2001) that his rejection of the Kyoto treaty "should not be read by our friends and allies as any abdication of responsibility." He said the United States realised its responsibilities to curb its greenhouse gas emissions, but at the same time believed the 1997 Kyoto agreement was "fatally flawed" (BBC: 2002). Some setbacks since Kyoto, which support Bush's refusal to sign the accord along with other industrialised nations like Australia are that even if every nation successfully met its "commitment" under the Protocol, emissions from the industrialized nations would drop 5 per cent below the level they were at in 1990 (Michaels, 2007). According to the Oak Ridge National Laboratory, from 1990 to 2007, global emissions increased by 27 per cent. One of the major lessons to be learned from Kyoto is that substantial emission reductions at present are not achievable without intolerable costs (Michaels: 2007). Furthermore, developing countries with no

commitments under Kyoto, are going to continue to resist anything that slows their growth, which is going to be powered by fossil fuels (Michaels: 2007).

In a complete turn-around from Bush's stance on Kyoto and other environmental issues, Barack Obama in his run up to the elections promised a \$150 billion "Apollo project" to bring jobs and energy security to the USA through a new, alternative, energy economy, if he was victorious in the presidential election on 4 November 2008 (Lean *et al.*, 2008). "That's going to be my number one priority when I get into office," Mr Obama said of his "green recovery" plans. However, the timing of the election could not have been worse, as it came right in the middle of the worst economic crisis since the Great Depression of the 1930s<sup>5</sup>, but despite this Obama declared: "We'll invest \$15 billion a year over the next decade in renewable energy to climate change, creating five million new green jobs that pay well, can not be outsourced and help end our dependence on foreign oil."

Subsequent to Obama's successful election campaign, Marla Dickerson wrote: Reporting from Hemlock, Michigan: "While Detroit's automakers struggle to rebuild their sputtering operations, the key to jump-starting Michigan's economy may lie 80 miles northwest of the Motor City. This is the home of Hemlock Semiconductor Corp. It makes a material crucial for constructing photovoltaic<sup>6</sup> panels." It is debatable whether clean energy can rescue Michigan, but the drive continues to redress America with so-called green-collar industries. President-elect Barack Obama has pledged to spend \$150 billion over the next decade to promote energy from the sun, wind and other renewable sources as well as energy conservation (Dickerson: 2009).

Obama's goals include the following: to create 5 million new jobs repowering America over the next 10 years; assert U.S. leadership on global climate change and wean the

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<sup>5</sup> The United States were badly affected by a global recession which hit in early 2008 and continued into 2009, moreover Brent Crude reached new highs of \$150/barrel and this sparked a rise in food prices, retrenchments

<sup>6</sup> Used in the making of solar panels.

U.S. from its dependence on imported petroleum. "Breaking our oil addiction is going to take nothing less than the complete transformation of our economy," Obama was reported to have said in a campaign stop in Michigan's capital, Lansing in 2008. This is in stark contrast to his predecessor, George Bush, who refused to ratify the Kyoto Protocol. In June, 2001 President George W Bush vowed to pursue scientific and diplomatic solutions to global warming, in an attempt to blunt international criticism of his rejection of the Kyoto climate treaty (BBC News: 2002).

As the Treaty took effect, a host of legislative proposals to control greenhouse gases were introduced in Congress. Some states in North America decided to take matters into their own hands (Dickerson: 2005). California demanded steep reductions in vehicle emissions. Several north-eastern states grouped together to limit greenhouse emissions and set up the kind of trading system that assimilated the Kyoto model. Pew Claussen is quoted as saying: "Arizona is moving forward because they see droughts, wildfires." "North Carolina is considering a comprehensive policy because they are concerned about the barrier islands." Robert W. Fri, a board member at American Electric Power Co, which is also the biggest coal burner in the United States, suggests "No one expects the Bush administration to change course, but dealing with a hodgepodge system might eventually prove more expensive to American industry than outright participation in a global system."

Interestingly, many environmentalists were in support of a proposal by Republican Senator John McCain (Dickerson: 2005), who, despite his affiliation to the same party as George Bush, wanted to impose modest emission limits in the United States and establish a trading system analogous to Kyoto to give American companies a financial incentive to develop technologies that lower emissions (McCain: 2005).

The blame cannot be pinned entirely on the US. Canada, their neighbour to the north, has been party to equally heinous activities which exploit the environments finite natural resources, such as tar sands in The Guardian (2008) on the environment, the following

finding was revealed: “Shell and BP were warned by investors that their involvement in unconventional energy production such as Canada's oil sands could turn out to be the industry's equivalent of the sub-prime lending that poisoned the banking system. The report, *BP and Shell, Rising Risks in Tar Sands Investment* (2008), co-authored by Greenpeace and fellow campaign group Platform, stated that oil companies are trying to make up a shortfall in conventional reserves by an irresponsible rush to extract oil from bitumen and other sources. This is a good example of how organisational, social and media pressure has encouraged companies to rethink and possibly halt irresponsible and unsustainable practices.

As a trigger for further debate amongst world economic powers, a documentary called the Great CO<sub>2</sub> Swindle produced by the BBC and featuring prominent scientists and economists, was released in 2007. Fred Singer, an atmospheric physicist at the Independent Institute, argues in support of the Great Global Warming Swindle and is quoted as saying in the San Francisco Examiner:

*“There is no proof that the current warming is caused by the rise of greenhouse gases from human activity. Ice core records from the past 650,000 years show that temperature increases have preceded—not resulted from—increases in CO<sub>2</sub> by hundreds of years, suggesting that the warming of the oceans is an important source of the rise in atmospheric CO<sub>2</sub>.”*

The best evidence supporting natural causes of temperature fluctuations are the changes in cloudiness, which correspond strongly with regular variations in solar activity. The current warming is likely part of a natural cycle of climate warming and cooling that's been traced back almost a million years. It accounts for the Medieval Warm Period around 1100 A.D., when the Vikings settled on Greenland and grew crops, and the Little Ice Age, from about 1400 to 1850 A.D., which brought severe winters and cold summers to Europe, with failed harvests, starvation, disease, and general misery (Singer: 2007).



If the cause of warming is mostly natural, then none of the schemes for greenhouse gas reduction currently promoted will do any good; they are all irrelevant, useless, and wildly expensive. These include the following: Control of CO<sub>2</sub> emissions, whether by rationing or elaborate cap-and-trade schemes; Uneconomic “alternative” energy, such as ethanol and the impractical “hydrogen economy”; Massive installations of wind turbines and solar collectors; Proposed projects for the sequestration of CO<sub>2</sub> from smokestacks or even from the atmosphere.

Singer (2007) concludes by saying that no one can show that a warmer climate would produce negative affects overall. The much feared rise in sea levels does not seem to depend on short-term temperature changes, as the rate of sea level increases has been steady since the last ice age, 10,000 years ago. In fact, many economists argue that the opposite is more likely; that warming produces a net benefit, that it increases incomes and standards of living. In response to this, the Inter-Governmental Panel on Climate Change’s (IPCC) (2007) concludes that there is a more than 90 per cent chance that the observed warming since the 1950s is due to the emission of greenhouse gases from human activities. It is interesting to note that developed countries are both guilty of contributing to and the opposition of climate change. Moreover, in further support of this response, Martin Rees, President of the Royal Society, one of the oldest and most prestigious, scientific bodies released the following statement in 2007: “TV companies occasionally commission programmes just to court controversy, but to misrepresent the evidence on an issue as important as global warming was surely irresponsible. “The Great Global Warming Swindle” was itself a swindle. The programme makers misrepresented the science, the views of some of the scientists featured in the programme and the work of the IPCC.” Furthermore, Ofcom, the UK media regulator, ruled that The Great Global Warming Swindle was unfair to the IPCC, David King, and Carl Wunsch and that it had breached a requirement of impartiality about global warming policy (Lambert: 2008).

In 2000, the EU launched the European Climate Change Programme (ECCP), under which they developed a range of cost-effective emission reduction measures. Key

among these has been the Emissions Trading Scheme (ETS), in place since 2005 and is the world's first and largest international emissions trading scheme, covering almost half of EU CO<sub>2</sub> emissions (European Commission: 2008). Moreover, the EU has also been active within the G-8 with regard to climate change, which has made significant progress in agreeing to at least 50 per cent emission reductions by 2050, which coincides with the Bali roadmap for the UN negotiations. Subsequent to this, in 2006, a landmark study (Harvey: 2009), led by ex World Bank chief economist Nicholas Stern, concluded that climate change could cut global economic output by between 5 and 20 per cent (Stern: 2006). This could cause massive conflict given that the human race is inherently driven by material wealth (Ikerd: 2008)<sup>7</sup>. Ultimately, it is countries which drive sustainability issues and despite valiant efforts by large private sector companies, government support is paramount to be able to ensure their long term success<sup>8</sup>. For example, Brazil has widely adopted cars, which can run on a mixture of gasoline and ethanol. Drivers can make informed business decisions on the relative prices of the two fuels (ANZ Industrial Brief: 2005).

Robert Donkers, an environment counsellor for the European Union, claimed in the Washington Post (Vedantam: 2005):

*"binding limits are needed for countries and companies to make the investments needed to cut emissions. It is not just the European Union versus the United States. This is Australia and the United States against the rest of the world."*

There was an enormous waste of resources and money spent on the Kyoto Treaty, but the real problem lies with the future of the polar ice caps. Global temperatures are indisputably (Vedantam: 2005) rising and, while there are still a handful of persistent skeptics, an overwhelming majority of scientists believe human activity is to blame. So far, European countries have been proactive in becoming 'greener' and have opposed

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<sup>7</sup> Ikerd argues in his article on Sustainable Capitalism that today's capitalist economies are not sustainable. We must renew and regenerate our ecological and social capital if we are to sustain the economic capital necessary for a sustainable economy.

<sup>8</sup> It is, however, regarded as the combination of, on the one hand, private sector resources, drive and entrepreneurial talent and, on the other hand, of a policy, legal, and regulatory environment which emphasize fairness, social cohesion and transparency.

North America in taking an anti-Genetically Modified (GM) stance (Mitchell: 2007). A 'Green Revolution' has engulfed Europe and was actively embraced by leaders of Germany, France and England in the late 1990s (Moore: 2001)<sup>9</sup>. Recycling has almost become second nature for some countries in Europe, for example Germany, where only two per cent of the population do no recycling at all<sup>10</sup>. Eco-villages, which adopt sustainable building practices and integrated waste management supporting companies in these sectors, have sprouted across the United Kingdom, with an additional five new eco-villages being proposed in England, which could feature a combination of both wind and solar power (BBC News: 2007), and numerous emerging in countries across Europe<sup>11</sup>.

In contrast to these, a good example of a developed economy responding positively to the challenges posed by climate change, is New Zealand, whose Prime Minister, Helen Clark, announced on 16 February 2007 that she aspired for her country "to be carbon neutral in our economy and way of life." And if that was not enough she raised the bar even higher with this statement: "I believe New Zealand can aim to be the first nation to be truly sustainable across the four pillars of the economy, society, the environment, and nationhood." Helen Clark believes climate change is akin to the threat of nuclear holocaust that hung over the world during the Cold War (EDANZ: 2009).

However, New Zealand faces numerous challenges to achieve this. They are struggling to meet their existing Kyoto commitments (EDANZ: 2009). Some of the measures mentioned in Helen Clark's speech on 8 June, 2009, include 3.4 per cent bio-fuel as a portion of fuel sales by 2012, plus all government agencies are to use energy efficient transport and buildings, reduce fuel bills and buy only recycled paper (EDANZ: 2009).

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<sup>9</sup> Moore's views in his book which centres itself on the GMO debate between Europe and America are supported by a small South African NGO called Biowatch which highlights the dangers of genetic modification of crops.

<sup>10</sup> while in a small town in England called Devon plastic bags have been banned and people seen carrying plastic bags are regarded as "social pariahs" (The Guardian: 2007).

<sup>11</sup> The Eurotopia website [www.eurotopia.de](http://www.eurotopia.de) provides a comprehensive list of eco-villages and their web addresses in cities across Europe

New Zealand may aspire to an innovative research and development sector, yet they spend a relatively low share of GDP on it and the level of reported business research and development is low by OECD standards (EDANZ: 2009). They aspire to a strong infrastructure that will support sustained economic growth and yet their energy, telecommunications, water and transport systems have some significant challenges to meet (EDANZ: 2009).

The following additional challenges were listed by EDANZ:

- A secure energy supply and distribution is fundamental to a sustainable economy, yet both security of energy supply and distribution are at risk.
- Access to clean abundant water is fundamental to individual and economic wellbeing. Yet, in some parts of New Zealand demand for water cannot always be met and in some areas water bodies are polluted and do not meet acceptable standards.
- An efficient transport system is essential to a sustainable economy, yet NZ has significant transport problems within our cities.
- And finally, the public sector has a large role to play in supporting a sustainable economy via strong infrastructure, encouraging innovation and entrepreneurialism, educating for a flexible and skilled workforce and addressing the challenges of 'market failure' (EDANZ: 2009).

This chapter on Government's response within the developed world started off by boldly stating that the EU is not acting despite of the global financial crisis, but in response to it. The integrity of the EU is illustrated here through their long standing commitments to environmental protection and willingness to sign the Kyoto Accord. They appear to be ahead of the rest of the developed world, while in comparison to this the US under Obama has great prospects for the future and New Zealand under Helen Clarke is already making active strides towards going green and becoming the first carbon neutral country. The next section deals with the Green versus Brown Agenda in the developed and developing world.

### **3.4 Challenges faced by the developed vs developing world**

Issues such as the green and brown agenda also deserve to be mentioned and facilitate the transition from the developed world's response to climate change to that of the developing world. The differences between them is explained through brown being the environmental health agenda and including items such as: human health, protection of lower income groups, the manipulation of nature to serve human needs, inadequate access to water, provision of housing, work, human exposure to polluted air and little provision for safe removal of human faeces (McGranahan & Satterthwaite: 2000). On the other hand 'green' is the sustainability agenda, which incorporates: ecosystem health, the protection of and ability to work with nature, protection of water resources, acid rain, loss of natural habitats and agricultural land to urban development and damage to water bodies through release of sewage effluent (McGranahan & Satterthwaite: 2000).

From a 'green' perspective, shifting the environmental burden is both unbalanced and economically unviable, as it transfers the onus from its point of generation onto the unsuspecting environment and people often far removed from the source and even down onto future generations. From a 'brown' perspective, the basic inequities and economic inefficiencies lie in the inadequate local water supplies, local air pollution, infrequent or absence of waste collection, poor sanitation and inadequate land available to the poor. In terms of equity, everyone should be able to meet their basic needs, as others have done in the past (DANIDA: 2000).

The conflicts between the two agendas highlight the need to address the two sets of issues independently, using crude policy instruments. For example, if one considers the amount of water per capita per day that people need to meet their health needs, this will be unlikely to threaten natural water supplies, but when water is made 'affordable' by across-the-board subsidies and then supplied in systems that leak up to 50 per cent of the water, problems exist (DANIDA: 2000).

Cities in the Northern Hemisphere, generally considered part of the developed world, often have the capacity to address their own local environmental problems efficiently and impartially are, therefore, more likely to be able to address both the Green and the Brown Agenda (DANIDA: 2009). Northern cities which have implemented a successful environmental management policy work hard to gain local support for environmental improvement and to ensure that local environmental issues are given prominence (DANIDA: 2009). Recent successes include Leicester's environmental city initiative and Stockholm, which is known for its good environmental management. In Southern Hemisphere cities, generally recognised as part of the developing world, except for cities in Australia and New Zealand, there is far more justification for devoting more attention to local environmental issues. In both the South and the North, locally driven initiatives often take extra-urban environmental impacts seriously (DANIDA: 2009).

One of the major challenges that still exists when looking at the Green versus Brown Agenda within the developed and developing world is to discover possible solutions for developing and financing urban environmental initiatives that address both these agendas (DANIDA: 2009). Urban environmental initiatives could reconcile the two by addressing the conflicting and complementing areas between the two and by designing measures that avoid the former and build on the latter (DANIDA: 2009). Both, however, remain somewhat unknown. It was reflected in the DANIDA workshop (2000) that poor cities in the south should focus primarily on locally driven environmental initiatives, which will highlight issues of governance and bring them to book, if necessary.

### **3.5 Developing world**

The focus now shifts to the developing world with particular emphasis on Africa and China. The African Development Bank (ADB) Group experts are concerned about the climate change and social welfare of their societies and how their long term sustainability is increasingly vulnerable to climate change risks (ADB: 2007). Developing countries, especially African countries, are the most vulnerable and they bear the highest risks on

their natural resources as climate change and climate variability critically jeopardize their economic development and poverty reduction achievements (ADB: 2007). Direct and indirect effects of climate change can set Africa back by decades and lose years of development efforts. According to the Stern Review, there is still time to avoid the worst climate change impact. The Review, however, indicates that, delaying for too long to respond to climate change might increase economic losses to up to 20 per cent of global GDP. Moreover, climate change risks are around 1 per cent of global GDP per year if nations start acting now (ADB: 2007).

African governments, along with many other nations around the world, are becoming more aware and concerned about the effects of global warming and this was expressed by African heads of states at the African Union (AU) held in January 2007 (United Nations, Economic Commission for Africa: 2008). Climate change experts hold that poor countries will be the hardest hit by the effects of climate change and the first to face the unsettling consequences of this new phenomenon (ADB: 2007). Africa only accounts for a small fraction, 3.8 per cent, of the total greenhouse gas emissions per year, but it is home to 14 per cent of the world's population, who are the most vulnerable to the effects of climate change in the world (UN: Economic Commission for Africa: 2008). The African continent is steadily warming up and models predict this trend to continue with significant changes in rainfall patterns (ADB: 2007). The whole African continent is approximately 0.75°C warmer than it was 100 years ago (Barr, J. *et al.*, 2007). The continent is highly susceptible to the effects of climate change for the following reasons: widespread poverty, the unsustainable use of natural resources, over-dependence on rain-fed agriculture and weak governance structures (ADB: 2007).

In many parts of the continent, bank group experts point out, climate change is already having profound and irreversible effects (ADB: 2007). This is seen through the increased frequency of natural disasters, droughts, floods and other weather extremes that lead to loss of lives, economic disruption, social unrest and forced migration, as well as major environmental problems (ADB: 2007). Moreover, global warming is causing rising sea levels, flooding that threatens agriculture, human health, infrastructure, near the coast

and on islands; prolonged drought periods that cause stress on water resources and reduced food security due to diminished agricultural productivity (ADB: 2007). The effects of climate change are seen through an increase in outbreaks of vector borne diseases and other health impacts; and various threats to forestry, water resources, biodiversity, and other natural resources. The effects of global warming will certainly make it difficult for many African countries to attain the Millennium Development Goals (MDG), unless immediate and innovative measures are taken (ADB: 2007).

Apart from the obvious and more direct effects, climate change has indirect affects that include social costs, increased conflict and obvious economic costs (ADB: 2007). Increased aridity and long droughts prompt the abandonment of the rural economy and migration to urban areas (ADB: 2007). This rural to urban migration known as urbanisation is nothing new in the modern world and is not continent specific, but it has been intensified in desert countries in Africa and South West Asia, in particular where countries have strong secondary and tertiary sectors such as Libya and Saudi Arabia (UNEP: 2006). Climate change could also be seen as preempting the risks of "resource wars" as nations and communities fight for rights to key resources like water and land. Most key economic sectors that include agriculture, fisheries, forestry, industry, energy and transport are very sensitive to climate change. Natural disasters destroy strategic national investments like infrastructure while there is a lack of requisite insurance to cover the loss (UN: Economic Commission for Africa: 2008). It is estimated that the cost of disasters over the next 20 years will be from 6 to 10 trillion US\$ (ADB: 2007), which is the equivalent of ten times the predicted amount of aid flow.

An interesting example of a city in the developing world is Cape Town in South Africa, which provides an insight on a larger scale of what the cumulative effect of companies continuing with business as normal could lead to a situation, which may spiral out of control, if the mitigation of climate change is not taken seriously. Cape Town could be seen as representative of most of the major cities in South Africa in terms of infrastructure, basic services, waste management and employment opportunities, yet its current elevated status as the second best travel destination in the world according to an



international poll (2009) should propel it to rise above the rest and lead by example. However, Cape Town's ecological footprint is said to be "so large that it takes a land mass the size of Greece to provide its water, coal and gas inputs and process its waste" (Lewis: 2009). The Organisation for Economic Co-operation and Development (OECD) has suggested in its review of Cape Town (2009) that: "if everyone lived as those in the southern suburbs and Atlantic seaboard of Cape Town do, then 2.3 planets would be required." Forecasters have indicated that the Western Cape would be most affected by climate change and that if the City's environmental problems were ignored much longer, it would be very short sighted of both the local and provincial government. They further predict that the restraints on resources, particularly energy and water are "likely to have significant impacts on the region's economic position." Agricultural food industries, tourism and the health of residents are likely to be affected by increased air pollution, flooding and fires. These, coupled with a lack of adequate sanitation, could have a disastrous effect during floods. What is more significant is that a large proportion of Cape Town's residents live near the coast in Fish Hoek, Hout Bay, Milnerton Lagoon, Sea Point, Strand and Gordon's Bay or in low lying areas like the Cape Flats, which will be affected by a rise in sea level due to global warming melting the Antarctic and Greenland ice sheets<sup>12</sup>. However, one thing is fairly certain, if we, as civil society, in conjunction with the public and private sectors, do nothing to mitigate climate change, the effects on business in South Africa across all sectors would be disastrous, which is reflected in the first motivation and hypothesis being tested here, listed in the methodology and supported by Gore's statement, in *Earth in the Balance* (2006):

*"A choice to 'do nothing' in response to the mounting evidence is actually a choice to continue and even accelerate the wreckless environmental destruction that is creating the catastrophe at hand." (Gore: 2006).*

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<sup>12</sup> The City of Cape Town commissioned a study to look into the possible effects of climate change, as experts had suggested that the city would be one of the first areas of the country affected.

According to the World Bank's 2010 Development Report (2010), 1.6 billion people in developing countries still have no access to electricity. Jasper Groening of e-Parliament, one of the event organisers said: "Decentralized solar systems have a huge potential." In Djabula, 50 miles south of Maputo, Mozambique's national electricity fund established a photovoltaic standalone station providing electricity for 45 residencies, a primary school and a health outpost (Browne: 2009). This served as a benchmark as legislators and politicians came to see the project to gain ideas on how schemes like this could provide answers to many of the energy and climate change problems facing communities across Africa (Browne: 2009). Bliss listed Tanzania, Malawi and Kenya as examples, where the price of kerosene, the main energy alternative, is rapidly increasing. Their studies found that 20 per cent of household income was being spent on fuel (Browne: 2009). Bliss said: "As with other solar products targeting poor communities, SolarAid does not give away its micro-solar kits. It's not a handout, we want to encourage a viable trade." In an award winning project in Remu, Ethiopia, the Swedish Solar Energy foundation supplied electricity to 10,000 people with an off-grid solar photovoltaic system charging less than \$2 per person (Browne: 2009).

It is evident that Africa is likely to be the worst affected by climate change and that the social and economic welfare of many African countries is being challenged. It was argued that it could have dire affects on the economies of these countries, driving many to the cities in search of work and placing a huge strain on natural resources within these cities and leaving the rural environment heavily degraded. Humankind would seriously need to rethink their approach to issues such as climate change, if they are to make a difference to the world.

China, with a population of almost 1.5 billion people is also highly susceptible to the impacts of climate change mainly in the fields of agriculture, livestock breeding, forestry, natural ecosystems, water resources and coastal zones (White Paper, China: 2008). It was estimated that at least 300,000 people in north-west China are short of drinking water because of unseasonably warm weather, which officials link to climate change (BBCNews: 2007). It was reported by state media that parts of Shaanxi province faced

severe drought after it received only 10% of its average rainfall in January 2007. Furthermore, the China Daily reported over the same period that “frozen lakes were melting and trees blossoming in Beijing as it experienced its warmest winter for 30 years” (BBCNews: 2007).

*“Climate change has already had discernible adverse impacts on China's agriculture and livestock industry manifested by increased instability in agricultural production, severe damages to crops and livestock production caused by drought and hot extremes and heat waves in some parts of the country, aggravated spring freeze injury to early-budding crops due to climate warming, decline in the yield and quality of grasslands, and augmented losses caused by meteorological disasters”* (Information Office of the State Council: 2008).

*“Climate change has also caused significant changes in the distribution of water resources all over China. Over the past two decades, the gross amount of water resources of the Yellow, Huaihe, Haihe and Liaohe rivers in northern China has been significantly reduced, whilst that of rivers in southern China has slightly increased. Floods happen more frequently, droughts get worse”* (Information Office of the State Council: 2008).

*“Climate change will also produce far-reaching impacts on society, economy and other fields, and cause huge losses to the national economy. Corresponding economic and social costs will have to be paid for addressing climate change. In addition, there will be increased chances of disease occurrence and spread, endangering human health, rising possibilities of geological and meteorological disasters and consequent threats to the security of major projects. The ecological environment and bio-diversity of nature reserves and national parks will be affected, accompanied by adverse impacts on natural and cultural tourism resources, and augmented threats to the safety of life and property, and to the*

*normal order and stability of social life*" (Information Office of the State Council, 2008).

In order for China to successfully address climate change they need to rely on the advancement, innovation of science and technology and technology transfer. Above all, technology is the most important. This coupled with innovation and transfer form the basis and support for addressing climate change. "While promoting their own technological development and deployment, developed countries are obligated to promote international technological cooperation and transfer, and effectively fulfil their commitments to provide financial and technological support to developing countries, so that the latter can have access to and afford climate friendly technologies to enhance their capacity to mitigate and adapt to climate change."

China is of the opinion that a certain level of reliance on public participation and extensive international cooperation is required. In order for them to successfully deal with climate change requires changes in the traditional ways of production and consumption, and the participation of the whole society. "China is working to build a resources-conserving and environmental-friendly society, foster a social atmosphere in which the enterprises and the public participate on a voluntary basis under the guidance of the government, and raise enterprises' awareness of social responsibility and the public's awareness of global environment protection. As a challenge faced by the entire world, climate change can only be solved through international co-operation and concerted efforts." (Information Office of the State Council: 2008).

One such attempt to address climate change was done in Dongtan, the proposed eco-city, located on an island close to the bustling and rapidly expanding city of Shanghai. The plan inspired and enticed people working in the field of economic and social upliftment and journalists from all over the world. In 2007, Wired Magazine wrote a praising article all about this "great green leap forward" in China, exploring in depth the challenges facing the designers. The piece concluded optimistically:

*“If Dongtan lives up to expectations, it will serve as a model for cities across China and the rest of the developing world cities that, given new tools, might leapfrog the environmental and public health costs that have always come with economic progress. Even old American and European cities may find bits and pieces of Dongtan that they can use, especially when they redevelop industrial plots or build out at the edges.”*

However, it was not long before a few sceptics entered the debate. In 2007, Ethical Corporation, a website on responsible business practices, came out against Dongtan. Calling it a Potemkin village (a reference to a Russian story about fake villages erected to impress the Empress Catherine II) and “a masterpiece of greenwashing,” Ethical Corporation claimed that Dongtan was never intended to become a reality. They were of the opinion that it was a mythical ‘Shangri-La’ and the plan would serve China as the ultimate greenwashing tool, greening the country’s image while in practice its cities could continue to develop along the same unsustainable path at lightning pace. The contractors and designers involved in the project had nothing to lose by cooperating, but invaluable connections in the Chinese government to gain (Ethical Corporation: 2007).

This chapter set out by paving the way for governments to respond to climate change and companies to respond to government policy. The Kyoto Accord was listed as a powerful inter-governmental tool to address the impacts of climate change. Obama set ambitious goals for the United States to provide 5 million new green jobs and spend \$150 billion over the next decade, yet his proactive stance is what is required to lead the world if climate change is to be mitigated. New Zealand similarly set themselves the bold target of becoming the first carbon neutral country. The mitigation of climate change, which is later tested on the case studies is discussed here and several other reasons behind their green drive were developed in this chapter, paving the way for their liberal use throughout the rest of the thesis and providing a platform for discussion on the interventions to address climate change in Chapter 4.

## **CHAPTER 4**

# **SOUTH AFRICAN INTERVENTIONS TO ADDRESS CLIMATE CHANGE**

### **4.1 Introduction**

This chapter looks at interventions in place and proposed by South Africa to address climate change and some of the challenges it faces. This chapter outlines two underlying motives behind companies mitigating climate change and going green as listed in the methodology and delves into trends and how people and companies are fast becoming more 'green' conscious. It further discusses examples of "greenwashing" as a public buy-in tool in South Africa.

It looks at new technologies available today as a means of addressing climate change. Christopher Flavin, the author of the World Watch Report 178 (2008), puts across some promising perspectives on the future outlook of the global energy economy and offers a more optimistic response to mitigation of climate change from what many see as a gloomy path ahead. He believes that technologies available today, and those expected to become competitive over the next decade, will permit a rapid decarbonisation of the global energy economy. New renewable energy technologies, combined with a broad suite of energy-efficiency advances, may allow global energy needs to be met without fossil fuels and by adding only minimally to the cost of energy services. He further argues that the world is now engulfed in an energy revolution, which could become as massive as the discovery of oil and electricity based economies a few centuries ago. The report reveals from climate simulations that CO<sub>2</sub> emissions will need to peak within the next decade and decline by at least 50 to 80 per cent by 2050.

## 4.2 A business case for sustainability

In reference back to Chapter 1.1, where sustainability is defined, innovation and transparency are listed as two key sustainability issues by reporting companies. Innovation refers to the requirement of new products and services that are less greedy of natural resources, create less pollution and waste, and are more affordable to poor people (Holliday *et al.*, 2002). The other key issue being the transparency imperative, which largely refers to those affecting basic human concerns, such as food, healthcare and reproduction, which can no longer suddenly appear from corporate headquarters, but now require buy in and advice from stakeholders. This potentially places companies in an awkward position as they have to weigh up whether they are going to push the transparency imperative or maintain their competitive advantage. In the book, *Walking the Talk* (2002), WBCSD's big wigs, the CEOs of DuPont, Anova and Royal Dutch Shell, state:

*“Sustainability’s business case is strengthened by the ways in which thinking of sustainable human progress encourages us toward innovation. It offers business opportunity, and it pushes companies toward thinking about more ‘sustaining’ forms of energy, agriculture, construction, mobility, and forestry. The relatively straightforward concept of eco-efficiency has already encouraged some companies to make radical shifts from sales to selling nothing at all – and being cleaner and more profitable in the process. Taking eco-efficiency and environment seriously can, and should, lead to strategic corporate innovation. By capitalizing on these assets a company stands to gain customer success, brand strength, first mover advantage, motivated employees and potentially more profits.”* (Holliday *et al.*, 2002).

Michael Porter (1995), a Harvard Business School Professor, promoted innovation in the business sector and pointed out some of the advantages, one of which being that “when companies improve their measurement and assessment methods to detect environmental costs and benefits, they raise corporate awareness and increase the incentive to encourage and reward innovations that enhance resource productivity.”

### **4.3 Statutory Response**

South Africa's response to the global economic crisis is that the parties recognise the opportunities in industries that combat the negative effects of climate change and believe that South Africa should develop strong capacity in these green technologies and industries (South African Government Online: Sept 2009). Accordingly, it is agreed to develop incentives for investment in a programme to create large numbers of 'green jobs', namely employment in industries and facilities that are designed to mitigate the effects of climate change (Framework for South Africa's Response to the International Economic Crisis: 2009). Recent legislation, in the form of The Waste Management Act (Act 59 of 2008), has the potential to provide the aforementioned green jobs and reduce CO<sub>2</sub> emissions through the recycling and minimisation of waste going to landfill.

South Africa is categorised along with China, India, Brazil and Russia in terms of their current rate of development, economic growth, sustainable development strategies and energy policies and are referred to as the BRICS (BRICS+G: 2005). However, their energy policies and their sustainability thinking are still somewhat outdated, as is supported by an article from Earthlife Africa, which states: "Despite strong evidence, the job creation, health and environmental benefits of renewable energy are being totally ignored by Eskom and the government. So much so, that South African companies specialising in renewable technologies are working in Uganda rather than back home." (SENSE: 2008). Replacing fossil fuel based energy with renewable energy could be seen as a means of averting potential disaster due to climate change should be considered high on the agendas of politicians and reflected in company policies in South Africa. Nevertheless private solar companies are slowly making their mark felt in South Africa and it is likely that in response to Eskom's 45 per cent tariff price hikes over the next three years these will become far more competitive (Engineering news: 2009). The climate is seen as reaching a dangerous tipping point by many prominent scientists (Eilperin, 2006).



A Green Economy Summit was held in South Africa in May 2010, which further supports their stance on pushing for a greener, more sustainable economy. South Africa's first Green Economy Summit ended with delegates pushing for the development of green growth policies and regulations which support the development of clean technologies. Six hundred and fifty international and local delegates attended the summit and they resolved to curb and ultimately stop carbon emissions and other forms of pollution that have proved to be a hurdle to green economy development. They also resolved to push for the diversification of energy sources and implementation of energy efficient programmes, crucial for ensuring green growth. The summit was organised by the Department of Environmental Affairs (DEA) and the declaration commits the government, with assistance from civil organisations and business, to implement a plan that would lead to a job intensive green economy.

A transition to a green economy has been put forward as a means of stimulating job creation in South Africa. Economic development minister, Ebrahim Patel, and his Environmental Affairs counterpart, Buyelwa Sonjica, are of the opinion that the renewable energy industry could boost the government's plans of halving unemployment by 2014 (Buanews: 2010). According to Patel (Buanews: 2010), speaking to delegates at the Summit, a South African green economy was capable of creating some 300 000 jobs over a period of ten years. It has been predicted that the benefits, ranging from health and pollution management to storage and disposal activities could generate up to R36 billion in the environmental sector and create in the region of 20,000 jobs by the year 2013. Green jobs were defined as "those which could reduce the environmental impact of enterprises and economic sectors to levels which are more sustainable."

One of the issues to emerge at the summit was the realigning the country's macroeconomic policy to meet the needs of green growth and how the DEA will work together with stakeholders to ensure the successful transition to a green economy and maximise job creation in the country. President Jacob Zuma addressed the summit and promoted renewable energy as an increasingly viable alternative to the energy sources that fuelled the growth of the developed world. He was reported to have said "for Africa to make use of its abundant renewable energy sources, it needs substantial investment, skills, technology and greater economic integration." (2010).

The summit declaration raised the role of transport as being pertinent in the shift to a green economy in reducing its carbon footprint through cost effective interventions, which range from shifting freight from road to rail and the adoption of public transport by passengers who would previously have used their own cars. Measures such as the introduction of bicycle lanes on all of the country's major roads were proposed. Concerns were raised at the summit that if the current rate of production and consumption continued it would lead to the collapse of natural ecosystems, which support social and economic growth. At the culmination of the conference, the delegates committed themselves to ensuring that the country's growth path is resource sufficient, far less carbon intensive and more labour absorbing.

The shift to a green economy could provide huge support for small solar power companies, recycling initiatives, organic farming, etc. Government Acts which have been promulgated in recent years further lend their support to these companies and South Africa's push towards a Green Economy. One such Act is the New Waste Management Act (Act 59 of 2008).

The New Waste Management Act (No 59 of 2008), which came into effect in July 2009, is anticipated to control and reduce the massive waste problem experienced in South Africa in a more sustainable manner. It is also hoped that it will go some way to reducing CO<sub>2</sub> and methane emissions, which contribute to climate change. The implementation of compulsory licensing for all waste related activities, aims to promote recycling within companies and reduce the amount of waste going to landfill (DEAT: 2009). A recycling culture in South Africa could result in massive reductions in the carbon footprint of companies and contribute to the mitigation of climate change. Joanne Jawitch, deputy director general, environmental quality and protection, of the Department of Environmental Affairs and Tourism (DEAT) points out that: "South Africa faces a complex situation with regards to waste, which in this country was a highly unregulated matter, with South Africans being generally regarded as a throw-away society." She added that waste problems had grown exponentially with the growth of the country and general urbanisation patterns (DEAT: Drafting new Waste Management Bill like walking

on eggs, Sabinet Law, News from Parliament). At the time of writing this article, the Act was only in Bill form. Gauteng is reported to have released figures that they generate the most waste per person equal to approximately 760kg/person/year, (as reported in the State of the Environment Report, <http://soer.deat.gov.za>), and waste generation is increasing by 5 per cent per year (ReSource, 2008, Gauteng, Draft Minimisation Plan). The reasons behind the Act were made clear by the DEAT deputy minister, Rejoyce Mabudafhasi, who, at the time when the Act was still a Bill, was reported to have said: "if we are to prevent our nation from drowning in waste we need innovative and practical ways of dealing with the problem. This is our intention with the new Waste Management Bill." The new waste management activities will now require licence applications instead of the permit applications in terms of Section 20 of the Environmental Conservation Act (ECA, Act 73 of 1989). Positive developments in the new legislation include:

The industry waste management plan, which states that waste generation must be monitored at all stages of the products life cycle, including manufacturing. This approach is crucial to meet the objectives of the new waste management legislation.

Recycling, reuse and recovery form a mantra for the Waste Act (2008). South Africa has set a national target to reduce the amount of 'Big 5' waste products (plastic, cans, paper, glass and tyres) going to landfills by 70 per cent by 2022, and to have plans in place to minimise and treat the remaining 30 per cent. Moreover, waste management is to be approached in an integrated manner from the point of generation to final disposal. (Engineering News, 2007) supports this in claiming that industries can attach value to waste streams, which are recyclable and have reuse options.

The new definition of waste specifies that waste, once reused, recycled and recovered, would cease to be waste in terms of the law and that it would only be waste when surplus, unwanted, rejected, discarded or abandoned. This presents exciting

opportunities for manufacturing companies, as it ensures that recyclables are handled as a product with value and not as waste<sup>13</sup>.

Despite all the above points, the solution to South Africa's waste problem cannot rest on legislation and regulations alone. In order for South Africa to meet the national waste management goals, all South Africans need to support the objectives of the New Waste Management Act (2008) to protect, health, well-being and the environment. This presents numerous other challenges, such as integrated waste management, clean production, recycling, awareness and education. "We need to change the throw-away society to one that cares about the environment."

#### **4.4 Companies' response**

In South Africa and the rest of the world, no business is likely to be exempt from the weather related impacts of climate change (Ziplies: 2008). It is how business reacts to these impacts that is of relevance. Business' response to climate change can be narrowed down into three categories: mitigating emissions, adaptation and response to changing market dynamics (Ziplies: 2008). Mitigation measures allow an organisation to effectively reduce its carbon emissions and ecological footprint. In the not too distant future, all businesses in South Africa irrespective of their emission levels are likely to be urged to demonstrate a reduction in emission levels within its own operations, supply and distribution chains (Ziplies: 2008)<sup>14</sup>. Pressure is likely to come through three main avenues, being: increased resource costs, regulations and stakeholder influence, all of which could shift a company to become greener either through making use of cheaper building materials (see Appendix E), which are also more available and sustainable or through adopting environmental policies, which attempt to mitigate the effects of climate change. This pressure could also promote corporate greenwashing in certain cases.

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<sup>13</sup> This could open the door for companies to start emulating Cape Brick and give birth to a sustainable manufacturing industry.

<sup>14</sup> In Europe product take back legislation is gradually being enforced, requiring manufacturers to take back used products for recycling. Motor car manufacturers are expected to have to recycle 85 per cent or more of their vehicles by 2015.

Means of achieving mitigation can be done through reducing energy intensive inputs and waste; implementing energy efficiency programmes; redesigning operations and using new technologies and alternative inputs; product life cycle analysis; applying “cradle to cradle” or “waste equals food” thinking; purchasing “green energy” (e.g. wind generated electricity) and finally and as a last resort carbon offsetting (Zipplies: 2008). McDonough (2002), supports this by suggesting that all materials be selected with a view to how they can enter biological and technical cycles safely and prosperously.

On a similar note, the WBCSD is of the belief that by taking both eco-efficiency and the environment seriously should lead to strategic corporate innovation. Stuart Hart, a professor of strategic management at the North Carolina Kenan-Flagler Business School, stated: “The environmental revolution has been almost three decades in the making and it has changed forever how companies do business.” He added that:

*“Those who think that sustainability is only a matter of pollution control are missing the bigger picture. Rarely is greening linked to strategy or technological development and, as a result most companies fail to recognise opportunities of potentially staggering proportions.” (Holliday et al., 2002).*

Hart’s thinking is highly relevant to the way many companies conduct their business today. This is particularly true in South Africa and countries in a state of transition or development, where the term ‘greenwashing’ has been adopted to describe the way in which companies window dress environmental concerns and sustainability issues in their annual reports (McManus: 2008).

The next step and probably the most relevant to companies now and over the next few decades, is adapting to climate change. It is imperative for companies to understand how climate change will affect their physical assets, markets, operations, supply chains and how they should respond to each of these impacts (Zipplies: 2008). Climate change and its impacts were dealt with extensively under Chapter 1.1 and more information can

be found there. However, the benefits of reducing carbon emissions to companies are tenfold; some of these are supported in this insert from McKinsey Quarterly below:

*“Tackling carbon exposure is more than good environmental stewardship; it could also protect a company’s share price in the near term and create a long term competitive advantage.”* (McKinsey Quarterly, 2004).

Finally, how are companies going to respond to changing market dynamics? Companies in South Africa are likely to feel the brunt of response measures adopted by government, business and consumers. This may come in the form of new local or international government regulations, industry guidelines, revised standards set by trading partners and changing consumer purchasing habits (Zipplies: 2008). Government measures are likely to vary in nature as the severity of climate change and its impact on the economy is more apparent. What is happening in other countries around the world is likely to affect South Africa, particularly those that trade with us. For example, carbon labelling of products in the UK, such as Walkers Crisps, Boots shampoos (Business Respect: 2007) and more significantly Tesco Supermarket<sup>15</sup>, the retail giant, vowed to label all its products (The Guardian: 2007) could have an impact on food and other products exported from South Africa and other parts of Africa, as the increasing carbon taxes prompt them to seek closer imports from other countries within the European Union (Bolwig, Danish Institute for International Studies: 2007). Similarly, tourism and travel may be affected in the future by rising flight prices due to carbon taxes and fuel price increases (Tol: 2007). This, along with tools, like ‘greenwashing’, has given rise to scepticism of the green movement and the value in mitigating climate change.<sup>16</sup>

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<sup>15</sup> Waitrose and Marks & Spencer already commit to this, although Sainsburys and Asda were prepared to make other commitments like reducing waste to landfill, but were apprehensive about labeling.

<sup>16</sup> An example of such is David Mullany in South Africa, who was interviewed by “The Property Magazine” (May, 2009) and is cited as saying:

“Please don’t misunderstand me: green is good, green is responsible and the right thing to do. After all, if you don’t look after your planet, where are you going to live? But like many formerly righteous causes, the concept of green has got totally out of hand. Once we left it to a few dedicated individuals – green peace warriors, ozone layer whistle blowers and so forth. Now everyone is in on the act – and not always for the right reasons. Green has become the trendy buzzword for a lip-service lifestyle affected by shallow socialites, who wouldn’t recognise an organic, non-GM, eco-politically correct turnip if it jumped up and bit them on the backside.”

Greenwashing within companies has become a quick fix response to government's ambitious CO<sub>2</sub> reduction targets, particularly in countries which ratified the Kyoto accord. One reason for this is that many companies may adopt a 'green facade' for fear of losing their competitive edge and only focus on one or two aspects with little time or effort applied (Donahue: 2004). Greenwashing has become a major element in companies' quest to go green and has tarnished the image of once reputable and so-called "sustainable" practices.

Good examples of Greenwashing in the South African context include the ADB previously referred to in Chapter 3, where the ADB won African Business Awards in 2009. Moreover, they published a Sustainability review of the private sector in 2008. However, they funded several mining projects throughout Africa and the Medupi Power Plant in South Africa, which is another coal fired plant contributing further to CO<sub>2</sub> emissions, when South Africa should be looking to renewable energy sources. Their winning of business awards, wind power projects, sustainability reviews and favourable public image successfully disguise the numerous dubious, environmentally and socially destructive projects it funds in Africa and South Africa.

Similarly, companies such as Lafarge, BP and Arcelor Mittal, all being international companies having offices in South Africa have, despite their sustainability reporting and quoted commitments against climate change, supported climate change deniers in the US Senate to the tune of \$107 200 in 2010. "Their total support for senators blocking climate change legislation in the US amounts to \$240 200" (Climate progress: 2010). This hypocrisy is strong evidence of greenwashing. BP, furthermore, built a "green" office at its headquarters in Green Point, Cape Town, which despite their good intentions to adopt renewable forms of energy and make use of passive lighting and natural through drafts, the nature of their business is still considered to be far from "green."

In countries like South Africa, which face myriad socio-economic problems that require urgent attention, the government appears to be dragging its feet to persuade companies to revise their corporate profile and to incorporate sustainability policies and give more attention to 'green issues' (ISEIS: 2003). Moreover, internal fighting within government has successfully impeded the government to reach any clear decision on issues such as sustainability (Pambazuka News: 2009). The mining sector stands out as one of the most environmentally destructive and a huge contributor to socio-economic problems in South Africa (Mining, Environment and Sustainable Development: 2001). In a survey done on 20 global mining companies, only 25 per cent of them incorporated the word 'sustainable development' into their corporate profile (Hilson: 2006). Mining, is considered to be a special case due to the transitory nature and the social and environmental impacts associated with mine closure (Warhurst & Noronha: 2000), which are exacerbated in South Africa due to its racially segregated history (Crush *et al.* 1991) as well as the industry's socio-economic significance (Segal: 2000). Increasing reference to corporate social responsibility (CSR) in mining companies deserves specific attention both internationally and in South Africa (Porter & Van der Linde: 1995). Proponents for the business case for CSR believe that the voluntary measure to improve companies' social impact will have positive effects on profit margins, at least in the medium to long term (Holliday *et al.*, 2002). Hence, the International Council for Minerals and Metals commits members to supporting 'sustainable development so as to enhance shareholder value' (Good Practice: 2010).

In research done in the Sustainability Handbook, panellists overwhelmingly saw sustainability issues, in many South African companies, as something which had to be addressed rather than a proactive response based on a sound business case (Sustainability Business Handbook: 2007). Slow service delivery and government's inability to meet targets has resulted in some South African companies taking the initiative and going green to remain competitive both locally and internationally. One such company is Cape Brick, which has been selected as one of the case studies and is discussed in detail later in this thesis. Cape Brick has illustrated that going green and sustainability need not be seen as window dressing, as by doing this a company can



actually reduce operating costs and be more profitable (Gracie and Tresfon: 2009). Reducing costs through adopting green business practices is another motivation behind companies going green. As a quick recap, the first motivation discussed was companies' genuine sense of custodianship for the environment and their embracing of the triple bottom line, while the mitigation of climate change was listed by other companies as their primary motivation, as it could jeopardise the future of their businesses. Other factors discussed in this paper are government legislation, continuing pressure from the public and private sector and where listed companies are involved, additional pressure from shareholders, as in the case of Enviroserv. This pressure and legislation could be channelled fruitfully into renewable energy companies such as wind and solar.

As a starting point, the work place, where most of the world (58 per cent) spends almost a third of their life, provides an opportunity for companies to reflect their devotion to being green (WHO: 2009). "Some organizations are increasingly adopting environmental policies not only 'to do the right thing' but also to distinguish themselves from their competitors for recruitment, staff retention and market-facing purposes." (Cook: 2008). It is when companies place primary importance on "doing the right thing" or "going green" for the right reasons, that is perceived to be a reliable gauge of how companies are proactively embracing sustainability issues (Cook: 2008). This could be seen as possibly the most 'genuine' or 'ethical' motivation for companies to go green and drive sustainability and in so doing mitigate climate change. The adoption of new and alternate technologies could be the means for companies to address this.

Sustainability issues are addressed in Freemantle's "The Sustainable Business Handbook" (2007), where a research panel analysis was done and only a quarter felt that South African boardrooms and companies were beginning to value the importance of sustainability issues. The general perception from the panel was that South Africa's larger companies were responding more comprehensively to sustainability, while the medium sized and smaller companies do not embrace it well (The Sustainable Business Handbook: 2007). This implies that sustainability is rarely being properly addressed at boardroom level and is often a mere afterthought and falls in line with the some of the

motivations discussed in Chapter 3 behind companies going green, in particular companies adopting a green facade to look good in the public eye, i.e. greenwashing. In some cases it could be argued that smaller companies are non-responsive to it and its relevance, where the resource costs of collating data and publishing a report remains an inhibiting factor. The development of common standard and efficient guidance will help make it more realistic for smaller organisations to produce reports (ACCA: 2004). This could be seen as a challenge for Government or larger companies to address through supply chain analysis. Moreover, the expertise in sustainability within these companies, if any, lies below directorship or managerial level (Freemantle: 2007).

Leading companies were regarded as being the exception where their directors embraced these issues based on their opportunity and risk (The Sustainable Business Handbook: 2007). The general perception gained from this panel research was that in South Africa corporate boardrooms were being forced to begin thinking about sustainability issues and acting on them, but that the shift to a 'values based' approach had not yet been made in most companies (The Sustainable Business Handbook: 2007). Their reactions to sustainability issues are not indicative of a fundamental change in business direction, but are more a response to societal pressures. The panel recommended as a measure of good business practice that "they ensure they comprehend the scale of possible consequence to business, proactively explore the value of making fundamental shifts and put in place initiatives to proactively shape their markets." These sound recommendations form the core behind what should drive any business; that is, seeking to embrace sustainability. It is pertinent to note here that in 2007, South Africa's JSE top 40 listed companies participated in the Carbon Disclosure Project (CDP) for the first time. This was initiated in the UK in 2000 and is a collective request by global institutional investors asking for standard company disclosure on their greenhouse gas emissions (CDP, 2007). South Africa's first CDP report was compiled in October 2007. This is indicative of the status of the South African market in comparison to their European counterparts where sustainability issues are concerned (CDP, 2007).

Clem Sunter, well known South African scenario planner, economist and chairman of the Anglo American Chairman's fund, is reported to have said in an interview with Kevin Campbell (2009) that South Africa could help Africa leapfrog established technologies and transform the continent (Sunter: 2009). He emphasised that South Africa is the gateway to Africa, not just in terms of ports and railways, but also in terms of investment and technology, pointing out that South Africa accounted for about 30 per cent of Africa's gross domestic product (GDP); which is the same as the percentage of the global economy accounted for by the US. "We're the United States of Africa." (Sunter: 2009). This could be seen as a unique opportunity for South Africa to steer the African continent onto a path towards sustainability, where renewable energy sources are actively adopted and a cradle to cradle approach is embraced by companies and government alike. Africa is blessed with more natural resources than any other continent (The Tech: 2001) and is also the recipient of an abundance of free unharnessed energy in the form of wind, tides and sun. In South Africa, the White Paper (2003) sets out Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa (Domestic Use of Energy Conference: 2003). Another tool used by government from a slightly different angle with a focus on the governance of corporations is the King Code.

The King Code of Governance (2009) recently proposed a new edition, namely King III. It proposed, as with King I and King II, to be at the forefront of governance internationally. They believe this has been achieved through the focus on the importance of conducting business reporting annually in an integrated manner, i.e. putting the financial results in perspective by also reporting on:

How a company has, both positively and negatively, impacted on the economic life of the community in which it operated during the year under review; and how the company intends to enhance those positive aspects and eradicate or ameliorate the negative aspects in the year ahead. (Engelbrecht: 2009)

Innovation, fairness, and collaboration are listed as key aspects of any transition to sustainability in the King Code, where innovation provides new ways of doing things, including profitable responses to sustainability; while fairness is necessary as social

injustice is unsustainable; and collaboration is often a prerequisite for large scale change (Engelbrecht: 2009).

#### **4.5 Fossil fuels vs renewable energy in South Africa**

South Africa would be in a position to 'leapfrog' the carbon intensive development path of developed nations in the twentieth century and move to advanced energy systems if it continued along a path towards sustainable economic growth<sup>17</sup> (Stern: 2009), but unfortunately coal fired power stations still serve as the main provider of energy, where Eskom is committed to spending R97 billion over the next five years to build new coal fired power stations and reopen mothballed ones (Media Club South Africa: 2007). The above statement supports the argument that the South African government is still of the belief that coal is the answer to its energy crisis for the next few decades. In further support of this argument, South African government spokesperson, Themba Maseko, was quoted as saying in an interview with 'Die Burger' (11 September, 2009) that:

*"it makes economical sense that coal will remain the main provider of energy in the nearby future and that they will not be bullied or pressured by other nations at the world convention on greenhouse gas reduction in December 2009 in Copenhagen, Denmark."*

Moreover, the private sector is expected to invest an additional R23 billion in increasing capacity in the same period (Media Club South Africa: 2007). If Germany and the United States can provide 259 000 and 200 000 jobs respectively in the renewable energy sector, South Africa could be seen to be losing out on a golden opportunity here (Democratic Alliance: 2009).

Solar could be seen as the best intervention for South Africa and other African countries against climate change. The Solar Energy Foundation, a Swedish non-profit organisation, is one of several organizations planning to bring solar power to poor

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<sup>17</sup> Todd Stern said at a US Delegation Press Briefing for UNFCCC Climate Change talks and included India and Brazil in the same bracket as South Africa.

communities in Africa. Politicians from 11 Southern African countries gathered in Maputo, Mozambique, to determine how to address climate change issues without reducing access to energy (Browne: 2009). Off-grid solar is seen as one of the continent's best options, as it capitalises on Africa's abundant sunlight without the need to invest in expensive grid networks. Renewable energy experts and politicians were shown practical examples of how sensitive green energy developments have the potential to satisfy both requirements (Browne, Green Inc: Sept, 2009).

Companies whose business nature may not be directly linked to having an impact on climate change, but are indirectly responsible for their staff emitting tons of CO<sub>2</sub> through frequent air travel have responded positively to mitigating the probable impacts of climate change. One such company is Accenture, who through means of the Supply Chain Academy (SCA) have built skills and achieved improved performance. As the SCA starts to replace traditional classroom training methods, "this not only leads to increased flexibility and better knowledge retention, but also eliminates the need for users to travel. This not only leads to cost-savings for the client, but at the same time significantly reduces the carbon emissions from people taking training." (Accenture: 2009). If one were to assume that the average trainer travels 2000 miles to deliver a training course and that through the SCA one workshop per student per year is replaced and the average class is 15 students, "then the annual savings in greenhouse emissions through the SCA are more than 1,300 tons of CO<sub>2</sub>. The same reduction as would be realised by a forest of 375 acres" (Accenture: 2009). In order for its users to be educated on the purpose of sustainability and motivate them to apply its principles, the SCA made a noteworthy investment and developed a sustainability curriculum in 2008 / 2009.

#### **4.6 Conclusion**

This chapter set out to discuss the interventions in place to address climate change from both a global and local perspective. It presented a strong case for sustainability in business and listed some of the challenges like stakeholder buy in and advice. Innovation was shown to be a key intervention for the sustainability of business. The

King Code of Governance discussed in this chapter reinforced the importance of adopting an integrated approach to business reporting. It provided a platform for further discussion and support for one of the motivations behind going green, namely, cost saving reasons behind company's mitigation of climate change, while highlighting some of the challenges for smaller companies, which adopt other motivations, namely a green facade, as an easy way out. The development of a common standard accompanied by efficient guidance was listed as a solution to address this. Cape Town was viewed through a wide lens as a mega-company and highlighted the potential disaster associated with not intervening to address climate change. This paves the way for the case studies and discussion on the hypothesis being tested, where genuine concern over climate change and the future of the planet is expressed, as is listed in the methodology.

## **CHAPTER 5**

### **CASE STUDIES**

#### **5.1 Introduction**

Some of the main rationales behind selecting these case studies were their active role in green job creation and their respective bids to mitigate climate change, which is evident in the interviews conducted in the next chapter. This chapter provides an introduction to the case studies giving a short background to each of them and assessing another company with similar aspirations. Sustainable building receives significant attention in this chapter due to its prominent link with the case studies on Cape Brick and Eco Design.

As a prelude to the case studies, it is pertinent to point out that these companies were selected largely for their active contribution towards driving the sustainability agenda in South Africa within their respective sectors and the acknowledgement they have received for it in the media. An example of a company not receiving as much media attention as the selected case studies, yet making strides towards sustainability on their wine estate is Spier. It is a recognised and popular wine estate with the highly acclaimed Moya Restaurant and open air entertainment arena in the Stellenbosch area, which since 2003 has made huge strides towards embracing sustainability. Andrew Milne, the CEO of Spier, is cited as saying in an interview with Penny Haw of Business Day, that despite their success to date and future ambitions, the ultimate achievement for Spier will be: "The shift in mindset throughout the value chain in the business, beginning with shareholders, and filtering down to employees, suppliers, and even visitors and clients" (Business Day: 2009).

## 5.2 Sustainable building

As a means of elaborating on two of the case studies to be discussed in this chapter and also providing a common thread between all four case studies, the sustainable building sector is discussed first. Building materials have been determined to have a massive impact on the environment, where huge savings in CO<sub>2</sub> could be realised through material selection, if one takes into consideration their full life cycle (Roaf *et al.*: 2003). Timber is regarded as being the most environmentally friendly, as it locks up carbon and thereby diminishes CO<sub>2</sub> emissions from the building, while steel is equivalent to 300 times its weight in water; with the worst of all materials, being plastic, which is equivalent to 5000 times its weight in water (Roaf *et al.*: 2003). The Green Building Council takes all this into careful consideration before awarding companies with its Leadership in Energy and Environmental Design (LEED) Green Building Rating System. LEED has had a resounding success establishing itself among mainstream leaders in the building sector in the United States, which is now worth in the region of tens of billions of dollars since being put in place (Green Building Impact Report: 2008). Ratings like LEED could provide benchmarks for companies striving to reduce their carbon footprint and if the government were to provide incentives for companies attaining such a rating the probability of meeting their carbon emission reduction targets would become more likely.

As the United States Green Building Society (USGBC) puts it in the USGBC website (2008):

*“Leadership in Energy and Environmental Design (LEED) promotes a whole-building approach to sustainability by recognizing performance in five key areas: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.”*

It is via the annual reports from the USGBS that real efforts made by large companies to go green can be seen. One such example is Lafarge, who is the largest supplier of construction materials in North America and Canada. It produces and sells cement, ready mixed concrete, gypsum wallboard, aggregates, asphalt, and related products and services. Their products are used in residential, commercial and public works construction projects across North America. Lafarge, however, believes that going green can give them a competitive advantage. The need for social, environmental and



economic considerations is included in their daily business decisions. They believe that this approach will help them achieve their objectives to be the preferred supplier, community partner, employer and investment. Lafarge is the only company in the construction materials sector to be listed in the 2008 “Global 100 Most Sustainable Corporations in the World award (Corporate Knights: 2009). Lafarge and World Wide Fund have formed a partnership and have focused their efforts on preserving biodiversity, restoring the eco-balance of quarries and forests, and mitigating global climate change (Lafarge: 2009).

In the book by Edwards called “*Towards Sustainable Architecture*” he singles out architects as being the most responsible for the world’s consumption of fossil fuels and the production of the global warming gas CO<sub>2</sub> out of all the professional groups (Edwards:1999). In the UK and Europe, which could be used to indicate trends in the rest of the world, half of all the energy used is related to heating, lighting, cooling and ventilation of buildings (Building Technology: 1993). Decisions about buildings, towns and their spatial distribution are the key to creating a future built upon the concept of ‘sustainable development’ (Edwards: 1999). Edwards implies that buildings are indirectly responsible for 75 per cent of the world’s energy usage, where 50 per cent is attributed to the buildings themselves and the other 25 per cent to the transport required to get to them and move supplies from rural areas to urban areas (1999). If this is considered by all companies, particularly energy intensive sectors like mining and agriculture, substantial savings in energy could be realised and CO<sub>2</sub> levels cut well below their current levels (Cities and Energy Use: 1999).

In Hawken’s “*Natural Capitalism*” the economic advantage of green design is discussed, where the advantages of green design extend throughout and beyond the project’s operating life, but it begins with the design, approvals and construction process. Integrative design often appears to be more costly, but more experienced designers offset this through savings on hardware. Many developers assume that green buildings cost more to build, but the opposite is true as green design can actually decrease costs, largely by saving infrastructure expenses and through using passive heating and cooling

techniques that make most costly mechanical equipment necessary (Hawken *et al.*: 1999). Efficient new buildings are supposed to save between 70 and 90 per cent of traditional energy use of and some several per cent in capital returns. Hawken and Co. list new alternatives, which offer three additional and sometimes more valuable economic benefits (Hawken *et al.*: 1999), as found below:

*“Green projects typically lease faster and retain tenants better. Because they combine superior amenity and comfort with lower operating costs and more competitive terms. The resulting gains in occupancies, rent and residuals all enhance financial returns.”*

The buildings greater thermal, visual and acoustic comfort creates a low stress, high performance environment that yields valuable gains in labour productivity, retail sales and manufacturing quality and output. These improvements create a key competitive edge and add to real estate value and market performance. Better indoor air quality can improve health and productivity and reduce liability risks. The Environmental Protection Agency (EPA) estimates that building related U.S. illnesses account for \$60 billion of annual productivity lost nationwide and a wider study valued that loss as over \$400 billion” (Hawken *et al.*: 1999).

If these three benefits were taken into consideration by new businesses or by businesses looking to retrofit old buildings, massive savings in energy consumption could be realised (Wilson *et al.*: 2007)<sup>18</sup>. Hawken *et al.*, (1999) list some of the benefits of factoring climate change mitigation measures into company policies in the excerpt from Natural Capitalism below:

*“Those who worry about the costs and burdens of redesigning their businesses will see those investments rewarded. Those who want improved jobs, competitiveness, quality of life, public and environmental health, and individual*

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<sup>18</sup> By decreasing energy use by 10-30 per cent through retrofitting the building could drastically decrease its air pollution helping to alleviate global warming, smog and chronic air pollution problems

*choice and liberty can get those things too. By emphasizing energy efficiency, and climate-protecting grazing, farming and forestry systems based on natural systems, we can responsibly and profitably address not only climate, but about 90 per cent of EPA's pollution and public health concerns; smog and particulate emissions, toxic emissions, runoff from agrichemicals, and many more. These actions are vital to a vigorous economy, national security, a healthful environment, sustainable development, social justice and a livable world."*

The value of nature is highly undervalued if one is to consider the value of goods and services provided by nature to humanity (Hawken *et al*: 1999). Fibre for clothing; timber for furniture and housing; fodder and crops; regulation of the climate and keeping the atmosphere breathable; capturing and purifying fresh water; energy; nutrient recycling (including managing our daily bowel movement); drugs that keep us healthy. No matter what or how we ingest something into our bodies, we require nature to provide a service to us (Daily: 1997). Modern man could be excused for believing that one could function independently of nature, as half the 6.4 billion people in the world now live in cities (Millennium Ecosystem Assessment Report: 2005), many of which have little or no natural vegetation. Good examples of these are cities like Lagos, Nigeria and Mexico City, Mexico which are so overpopulated and removed from natural systems many forget about the natural link (BBC: 2005). Moving to a South African context, cities in South Africa are closely linked to their natural systems yet there is a lack of action to reinforce this link, as is discussed in the next section (Earthsummit: 2002).

### **5.3 Supporting case studies**

To date, few high profile companies in South Africa have made any commitments in response to climate change, although they have been developing and implementing strategic responses to the challenges of global warming (Zipplies: 2008). Those that have responded in some way are largely in the mining (e.g. Kapelus: 2002) and petrochemicals sector (e.g. Acutt *et al*: 2004), where one would expect them to answer for their prominent role in environmental degradation and human exploitation (Visser:

2007). Over the last few years they have published annual audited accounts of their global greenhouse gas emissions. This action has been followed by Pick n' Pay and Woolworths, where they have similarly started monitoring and attempting to reduce their carbon emissions and agreeing on specific targets<sup>19</sup>. In addition to these early signs of companies increasing awareness around and response to climate change issues, local businesses such as Highveld Steel, Mondi, Petro-SA, Sappi, Sasol and South African Breweries (SAB) have successfully managed to draw on funds that were offered by the Kyoto Protocol Carbon Disclosure Mechanism (CDM) (Zipplies: 2008). As the energy sector is considered the frontrunner in responding to climate change the researcher decided to investigate other sectors for his case studies.

Spier, on the other hand, received no funding from the CDM, which reinforce their genuine commitment to going green, reflected in the first motivation, as listed in the methodology. Andrew Milne, CEO of Spier, claimed profoundly that "it is all about changing people's perspective and thereby, behaviour." The excerpt below taken from Milne's interview with Business Day will act as a sustainability indicator for the four case studies being investigated in the next section.

*"It is widely accepted that employees play an invaluable role in supporting companies' corporate sustainability and responsibility initiatives. Not only is their involvement necessary to achieve the objectives of the initiatives, but engaging employees in sustainability also helps increase their commitment all round. This leads to improved performance and increased productivity. Furthermore, it can translate to higher levels of retention because employees have a favourable perception of their company. The challenge for many organisations, particularly those that employ a diversity of people at numerous different levels, is to get all employees to buy-in to their sustainability initiatives."*

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<sup>19</sup> In comparison to these, Wal-mart, General Electric and Tesco overseas were among the first to commit to green strategies and set themselves targets for reducing greenhouse gas emissions. There reasons for doing it are not only to manage risk, but also because they see the competitive advantage of providing low-impact products and services and thus building value. Moreover it is important to note that none of these companies could be considered to be 'green'.

Spier's sustainability drive is further supported by companies like Enviroserv, which is one of the case studies to be discussed in the next chapter. It provides evidence that some companies deciding to go green have remained profitable and in some cases noticed increasing profit (Enviroserv Annual Report: 2008). This is not to say other companies are not profitable, but this is one of the few examples of listed companies that have actively gone green and benefited from increasing profit margins. This is also reflected in Cape Brick, one of the other case studies investigated here.

## **5.4 Prelude and background to the case studies**

The study moves to focus on the actual case studies of four South African companies from different sectors of the economy. Each case study follows the same format, starting with an introduction, the motivation behind it, its method of intervention, evaluation, challenges and the way forward. The responses from the interviews conducted will be immersed in the abovementioned sections. The case studies discussed here are based predominantly on one-on-one interviews with the owners and where possible employees of the respective companies. The interviews attempt to gauge the impacts going green has had on their company image, their staff and their profit margins. They also outline the challenges faced by these companies and how they see their prospects in South Africa and for others wishing to go green within their respective sectors. The case study questions for each of the four case studies are attached as addendums to this thesis. In keeping with the trend established earlier this chapter begins with Backsberg. As Backsberg has received numerous accolades in the press and has been advertised on the radio and television, it was investigated at first.

## **5.5 Backsberg**

### **5.5.1 Background to Backsberg**

Backsberg Wine Cellars is the first case study and probably one of the most significant achievements in the agricultural sector towards going green and challenging the

conventional farming system through counteracting the resource intensive wine manufacturing process and producing carbon neutral wines. Before dissecting the actual case study, a brief introduction into the makings of Backsberg follows. Backsberg Estate, as it is known today, is situated along the slopes of the Simonsberg Mountains, midway between Paarl and Stellenbosch and currently has 110ha under vineyard (Backsberg website, 2009). It has been producing quality wines for over 70 years and enjoys international acclaim as one of the Top 100 Wineries in the world as rated by Wine & Spirits Magazine in New York (Backsberg website, 2009). Backsberg is a member of Biodiversity and Wine initiative and 40 ha of critically endangered Swartland Alluvium Fynbos on the estate has been dedicated for conservation purposes over the generations (Winter, 2009).

*“Backsberg’s environmentally responsible approach to its wine farming, production and sales started by measuring the impact its operation had on the environment in terms of fuel usage, water and electricity and many other quantifiable factors. The CO<sub>2</sub> emissions caused by their operation is offset by a dedicated programme to restore their carbon footprint by tree planting and by changing how they do things. Energy saving light bulbs are used; holes were cut in the roof to let in natural light; Michael Beck drives a Ford Bantam bakkie which is less environmentally damaging and lighter on fuel than a heavyweight one; fresh dam water is used to cut out on refrigeration costs; smaller tractors are used; barrelwood is re-used and furniture is made from it. Backsberg has recently introduced the tread-lightly range where plastic bottles weighing 50 grams instead of the 650 grams for the glass bottles or 450 grams for their light weight bottles.” (von Ulmenstein, 2010).*

Backsberg exemplifies how man should retain his natural link with nature. The wine industry, *per se*, could be considered to be resource intensive, where the water footprint of wine production is estimated to be 960 litres to produce one litre of wine (Wine Economist: 2008), yet the owner, Michael Back, has tried for years to counteract these effects through other cost saving and environmentally friendly initiatives, which culminated in it becoming the only carbon neutral wine in South Africa. Backsberg’s

attention to detail and its notable shift to incorporate greening into its business so impressed the greening judges that they won the recently introduced agriculture category, while last year it won the energy efficiency and carbon management category (Mail and Guardian: 2009). This case study also takes into account some of the key challenges and issues faced by the owner to achieve this. Michael Back is reported as saying in an interview with Yolandi Groenewald of the Mail and Guardian (2009) that: “green-washing” presented a serious threat to entities such as Backsberg, which is committed to operating in a green and sustainable way – and thus the integrity of what the farm does must be above reproach and open to debate. This can be explained through the high level of scepticism within the conservative South African market, unwilling to accept anything at face value (Back: 2009).

### **5.5.2 Motivation**

What could be seen as Backsberg’s most proud achievement in the eyes of South Africans and the international community is that it has become the first wine producer in South Africa and one of only three in the world to gain carbon neutral status by sequestering its carbon emissions (Urban Sprout, 2009). Proprietor, Michael Back, is passionate about the environment, believing that each generation is the custodian of the land for a limited period of time only (Backsberg, 2009). He claimed that “Care for the environment means care and concern for succeeding generations.” His sustainable way of thinking became more evident in the researcher’s interview with him, where he said one of his motivations for becoming carbon neutral was: “As custodians of the land, it is our duty to understand and recognise potential threats, and to protect against them for the benefit of the next generation.” Michael Back further pointed out in the researcher’s interview with him that pressure on companies to become greener will come from the markets doing carbon emission labelling and that both the local and international commodities sector would have to adhere to this. Government tax breaks and incentives would also go some way towards achieving this.

His progressive manner of thinking has already rescued several plant species (see Addendum E) from extinction by reserving 10 per cent, of his land for non-development and preservation of the endangered "Fynbos" biome (Backsberg, 2009). This, on a follow up telephonic discussion with John Spier, CEO of Backsberg, was considered to be a bold move, considering land was sold at R500 000/acre in the Franschhoek Valley. Moreover, he has recently set aside more land for creating renewable energy. Ten per cent (10%) was considered to be above the norm in the Franschhoek Valley. Backsberg is also one of 19 wine farms to join the biodiversity and wine initiative (BWI) (Winter, 2009).

### **5.5.3 Intervention**

Backsberg has completed a comprehensive carbon audit initiated to understand the carbon emission consequences of its farming and wine making activities. The carbon audit reviewed all activities from overall energy consumption, to CO<sub>2</sub> emitted during fermentation. The level of detail considered in the audit allows Backsberg to deliver a range of carbon neutral fruit and wine to clients, both domestically and internationally. In addition to this, when I questioned Michael Back about it, he added that Backsberg also has future plans to audit their suppliers to ensure that they receive greener more ethical products right through the supply chain. The carbon standard applied at Backsberg follows the Kyoto protocol on green house gas (GHG) emissions. The scientific nature of the carbon audit allows Backsberg to understand the magnitude of the sequestration solutions it needs to seek and develop, in order to reduce its carbon footprint and maintain a status of carbon neutrality going forward.

Despite being carbon neutral and embracing sustainability where possible Backsberg's sales pitch is "quality wines" not organic or carbon neutral wines. Nevertheless, as a means of demonstrating their devotion to protecting the environment, they have devoted a block of their land to producing certified organic wine. However, Back pointed out that the spray programme is twice as expensive as conventional methods, which was probably the main motivation for not going completely organic. Backsberg does,



however, adhere to the stringent nature's choice standards (NCS), which are considered to be more stringent than Eurogap standards. This on its own could be considered an assurance of both customer and environmental protection. On the social side of sustainability the researcher returned to the farm and chatted briefly to one or two workers there, who were both very happy with their work conditions, their pay and the relationship with their employer. They mentioned that Michael Back had built houses for them near Klapmuts and they would not consider working anywhere else. Alcohol abuse still existed amongst workers but has been reduced to only weekends.

In the South African Wine News (March, 2007), the following article was written:

*"The sequestration solutions developed by Backsberg will involve a greening programme in the nearby village of Klapmuts. This programme is to be managed by the internationally respected Jeunesse Park, CEO of Food and Trees for Africa, the non-profit national greening organization driving the carbon standard offset programme in South Africa. This collaboration will see Backsberg use the Food and Trees for Africa carbon standard logo. "We are indeed proud to be associated with Food and Trees for Africa," said Back, who believes that a whole new market sector with the emphasis on care, not only for the wine and the consumer, but also care for the environment is about to open.*

*"Trees are the most efficient and simple means for us to store carbon, providing us with the air we breathe and absorbing the carbon dioxide we exhale and that is emitted in large quantities by our carbon based society," claimed Park, who was honoured with an International Chevron Conservation Award in California in October 2010, for her efforts to improve the quality of life for disadvantaged South Africans through natural resource improvements. Since the start of the public benefit organization 17 years ago, Food and Trees for Africa has distributed over 2,5 million trees throughout South Africa. Whilst tree planting is crucial to the absorption of greenhouse gas emissions, it is equally important to develop more conservation oriented practices by becoming more energy efficient for long term sustainability."*

#### **5.5.4 Evaluation**

Ronnie Morris, editor of Business Report (2007), wrote an article about Backsberg and claimed that: "The SA Wine Industry Council this week welcomed the news that the Backsberg wine estate has become the first wine producer in the country - and one of only three in the world - to gain carbon neutral status." John van Rooyen, the Council's chief executive interviewed by Morris, was hopeful that the world's largest CO<sub>2</sub> producers, namely North America and Europe, would lead by example through imposing restrictions, however he added that "we must hope that policing carbon emissions does not become another trade tariff barrier"(Business Report: March 2007). Michael Back further pointed out in my interview with him pressure on companies to become more green will come from the markets doing carbon emission labelling and that both the local and international commodities sector would have to adhere to this. Government tax breaks and incentives would also go some way to achieving this.

Andre Morgenthal, communications manager for Wines of SA (Wosa), was reported to have said in The Business Report (March, 2007) "it was encouraging that producers were taking the initiative on reducing CO<sub>2</sub> emissions." Morgenthal observed during a trip to London that it was evident that the issues around eco-friendly wine production, specifically social and environmental responsibility, were becoming key factors in the purchasing decisions of major buyers, retailers and high-end consumers. Morgenthal was cited as saying, in the interview with Morris, that "This is another aspect that the SA Wine Industry Council and Wosa are trying to encourage South African wine producers to move towards, otherwise we will lose our competitive edge."

#### **5.5.5 Way forward and conclusion**

Michael Back said he saw the conversion of biomass into energy, as the way forward and was currently investigating this. Moreover additional land has been set aside to undertake this. He has investigated solar options and considered these not be economically viable in South Africa at the moment. I quote him as saying 'sustainability

is obvious and is staring us in the face'. He felt the others were making big waves in Europe, yet not enough farmers were doing anything in South Africa. In the last year (2008-2009), since starting to monitor his profits he had observed a substantial improvement in profit margins, despite the economic downturn. His passion for the environment and commitment to do the right thing reveal genuine concern about the impacts of climate change and the future of the planet. His constant investigation into new ways to mitigate it and in so doing reduce the overhead costs of operating his business further support this. However it was also revealed that wine farming is not a green business and can be highly resource intensive, which Back has managed to keep to a minimum and turn Backsberg into one of three carbon neutral wine farms in the world. Despite this the production of 'quality wines' emerged as the priority at Backsberg and climate change mitigation, although being of genuine concern and ranking highly on the agenda, was of secondary importance. Reduction of operating costs through becoming carbon neutral and protection of profit margins were of primary importance.

## **5.6 Cape Brick**

### **5.6.1 Background to Cape Brick**

Cape Brick was founded in 1938 and used to occupy the site alongside the Salt River power station in Paarden Eiland. The company was originally contracted to transport the waste ash out of the power station. This product was then used to make bricks as well as being sold on to other clay brick manufacturers. Cape Brick now manages the recycling process that begins with waste material selection on site and facilitates the dumping, primary crushing and sieving of the waste material. A steel removal process is then undertaken which is followed by secondary crushing and sieving and a grading process for material quality identification.

Anthony Gracie (June, 2009) believes that Cape Brick is the only local manufacturer of truly environment-friendly bricks in South Africa<sup>20</sup>. "Our recycled bricks are engineering grade, load-bearing, and structural concrete masonry units, which have been approved by the Concrete Manufacturers Association (CMA). This view is supported by his partner and half brother, Jean Tresfon, who claims they hold the lowest embodied energy content of all the bricks manufactured in South Africa," states Tresfon. He added that the use of recycled material also has a beneficial effect on product quality. Tresfon says: "It is actually superior to that of quarried materials available at a similar price, offering higher compressive strengths. The end product is a truly green building material, a recycled brick with a low embodied energy, which is, in itself, fully recyclable." He pointed out that "energy consumption during the manufacturing process should also be low," so as to ensure the lowest embodied energy and has the added benefit of being a cost saving measure (Capebrick: 2009). This is reflected as another motivation to going green in order to become more profitable.

### **5.6.2 Motivation**

Cape Brick remains the only brick manufacturer to supply environmentally friendly masonry with a minimum of 70 per cent recycled materials content to the Western Cape market (capebrick, 2009). However, it was uncovered during the interview with Anthony Gracie that C. B.'s initial motivation behind their eco-friendly, recycled bricks had little to do with embracing sustainability or going green *per se*, but was more for the purpose of reusing their factory waste<sup>21</sup>. This led to the realization that they could produce more from recycled aggregate at a lower cost than they would have through the conventional manufacturing process. The initial capital cost was, however, higher than for conventional brick manufacturing, but since making the conversion and through the aid of government legislation, they have been able to get aggregate at a much cheaper rate.

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<sup>20</sup> Anthony Gracie mentioned that some other small companies also do it, but have no impact on the market in South Africa.

<sup>21</sup> Corobrik and other major brick manufacturers also recycle their waste on site, but have not expanded on this, as Cape Brick have done.

As the interview revealed and the researcher mentioned earlier, Cape Brick started out with conventional concrete and used to make bricks from the conventional mixture of sand, stone, cement and chemical additives. It was only about five years ago that the company evaluated its material supplies situation and decided to start recycling building material in order to reduce its reliability on quarried stone and mined sand from the surrounding area. "Quarried material was becoming increasingly scarce and expensive in the Cape, so we started looking at recycling building rubble as an alternative to virgin aggregate, to ensure a steady supply of raw material for our brick-making plant," claims Tresfon, a partner at Cape Brick. The actual brick making process remained the same, by using brick machines to produce normal concrete bricks. Tresfon pointed out that "apart from the obvious energy savings, our product remains fundamentally the same. The only difference is that we use sand and stone in our concrete mix, recovered from rubble instead of originating from quarries." The product is in no way inferior to other concrete bricks and has a much lower embodied energy as a result of the recycling process. Cape Brick has slowly increased the use of recovered aggregate over the years and now produces bricks that consist of up to 90 per cent recycled material. In times of high brick demand, the company sources material from the surrounding quarries in order to supplement its stockpiles. Moreover, the company found suitable and willing partners for the venture in demolition experts, such as Ross Demolition and Bradis, to help with the sourcing of the correct material to use from demolition processes that could help in brick making (Capebrick, 2009). In collecting their materials, significant amounts of unused materials are also brought on site and have to be separated. One such material is wood, which was divulged in the researcher's interview with Anthony Gracie, as something which could be handled in a greener and more responsible manner and used as wood chips or as firewood. This is something Cape Brick have considered investigating in the future.

### **5.6.3 Interventions**

Cape Brick, which in August, 2009 had 7 per cent of the market share of the total concrete brick market in the Western Cape and competed directly with major conventional brick manufacturing companies like Corobrik, manufacturers only

environmentally-friendly bricks, and has supplied the bricks to a range of building projects, including an eco-friendly office block in Westlake, Cape Town, which used a range of environment-friendly materials to construct the building. As mentioned previously, Cape Brick has also supplied the City of Cape Town with bricks to construct RDP houses in Hout Bay.

The company is today one of the leading manufacturers of concrete products in the Western Cape. Cape Brick's location in Salt River is only 5km from the city centre, and is also the closest large-scale masonry manufacturer to the Atlantic seaboard and the Southern Suburbs. Cape Brick employs 71 skilled and semi-skilled workers and has a management team of 8 members. Anthony Gracie informed the researcher that through manufacturing eco-friendly bricks they are able to provide 10 per cent more jobs than a conventional brick company would and produce and sell bricks at a cheaper rate. The company is also a member of the concrete manufacturers association (CMA) and is fully black employment equity (BEE) accredited, with level 2 contributor status and a recognition level of 125 per cent (Capebrick, 2009).

*“Cape Brick has long been looking to expand its operations and product offering, and Pavatile became a natural choice. They claimed to be manufacturing the highest quality wet-cast paving products in Southern Africa and having a good reputation for excellent customer service, which fitted well within the Cape Brick ethos of customer satisfaction above all else. Pavatile has consistently managed to perform in a competitive market through the ability to offer a great diversity of application specific products according to customer expectations. The partnership between Cape Brick and Pavatile was formed in May 2008 and is expected to result in more streamlined production, with increased output and expanded distribution, but it will also make it possible for Pavatile to devise integrated paving solutions incorporating both wet-cast and dry-press paving, as well as solutions which go far beyond paving alone, including landscaping and retaining wall systems. The next challenge will be for Cape Brick and Pavatile to release an environmentally friendly range of wet-cast products.*

*The power crisis hit headline news in South Africa in 2007 and 2008 and Eskom were desperately trying "to balance both sides of the scale by both increasing generating capacity and campaigning to reduce demand." Cape Brick has acknowledged that bricks and cement have a large carbon footprint which can be attributed to their high embodied energy, required to source raw materials, manufacture the product and bring it to site through to their thermal resistance and insulation properties. Cape Brick has now managed to manufacture a brick with 70 per cent lower embodied energy, which on average is 0.50 mJ/kg (see Addendum F for comparison of embodied energy values for all building materials) and excellent thermal resistance and insulation properties claimed Anthony Gracie. He added that Cape Brick also prides itself on its close proximity and accessibility to building sites, which attributes to its low embodied energy and aids in mitigating climate change. Anthony admitted that the motivating factor behind this was cost based, but it carried the added benefit of being the most environmentally friendly. Ultimately, the company was driven by producing bricks in the cheapest possible manner so as to gain maximum profit. As Cape Brick is not a listed company, shareholder interests do not come into play, only those of the Tresfon/Gracie family and their staff." (Cape Brick: 2009)*

It speaks for itself that: the less energy required to manufacture something, the less electricity will be required. Even if the manufacturing equipment is diesel driven, the production process for the fuel itself still requires electricity usage. Anthony Gracie is quoted as saying that only 200ℓ of diesel is used a day, which is fairly insignificant in the bigger scheme of things. They could buy carbon credits, but the high cost would outweigh the benefit and they would only consider this if it became a requirement or was more affordable. They do recycle paper used in the office, but this has a negligible impact, as the amount of paper used is insignificant. Fluorescent lights are used in the office, as a cost saving device, not as a means of being greener.

On a different note, Gracie mentioned that they support low income communities and said that they had been contacted by the City of Cape Town which had already bought some of their bricks for an RDP housing project in Hout Bay, which had been a success. On completion of the interview, the researcher spoke to some of the employees who worked there. Some had been there over 15 years and all seemed very happy and had no intention of leaving, as Cape Brick pays their staff well and on visiting their offices, he gained the impression that management held a good rapport with their employees.

In 2001, the company became one of the first manufacturers to set up a sieving and waste recycling plant on site, which was done through buying a jaw crusher and a gyro crusher. This was initiated by Jean Tresfon and Anthony Gracie and Anthony informed the researcher during the interview that the initial cost was high, but was worthwhile as it led to the introduction of the environmentally friendly product range, which could all be done on site. (Cape Brick: 2009).

Prior to using recycled, crushed aggregate, Cape Brick used regular virgin aggregates like most of the other large manufacturers and their stock bricks had an embodied energy value of 0.86mJ/kg, which is still significantly lower than most manufacturers' current values. The change to recycled materials and the resultant lowering of the embodied energy saw an energy saving of 3,625,505mJ per month. This equates to 1,007,085 kWh, (see Addendum F) or the equivalent of running 2000 medium income houses per month (capebrick, 2009). As stated by Tresfon, one can not look at the manufacturing process without taking into account the energy savings of the finished masonry product. The main requirement of any masonry product in terms of energy efficiency is that the product should have good thermal insulation and resistance properties. Tresfon claims that: "The energy efficiency of any walling material is determined by how it handles heat, how heat transfers through it and how well it holds or stores heat." Heat always moves from warm to cold, so in summer with the outside temperature warmer than the inside, the heat transfers through the walls from the outside in and vice versa in winter ([www.capebrick.com](http://www.capebrick.com)). Concrete masonry is naturally thermally efficient and when used in conjunction with cavity wall construction it has the



added effect of ensuring that buildings stay warm in winter and cool in summer, thereby reducing the need for heating ventilation air conditioners (HVAC), fans and other artificial means of climate control, which waste energy and emit carbon.

#### **5.6.4 Evaluation**

How green are Cape Bricks' bricks? This question can only be answered through comparing them to conventional bricks. If one considers that the impact of typical embodied energy values for burnt clay bricks is 2.5mJ/kg and the typical embodied energy values for standard concrete masonry is 0.95mJ/kg. These values are all listed in Table F1 in Addendum F and compared with other building materials. (cf. Addendum F). The average embodied energy value determined for their product range is 0.50mJ/kg, which is one fifth that of a conventional clay brick. All their concrete products contain a minimum of 70 per cent recycled material and some up to 90 per cent as mentioned earlier, but their plaster stock brick is far better at 96 per cent recycled material. According to Anthony Gracie, the stock brick is also known to have the lowest value for carbon emissions. These results indicate the energy content from cradle to the factory gate, not from cradle to cradle<sup>22</sup> as would be the ideal scenario. When considering the transport energy to site, Cape Brick is argued to be one of the lowest on the embodied energy score, being located only 5kms from Cape Town city center and also within 5-10 kms of Parow, Paarden Eiland, Epping and other industrial areas. The researcher did a visual assessment with some of the other brick making companies like, Corobrik and Cramics, which were not as well located in relation to industrial areas.

Cape Brick revealed that the secret of concrete block's energy efficiency lies in its mass. This is achieved by the thermal mass of concrete, which slows down the passage of heat moving through the wall and allows a masonry structure to absorb heat, instead of passing through it to the inside of the building. As the wall is cooled by shade or nightfall, the absorbed heat is then released back to the outside, keeping the inside cool.

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<sup>22</sup> McDonough and Braungart promote a cyclical approach to manufacturing in their book Cradle to Cradle

Likewise, this thermal barrier helps keep a concrete masonry structure warmer during the winter months (Cape brick, 2009).

Jean Tresfon, Sales director of Cape Brick, was reported to have said the following in an interview with Aden Thomas of Cape Talk on Friday, June 6, 2008. Jean promoted their environmentally friendly bricks. He explained that a large percentage of the energy footprint comes from building materials. Dumping is also a big problem in Cape Town. They use recycled construction and demolition rubble to make their bricks so they do not need to quarry the stone and mine the sand. This means they save 1 mill kW a month which is the equivalent amount of power needed for 1000 large houses (Cape brick: 2009). They also reduce their carbon footprint by not having to transport their product from sites out of town. They use a special sieving process to recover the sand and stone which has made up the concrete and remove the wood and paper and steel contaminants so that 80 per cent of their bricks' make-up is from re-cycled goods. The bricks cure naturally and do not need to bake which also uses large amounts of fossil fuel. He concluded by saying that the bricks have full SABS approval and while the bricks cost the same as other bricks, there is a huge saving for the environment (Cape brick, 2009).

Sylvester Haskins interviewed Jean Tresfon of Cape Brick and wrote the following article in Engineering News (Feb, 2008):

*"CMA director John Cairns says that the thermal resistance and insulation of the eco-friendly brick assists in moderating ambient temperatures, enabling buildings to retain heat and remain cool in summer, which ultimately lessens the need for artificial climate control, and its concomitant energy requirements." The secret of concrete masonry's energy efficiency lies in its mass. The thermal mass of concrete acts as a buffer, absorbing the excesses of external temperatures as they move through a wall, making the insides of buildings more comfortable," says Cairns. Concrete manufacturers and CMA members False Bay Bricks and Columbia DBL, of the Western Cape, joined the eco-friendly materials crusade, as both company's recently gained national home builders registration council (NHBRC) approval for a range of thermally efficient, single-leaf, hollow-core*

*concrete blocks, which can be used without plastering, reports Cairns. He says that rigorous testing by the South African bureau of standards (SABS) on these blocks demonstrates conclusively that they comfortably exceed the NHBRC's thermal performance requirements for concrete masonry in single-leaf walls. This means they do not require plastering for additional thermal insulation."*

*The 140mm hollow concrete block is the most widely used masonry unit for low-cost, and affordable housing in the country, and that, prior to the SABS tests, very little work had been done to establish a thermal properties standard. "We were confident that the tests would prove satisfactory, as the SABS conducted a thermal test on our behalf in 2001. However, the NHBRC was concerned that units could vary over time, or that units from different companies might not have the same properties. This is why they have stipulated that each manufacturer must submit its own product for testing," states Cairns*

*The thermal performance of the 140mm block is almost equal to the 190mm block, but it presents several advantages, adds Cairns. He reports that it is about 2 kg lighter and production output is about 50 per cent greater, which results in cost savings. "The fact that a less expensive block has similar performance attributes, and certain advantages over its larger sibling, indicates that it is likely to strengthen demand for the block, especially in the wake of these tests," says Cairns. Other concrete manufacturers, and members of CMA, are currently in the process of analysing the physical characteristics of concrete blocks in order to ensure consistent thermal resistance values, in order to comply with the NHBRC's monitoring requirements, reports the CMA." (Engineering news, 2008).*

### **5.6.5 Way forward and conclusion**

Gracie pointed out that even though eco-friendly bricks are more cost effective, in terms of manufacturing the product, there are also many challenges to manufacturing it. "It is

cheaper to manufacture, but there are challenges in terms of variance in raw material size, colour, and quality. This makes manufacturing more challenging." It is important to reiterate that, although at present a mix of up to 90 per cent recycled material is used, this could be increased to up to 96 per cent recycled materials, which can be recycled again providing continuity to the cradle to cradle cycle.

All having been considered, bricks manufactured and sold by Cape Brick are probably the most environmentally friendly, conventional masonry products that are commercially available to the South African market. The nature of their business is 'green' *per se*, however, the business could not be considered to be green to the core, nor were the initial motivations behind their product line and the mitigation of climate change was not an initial consideration when starting out the business. Furthermore wastages still occurred in the form of wood chips, which in the future could be reused for fuel, although the amount was negligible. Anthony Gracie pointed out in the interview that the provincial government of the Western Cape had expressed an interest in their products, yet little had happened and it may only happen in some years. It would be an ideal opportunity for them to promote sustainable buildings if they were to use their Cape Brick for future projects or in refurbishing and extending existing government/council buildings. If government were to specify the source and make use of Cape Brick's products, their development/project could realize a huge difference in the amount of energy and carbon emissions saved, with no increase in cost, no compromise in quality and no changes in building methodology and this could serve as a blueprint for developers or builders. Cape Brick, despite the nature of their business being green and climate change mitigation now being considered as of increasing importance, the initial and primary motivation behind their company going green was predominantly to reduce costs.

## **5.7 Eco Design**

### **5.7.1 Background to Eco design**

Eco Design; Architects & Consultants is an architectural practice specialising in ecological friendly green building and consulting. It was established in 1998 by Andy Horn, a University of Cape Town graduate (1995), out of his concern for a rapidly degrading natural environment and social inequalities. The practice has since been at the forefront of the green building movement in South Africa and has won numerous international awards in the field of sustainable design. It embodies a holistic vision and has a particular focus on the use of local, natural, non-toxic and recycled materials such as stone, clay, sand, straw, reeds, thatch, cob, compressed earth, bottles, poles etc.

Andy's practise is now well recognised in South Africa through the numerous awards it has won, which included the "Daimler Chryssler award for South African architecture in 2007 and a finalist for the Holcim award in 2006" (Eco Design: 2008), and could be compared to other green architect firms in South Africa, like Paul Karoo and ARG, which do similar work to them (Horn: 2009). When asked who they model themselves on, Rural Studios, a design- build architecture studio run by Auburn University in the USA, was listed as the most prominent in the field (Horn: 2009). He was of the opinion that the biggest innovation in green architecture locally was the prefab biogas generator, where as an aside to this algae from ponds could be used for cooking and cleaning. Otherwise he was of the opinion that LED lighting had made significant headway and was fast becoming more efficient and economical.

He further lists the following as benefits and rationale for green building:

"Reduced operational costs; Community involvement and benefit to local economies; Healthy buildings; Higher occupancy rates; Improved productivity of work spaces; Better sales with retail; Improved learner-ship in education; Lower environmental impacts; Improved marketability and Sustainability" (Source: [www.ecodesignarchitects.co.za](http://www.ecodesignarchitects.co.za))

David Cook explains in his article on Green Buildings (2008) that ‘sustainability is not so much a political issue as a humanistic issue; for qualities are just as important as quantities and a “sustainable,” or indeed “green,” architecture must not solely focus on environmental constraints or pre-defined performance criteria, but also celebrate the wealth and diversity of nature.’ Buildings are only regarded in sustainable terms if they fit the purpose they were designed for and operate efficiently. If they do not they become a burden to the owner, use up unnecessary resources and risk premature replacement.

### **5.7.2 Motivation**

In an interview conducted with Andy (June: 2009) the researcher was informed that he became environmentally aware as a teenager when his parents took him to game reserves. His passion for the environment and design grew through his teen years and some of the motivations behind going into green architecture developed through his observations of how western building clash with their landscape, while indigenous buildings blend in with their natural surroundings. He informed me that at the time when he started out in the field it was very new in South Africa and that he had to come up with his own design principles. Despite green building carrying higher upfront costs, Andy believes that their resale will be better in the long run. This trend has been observed in Europe and at the moment it is too early to say in South Africa, but looks like it will follow suit. Moreover the lower running costs and healthier living space is an added advantage. Cheaper green technology is fast becoming available and one can do more for less cost.

### **5.7.3 Interventions**

Eco Design’s first commission as an independent practice was to rebuild an old *langhuis*. The project used straw bale infill construction techniques, which set the standard for much future Eco Design work and afforded them the opportunity to explore and refine the use of natural and local materials. With many of the older buildings built using local, natural materials, Eco Design’s experience has also led to some historical restoration work, including several reports for the South African heritage resource agency (SAHRA).

Andy, a staunch supporter and driver for green building, uses a fuel efficient car and has a fuel additive in his fuel tank, which assists reduce fuel consumption, but above all he believes the key to mitigating carbon emissions associated with travelling is by living close to work. He added in the interview that their current office premises was leased, but that he would like to have his own premises, which would adopt green technology and design, where possible. However, this was not financially possible at that moment. As a means of reducing their operational environmental impact in their current office, they recycle all paper, glass and they use typack paper. All toilets are multi-flush, LED lights are fitted and they have a worm bin.

During the interview with Andy the researcher was informed that he had observed an increasing number of green contracts over the past few years. The first real indication was when he was approached by a developer in 2005 and since then contracts increased steadily until the release of the movie “An Inconvenient Truth” towards the end of 2006, beginning of 2007, which was the real watershed year where he noticed a marked increase in green contracts. This trend has continued to date. However repeat clients are not actively monitored by Eco-design, but they have noticed a few, otherwise Andy pointed out that he is often asked to come back and lecture at universities and institutes, so there was some level of growing interest in the field.

Earth Rising foundation in collaboration with Eco Design architects completed Cape Town’s first low cost earthen house in Masiphumelele ([www.ecodesignarchitects.co.za](http://www.ecodesignarchitects.co.za)). The house is home to a family of six, with four bedrooms, a living room, bathroom and kitchen. The plan was based on a Habitat for Humanity low cost house model and built with an earth construction method called Cob replacing concrete blocks and a rubble trench foundation instead of the usual concrete. All involved in the project were very satisfied with the result, in particular the family. It is hoped that a trend will start from this. Andy mentioned that this together with a project in the Transkei and a sandbag building project in Delft, where residents from Mandela Park were actively involved in the

process, which provide more support of their active role in uplifting low income communities.

Eco-Design adheres to the green star rating system, devised by the GBC, by default. However, it does not intentionally follow their principles, as they work according to their own set of guidelines, which include a socio-economic standard, which was set through a voluntary consensus, as no laws support it, as part of their principles. Andy is of the opinion that Eco-Design exceeds green star. Eco-Design is not, however, 100 per cent purist, as they do use cement in some of their buildings, but only where absolutely necessary. They are highly conscious of its resource value. The researcher was informed that they do no advertising and promote themselves through networking at conferences, word-of-mouth, lectures at UCT, Peninsula Technikon, sustainability institute and their website.

In comparing Eco-Design to their European counterparts, Andy felt that his practice was on a par with some of them. However, due to the different climate and context within which they work, an accurate reflection could not be drawn. Andy made mention of Tom Woollie, working for the centre for alternate technologies (CAT) with whom he was in fairly regular contact and benefitted from knowledge transfer. However, two of the most useful networking tools, according to Andy, are the Global Straw Bale network and, of which he is a representative, and the Sustainable Building Conference Series, which is more global than European. He felt that there was far more to gain from a global series, than Europe, as most of Europe is highly industrialized and first world, while South Africa is on a different page and more in line with Latin America or South East Asia.

Most building materials used by Eco-design are sourced locally and where possible within a 5-10 kilometre radius. Andy maintains that they try as hard as possible to monitor their suppliers and develop a relationship with those that they trust are both ethical and actively practising corporate social responsibility. However, he added that with 'greenwashing', these days it was hard to be sure who was genuine about the



nature of their product. Andy promotes the sourcing of local labour for projects and educates contractors on the importance of this, as it is requirement for government contracts.

#### **5.7.4 Evaluation**

In 2007, Eco-Design was awarded the Daimler-Chrysler Award for South African Architecture. On handing over the award, Daimler Chrysler was full of praise for Andy Horn and is recorded as saying: "Andrew Horn of Eco Design Architects has been nominated for displaying exceptional talent in the field of architecture in South Africa. By addressing aesthetic, structural, and functional consideration, in a uniquely dynamic and creative manner, a significant contribution has been made in enhancing the image of an enigmatic and diverse South African people." Andy was one of the eight architects nominated to receive the Daimler Chrysler Award for displaying 'exceptional talent in the field of architecture' in South Africa (ecodesign, 2009).

In 2006, Eco-Design architects and consultants were invited to attend the Global Holcim Awards in Bangkok. The prestigious honour is not to be undermined as they were chosen from over 3000 entrants from 118 countries from around the world. They were shortlisted as one of the 15 finalists of the Global Holcim Award for Sustainable Construction. In 2005, Eco-Design was awarded silver for their design of the Nieuwoudtville Caravan Site Upgrade by the Holcim Foundation Award for Sustainable Construction in the Africa and Middle East Region. Over 900 companies from around the world entered the Holcim Awards for Sustainable Construction in 2005. The criteria were for conceptual entries, no built submissions were allowed. They were evaluated according to the following: 1. quantum change and transferability, 2. Ethical standards and social equity, 3. Ecological quality and energy conservation, 4. Economic performance and compatibility, 5. Contextual response and aesthetic impact (holcim, 2009). A prize of US\$ 50,000 was awarded to Eco-Design to develop a gatehouse, six chalets and conduct renovations to the existing ablution block at a caravan site in Nieuwoudtville, South Africa. This project aims to support the holistic development on

the Bokkeveld Plateau, known as the bulb capital of the world. Dr Irurah said the project was praised for its systematic approach to addressing the target issues of sustainable construction in a non-invasive manner that respects the context in which the project is situated. "Highly-transferable and well-considered selection of local materials and construction techniques optimize renewable energy," he said. The use of composting toilets rather than water-based sewage allows for an opportunity to do water recycling following preliminary treatment in a constructed wetland.

At the awards ceremony held in Johannesburg, South Africa in 2005 Minister of Housing, Dr Lindiwe Sisulu (Holcim: 2005), said in her keynote address that: "Sustainability was an essential part of creating the built environment of the future." This, according to Andy, is not being implemented on the ground, who claims that despite government having a green brief, their process is inhibiting. He added that NHBRC legislation is a major incumbent on green building, as they have to adhere to their standards. Sisulu added that: "Urban development and human settlements, particularly urban slums in the context of rapid population growth across the continent, were critical issues that need to be addressed to enable fundamental progress to be achieved collectively." She concluded by saying: "Meeting economic, social and environmental needs with regard to the development of the built environment is a key to sustained progress, and sharing innovative ideas is an essential component." Her conclusion is in harmony with what Andy informed the researcher was one of the major challenges facing the success of green design and building, as consultants do not work as a team, there is no synergy between them. Green building should be a closed system where all inputs and outputs are balanced and the project is not done in a piece-meal approach.

#### **5.7.5 Way forward and conclusion**

Unfortunately, challenges facing the industry in South Africa are that the local market is conservative and the market structure favours lower cost over the 'green' alternative. 'Greenwashing', Andy claimed is one of the biggest fears in the relatively new South African market, where confusion reigns over what is green and what is not. Andy's belief

was that in order to be truly green one would have to audit all their suppliers of materials and adopt 'green' practices throughout all facets of their business, which at present Andy admitted they were not able to do, but would be striving towards once they had their own offices. This is in line with the researcher's understanding of being genuinely green. Eco-design observed increasing profit margins and were doing well until the end of 2007/beginning of 2008 when the economic recession kicked in and froze lots of projects. They were forced to work at risk at the start and often received no payment. Another negative trend developing was that developers and government sometimes wanted to embrace green building, but their idealism was soon surpassed by realism and their projects ran out of steam and fast became mystical 'Dongtan' conceptual designs and nothing more.

Eco-Designs latest commission is the Mamre revitalization project which is an initiative by the City of Cape Town to promote the preservation and restoration of Mamre's rich heritage resources, while simultaneously helping to alleviate poverty and promote skills transfer. Eco Design architects were appointed by the City of Cape Town to assist the community with this project, which consists of two phases:

Phase 1: Public participation: community consultation and design workshops (Charettes) to determine the wants & needs for a small project serving the community. The community needs to express their ideas for what type of project (i.e. guest house, tea room etc.) would be of most benefit to the people of Mamre and where it would be best located. They will also need to discuss ideas for how, once built, the project would be managed.

Phase 2: A heritage building project: The city has a limited amount of funds to build a small building with the help of the community. The idea was that the project will have a strong focus on the reviving and transferring of old building techniques and skills (<http://mamrerevitalization.wordpress.com>).

The interview concluded with Andy saying that when he started out, he had to make his own paint, now there are five different paints available, similarly boron treated wood is now available in three to four varieties. The internet has served as an incredible tool for accelerating change. Computer programmes are also easily accessible nowadays. Paul Karoo uses thermal modelling. In looking at projects undertaken by Eco Design, Andy's commitment to uplifting the local community is evident in his undertaking of social upliftment projects, like the Mamre Revitalization Project. This coupled with his attention to detail and use of sustainable building materials, where possible, to ensure that the built and natural landscape merge with one another in perfect harmony, reinforce his values and vision for the ecological design of buildings in South Africa. In future Andy aims to make his practice greener once Eco Design are able to move to their own office premises. Andy added as a closing statement that green architecture has given him a niche that has set him aside in the market and given him lots of exposure, opportunities for travel and grants to attend conferences and workshops around the world. Eco-Design arguably started out the practise with genuine concerns for the environment and the future of the planet with the mitigation of climate change in mind. Making his practice become profitable was a long term goal, when starting out. However profitability and the mitigation of climate change through the use of greener building materials were considered to rank of equal importance.

## **5.8 Enviroserv**

### **5.8.1 Background to Enviroserv**

Enviroserv, whose core business is to manage, reuse and recycle waste, is the last of the case studies and provides a link between all three previously discussed cases, in that all address recycling and re-use in their business, in particular Cape Brick where it is a core feature. Holfontein was Enviroserv's first hazardous waste landfill site, which had an encapsulation facility, designed to meet internationally accepted standards for the disposal of hazardous waste and was commissioned in 1992. In 1995 the fourth and

largest cell was built, which was able to handle the entire industrial waste stream generated in Gauteng. In May 1996 EnviroServ became the first waste management company to be listed on the JSE Securities Exchange. Within six months of listing EnviroServ pushed to expand their operations outside Gauteng. Some of the acquisitions EnviroServ made include the Shnogweni landfill site in KwaZulu-Natal (1996), Waste-Tech (1997), which helped create Africa's largest private waste management company. In 2000 EnviroServ acquired 35 per cent in Chargold, a company specialising in the recovery and re-use of carbon waste (McDonald, 2009 and [www.enviroserv.co.za](http://www.enviroserv.co.za)).

EnviroServ Waste Management (Pty) Ltd today focuses on providing innovative and sustainable waste management solutions "through careful investigations into the waste sector" (Inspired Evolution Investment Management: 2010). These include integrated waste management, cleaner production, waste minimisation, process solutions as alternatives to landfill and innovative treatment and disposal options (EnviroServ: 2008). EnviroServ is now the "leading and largest provider of waste management solutions in Southern Africa" (Inspired Evolution Investment Management: 2010) and operates five of the six commercial high hazardous sites in South Africa, including Vissershok in the Western Cape, where it has a 50 per cent share<sup>23</sup>. Its activities include all aspects of the waste management value chain, including transportation, disposal and waste stream processing. "Major clients in the mining, manufacturing, chemical, oil and gas sectors include, *inter alia*, Sasol, Chevron SA, Columbus Steel, ArcelorMittal, Samancor, BHP Billiton, Impala Platinum and City of Cape Town" (EnviroServ: 2009). "The Company's technology solutions are at the forefront of the industry and currently employs in the region of 50 scientists and engineers. The management team is highly experienced and motivated and passionate about the business. The enterprise value is currently at R2, 200 million" (EnviroServ: 2009).

EnviroServ has a number of services which include the following: "Hazardous waste assessments, which are the most important due to their high risk nature, Safe

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<sup>23</sup> The other 50 per cent is owned by Waste Man, which is their biggest competitor in the Western Cape.

transportation, handling and storage of industrial and domestic refuse, Door-to-door collection of industrial and commercial waste, Container customisation for all types of waste, HAZMAT Emergency Response Services, Industrial Cleaning, including super sucking of hazardous and non-hazardous products, Landfill site development and operation, Equipment and plant hire on short or long term contracts, Beneficiation of carbon-based materials, Carbon credit projects for landfill and waste process plants, Joint ventures in beneficiation of waste, Composting, Construction and management of tailings dams for mines, Waste minimisation and recycling to Waste tracing systems” (EnviroServ: 2009).

*“EnviroServ is currently, and they are determined to remain so, the industry leader in responsible waste management and environmental stewardship. Their Environmental Policy conforms to the standards stipulated in the ISO 14001 Environmental Management Systems as well as fulfilling the requirements of the SABS. EnviroServ’s commitment is to offer services and procedures that constantly raise the standards of the Best Practical Environmental Option. This is achieved through an environmental health and safety management system that is based on international standards. The Logistics Solutions and Treatment and Disposal Solutions divisions have ISO 14001 accreditation and are committed to continuous improvement principles” (EnviroServ: 2009).*

In support of EnviroServ’s business strategy, an unrelated study was done by two Harvard professors who compared the eleven year records of large established companies that gave stakeholders in the form of customers, shareholders and employees equal priorities with those companies that always put their shareholders first. It became evident that the more stakeholder sensitive companies grew sales four times faster, created eight times as many jobs, improved the share price eightfold and experienced greater net income growth. In other words this means that being sustainable is a sound business strategy and reducing carbon footprint and mitigating climate change is at the heart of the strategy (Des Gordon, CEO EnviroServ: 2008). It is important to note here that the green agenda is foremost in this strategy, which has been emulated by EnviroServ to resounding success, which is reflected in their financial

statements, which show that profit before tax increased from R93 664 in 2007 to R114 339 in 2008, which reflects a 22 per cent profit, despite the recession hitting in early 2008.

During the interview with Linda McDonald (2009), Sales Manager of EnviroServ she revealed that profit margins increased significantly up until their last Annual Report in 2008, despite the economic downturn. Reportable revenue from assets under their management surpassed the R1 billion mark for the first time in 2007 and revenue increased by 33 per cent throughout the year with a total revenue of R1.2 billion. Des Gordon outlined the following reasons for this (Enviroserv Annual Report: 2008):

*“Enviroserv’s business mix is predominantly industrial; In the main sectors within which EnviroServ operate, namely petrochemicals, mining and manufacturing, activities remained buoyant on the back of an extended global commodities boom; Eskom’s power outages had minimal effect on EnviroServ, as their volumes were buoyed by managing legacy waste stockpiles, despite production being delayed and finally EnviroServ work mainly on process side of mining.”*

### **5.8.2 Motivation**

Linda McDonald (July: 2009), financial manager at EnviroServ, informed the researcher in an interview that they delisted from the JSE Securities Exchange in 2008, as it was bought up by ABSA Capital and they wanted to sign a large Black Economic Empowerment (BEE) deal, which they could not do whilst being listed on the Exchange. Their intention, however, is to list again on the JSE in approximately five years time. By being listed also came at a huge cost, which they considered to have been a setback in some respects, but at the same time it gained them far more publicity than they have had in the last year. This is one area where they considered themselves to be falling behind.

Linda mentioned that a marketing programme would certainly be beneficial and was something worth looking at. Awareness campaigns such as “zap it in the zibi” which was released in the 1980s and had huge success, are on their ‘to do’ list and could well be realised in the near future. As Enviroserv are a private company, they lose a lot of work to government and are also restricted by government legislation from expanding their work into certain areas.

Enviroserv is a green company through the nature of their business and they receive carbon credits for it. However, when tackling issues of being green in the office place they were found wanting. HVACs, halogen lighting and standard high embodied energy building materials were evident within the office space. When questioned on this, they shrugged it off saying that all other aspects of their business are green. This, albeit true, does not show signs of a genuine green drive stemming from management level. Sustainable travel, however, was promoted with a teleconferencing room available and air travel avoided at all costs. Biodiesel is also being investigated for use in their truck fleet. The head office in Johannesburg uses solar panels for electricity generation and this is one of the future plans for Enviroserv in the Western Cape. Enviroserv is also a firm believer in employing local people only and localizing their work as much as possible to minimize travel distance. They have depots in almost all the towns within which they work.

### **5.8.3 Intervention**

Reports have revealed that current energy consumption is running up unsustainable ecological debts. Gordon is cited as saying in *Waste Solutions* (August, 2008 edition) that: “We have to transform the way we produce and use energy. We have to place ecological imperatives at the heart of economics.” This is further supported by the United Nations development programme (UNDP) who pointed out that climate security and rising prosperity are not conflicting objectives. Enviroserv have gone a long way to achieving both of these through their Chloorkop landfill gas recovery project, registered



in April 2007 and is among the first carbon credit<sup>24</sup> projects to be signed in South Africa. Under the Kyoto Protocol, South Africa is selling carbon credits equivalent to one million tonnes of extracted greenhouse gasses over the next seven years. This project will go some way to contributing to more sustainable landfill practices and reduce greenhouse gas emissions through the capture of greenhouse gasses currently emitted into the atmosphere. Landfill gas is rich in methane (22 times more harmful to the atmosphere than CO<sub>2</sub>) and mitigating it is, therefore, one of the primary health and environmental concerns surrounding waste disposal facilities. The Chloorkop site produces 20 million Nm<sup>3</sup> of landfill gas a year which escapes into the atmosphere. The extraction and flaring of landfill gas is considered an effective and safe way to reduce the emission of greenhouse gasses and minimize odour nuisance, health risks and adverse environmental impacts. Some of the benefits of the Chloorkop project are listed below:

- Promotion of local economic development through the creation of a new market and/or strengthening the existing market in South Africa for the equipment and materials required by the project (i.e. piping and flares)
- Improved protection of the groundwater resource in the vicinity of the waste disposal facility, as the gas extraction valves will be equipped for leachate removal
- The project would be developed in accordance with the laws and regulations of South Africa, demonstrating their capabilities to the international emission trading market and promoting South Africa as a prime destination for further clean development mechanism (CDM) projects, which in turn will attract additional and sustainable foreign investment into the country
- Enviroserv is committed to assist to establish a social benefit project, which is considered to be one which intentionally and significantly benefits society through collaboration to accomplish an important social task.

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<sup>24</sup> Also referred to as Certified Emission Reductions (CERs)

South Africa is estimated to be 13<sup>th</sup> on the list of the world's largest carbon emitters. It is thus our responsibility to pay particular attention to ways and means of mitigating climate change.

As the mitigation of climate change is the hypothesis being tested in this thesis as the primary motivation for companies to go green, Enviroserv have revealed that is of huge concern to them and they are constantly seeking new ways of lessening their carbon and in so doing mitigating the impact of climate change. They have also managed to disprove the theory that going green need always require large capital overheads through their composting plant, where they compost organic waste and resell it (Resource Magazine:2008). This has proved to be a profitable venture, as is not capital intensive and there is large scale opportunity to resell it<sup>25</sup>.

#### **5.8.4 Evaluation**

Worth noting is Enviroserv's recent and most prominent award as the winner at the Greening the Future Awards in the category: "Companies and organisations with innovative environmental strategies that improve business performance". This was achieved through their hard work and dedication into the Green Pallet project, which uses waste from its client tetrapak and converts it into composite boards, which are then made into pallets. Tetrapaks are composite cartons, which are made of three separate layers – paper, aluminium and polyethylene, which would previously have been separated into three separate bins. Enviroserv Polymer solutions now recycles Tetra Pak cartons into pallets for transport purposes. This was done through the partnership between Enviroserv Polymer Solutions and Diamond facet board to 'develop commercially viable extrusion methods to combine Tetra Pak's liquid packaging board and plastic polymers into a highly durable new composite (Nel: 2008)'. Wood has always been the traditional pallet material for handling and storage of goods in South Africa and 95 per cent of all pallets for these purposes are still made from wood. Wood is

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<sup>25</sup> Similarly the recycling of tetrapaks for use as roof tiles has proved to be profitable and not very capital intensive.

now getting scarcer and becoming more expensive and cheaper wood cuts are being used the structural reliability of the pallet decreases. Recycled pallets on the other hand are made of plentiful waste stream materials, are more durable, easier to clean and are more UV-resistant. Composite pallets do not have to be heat treated for the export market, as they do not host any microbes, as wooden pallets sometimes do. The only setback presently is the price difference between wooden and composite pallets, as wood pallets start at R90 and composite pallets at R400. Enviroserv counteracted this by renting out their pallets and micro-chipping them, so they did not go missing. Enviroserv Polymer Solutions aim to increase production and market demand by 30 000 new pallets a month. This will save 680 tonnes of Tetra Pak a month<sup>26</sup> that would otherwise have gone to landfill.

Enviroserv have also made an invaluable partnership with Xerox, which is by nature an un-environmentally friendly company. This partnership, besides from recycling otherwise discarded e-waste has little benefit, but has massive spin offs for Xerox, who can now promote themselves as being 'green conscious'. The article below taken from Enviroserv outlines some of the important issues addressed through the formation of this partnership:

*"From mobile phones to printers, Xerox and Enviroserv come together to properly address the waste issues as far as old printers and imaging equipment. The growing problem of e-waste has become an alarming issue and today we see a lot of companies trying to do their part to clean the clutter, the latest of which is this one between Xerox and Enviroserv. "The main objective of this program is to help our customers who are initiating 'green practices' in their workplaces to reduce environmental waste by recycling their used machines, print cartridges and toner bottles. Xerox has a long heritage of supporting and promoting eco-friendly products and solutions and since 1991 it has successfully diverted more than 2 billion pounds of waste from landfills on a global scale, which is the equivalent of the weight carried by more than 166,000 trucks to various recycling programs*

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<sup>26</sup> This is the equivalent of 2.4 million beverage cartons

*worldwide”, said Andrew Hurt, General Manager. “We are delighted to offer this service to our customers supporting them in their own green initiatives. As a result of this, we have signed a three year agreement with Enviroserv for the recycling of used equipment imaging supplies such as print cartridges and toner bottles.” (Enviroserv: 2008)*

In quotes from the article on Food and Trees for Africa (FTFA) website, Enviroserv’s commitment to the environment is evident through their establishment of an important partnership with FTFA. Enviroserv is working with FTFA to distribute trees through the award winning Trees for Homes programme that will help with carbon offset whilst simultaneously improving the quality of life and the environment for 100 Etwatwa residents,” says Candice Smith, Enviroserv Group Marketing Co-ordinator. FTFA has been working with the Ekurhuleni Metropolitan Municipality (EMM)’s Parks Division to supply thousands of trees to improve the quality of life of the residents by adding value to their housing units, improve food security and environmental management. On 31 October 2007, Enviroserv, leaders in environmentally responsible waste management, added 100 trees to this initiative. Enviroserv has a landfill site at Holfontein and many of the employees at this site live in Etwatwa where these trees were planted. (FTFA: 2008)

FTFA provided training for the Community Based Educators (CBEs) who visited all residents who received trees to provide them assistance to plant and maintain the fruit trees and the benefits they will enjoy from having greener suburbs and the addition of the fruit in their diets. Over and above their training, the CBEs received remuneration for their efforts. “This is part of a bigger plan to provide fruit trees to residents in all wards of the municipality over the next few years and we commend Enviroserv for their contribution,” said Renier Cooper, EMM Parks Division representative. “The project involves Ekurhuleni officers and Ward Councillors of the selected wards working together to ensure that their communities are well informed about the project and its benefits and to select CBEs for each selected ward.”

### **5.8.5 Way forward and conclusion**

Enviroserv through the nature of their business have made huge strides in greening the planet, where projects such as the pallets from tetrapaks, composting and recovery of gas from landfill stand out. While they were listed on the JSE their impressive profit margins speak for themselves despite the economic downturn. However, minor areas such as using solar and renewable fuel sources could be seen as a means of improving the outlook of their offices and maintaining a green image right to the core of their business. Their business, by nature, mitigates the impacts of climate change, however, its previous listing on the Johannesburg Stock Exchange (JSE) could be viewed in a positive and negative light. This is attributed to the need to not only improve profit, but also to satisfy shareholders, which could prompt decisions that are not beneficial to the environment. On the other hand, its listing was positive, in reinforcing its market leader status through strong positive growth and rise in share prices reflected on the JSE. It could, nevertheless, be deduced that Enviroserv's primary drive was to improve profit margins, but through the green nature of their business, which served to mitigate the impacts of climate change. Future plans are for Enviroserv's truck fleet to run on biodiesel and for the company to re-list on the JSE.

This chapter set out to discuss, compare and elaborate on the case studies before discussing the interviews with the respective companies. It gave a brief prelude to each of the case studies and then moved on to the motivation and interventions looked at by the companies to mitigate climate change, where applicable, and their reasons behind it. The sustainable building sector was discussed in detail initially providing a platform for some of the case studies, where building formed an integral part of their attempts to mitigate climate change through adopting sustainable building practices on their office buildings and making use of renewable energy technology, where possible.

## CHAPTER 6

### CONCLUSION

#### 6.1 Introduction

In comparing the results of the literature study and the case studies some key similarities surface; namely, that a certain degree of scepticism was still evident in South Africa over the new 'green era' and how cost is still favoured over a green, sustainable product (McDonald, 2009). This is unfortunate, as it is becoming increasingly evident that Europe and certain states in North America are privy to huge subsidies making green technologies, like solar, more economical. Government legislation in South Africa, despite its good intentions, has proved to inhibit where it should facilitate the shift to green technologies (Horn, 2009). However, the New National Environmental Management Waste Act 2008 (Act No. 59 of 2008) is one such example, where this trend could be reversed. Although the newness of this Act means it remains to be seen whether its benefits are cast in stone or whether it merely serves as another greenwashing tool introduced by government to placate the public (The Guardian, 2009).

The mitigation of climate change is now at the forefront of the international agenda (UNCTD: 2008), as was reflected by some of the case studies discussed in this thesis and given as a key motivation behind going green. Despite the element of doubt and scepticism that still exist around going green and climate change (Singer, 2007), which, even if it holds true a renewable energy sector, cleaner atmosphere and better living environment could only be beneficial to the planet (Midgely *et al.*, 2005).

Climate change forms the core motivation, albeit not the primary motivation in many cases, and discussion point throughout this thesis. Chapter 3 looked at a global perspective of how countries in developed and developing nations dealt with climate change, while Chapter 4 looked at the interventions in place and proposed by companies to address climate change and Chapter 5 looked at the case studies and once again touched on the subject of climate change mitigation, especially where the building sector was concerned. However, despite all these chapters looking at the impacts of climate change and interventions put in place, there was only one argument which contested the very existence of climate change; namely, the great CO<sub>2</sub> Swindle, which was released by the BBC as a documentary in 2007 and debunked the whole global warming debate.

Even if global warming was disproved, around the world, new energy systems such as solar power, wind, geothermal and tidal could become a huge engine of industrial development and job creation, opening vast new economic opportunities (Centre for American Progress, 2009). If developing countries like South Africa are to 'leapfrog' the carbon intensive development path followed in the twentieth century, as previously suggested, then legislation enforcing a moratorium on coal power not equipped with carbon capture and storage (CCS) may be required to facilitate this process (Bulling-Schroter, 2009).

Few could argue that the North South debate and South Africa's prominent position in the south are one of the biggest challenges facing the nation. Should South Africa take a stance and address environmental issues first then brown issues or address them both at the same time drawing on the areas where they complement each other and avoiding the negatives? (DANIDA, 2000). Opportunities to leapfrog the industrialized nations of the north present a way forward for nations like South Africa (Stern, 2007), yet their reliance on coal as their primary fuel source could be seen as a major stumbling block towards them embracing sustainability and facilitating local companies to go green. Solar could be the answer for South Africa and other African countries, yet cost becomes an overriding factor here and the high initial overhead expenses often prove

too much for the average South African citizen, in particular the poor (Mail and Guardian, 2007).

The mitigation of climate change was used as the main factor behind many companies changing their policies and adopting a green outlook in this document, which fast gave rise to the emergence of term referred to as 'greenwashing'. This has become a useful tool for companies trying to outwardly look good in the eyes of the public, yet their real intention is anything but good (Treehugger, 2007). Tesco, the British supermarket giant, has been blamed for trying to excuse their poor environmental record by trumpeting its relatively small effort to be greener, for example its plastic bag campaign (Wiemers, 2008). Arup and its involvement in the mythical Dongtan 'eco-city' proved to be a useful example of this. Other such examples would be mining and construction companies, who are often the first to react due to the nature of their business and external pressure from markets and international governments.

In analysing the literature study, which encompassed chapters 3 to 4, three motivations behind companies going green were listed. These were namely; 1) genuine and/or ethical motivations behind the mitigation of climate change and concern over the future of the planet, being the primary hypothesis being tested in this thesis 2) cutting costs and being more profitable and 3) greenwashing. Others were looked at in the literature review, such as legislation and external auditing, but did not receive much attention in this study, as neither of them had received much attention in the South African media or literature and were not considered by the interviewees as being strong motivations at present for them to go green. The first motivation for the purposes of this study was only considered for companies who started off for the right genuine reasons, not those who may have started out for the wrong reasons, but have become green by coincidence through the nature of their business, such as Cape Brick, which started recycling bricks merely to reduce costs. Another good example of this was Wall-mart in the US, who previously paid millions of dollars to state and federal government to violate air and water pollution laws (Gunther, 2006), but through public pressure they realized they had to make the shift and today Wall-Mart, through eliminating excessive packaging, saves



\$2.4 million/year, 3800 trees and 1 million barrels of oil (Gunther, 2006). This could be considered a classic example of bad company being turned good and could pave the way for further research on this breed of companies. Greenwashing was identified as one of the most notorious mechanisms used by these companies.

Greenwashing is used by large corporations and small companies alike, which they employed to lie about or play down environmental benefits of projects to the public and prospective buyers (Oecotextiles, 2010). Debate continues today about the true intentions of the “mythical eco-city” called Dongtan (Ethical Corporation, 2009). This was the only negative motivation discussed in this thesis, although many others exist, behind companies going green and as was seen in Chapter 5 none of the case studies analysed were found to be guilty of “greenwashing.”

In the literature study, few examples of greenwashing were listed, where the most prominent was Arup and their design of the Dongtan eco-city. To date, little has happened on this project apart from a few wind turbines (Treehugger, 2009). Now the project has lapsed and a number of high rise apartment buildings have arisen being dubbed as green. Despite the failure and greenwashing the project has been associated with, the elaborate plans devised by Arup could still serve some use for future Eco-City plans (Ethical Corporation, 2007). Greenwashing can be considered as controversially applied as many companies may approach a project with right intentions and then realize it to be unfeasible for a variety of reasons and achieve little on the ground. This may have occurred with Arup, yet large companies are often too proud to admit this failure when undertaking ambitious projects.

Greenwashing was identified as a widely used tool by large corporations and small companies alike, which they employed to lie about or play down environmental benefits of projects to the public and prospective buyers (Oecotextiles, 2010). Debate continues today about the true intentions of the “mythical eco-city” called Dongtan (Ethical Corporation, 2009). This was the only negative motivation discussed in this thesis,

although many others exist, behind companies going green and as was seen in Chapter 5 none of the case studies analysed were found to be guilty of “greenwashing.”

This study set out to establish the motivations behind companies going green. Four companies were selected from different sectors, albeit two of them working with building materials. The hypothesis about mitigation of climate change was tested on these companies in their quest to go green and through this two other key motivations emerged. Other motivations were looked at, but did not have enough weight in South Africa at present and were not expanded on in detail as a result. As climate change is a hot topic today, it was given particular weight in the literature study, where government’s response to it was considered and the interventions to address it in chapters 3 and 4. The debunking of the global warming swindle and proposed actions by world powers such as the US is evidence enough that it is well supported by the global scientific community and the IPCC. The findings of this study supporting climate change and the mitigation thereof at a company level could be used as a reference point for other companies, particularly those within the building sector to become ‘greener’ and reduce their carbon footprint. It can also be deduced from this study that green is cost efficient, profitable and goes a long way to mitigating the effects of climate change, which could contribute to a cleaner, healthier planet (Our Planet, 2009). Our environment is our heritage and nature’s resources are our lifeblood, it is, therefore, our duty to protect and care for it during our time on this earth so that future generations may inherit it from us in the same state (Brundtland, 2002,).

## **6.2 Interventions Case Studies**

Some of the interventions proposed by the four case studies include: Backsberg adhering to Natures Choice stringent standards for irrigation water quality, the planting of trees for CO<sub>2</sub> sequestration. Cape Brick manufactures low embodied energy bricks, which are one fifth the embodied energy required to produce a brick from scratch. They recycle paper and adopt other energy saving methods in their offices, such as fluorescent light bulbs, but their most important intervention is their strategic position,

only a few kilometres away from demolition sites and necessary materials for recycling. Eco-Design also pride themselves on position, being within a few kilometres of work areas and access to building materials. Moreover, they audit their suppliers where possible and adopt energy saving techniques in the office, where possible. Enviroserv are currently involved in landfill gas recovery project at Chloorkop, which is viewed as a major intervention. Otherwise, composting of organic waste is listed as their most cost effective and efficient means of dealing with organic waste. Enviroserv are also investigating using biodiesel in all their cars at the moment.

Some of the challenges that the four selected case studies suffered in going green were lack of government legislation, whereby they had to adhere to unrealistic and inappropriate legislation and standards. The relative novelty of the market leading to scepticism around it, which at present is fairly conservative and its structure favours lower cost over the green alternative. Greenwashing posed a real threat to the integrity of their businesses, despite their genuine motives, with the inconsistency of the raw material size and quality in the building sector. The global economic downturn also took its toll on certain sectors, in particular the building sector, where Eco-Design struggled in 2008 in the heart of the recession.

The Green Economy Summit held in South Africa in May 2010, could provide the much needed boost companies like Eco Design require to further promote green building and ecological design in South Africa. Similarly, this would further assist to enhance the importance waste management companies like Enviroserv hold in South Africa. The summit declaration raised other issues such as the role of transport as being pertinent in the shift to a green economy in reducing its carbon footprint through cost effective interventions. These range from shifting freight from road to rail and the adoption of public transport by all South Africans. Measures such as the introduction of bicycle lanes on all of the country's major roads were also proposed. At the culmination of the conference the delegates committed themselves to ensuring that the country's growth path is resource sufficient, far less carbon intensive and more labour absorbing. It was stated that up to 300 000 green jobs could be generated over a 10 year period.

Backsberg has received numerous accolades for being carbon neutral and has gained international prominence (Back, 2009). In comparison to Spier, which was discussed in the literature study, they also aim to go carbon neutral. One area where Spier outperformed Backsberg was through its scrutiny of its suppliers to ensure that they were ethical right down the supply chain. Spier had also observed substantial profit margins over the last few years (Business Day, 2009), while Backsberg only started monitoring this last year. Backsberg, through their serious commitment to the environment and sustaining the link between nature and their farming practices, actively embrace two positive motivations for going green; namely, the first for genuine reasons and the second to mitigate climate change.

Cape Brick, which did not receive much attention in the literature study due to lack of information on the small family run business, has nevertheless done well in its sector and is in direct competition to companies like Corobrik, yet it does not receive half as much recognition as they do (Gracie: 2009). Through the very nature of their business they are green, however as mentioned earlier their initial intention was not to go green, but merely to reduce costs. In evaluating them, their sole purpose was to reduce overhead costs. Cape Brick has, nevertheless, proven that recycling can be cost effective, which could offer a solution to many other companies and go some distance to improving their public image and sparing the world's natural resources (Cape Brick: 2008). Moreover, most of the companies interviewed are green by nature and have realised increasing profit margins, except Eco Design, despite the economic downturn. This could have been attributed to a host of factors ranging from their industrial business practice mixed into the release of influential, environmentally minded documentaries and literature. It could also be seen to reflect a trend within their respective sectors. Lastly, most of the companies had gone green out of genuine concern to mitigate climate change, however it was revealed that cost reduction was their primary motivation. All pointed out that people in South Africa were slowly becoming more environmentally aware and there was an increasing availability and variety of environmentally friendly products. Despite this, there are still too many sceptical companies of the green

movement, who will not change unless forced to by legislation or all other companies are doing it and they lose their competitiveness, yet this may be some time in coming before it actually has an impact on companies in South Africa (McDonald, 2009).

Green building has gained significant prominence and this is evident in both the literature studies and the case studies. The literature studies look at the green building council(GBC) and its green star rating, LEED, retrofitting of buildings and energy efficient building materials. When interviewing Andy Horn from Eco-Design and raising these tools with him he pointed out that the flaws with some of these such as the green star rating, which has no focus on socio-economic factors and although Eco-Design adhere to their standards by default, they exceed them in respect of the socio-economic aspect. Other issues which came up in the interview with Andy and were not raised in any building literature was 'greenwashing', where Andy was quick to note that, although, he tried to audit his suppliers and ensure that their products were ethical and 'green,' it was very difficult due to the abundance of greenwashing. Conservative market structure and NHRBC legislation also emerged as being inhibiting factors to building green, which were not listed in the literature. Eco-Design, through the interview conducted and reading of literature was genuinely concerned about the impacts of climate change and the future of life on earth before starting up the practice. Cost savings and improved profit margins are still to be realised in their business, yet it is anticipated that these will occur in the future once the economy makes a full recovery from the global recession. No hint of greenwashing was evident in their business practice.

Enviroserv claim that despite the implementation of the New Waste Management Act in 2008, which was referred to in the literature study, they would have observed an increase in profit margins, as their company is an industrial business mix and the main sectors which they operate in; namely, petrochemicals, mining and manufacturing remained buoyant on the back of an extended global commodities boom, thus Enviroserv escaped the economic downturn. Enviroserv was the only listed company analysed, even though it delisted in late 2008 and its profitability over the years has been noteworthy. Some of the projects Enviroserv were involved in such as Chloorkop

landfill gas recovery, tetrapak pallets and composting are all innovative means of adopting a cradle to cradle approach to waste and despite only referring to literature on this in the website, these should be well documented and used as reference points by the national department of waste or public/private partnerships formed as a means to achieve relevant knowledge transfer. One of the most pertinent points to arise from this interview was that people were more scared about losing business and profits by 'going green' and that seeing that it could not be properly policed at the moment in South Africa they would avoid doing it at all costs until everyone else was doing it. This hit home hard, as it insinuates we are being subjected to poor quality for a better price. In so doing, we are losing touch with sustainable purchasing and ignoring 'green' and ethical products in favour of those sold by unscrupulous dealers with only half of the lifespan (African Business Journal, 2005). Enviroserv are green through the nature of their business and thus contribute positively towards mitigating climate change. They are, however, primarily concerned about the cost effectiveness of waste solutions to improve their profit margins. In summary three out of the four companies investigated appeared to be genuinely concerned about the mitigation of climate change, although cost reductions and the improvement of profit margins was generally listed as their primary motivation behind going green. Cape Brick was the only company investigated, which despite being green through the nature of their business, were not overly concerned about the impacts of climate change and the mitigation thereof.

### **6.3 Way forward**

As a way forward for each of the respective case studies, Backsberg sees biomass conversion as a new energy form which could take Backsberg off the grid. Cape Brick see the utilization and recycling of all by products, such as wood chips, when collecting aggregate from site, as a means of being greener and completing the cradle to cradle approach. Eco-Design is looking to design their own office space, which utilizes all principles they adopt in their design of other buildings. Enviroserv see biodiesel as being the new fuel source in all of their vehicles and plan to install solar panels on their office in Cape Town. As is seen here, all four companies assessed have separate agendas for their future. The future transformation of these companies cannot be predicted and could

pave the way for future research, which could offset companies such as Backsberg, which have gone green for genuine reasons, but due to external reasons or a change in management have changed their environmental policies and lost their carbon neutral status against a company like Wall-Mart, which has become green through market pressure despite being accused of contributing to air and water pollution previously.

On a final note, coal is regarded by the World Watch Report as the single greatest problem the world's climate faces given that it is both more abundant and carbon intensive than oil (World Watch Report, 2008). Its abundance in China, India and other developing countries like South Africa, is of huge concern if they are to attempt to "leapfrog" the carbon intensive economies, so often the hallmark of developed nations in the modern world (World Watch Report, 2008). Issues such as the 'Green Revolution' do not receive nearly as much prominence from the South African government, as they deserve. However, the recent 34 per cent energy price hike has triggered concern amongst the South African public (Flavin, 2007) and could be the spark that is needed for the relatively new renewable energy sector to flourish (World Watch Report, 2007). However, leading scientists around the world have come to the conclusion that carbon emissions will have to be cut by at least 50 to 80 per cent below current levels by 2050 in order to prevent potentially disastrous rates of climate change (World Watch Report, 2007). The challenge of convincing developing countries to abandon their abundant coal reserves for renewable energy could be identified as a future study and the way forward for mankind if we are sincere about reducing emissions and living in a cleaner, healthier planet and in a more sustainable manner.

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## **` ADDENDUM A**

### Case Study Questions:

#### Backsberg:

1. What initially made you decide to go green/become carbon neutral? *Addressed*
2. Have you observed many benefits since making this shift? Have sales increased? *Addressed*
3. Did it involve a large cost? *Addressed*
4. Did you experience any setbacks whilst or since making the shift? *Addressed*
5. What in your view holds other South African companies from following suit?
6. Why have you not utilised renewable energy sources eg. Solar? *Addressed*
7. What about going organic/biodynamic? *Addressed*
8. Has there been a noticeable difference in the worker's attitude towards their work since adopting an 'environmentally friendly' approach to farming? *Addressed*
9. Has there been an improvement in any of the employees' health since going carbon neutral? Has work attendance improved? Have you in fact measured the impact that going carbon neutral has had on your staff? *Addressed*
10. Where is the triple bottom line, ie. the relationship between social, economic and the environment evident in day to day business on the farm? *Addressed*
11. To what extent has Backsberg's carbon neutral stance impacted on other organisations? *Addressed, not sure*
12. Does Backsberg audit their suppliers and put pressure on them to supply them with a greener product? *Addressed*
13. What are the positive offshoots seen in their business? *Not sure*
14. To what extent has going carbon neutral had on their business? *Not addressed*
15. Backsberg is renowned for being the first carbon neutral wine farms in the Country. How many other farms have they seen change since then. Is it happening fast enough? What do they think can be done to accelerate the process? *Addressed, not sure*
16. On average how many schools visit them? In their view are people well enough educated and is there enough awareness created around the importance of going green? *Addressed*

17. Have you noticed an improvement in local/international sales as a result of going carbon neutral? *Addressed, no*
18. How do you cut back on water consumption, when your business is water intensive by nature? *Addressed*
19. What is Backsberg's best sales pitch? *Addressed*
20. What other plans does Backsberg have to reduce environmental impacts? *Addressed*
21. What is Backsberg doing to mitigate climate change? *Addressed, trees*
22. How does Backsberg rate against European counterparts? *Not sure*
23. Are your future plans for permaculture? *Addressed, already intercropping with cover crops*
24. Does Backsberg recycle broken or unused bottles? Is there scope to recycle on the farm? *Addressed, yes*
25. Are farm workers all sourced from the local community? *Addressed*
26. What form of sewage treatment is used – conventional or UV disinfection? *Not addressed*
27. Is grey water recycled on the farm? *Addressed*
28. Have other neighbouring farmers also followed suit? *Unsure*
29. Where do you feel there is still room for improvement? *Addressed*
30. Does Backsberg engage in carbon trading? *Not applicable, carbon neutral*
31. What does Backsberg do with leftovers? *Addressed, all used.*
32. Any advice for another farmer wanting to turn his farm carbon neutral? *Addressed, not sure*
33. How do you see wine farming in South Africa over the next 5, 10 and 20 years? *Not addressed*

## ADDENDUM B

### Case Study Questions:

#### Cape Brick – Recycled bricks

1. What was the initial motivation behind recycling used bricks? *Addressed*
2. Have profit margins increased over the years and has there been a notable difference since ECA and NEMA were introduced in 1989 and 1998 respectively? *Addressed, Not applicable*
3. Does the recycling of building material involve large costs? *addressed*
4. What is Cape Brick doing to mitigate carbon emissions from smelting process? *addressed*
5. Does Cape Brick plan to diversify into tiles and other building material? *addressed*
6. What is Cape Brick's best sales pitch? *Not addressed*
7. What other plans does Cape Brick have to reduce environmental impacts? *Not addressed*
8. What is Cape Brick doing to mitigate climate change, ie travel and production process? *addressed*
9. Are there other companies doing the same as Cape Brick and how do they rate?
10. Who does Cape Brick supply? *Not applicable*
11. Have other construction companies followed suit? Has their business focus had an impact on other companies? *Not addressed, not applicable*
12. Does Cape Brick adopt the same policy throughout their business, ie. recycling of paper in the office, grey water and natural lighting or energy efficient lighting, low impact HVAC or natural venting, if not why not? *addressed*
13. Are building materials from sites all sourced locally – within what radius? *Addressed, Yes, 5-10kms*
14. Does Cape Brick have or have future plans to put in place an education programme for schools/universities to educate their students on the nature of Cape Brick's business and the importance of a cradle to cradle approach? *addressed*
15. Is labour sourced locally for projects? *addressed*

16. Does Cape Brick receive carbon credits or are they involved in carbon trading?  
*Addressed, no*
17. Does Cape Brick make use of solar panels for their office buildings? If not are there plans to do so? *Addressed, not feasible*
18. Where do you feel there is still room for improvement in the management of their business and/or reduction of their carbon footprint? *addressed*
19. Does Cape Brick promote sustainable travel? Give examples – train, bus, new BRT system, showers at work etc. *Not addressed, no facilities*
20. Are they involved or provide support for any development projects in low income communities? *addressed*
21. Who does Cape Brick aspire to model in terms of modelling their business practice and why? Who do they consider to be the leaders in the construction of building materials through recycled material? *Not applicable, only Cape Brick in SA do it*
22. Where do they see themselves fitting in with conventional brick making firms? How far do they have to go or are they keeping up with global trends? If not what plans are in place to do so? *addressed*
23. How is the triple bottom line, ie. Economic, social and the environment evident their day to day business? What about RDP housing and the possible exposure they could create themselves there? *addressed*
24. To what extent does the recycling of bricks create more jobs? Are government involved or aware? This would be a huge feedback opportunity. *addressed*
25. What in your view is the biggest innovation in the construction of building materials? *Addressed, unsure*
26. Has Cape Brick noticed an increase in repeat customers and a rise in new customers over the last few years directly related to their eco-friendly bricks?  
*addressed*
27. Where do you feel there is still room for improvement? What is Cape Brick's primary objective? *addressed*
28. Does Cape Brick audit suppliers of equipment to ensure they are receiving quality locally made machinery? *Not addressed, unsure*

## **ADDENDUM C**

### Case Study Questions:

#### Enviroserv –Waste management

1. What was the initial motivation behind starting up Enviroserv? *addressed*
2. Have profit margins increased over the years and has there been a notable difference since ECA and NEMA were introduced in 1989 and 1998 respectively?  
*Addressed*
3. Does the recycling of waste involve a large cost? *Addressed*
4. What is Enviroserv doing to cut back on emissions from the recycling process and travel? *Addressed*
5. Does Enviroserv plan to diversify into all waste materials and investigate methane capturing as an alternative energy source, as is being done in Durban at the landfill site there? *Addressed, already in progress*
6. What is Enviroserv's best sales pitch? To what extent could going green be considered to be a sales pitch? *Addressed, Not applicable*
7. Are they following the current trends in Europe and/or North America and anticipating it will take off in South Africa or adopting the best practice approach?  
*Not applicable*
8. What other plans does Enviroserv have to reduce environmental impacts?  
*addressed*
9. What is Enviroserv doing to mitigate climate change, ie travel and production process? *addressed*
10. Are there other companies doing the same as Enviroserv and how do they rate?  
*addressed*
11. Enviroserv promotes recycling, why don't they get into a joint venture with the City of Cape Town and provide easy access to recycling bins in each suburb and

an awareness campaign on responsible waste management? *Addresse, Enviroserv private.*

12. Who does Enviroserv supply? *Not applicable*
13. Have other waste management companies followed suit? Has Enviroserv's business line had an impact on other companies? If so how? To what extent do they consider themselves to be leaders? Do they feel they're leading by example? Where would they like to improve? *addressed*
14. Does Enviroserv adopt the same policy throughout their business, ie. recycling of paper in the office, grey water and natural lighting or energy efficient lighting, low impact HVAC or natural venting, if not why not? *addressed*
15. Are all jobs carried out within a local area or does the job require large areas? *addressed*
16. According to your website Enviroserv educates at tertiary level and beyond – how far reaching is this and are there plans to develop it further? i.e. Advertising and marketing the importance of a cradle to cradle approach and creating awareness around this? *addressed*
17. Is labour sourced locally for projects? *addressed*
18. Does Enviroserv receive carbon credits? *addressed*
19. Does Enviroserv make use of solar panels for their office buildings? If not are there plans to do so? *addressed*
20. Does Enviroserv promote sustainable travel, ie biodiesel, methane etc..? *addressed*
21. Are they involved or provide support for any development projects in low income communities? *addressed*
22. Who does Enviroserv aspire to model and why? Who do they consider to be the leaders in the waste management and why? *Not applicable*



23. Are there other companies in SA for them to model or do they draw inspiration for overseas countries. Do they have a research and development division that works on keeping abreast with global trends and pressures? Where do they see themselves fitting in with current practice? How far do they have to go or are they keeping up with global trends? If not what plans are in place to do so? *addressed*
24. How do they incorporate the triple bottom line, i.e. economic, social and the environment into their day to day business? *addressed*
25. What in your view is the biggest innovation in the recycling and reuse of waste? *addressed*
26. Countries like Italy are introducing robots to manage waste, how far is South Africa away from this? *addressed*
27. Has Enviroserv noticed regular repeat customers and a rise in new customers over the last few years? *Not applicable*
28. Where do you feel there is still room for improvement? What is Enviroserv's primary objective? *addressed*
29. Enviroserv have registered good financial reports over the last few years? What do you attribute these to? How are sustainable development and the triple bottom line evident in their day to day business? *addressed*
30. Do these reflect that the sustainable nature of their business and can they increase profit margins . . . What evidence do they have to support this notion? *Addressed*
31. Enviroserv used to be listed on the JSE? Why has it been taken off? *addressed*
32. With the promulgation of the New Waste Management Act, do you see Enviroserv becoming even more profitable? *addressed*

## **ADDENDUM D**

Case Study Questions:

Eco-Design – Green Architects : –

1. What was the initial motivation behind adopting green architecture? *addressed*
2. Has Eco-Design observed an increasing number of contracts over the years? *addressed*
3. How does green building compare cost wise to conventional building materials and where there are huge differences how is this compensated for? *addressed*
4. Were there any challenges from doing it? *addressed*
5. What is Eco-design doing to mitigate carbon emissions from travelling? *addressed*
6. Does EcoDesign adhere to the Green Star rating? *addressed*
7. Does Eco-Design use any cement as a building material? If so, why and are there plans to reduce the amount of cement usage? *addressed*
8. How do Eco-Design promote themselves? *addressed*
9. What other plans does Eco-Design have to reduce environmental impacts? *addressed*
10. What is Eco-Design doing to mitigate climate change? *addressed*
11. How does Eco-Design rate against European counterparts? *addressed*
12. Does Eco-Design adopt on site recycling of paper, grey water and natural lighting, low impact HVAC or natural venting in their office building, if not why not? *addressed*
13. Are building materials sourced locally? Do they audit/monitor their supply chain to ensure suppliers are ethical and supply green materials? *addressed*
14. Does Eco-Design have already or have any future plans to put in place an education programme for schools/universities to educate their students on green/sustainable architecture? *Addressed*
15. Is labour sourced locally for projects? *addressed*
16. Does Eco-Design receive/buy carbon credits? *addressed*
17. Does Eco-Design make use of solar panels for their office buildings and building designs? If not are there plans to do so? *addressed*
18. Where do you feel there is still room for improvement? *addressed*

19. Does Eco-Design promote sustainable travel? *addressed*
20. Are they involved or provide support for any development projects in low income communities (i.e. RDP projects)? *addressed*
21. Who does Eco-Design aspire to model and why? Which model/building is most inspirational to them? Who do they consider to be the leaders in 'green architecture'? *addressed*
22. Where do they see themselves fitting in with current practice? How far do they have to go or are they keeping up with global trends? If not what plans are in place to do so? *addressed*
23. Who do you consider to be leaders in sustainable design in SA and why? *addressed*
24. What in your view is the biggest innovation in green architecture? What plans do they have to match these? *addressed*
25. How do you see green architecture and building in South Africa taking off in the future? *addressed*
26. Have profit *margins* increased over the years? *addressed*
27. Does Eco-Design monitor repeat and new clients? Have these been constant or increased over the years. *addressed*

## ADDENDUM E

Some species of plant rescued by Backsberg



*Babiana purpurea*

*Adenandra uniflora* (China flowers)



*Species rich Swartland Alluvium fynbos that is being conserved on Backsberg (Courtesy: Sue Winter).*

| BWI MEMBERS                   |                                      |
|-------------------------------|--------------------------------------|
| 1. Mooiplaas                  | 11. Towers                           |
| 2. Koopmanskloof              | 12. Spier                            |
| 3. Tulbagh Mountain Vineyards | 13. Black Pearl Wines                |
| 4. Montagne                   | 14. Waterkloof (False Bay Vineyards) |
| 5. Delheim                    | 15. Beaumont Wines                   |
| 6. Louisenhof Wines           | 16. Plaisir de Merle                 |
| 7. Oak Valley Wines           | 17. De Grendel                       |
| 8. Avondale                   | 18. Boschendal                       |
| 9. Hartenberg                 | 19. Paul Cluver Wines                |
| 10. Backsberg                 |                                      |
| 1st Champion: Vergelegen      |                                      |

Source: Wynboer: November 2005

## ADDENDUM F

**Table F1** Embodied energy values

| MATERIAL                    | PER EMBODIED ENERGY MJ/kg |
|-----------------------------|---------------------------|
| Kiln dried softwood<br>sawn | 3.4                       |
| Kiln dried hardwood<br>sawn | 2.0                       |
| Air dried hardwood<br>sawn  | 0.5                       |
| Hardboard                   | 24.2                      |
| Particleboard               | 8.0                       |
| MDF                         | 11.3                      |
| Plywood                     | 10.4                      |
| Glue-laminated timber       | 11.0                      |
| Laminated veneer<br>lumber  | 11.0                      |
| Plastics – general          | 90                        |
| PVC                         | 80.0                      |
| Synthetic rubber            | 110.0                     |
| Acrylic paint               | 61.5                      |

|                          |             |      |
|--------------------------|-------------|------|
| Stabilised earth         |             | 0.7  |
| Imported granite         | dimension   | 13.9 |
| Local granite            | dimension   | 5.9  |
| Gypsum plaster           |             | 2.9  |
| Plasterboard             |             | 4.4  |
| Fibre cement             |             | 4.8* |
| Cement                   |             | 5.6  |
| In situ Concrete         |             | 1.9  |
| Precast concrete         | steam-cured | 2.0  |
| Precast tilt-up concrete |             | 1.9  |
| Clay bricks              |             | 2.5  |
| Concrete blocks          |             | 1.5  |
| AAC                      |             | 3.6  |
| Glass                    |             | 12.7 |
| Aluminium                |             | 170  |
| Copper                   |             | 100  |

Galvanised steel

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Source: Lawson Buildings, Materials, Energy and the Environment (1996);

\* fibre cement figure updated from earlier version and endorsed by Dr. Lawson.